REQUEST FOR PROPOSAL

New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project (Site 1)

New Bedford, Massachusetts

CONTRACT NO. MACEC-FY25-02

FOR BID
MAY 16, 2025

Massachusetts Clean Energy Technology Center
4 Wright Street
New Bedford, MA

Request for Proposal

New Bedford Marine Commerce Terminal
Phase 3 Terminal Heavy-Lift Expansion Project (Site 1)
New Bedford, Massachusetts

Table of Contents

Attachment 1: Contract Documents

Division 00 – Procurement and Contracting Requirements

00100 Notice to Bidders
00200 Instructions to Bidders
00400 Bid Form
- Schedule of Bid Prices
- Bidder Status Identification
- Certification Pertaining to Ineligible Contractors
- Certification Pertaining to Undocumented Workers
- Non-Collusion and Tax Compliance Form
- Right-to-Know Law Certification
- OSHA Certification Requirement
- Certification of Construction Equipment Standard Compliance
- Certification of Dumping Facilities

00430 Bid Bond
00439 Bidder's Checklist
00525 Agreement
00610 Performance Bond
00614 Payment Bond
00627 AIA Pay Application
00636 Change Order
00700 General Conditions
00800 Supplementary Conditions

Division 01 – General Requirements

01 00 00 Bidding Schedule
01 11 00 Summary of Work
01 22 00 Measurement and Payment
01 71 23 Field Engineering
01 33 00 Submittal Procedures
01 32 16 Construction Progress Schedule
01 35 43 Environmental Protection
01 41 29 EPA NPDES Construction General Permit

01 45 16.13 Contractor Quality Control
01 50 00 Temporary Facilities and Controls
01 57 00 Traffic Regulations
01 60 00 Plant and Equipment
01 90 00 General Safety Requirements

Attachment 2: Technical Specifications

Division 02 – Existing Conditions

02 11 00 Clearing and Grubbing
02 11 05 Site Clearing
02 11 10 Excavation and Handling of Contaminated Material
02 20 00 Earthwork
02 22 20 Excavation, Trenching, and Backfilling for Utility Systems
02 26 00 Geosynthetics
02 41 10 Site Demolition
02 41 19 Selective Structure Demolition
02 60 50 Underground Piping
02 81 00 Transportation and Disposal of Hazardous Materials within Structures

Division 03 – Concrete

03 30 10 Cast-in-Place Concrete

Division 10 – Specialties

10 14 10 Site Signage

Division 26 – Electrical

26 56 68 Exterior Lighting – Musco

Division 31 – Earthwork

31 14 00 Earth Stripping
31 20 00 Earth Moving
31 23 19 Dewatering
31 25 00 Erosion and Sedimentation Controls
31 50 00 Excavation Support and Protection

Division 32 – Exterior Improvements

32 12 16	Asphalt Paving	
	Attachment 1	Method of Test for Bulk Specific Gravity of Aggregate Blends with Reclaimed Asphalt Pavement
32 13 13	Concrete Paving	
32 16 13	Curbs	
32 17 26	Tactile Warning Surfacing	
32 31 00	Fences and Gates	
32 31 13	Chain Link Fences and Gates	
32 39 13	Manufactured Metal Bollards	
32 92 00	Turf and Grasses	
32 93 00	Plants	

Division 33 – Utilities

33 05 26.23	Utility Identification Trace Wires
33 41 00	Storm Utility Drainage Piping
33 46 23	Modular Stormwater Storage Units
33 49 00	Storm Utility Drainage Structures

Attachment 3: American Rescue Plan Act (ARPA) Contract Addendum

Contractor's Certification

Attachment 4: Prevailing Wage Rates

Attachment 5: Contract Drawings

Drawing G-001	Cover Sheet
Drawing G-002	Drawing Index
Drawing G-003	Legend & Abbreviations
Drawing G-004	Key Map
Drawing C-001	General Notes
Drawing C-100	Overall Existing Conditions
Drawing C-101	18 & 54 Wright Street Existing Conditions
Drawing C-110	18 & 54 Wright Street Demolition and Erosion Controls
Drawing C-200	Overall Layout Plan
Drawing C-201	18 & 54 Wright Street Layout Plan
Drawing C-301	18 & 54 Wright Street Grading and Drainage Plan
Drawing C-401	18 & 54 Wright Street Contour Plan
Drawing C-501	18 & 54 Wright Street Utilities Plan
Drawing C-600	Sections Sheet 1

Drawing C-601 Sections Sheet 2
Drawing C-800 Details Sheet 1
Drawing C-801 Details Sheet 2
Drawing C-802 Details Sheet 3
Drawing CF-1 Overall Site Cut/Fill Exhibit
Drawing CF-2 Unsuitable Material Cut/Fill Exhibit

Attachment 6: Soil Management Plan (Civil & Environmental Consultants, Inc., March 2025)

Attachment 7: Stormwater Report (Civil & Environmental Consultants, Inc., April 2025)

Attachment 8: Heavy Lift Design Narrative (Civil & Environmental Consultants, Inc., March 2025)

Attachment 9: Draft Release Abatement Measure Plan/ EPA Self-Implementing Plan (Civil & Environmental Consultants, Inc., March 31, 2025)

Request for Proposal

New Bedford Marine Commerce Terminal
Phase 3 Terminal Heavy-Lift Expansion Project (Site 1)

MAY 16, 2025
Proposals Due: Not later than 12:00 PM on JUNE 10, 2025

All proposals must be submitted electronically as described in Section I. of this Request for Proposal

I. SUMMARY & GENERAL REQUIREMENTS

The Massachusetts Clean Energy Technology Center ("MassCEC" or "Owner") seeks proposals from qualified contractors ("Bidders") for Contract No. MACEC-FY25-02, New Bedford Marine Commerce Terminal: Phase 3 Terminal Heavy-Lift Expansion Project (Site 1) (the "Project"), which will take place at the New Bedford Marine Commerce Terminal located at 18 Wright Street and 54 Wright Street, New Bedford, Massachusetts ("Terminal"), which is a multi-purpose marine cargo facility and part of the Terminal expansion.

BIDDERS TAKE NOTE: MassCEC is an independent agency that is not a "political subdivision" of the Commonwealth. As such, MassCEC is not required to procure most public works construction projects, including this Project, under G.L. c. 30, s. 39M. In addition, as provided by MassCEC's enabling statute, G.L. c. 23J, ss. 9A(c) and/or 15(c), because MassCEC is funding the Project entirely from its Climatetech Investment Fund and/or Offshore Wind Industry Investment Fund, this procurement is exempt from the requirements of the Massachusetts public bidding laws, including both G.L. c. 30, s. 39M and G.L. c. 149, ss. 44 et seq.

Therefore, Bidders are advised that this Project is not being awarded as a "lowest bidder" contract under the Massachusetts public bidding laws. Pursuant to M.G.L. c. 23J, this is a "best value" procurement by which MassCEC will award the Project using the selection procedures described in Section VIII. of this Request for Proposal (RFP). Pursuant to that process, there will be no public opening of proposals. By submitting a proposal, bidders affirm (i) they understand these procurement procedures, including basis for selection, and (ii) that MassCEC will select the proposal it determines will provide the best total value for the Project and may not necessarily include the lowest price. The reference in this RFP to "Bidders" or "Bids" is for convenience only and does not connote a "lowest price" selection process.

II. SCOPE OF WORK

The Project consists of site work at the Terminal and at the recently acquired parcels of 18 Wright Street and 54 Wright Street, which all abut the Terminal and building demolition has been completed.

The Scope of Work, as described in **Attachment 1 of the RFP** and defined in the Project Specifications and Contract Drawings provided in **Attachments 2 and 5 of the RFP**, respectively, generally includes site demolition work (concrete building foundations, utilities, and structures; pavements; utility disconnections including removal of oil water separators); salvaging and/or disposal of existing fencing; soil remediation and disposal; earthwork related site filling, grading, and erosion control; installation of drainage utilities, site fencing, and erosion control including catch basin inlet protection and track out controls, and associated traffic control.

All work at the Terminal is to be performed in the summer/fall of 2025, as subsequent Terminal expansion projects will commence in early 2026.

Bidders hereby certify as part of their Bid submission that they are able to furnish labor that will work to the extent required, with all other resources and elements of labor employed or to be employed on the Work.

The "American Rescue Plan Act (ARPA) Contract Addendum," is hereby made a part of the General Conditions and is provided as **Attachment 3 to the RFP**. The Contractor shall be responsible for compliance with all requirements therein in addition to all other federal and state requirements applicable to the Project, which is funded with ARPA grants. The Contractor shall also comply with the Equal Employment Opportunity (EEO) requirements for this Project and other restrictions placed on the Work. The Contractor shall submit a signed Contractor's Certification form, which is provided in **Attachment 3 to the RFP**, with their bid for a state construction contract or state-assisted construction contract.

This Contract is subject to prevailing wage rates applicable in the Commonwealth of Massachusetts as well as all other applicable labor laws. The current Prevailing Wage Rate Schedule is provided in **Attachment 4 to the RFP**.

Each Bid must be accompanied by bid security in the amount of five percent (5%) of the value of the total Bid, in the form of (i) Cash, (ii) Cashier's or Treasurer's Check issued by a responsible bank or trust company, or (ii) a Bid Bond (a) submitted on the form included with the Bidding Documents, (b) issued by a surety company qualified to do business in the Commonwealth and satisfactory to MassCEC and (c) conditioned upon the faithful performance by the principal of the agreements contained in the Bid.

The successful Bidder shall be required to furnish a Performance Bond, and a Labor and Materials Payment Bond. Each bond shall be written with a penal sum in the amount of the Contract Price. Section 00610, Performance Bond, and Section 00614, Payment Bond, are provided in **Attachment 1 of the RFP** and shall be written by a qualified surety company licensed by the Commonwealth of Massachusetts Division of Insurance and whose name appears on United States Treasury Department Circular 570. Refer to Section 00200, Instructions for Bidders (in **Attachment 1 of the RFP**), for further information.

MassCEC reserves the right in its sole discretion to reject any or all Bids, to waive informalities, to advertise for new Bids or proceed to do the Work otherwise or take any other action as may be deemed to be in the best interests of MassCEC.

II. ABOUT MASSCEC

MassCEC is a quasi-state economic development agency dedicated to accelerating the growth of the clean energy sector across the Commonwealth to spur job creation, deliver statewide environmental benefits and to secure long-term economic growth for the people of Massachusetts. MassCEC works to increase the adoption of clean energy while driving down costs and delivering financial, environmental, and economic development benefits to energy users and utility customers across the state.

MassCEC's mission is to accelerate the clean energy and climate solution innovation that is critical to meeting the Commonwealth's climate goals, advancing Massachusetts' position as an international climate leader while growing the state's clean energy economy. MassCEC is committed to creating a diverse, equitable, and inclusive organization where everyone is welcomed, supported, respected, and valued. We are committed to incorporating principles of diversity, equity, inclusion, and environmental justice in all aspects of our work in order to promote the equitable distribution of the health and economic benefits of clean energy and support a diverse and inclusive clean energy industry. MassCEC strives to lead and innovate in equitable clean energy and climate solutions.

III. PROJECT GOALS AND DESCRIPTION

The objective of the Project is to complete expansion improvements to the Terminal site necessary for its forthcoming use as a staging area for the assembly of wind turbines, which includes heavy-lift operations and related activity.

IV. ELIGIBILITY

Qualified Contractors with demonstrated experience in successfully completing civil infrastructure projects, similar to the description set forth in the Contract Documents and Technical Specifications provided in **Attachments 1 and 2 of the RFP,** respectively.

V. ESTIMATED TIMELINE

Release Request for Proposal	May 16, 2025
Pre-bid Meeting & Site Visit (virtual)	May 22, 2025 at 10:00AM
Questions due to MassCEC	May 28, 2025 at 5:00PM
Questions answered	June 2, 2025
Bid Proposals due to MassCEC	June 10, 2025 at 12:00 PM
Contractor Down-Select *(short-list)*	June 12, 2025
Contractor Interviews *(virtual)*	June 17 & 18, 2025 (anticipated)
Notice of Award	June 23, 2025
Notice to Proceed	July 15, 2025 (anticipated)
Substantial Completion	130 days
Final Completion	14 days later

VII. HOW TO APPLY

Bidding Documents (Plans and Specifications) may be obtained electronically by contacting **BETH SCHUH** via email at **beth.schuh@foth.com**, with subject: "**NBMCT PHASE 3 IFB REQUEST: MACEC-FY25-02**" on or after **MAY 16, 2025**. All interested parties are required to be registered Planholders for this Project such that they will receive corresponding communications including, but not limited to, addenda, responses to Bidder questions, or revisions to the project Plans and Specifications.

A **non-mandatory, virtual Pre-bid Meeting** will be held by MassCEC, on **MAY 22, 2025, at 10:00 AM**. Representatives will be present to discuss the Project. When Bidders request the Bidding Documents, they will receive the Pre-bid Meeting link and be added to the Planholders list.

Bidders are encouraged to visit the site at 4 Wright Street, in New Bedford. Site visits will be offered between **MAY 28, 2025 through JUNE 4, 2025**, during normal working hours, by appointment only. To schedule a site visit, contact **BETH SCHUH via email at beth.schuh@foth.com, with subject: "NBMCT PHASE 3 SITE VISIT: MACEC-FY25-02."**

Proposals shall be submitted via email to TIM GRIFFIN at: NBMCT_OPS@MassCEC.com no later than**: JUNE 10, 2025, at 12:00 PM ("Bid Proposal Due Date").**

- Under no circumstances will MassCEC accept proposals past the Bid Proposal Due Date.
- No Bidder may withdraw its bid for a period of 30 work days after the Bid Proposal Due Date.
- See **Attachment 1**, Contract Documents, in particular, Section 00200, Instructions to Bidders.
- The Bidder shall submit the required documents/forms, as stated in Section 00439, Bidder's Checklist, as part of their formal bid (see **Attachment 1**).
- See **Attachment 2** for Technical Specifications.
- See Attachment 3 for the Contractor's Certification.
- See **Attachment 4** for the Prevailing Wage Rates for the Project.
- See **Attachment 5** for the Contract Drawings.

REFERENCE DOCUMENTS

The following reference documents contain technical data upon which the Bidder may rely:

- See **Attachment 6**: Soil Management Plan
  (Civil & Environmental Consultants, Inc., March 2025)
- See **Attachment 7**: Stormwater Report
  (Civil & Environmental Consultants, Inc., April 2025)
- See **Attachment 8**: Heavy Lift Design Narrative
  (Civil & Environmental Consultants, Inc., March 2025)
- See **Attachment 9**: Draft Release Abatement Measure Plan/EPA Self-Implementing Plan
  (Civil & Environmental Consultants, Inc., March 31, 2025)
  NOTE: **Attachment 9** is provided as a separate PDF.

VIII. SELECTION CRITERIA

As noted above, because MassCEC is funding 100% of the Project from its Climatetech Investment Fund and/or Offshore Wind Industry Investment Fund, the Project is exempt from the requirements of Massachusetts public bidding laws. MassCEC accordingly is procuring all construction services for this project pursuant to M.G.L. c. 23J, Sections 9A(c) and/or 15(c) using the selection procedures described herein, which take into account price, quality and schedule, qualifications of the Bidder and its team, and quality of plan for executing the work. MassCEC will select the Proposal that it determines provides the best overall value for the Project, even if the selected bid is not the lowest bid received. Following receipt of bids, MassCEC will evaluate the bids using the specified criteria to select a short list of Bidders for interviews. In connection with such interviews, MassCEC reserves the right to request that the shortlisted Bidders submit such additional information as MassCEC shall require in order to aid its final review and selection of proposals.

CONTRACTOR SELECTION PROCESS

MassCEC is seeking comprehensive construction services and will be evaluating qualifications, capabilities, and representative experience from the Bidders to deliver the Scope of this Project as described in Drawings and Technical Specifications. All proposals and responses must be responsive to the requirements outlined in this RFP.

A. Evaluation & Selection Criteria

Upon initial receipt of responses, MassCEC will evaluate each response for completeness and tabulate the bid prices received from the respondents. MassCEC will then create a subset, or "short list" of candidates to be interviewed based on completeness of their responses and the bid prices provided.

The following criteria, not listed in priority order, will then be used by the selection committee to evaluate proposals for the short-listed contractors. (Maximum of 100 points available.)

Criteria	Selection Criteria Category	Rating Points
1	Understanding of the Scope of Work	20
2	Qualifications & Experience	20
3	Work Plan & Schedule	15
4	Safety	10
5	Communication and Preparedness (during interview)	15
6	Bid Price	20
	Available Total Rating Points After Interviews	**100**

B. Contractor Interview

MassCEC and Foth Infrastructure & Environment, LLC (Foth) Team will interview the "short listed" Contractors. Key members from the Contractor's construction team (the "Construction Team") are expected to participate in the interview including the Principal-in-Charge, Project Manager, Project Superintendent, and/or other individuals outlined and envisioned to play key roles in the construction of the Project. The interview will be held virtually and consist of a question-and-answer format. MassCEC will complete an evaluation scoring of each proposer's interview under Evaluation & Selection Criteria and select a Contractor of the short-listed candidates.

MassCEC has provided the attached Contract Documents and Technical Specifications in a format similar to an Invitation for Bid solely for the ease of use, familiarity and convenience of potential Bidders, and references to Bids and "Bidders" throughout this RFP are solely for the Bidder's convenience.

IX. CONTACT INFORMATION FOR QUESTIONS

Bidders are encouraged to submit any requests for clarifications of the Bidding Documents, in writing, not later than **MAY 28, 2025, at 5:00 PM.** All requests shall be submitted via email to **BETH SCHUH** at **beth.schuh@foth.com,** with subject: **"NBMCT PHASE 3 IFB REQUEST: MACEC-FY25-02."** Verbal requests for clarifications or interpretations of the Bidding Documents will **not** be taken or given consideration. Responses to requests for interpretation of the Bidding Documents shall be included in Addenda, which shall become part of the Contract Documents, in accordance with the timeline indicated in this RFP.

X. GENERAL REQUEST FOR PROPOSALS CONDITIONS

NOTICE OF PUBLIC DISCLOSURE

As a public entity, MassCEC is subject to Massachusetts' Public Records Law, codified at Chapter 66 of the Massachusetts General Laws. Thus, any documentary material, data, or other information received by MassCEC from a Bidder is a public record subject to disclosure. Bidders shall not send MassCEC any confidential or sensitive information in response to this RFP. If confidential information is submitted as part of the application and not clearly marked as confidential, such information may be made publicly available by MassCEC without further notice to the Bidder.

DISCLAIMER, REJECTION OF PROPOSALS & WAIVER AUTHORITY

This RFP does not commit MassCEC to award any funds or pay any costs incurred in preparing a proposal. MassCEC reserves the right to accept or reject any or all proposals received in its sole discretion, waive minor irregularities in submittal requirements, modify the anticipated timeline, request modification of the proposals, negotiate with all qualified Bidders, cancel or modify the RFP in part or in its entirety, or change the application guidelines, when it is in its best interests.

This RFP has been posted publicly on MassCEC's web portal for the solicitation of proposals and all documents related to this procurement such as addenda and responses to Bidder questions will be posted at the same address described above. MassCEC accepts no liability and will provide no accommodation to Bidders who submit a proposal based on an out-of-date RFP document.

MassCEC reserves the right to consider as unqualified any Bidder who does not regularly and customarily perform with its own forces the primary portions of the work required by the Contract Documents.

MassCEC also reserves the right to not award the contract to any Bidder who, at the time of the award, is ineligible for such contract under the provisions of any applicable regulations issued by the Secretary of Labor, U.S. Department of Labor, or is not qualified under applicable state and local laws and regulations.

CONTRACT REQUIREMENTS

Upon MassCEC's authorization to proceed with the proposal, MassCEC and the awarded Bidder(s) will execute a contract, substantially in the form of the Agreement Between Owner and Contractor included in **Attachment 1 of the RFP,** which will set forth the respective roles and responsibilities of the parties.

The Contractor, its subcontractors and all other personnel working at the Project site will be required to comply with specific Terminal security requirements and procedures. Your attention is directed to Section 01 11 00, Summary of Work, "Section 1.6 Security," which summarizes those requirements and procedures.

ATTACHMENT 1: CONTRACT DOCUMENTS

SECTION 00200

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - INTERPRETATION OF BASIC ESTIMATED QUANTITIES

1.1 Bids will be compared based on the estimated quantities of work to be done, as shown on Section 00400, Bid Form.

A. Quantities on the Bid Form are approximate and are provided for purposes of bid comparison only. The Massachusetts Clean Energy Technology Center ("MassCEC") does not expressly or by implication agree that actual quantities will correspond therewith but reserves the right to increase or decrease the amount of any class or portion of the Work, as may be deemed necessary or expedient by MassCEC.

1.2 Bidders shall submit their Bids upon the following express condition, which shall apply to and become part of every Bid received.

A. An increase or decrease in the estimated quantity for any item shall not be regarded as cause for an increase or decrease in the applicable Contract Price, nor in the time allowed for the completion of the Work, except as may otherwise be provided in the Contract Documents.

B. If any item of the Work or the total Contract Price is let on the basis of a lump sum, Bidders by submitting a bid are assumed to have obtained, and will be responsible for, the data upon which the Bidders base their lump sum Bids. **The Bidders shall not be entitled to any additional compensation for lump sum items where the quantities of work actually performed to fulfill the Contract and complete the Work are different from estimated quantities.**

ARTICLE 2 - EXAMINATION OF BIDDING DOCUMENTS AND SITE OF WORK

2.1 Before submitting a Bid, each prospective Bidder shall do the following:

A. Examine the Bidding Documents thoroughly.

B. Visit and inspect the site to become familiar with observable conditions that may in any manner affect cost, progress, or performance of the Work. Bidders shall satisfy themselves as to the condition under which the work is to be performed and gain complete knowledge of the scope of the work. No allowances shall subsequently be made for any extra expense incurred by a Bidder due to failure to make such examination and to include the required materials and labor in its Bid. Bidders shall be responsible for having examined the premises before submitting the Bid for the work and to have knowledge as to the existing conditions under which the work is to be accomplished.

C. Examine all reference documents provided as Attachments to the Request for Proposal (RFP).

D. Familiarize themselves with Federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress, or performance of the Work.

E. Study and correlate information thus determined with the Bidding Documents.

2.2 A **non-mandatory, virtual** Pre-bid Meeting will be held by MassCEC at the date and time specified in the RFP.

2.3 In addition to visiting the site for the purposes specified above, Bidders shall visit the site to ascertain pertinent local conditions readily determined by inspection and inquiry, such as the location, accessibility, traffic conditions and general character of the site, labor conditions, the character and extent of existing work within or adjacent thereto, and any other work being performed.

2.4 Statements as to the condition under which the Work is to be performed, including Plans, surveys, measurements, dimensions, calculations, estimates, borings, etc., are made solely to furnish a basis for comparison of bids, and MassCEC does not guarantee or represent that they are correct. The Bidders must satisfy themselves by their own investigation and research regarding all conditions affecting the Work to be done and labor and material needed and make its bid in sole reliance thereon. Bidders must familiarize themselves with the location and site of the Work. All necessary information shall be verified in the field before the fabrication of new products/material. No claim for extra cost will be allowed by MassCEC because of the successful Bidder's unfamiliarity with site conditions.

2.5 By submitting a Bid, each Bidder represents that they have complied with every requirement of this Article 2 and that the Bidding Documents are sufficient in scope and detail to indicate and convey an understanding of all terms and conditions for performance of the Work at the prices contained in their Bids.

ARTICLE 3 - <NOT USED>

ARTICLE 4 - PREPARATION OF BIDS

4.1 Bid Prices

A. Bidders shall submit their Bids on Section 00400, Bid Form. The Bid Form with the Schedule of Bid Prices, the Bid Guaranty, the forms specified in the Bid Form, certification, and documents constitute the Bid.

1. All blank spaces for Bid prices in the Schedule of Bid Prices shall be filled in with a unit price or a lump sum as applicable to the item.

2. The total amount of the Bid shall be obtained by adding the dollar amounts of the individual Bid items as shown in the Schedule of Bid Prices.

B. All words and figures shall be in black or blue ink or be type-written. Bid prices of each item in the Schedule of Bid Prices shall be stated in written words and numbers.

1. In case of conflict between written words and numbers, the written words shall govern.

2. In the event that there is an error in the computed totals based upon the unit prices and estimated quantities, the unit prices shall govern.

3. If erasures or changes appear in the Bid Form or the Schedule of Bid Prices; each erasure or change shall be initialed and dated by the individual signing the Bid Form.

C. The price for any item, unless otherwise noted or specified, shall include full compensation for all products/materials equipment, tools, labor, testing and incidental work necessary to complete the item to the satisfaction of the Engineer. Prices, without exception, shall be net, not subject to discount, and shall include all royalties and costs arising from patents, trademarks and copyrights in any way involved in the Work.

D. The Schedule of Bid Prices, which is included in the Bid Form, will be used for the indicating of the Bid price information specified above.

4.2 Non-Collusion

A. Bidders shall certify that to the Bidder's best knowledge, they have not, either directly or indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free and competitive bidding in connection with the Bid.

4.3 Addenda

A. Bidders shall acknowledge receipt of Addenda by writing in the numbers and date of the Addenda received in the Bid Form. Failure to acknowledge receipt of Addenda shall render a Bid non-responsive.

4.4 Signatures

A. Bids shall be signed by electronic signature, as applicable, in the proper place provided as follows.

1. If the Bid is made by an individual, that person's name and mailing address shall be stated.

2. If the Bid is made by a firm, partnership, limited liability company or corporation it shall be signed by a person having such legal authority from such firm, partnership or corporation and the person so signing the Bid shall give their own name and title, if any, in addition to the name and address of the firm, partnership or corporation. If the Bid is made by a firm or partnership, the names and addresses of the individual members shall be given.

3. If the Bid is made by a firm, partnership, limited liability company or corporation, the name of the state under the laws of which the business entity was chartered or organized, and the names and titles of the president, treasurer and secretary or clerk of the corporation shall be given.

4. If the Bid is made by two or more individuals, partnerships, limited liability companies or corporations, or any combination thereof, each party joining to make the Bid shall submit, attach to, and make a part of the Bid, information and signatures in compliance with the foregoing provisions applicable to an individual, firm, partnership or corporation. In addition, if any members of the joint venture are a corporation, an attested copy of the vote of the corporation authorizing such joint venture shall be attached to the Bid.

4.5 Bidder's Checklist

A. Bidders shall complete Section 00439, Bidder's Checklist, and submit it with their Bid.

ARTICLE 5 - DELIVERY OF BIDS

5.1 Prior to the deadline set for receiving Bids, Bidders shall submit their Bids on the Bid Form provided with the Bidding Documents. Bidders shall submit their Bid Form, Bid Guaranty and all other documents required for submission to **TIM GRIFFIN, Terminal Director, via email at: NBMCT_OPS@MassCEC.com**, on or before the date and time as specified in the RFP. Bids received after the stated time for receipt of Bids will not be accepted by MassCEC and will be returned to the Bidder unopened.

ARTICLE 6 - BID GUARANTY REQUIRED

6.1 In order to ensure the faithful fulfillment of its term, each Bid shall be accompanied by a Bid Guaranty. The Bid Guaranty shall be in the amount stated in the RFP on the form specified therein; if submitting a Bid Bond, it shall be of an acceptable form issued by a surety or insurance company authorized to do business in the Commonwealth of Massachusetts and satisfactory to MassCEC.

ARTICLE 7 - WITHDRAWAL OF BIDS

7.1 A Bidder may withdraw its Bid provided the request is in writing and is in the hands of MassCEC prior to the deadline for receipt of Bids.

ARTICLE 8 – NO PUBLIC OPENING OF BIDS

8.1 Bids will not be publicly opened. MassCEC will review and evaluate Bids according to the criteria and timelines set forth as provided in the RFP.

ARTICLE 9 - REJECTION OF BIDS

9.1 Bids that are incomplete, conditional or obscure, or contain additions/deletions not called for, erasures, alterations or irregularities of any kind or in which errors occur, or that contain abnormally high or abnormally low prices for any class or item of work may be rejected.

9.2 More than one Bid from the same Bidder, whether or not the same name or different names appear on the signature page, will not be considered. Reasonable proof for believing that a Bidder is interested in more than one Bid for the Work contemplated will cause the rejection of all Bids made by the Bidder directly or indirectly.

9.3 Any or all Bids may be rejected if there is reason for believing that collusion exists among Bidders.

9.4 Bidders are advised that the Bid Form's Schedule of Bid Prices shall include a Bid price for each of the items listed in the Schedule of Bid Prices. The omission of a Bid price for any of the items is cause for rejection of all Bid prices in the Bid and the Bid itself.

9.5 No contract will be awarded except to Bidders capable of performing the class of work contemplated. Before the award of the Contract, any Bidder may be required by MassCEC to submit information in writing, in such form as MassCEC may require, showing that the Bidder has the skill, ability and integrity necessary to the faithful performance of the Work, and that the Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

ARTICLE 10 - DISQUALIFICATION OF BIDDERS

10.1 Bidders whose Bids have been rejected because of evidence of collusion will not be considered in future Bids for the same work and such Bidders may be disqualified from bidding on future work.

ARTICLE 11 - MATERIAL GUARANTY

11.1 Bidders may be required to furnish, at no additional cost to MassCEC, a complete statement of the origin, composition and manufacture of any or all products/materials

proposed to be used in the construction of the Work, together with samples that may be subject to testing as determined by MassCEC to determine the quality and fitness of the products/materials.

ARTICLE 12 - CONSIDERATION OF BIDS

12.1 MassCEC reserves the right to reject any or all Bids, to waive informalities, to advertise for new Bids, or proceed to do the Work as may be deemed to be in the best interests of MassCEC.

ARTICLE 13 - AWARD OF CONTRACT

13.1 Subject to the reservations set forth in these Instructions to Bidders and applicable law, MassCEC shall award the Contract to the Bidder whose proposal MassCEC deems provides the best overall value for the Project – based on the criteria described in the RFP. Following the receipt of Bids, MassCEC will first identify and select a short list of Bidders to be interviewed by MassCEC and its Project Team. In connection with such interviews, MassCEC reserves the right to request that the shortlisted Bidders submit such additional information as MassCEC shall require in order to evaluate such Bids. After completion of the interview process, MassCEC will finalize its evaluations of the shortlisted Bidders, in accordance with the procedures described in the RFP, and select one proposal for Contract award.

13.2 The successful Bidder will be notified in writing that their Bid has been accepted and that the Contract has been awarded.

13.3 The award of the Contract is predicated upon the availability of funds for the Project. The Contract will not be awarded if funds are not available to MassCEC for the Project.

13.4 MassCEC shall issue its Notice of Award of the Contract within 14 days after the completion of all interviews.

ARTICLE 14 - CANCELLATION OF AWARD

14.1 MassCEC reserves the right, to be exercised in its sole discretion, to cancel the award of the Contract at any time before the execution of the said Contract by all parties thereto. In the event that MassCEC exercises this right, it shall have no liability for any costs or damages incurred by any Bidder and alleged to arise out of or related to such cancellation.

ARTICLE 15 - RETURN OF BID GUARANTY

15.1 The Bid Guaranty in the form specified in Article 6 will be returned within 7 calendar days following the deadline for submission of Bids, except for the Bid Guaranty of any Bidders “shortlisted” by MassCEC or, as the case may be, the single Bidder MassCEC has selected for award of the Contract.

15.2 The Bid Guaranties of any shortlisted Bidders or (as the case may be) of the Bidder MassCEC selects for award will be retained by MassCEC until execution of the Contract.

15.3 If after 90 days from the opening of the Bids the Contract is not awarded by MassCEC, any or all of the shortlisted Bidders (if applicable) may request in writing that their Bid Guaranty be returned. Bidders whose Bid Guaranties are returned will not be considered for the awarding of the Contract.

ARTICLE 16 - PAYMENT AND PERFORMANCE BONDS REQUIRED

16.1 The successful Bidder shall provide a Performance Bond with a penal sum in the full amount of the Contract Price.

16.2 The successful Bidder shall provide a Labor and Materials Payment Bond with a penal sum in the full amount of the Contract Price.

A. The Labor and Materials Payment Bond shall remain in force until the validity of all claims is determined and if valid, are paid by the successful Bidder or its surety.

16.3 The name of the agency or agent writing these bonds shall be identified with or on the bond.

A. The bonds shall be written on a form substantially similar to the form enclosed with the RFP, or otherwise acceptable to MassCEC in its sole discretion, and furnished by a surety authorized to do business in the Commonwealth of Massachusetts.

B. All modifications, extensions of time, extra work and other changes authorized under the Contract Documents may be made without obtaining the consent of the surety.

ARTICLE 17 – EXECUTION OF THE CONTRACT

17.1 The successful Bidder shall execute and deliver the Contract and furnish the required Payment and Performance Bonds, and applicable Certificates of Liability Insurance to MassCEC within 7 calendar days after the Notice of Award is issued.

17.2 The Contract shall be in writing and shall be executed in the number of copies required by MassCEC.

17.3 One fully executed copy of the Contract will be delivered to the Contractor.

ARTICLE 18 – FAILURE TO EXECUTE CONTRACT

18.1 Should the successful Bidder fail to execute the Contract and furnish Payment and Performance Bonds and Certificates of Liability Insurance within the time stipulated,

MassCEC may, at its option, determine that the Bidder has abandoned the Contract and thereupon the Notice of Award shall be null and void and the Bid Guaranty accompanying the Bid will be retained and collected by MassCEC not as a penalty but as liquidated damages to compensate MassCEC for all additional costs and damages incurred by MassCEC due to the failure of the Bidder to execute the Contract as required by the Bidding Documents.

ARTICLE 19 - INTERPRETATION OF BIDDING DOCUMENTS

19.1 Bidders shall submit requests for interpretation and clarification of the Bidding Documents as specified in the RFP.

19.2 Obvious discrepancies in Bidding Documents that are not addressed by a Bidder in accordance with the above procedure will be construed against the successful Bidder should a dispute arise.

19.3 Responses to requests for interpretation will be included in addenda and will be issued electronically to all registered Planholders. All addenda, so issued, will become part of the Bidding Documents.

ARTICLE 20 - MASSACHUSETTS SALES AND USE TAX LAW OF 1967

20.1 The attention of the Bidders is directed to the Massachusetts Sales Tax, Chapter 64H, Section 6 and the Massachusetts Use Tax, Chapter 64I, Section 7, which states that these taxes are not applicable to the sales of construction materials and supplies incorporated, consumed, employed or expended in construction projects of the Commonwealth, any political subdivision thereof or any of their respective agencies, including MassCEC. This exemption is also applicable to rental charges for construction vehicles, equipment, and machinery rented, specifically for use on the site of MassCEC's construction projects. Bidders are directed to exclude any allowance for Sales or Use Tax from their Bid Form as said tax would relate to the foregoing specific categories.

ARTICLE 21 – EQUAL EMPLOYMENT OPPORTUNITY

21.1 Bidders shall comply with all Equal Employment Opportunity requirements of the Contract Documents.

ARTICLE 22 – NOT USED

ARTICLE 23 - CERTIFICATION PERTAINING TO INELIGIBLE CONTRACTORS

23.1 Bidders are advised that the Certification Pertaining to Ineligible Contractors, included in the Bid Form, must be completed in its entirety and submitted with the Bid.

23.2 Failure to comply fully and submit the required certification may render the Bid non-responsive.

ARTICLE 24 - BIDDER STATUS IDENTIFICATION

24.1 The Bidder's attention is directed to the Bid Form and information to be furnished regarding status identification (Corporation, Partnership, Individual, Individual Doing Business Under a Firm Name and Joint Venture).

24.2 Bidders are advised that the applicable section regarding status identification shall be complete in its entirety.

24.3 Failure to comply fully and submit the required status identification information may render the Bid non-responsive.

ARTICLE 25 - NON-COLLUSION AFFIDAVIT

25.1 Bidders are advised that the Non-Collusion Affidavit included in the Bid Form shall be completed in its entirety and submitted with the Bid.

25.2 Failure to comply fully and submit the required affidavit may render the Bid non-responsive.

ARTICLE 26 - RIGHT-TO-KNOW LAW CERTIFICATION

26.1 Bidders are advised that the Right-to-Know Law Certification included in the Bid Form shall be completed in its entirety and submitted with the Bid.

26.2 Failure to comply fully and submit the required certification may render the Bid non-responsive.

ARTICLE 27 - CERTIFICATION OF DUMPING FACILITIES

27.1 Bidders are advised that the Certification of Dumping Facilities included in the Bid Form shall be completed in its entirety and submitted with the Bid.

27.2 Failure to comply fully and submit the required certification may render the Bid non-responsive.

ARTICLE 28 – ARPA COMPLIANCE

28.1 Bidders also should note that funding for this Project contains certain federal funding made available to MassCEC through the American Rescue Plan Act of 2021 (ARPA). Your attention is directed to the “ARPA Contract Addendum” made part of the Contract forms, with which the selected Bidder must comply as part of the Contract. The Contractor shall submit a signed Contractor’s Certification form, which is provided in **Attachment 3 to the RFP,** with their bid for a state construction contract or state-assisted construction contract.

ARTICLE 29 - INFORMATION TO BE PROVIDED BY BIDDERS

29.1 Along with their Bids, all Bidders shall submit to MassCEC a list of references. The list of references shall include the following:

A. Business References

1. Submit three (3) business references. The business references shall include the following information:
   a. Name
   b. Title
   c. Company name
   d. Company address
   e. Telephone number
   f. Relationship to Bidder

B. Project References and Project Contacts

1. Submit three (3) project references with their respective project contacts. The projects shall have been completed within the last five (5) years and shall have been of a similar type of work, scope and construction contract dollar value. The contacts shall have been involved in the project as part of the Owner's project team and have knowledge of the overall project.
   a. The project references shall include the following information:
      i. Name of Owner
      ii. Address of Owner
      iii. Name of project
      iv. Address of project
      v. Type of project
      vi. Construction contract dollar value
      vii. Start and end dates of the Work
      viii. Summary of change orders (number and total change in project cost), for each contract and a brief explanation of the basis of each change order that resulted in a change of 1% or greater in the Total Contract Price for the project.

   b. The project contacts shall include the following information:
      i. Name of contact
      ii. Title
      iii. Project responsibility
      iv. Address of contact
      v. Telephone number

C. Qualifications and Experience

1. Provide written references for at least two (2) earthwork, soil remediation and disposal, sitework, grading and drainage projects completed in the past (5) years similar in size and scope to this Project.

2. Provide written documentation regarding your company's environmental compliance on previous projects. Provide a summary of fines for violation of environmental permit conditions, and/or commendations for exceeding permit conditions.

3. Provide written documentation regarding your company's Health and Safety program, and your company's EMR index for the past five (5) years. Provide a summary of OSHA recordable incidences.

4. Provide documentation regarding your company's management, labor resources and equipment/fleet capabilities. Identify the specific resources that will be dedicated to this project, and their specific experience.

5. Provide a narrative of your implementation plan to comply with the project schedule. Describe your planning efforts for contingencies.

6. Bidders must clearly demonstrate within their proposal the capability to successfully complete all technical aspects of the Work.

7. Provide any additional information regarding your company's resources and capabilities which are pertinent to this solicitation.

END OF SECTION

SECTION 00400

BID FORM

Note: This Bid Form must be submitted (along with Section 00439, Bidder's Checklist) as part of Bidder's proposal.

BIDDER'S COMPANY NAME: _____

CONTRACT NO.: _____

The undersigned Bidder hereby declares that it has carefully examined the Bidding Documents and the sites upon which the Project Work is to be performed.

The undersigned proposes to furnish all labor, products/materials, testing and equipment required for Massachusetts Clean Energy Technology Center ("MassCEC") Contract No. MACEC-FY25-02, New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project (Site 1), for MassCEC, in accordance with the Bidding Documents for (as applicable) the unit price, lump sum and allowance prices specified in the Schedule of Bid Prices, subject to additions and deductions according to the terms of the Bidding Documents.

Accompanying this Bid Form is a Bid Guaranty in the amount of five percent (5%) of the total Bid Price that shall become the property of MassCEC if the undersigned fails to execute the Contract following receipt of MassCEC's Notice of Award and to furnish such bonds, certificates and other documents as may be required by the Bidding Documents.

The undersigned also hereby declares that it is the only Bidder interested in this Bid; that it is made without any connection with any other Bidder making any Bid for the same Work; that no person acting for, or employed by, MassCEC is directly or indirectly interested in this Bid, or in any contract which may be made under it, or in expected profits to arise therefrom; and it is made without directly or indirectly influencing or attempting to influence any other person or corporation to Bid or to refrain from bidding or to influence the Bid of any other person or corporation and that this Bid is made in good faith, without collusion or connection with any person bidding for the same work; and that this Bid is made with distinct reference and relation to the Bidding Documents prepared for this project and herein mentioned. The undersigned declares that in regard to the conditions affecting the work to be done and the labor and materials to be provided, this Bid is based solely on its own investigation and research and not in reliance upon any plans, surveys, measurements, dimensions, calculations, estimates or representations of any employee, officer, or agent of the MassCEC.

If the Bidder is a foreign corporation, it agrees, in case this Bid is accepted, to comply with the applicable provisions of Massachusetts General Laws, Chapter 156D, before the time for execution of the Contract occurs.

The undersigned Bidder proposes and agrees that within 7 days of receiving MassCEC's Notice of Award, the Bidder shall execute the Contract and furnish a Performance Bond and Payment

Bond each with a penal sum in the full amount of the Contract Price, substantially similar to the forms of bonds included in the Bidding Documents.

The undersigned agrees to commence Work within 7 days from the date of the mailing of the executed Contract to the Contractor unless otherwise directed in writing by MassCEC; and it shall complete the entire Work, fully and acceptably, in accordance with Section 00525, Agreement.

The undersigned covenants that it has not employed or retained any company or person (other than a full-time bona fide employee working for the Contractor) to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person (other than such an employee) any gift, fee, contribution, percentage, or brokerage fee contingent upon or resulting from the award of this Contract.

The Bidder warrants, represents and agrees that during the time this Contract is in effect, neither it nor any affiliated company, as hereinafter defined, shall participate in or cooperate with an international boycott, as defined in Section 999 (b) (3) and (4) of the Internal Revenue Code of 1954, as amended, or engages in conduct declared to be unlawful by Section 2 of Chapter 151E, Massachusetts General Laws. If there shall be a breach in the warranty representation and agreement contained in this paragraph, then without limiting such other rights as it may have, MassCEC shall be entitled to rescind this Contract. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Bidder or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the Bidder, or which directly or indirectly owns at least 51% of the ownership interest of the Bidder.

This Bid includes the following ADDENDA:

_____ Date: _____

_____ Date: _____

(Bidder shall list additional ADDENDA by number and date, as necessary.)

The TOTAL ESTIMATED BASE BID PRICE based upon the Schedule of Base Bid Prices is:

_____ Dollars

(Total Amount of Base Bid in Words)

$ _____

(Total Amount of Base Bid in Figures)

_____

(Name and Address of Bidder)

USE BLACK INK OR TYPEWRITER TO COMPLETE BID FORM, THE SCHEDULE OF BID PRICES, AFFIDAVIT, AND CERTIFICATIONS.

SECTION 00400

SCHEDULE OF BID PRICES

NEW BEDFORD MARINE COMMERCE TERMINAL

PHASE 3 TERMINAL HEAVY-LIFT EXPANSION PROJECT (SITE 1)

Bid Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Price
	SECTION 01 - GENERAL				
1	Mobilizatization and Demobilization	1	LS		
2	Traffic Control	1	LS		
	SECTION 02 - SOIL REMEDIATION / DISPOSAL				
3	Disposal of Unsuitable Soil (Environmental PCBs > 25 ppm)	260	TON		
4	Disposal of Unsuitable Soil (Environmental PCBs >1 ppm and <25 ppm)	820	TON		
5	Disposal of Unsuitable Soil (Environmental PCBs <1 ppm)	7,200	TON		
6	Disposal of Miscellaneous Contaminated Items	1	LS		
	SECTION 03 - SITE DEMOLITION				
7	Erosion Control - Inlet Protection (silt socks)	8	EA		
8	Erosion Control - Silt Fence	1500	LF		
9	Erosion Control - Trackout Control Pad (stabilized construction entrance)	2	EA		
10	Tree Protection	3	EA		
11	Salvage Chain Link Fence, 6 ft (black vinyl salvaged reuse)	240	LF		
12	Salvage Chain Link Fence, 6 ft (galvanized salvaged for construction fencing)	400	LF		
13	Removal of Asphalt Pavement	2,100	SY		
14	Removal of Concrete Pads	1	LS		
15	Building Foundation & Footing Removal	1	LS		
16	Removal of Curb	600	LF		
17	Removal of Trees	1	LS		
18	Removal of Water Line	250	LF		
19	Removal of Abandoned Sewer Manhole	1	EA		
20	Removal of Sewer Pipe	600	LF		
21	Removal of Drainage Structure	3	EA		
22	Removal of Drainage Pipe	100	LF		
23	Excavation and Grading	5,100	CY		

Bid Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Price
	SECTION 04 - SITE LAYOUT AND MATERIALS				
24	Heavy-Lift Section - Dense Graded Aggregate (furnish and place)	10,200	TON		
25	Infiltration Trench Aggregate - 1-1/2" washed crushed stone (furnish and place)	100	TON		
26	Geogrid - Tensar Interax NXF (furnish and place)	11,000	SY		
27	Geotextile – Tensar Interax NXF Filtergrid (furnish and place)	11,000	SY		
28	Geotextile - Mirafi 140 N (furnish and place)	100	SY		
29	Preparation of Subgrade	11,000	SY		
30	Timber Border (12"x10" pressure-treated pine timbers, painted yellow)	500	LF		
31	Chain Link Fence, 6 ft - Salvaged Black Vinyl Coated	240	LF		
32	Chain Link Fence, 6 ft - New Black Vinyl Coated	95	LF		
33	Chain Link Fence, 6 ft - Temporary Construction	500	LF		
34	Post-Construction Site Access	1	LS		
	SECTION 05 - STORMWATER DRAINAGE IMPROVEMENTS				
35	Ferguson Waterworks, R-Tank 2.0 Stormwater Chambers (HD Heavy Duty)	340	EA		
36	Ferguson Waterworks, R-Tank 1.5 Stormwater Chambers (HD Heavy Duty)	430	EA		
37	Stormceptor Water Quality Units (Contech-STC900)	4	EA		
38	Stormwater Backwater Valve (NAPCO 30" in-line)	1	EA		
39	Stormwater Outlet Control Structure (special 48" precast concrete)	2	EA		
40	Stormwater Drain Manhole (48" precast concrete)	1	EA		
41	Stormwater System HDPE Piping (ADS N-12 Dual Wall varying sizes)	450	LF		
42	Stormwater Landscape Drain (ADS Nyloplast)	8	EA		
	SECTION 06 - ELECTRICAL UTILITIES				
43	Conduit, Schedule 80 PVC (2.5-inch direct buried duct bank)	1000	LF		
44	Conduit, Schedule 80 PVC (3.0-inch direct buried duct bank)	1000	LF		
	SECTION 07 - LANDSCAPING				
45	Surface Restoration - Loam and Hydroseed	8,900	SF		
46	Inlet Protection - Silt Sacks (on-site)	8	EA		
	SECTION 08 - OFF-SITE IMPROVEMENTS				
47	Sewer Drain Disconnections	5	EA		
48	Domestic Water Disconnections	2	EA		
49	Storm Drain Connection	1	EA		
50	Stormwater RCP Piping (30" Dia. Class V)	25	LF		
51	HMA Pavement Restoration	1,700	SY		
52	Cement Concrete Sidewalk	340	SY		
53	Curb Replacement (Type VA1 vertical curb straight)	50	LF		
	TOTAL BASE BID PRICE (Items 1 through 53)				

Bid Schedule Notes:
(1) Identified quantities are estimates for comparison purposes only. Actual quantities will be determined in accordance with Section 01 22 00, Measurement and Payment. All volumes based on as constructed and completed quantities.
(2) Insert Unit Price for additive total of material price and labor costs columns.

The Bidder agrees that it shall be a condition of its Bid, and shall be made a condition of each subcontract entered into pursuant to the Bid, that the Bidder and any of its subcontractors shall not require any laborer or mechanic employed in performance of the Work to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to its health or safety, as determined under construction safety and health standards (Title 29, Code of Federal Regulations, Part 1518, published in the Federal Register on April 17, 1971) promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act, (83 Stat. 96).

The undersigned hereby certifies that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

The Bidder certifies herein, under penalty of perjury, that the information contained within its bid is accurate and complete.

Full name and address of the individual or concern submitting this Bid:

Date: _____ , 20 _____

Name of Bidder: _____

Signed: _____

Title: _____

Address: _____

NOTICE: The Bid Form should be signed in ink by a person having proper legal authority, and the person's title should be given, such as "owner" in the case of an individual, "partner" in the case of a general partnership, "president," "treasurer" or other authorized officer in the case of a Corporation.

NOTE: BIDDER MUST SET FORTH ACCURATE AND COMPLETE INFORMATION AS REQUIRED BY THIS SOLICITATION. FAILURE TO DO SO MAY RENDER THE OFFER NON-RESPONSIVE OR UNACCEPTABLE.

BIDDER STATUS IDENTIFICATION

NOTE: IF THE BIDDER IS A CORPORATION, INDICATE STATE OF INCORPORATION; IF A PARTNERSHIP, GIVE FULL NAMES AND ADDRESSES OF ALL PARTNERS; IF AN INDIVIDUAL, GIVE RESIDENTIAL ADDRESS IF DIFFERENT FROM BUSINESS ADDRESS; AND IF JOINT VENTURES, GIVE NAMES AND ADDRESSES OF ALL FIRMS OF THE JOINT VENTURE.

If a CORPORATION:

Incorporated in what State: _____

President: _____

Treasurer: _____

Secretary: _____

If a PARTNERSHIP (Name all Partners):

Name of Partner: _____

Residence: _____

Name of Partner: _____

Residence: _____

If an INDIVIDUAL:

Name: _____

Residence: _____

If an INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME:

Name of Firm: _____

Name of Individual: _____

Business Address: _____

Residence: _____

If a JOINT VENTURE:

Name of Venture: _____

Business Address: _____

Name of Firm or Corporation: _____

Address: _____

Name of Firm or Corporation: _____

Address: _____

Name of Firm or Corporation: _____

Address: _____

Name of Firm or Corporation: _____

Address: _____

If any of the joint ventures is a corporation, a copy of the vote of the corporation authorizing the joint venture should be attached hereto.

The proposed Surety on the bond to be given is:

Name: _____

Home office Address: _____

Massachusetts Address (If Different): _____

CERTIFICATION PERTAINING TO INELIGIBLE CONTRACTORS

Date: _____ , 20 _____

A. The _____
(Name and Address of Bidder)

hereby certifies that it is not included on the Commonwealth of Massachusetts - EOAF/DCPO - List of Debarred or Suspended Contractors, the Concerns on Debarment List from the Massachusetts Attorney General's Fair Labor and Business Practices Division, and is not subject to debarment or proposed debarment notice from any federal agency or official.

_____
(Signature of Authorized Representative of Bidder)

_____
(Title)

OR

B. The _____
(Name and Address of Bidder)

hereby Certifies that it is included on the Commonwealth of Massachusetts- EOAF/DCPO - List of Debarred or Suspended Contractors, or the Concerns on Debarment List from the Massachusetts Attorney General's Fair Labor and Business Practices Division, and is not subject to debarment or proposed debarment notice from any federal agency or official.

_____
(Signature of Authorized Representative of Bidder)

_____
(Title)

NOTE: A BIDDER WILL NOT BE ELIGIBLE FOR AWARD OF A CONTRACT UNDER THIS NOTICE TO BIDDERS BIDS UNLESS SUCH BIDDER HAS SUBMITTED AS A PART OF ITS BID THE FOLLOWING CERTIFICATION PERTAINING TO INELIGIBLE CONTRACTORS WHICH WILL BE DEEMED A PART OF THE RESULTING CONTRACT.

CERTIFICATION PERTAINING TO UNDOCUMENTED WORKERS

As evidenced by the signature of the Bidder's authorized representative below, the Bidder certifies under the pains and penalties of perjury that the Bidder shall not knowingly use undocumented workers in connection with the performance of any MassCEC contract; that pursuant to federal and state requirements, the Bidder shall verify the immigration status of all workers assigned to such contracts without engaging in unlawful discrimination; and that the Bidder shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker(s). The Bidder understands and agrees that breach of any of these terms during the period of each contract may be regarded as a material breach, subjecting the Bidder to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

_____

Bidder Authorized Signature

_____

Printed Name

_____

Date

Title_____ Telephone:_____

Email:_____

NON-COLLUSION AND TAX COMPLIANCE FORM

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity or group of individuals.

_____

Signature of individual submitting bid

_____

Name of business/organization

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes reporting of employees and contractors, and withholding and remitting child support.

_____

Signature of person submitting bid

_____

Name of business

RIGHT-TO-KNOW LAW CERTIFICATION

The Bidder hereby certifies that, if awarded this Contract, it will fully comply with the Massachusetts Right-to-Know Law, c. 470 of the Acts of 1983 (the Act). In addition, it shall:

1. Obtain a Safety Data Sheet (SDS), for all substances or mixtures of substances which appear on the Massachusetts Substance List that it or any of its subcontractors brings to or uses on the work site and will keep a copy of that SDS on the work site of this Contract.

2. Label each container of a substance or mixture of substances on the Massachusetts Substance List as required in §7 of the Act.

3. Provide the same training and non-technical instruction that it is required to provide under §15 of the Act to all Massachusetts Clean Energy Technology Center (MassCEC) representatives and their authorized representatives who are exposed to the substance or to the mixture of substances. Training shall include instruction on the nature and effects of any substance or mixture of substances listed on the Massachusetts Substance List which the Bidder or any of its subcontractors brings to or uses on the work site. Training and non-technical instruction shall be provided to all MassCEC representatives and its authorized representatives, at no additional cost to the MassCEC.

4. Provide to the MassCEC representatives and its authorized representatives on the work site the same protective equipment that the Bidder or any of its subcontractors provides to its employees. Equipment shall be provided to all MassCEC representatives and its authorized representatives, at no additional cost to the MassCEC.

Date: _____ , 20 _____

_____
Signature of Authorized Representative of Bidder

_____
Name and Address of Bidder

NOTE: BIDDER WILL NOT BE ELIGIBLE FOR AWARD OF ANY CONTRACT UNDER THIS REQUEST FOR PROPOSALS UNLESS SUCH BIDDER HAS SUBMITTED AS PART OF ITS BID THE FOLLOWING CERTIFICATION WHICH WILL BE DEEMED A PART OF THE RESULTING CONTRACT.

OSHA CERTIFICATION REQUIREMENT

I, _____, as _____, of the
(Print Name) (Position with the entity submitting bid)

joint venture/corporation/partnership or other legal entity submitting this bid for a project, do hereby certify that any and all employees found on my worksite for this project have, or will have by the start of their work on the project, successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration (OSHA) that was at least 10 hours in duration.

A copy of the OSHA completion cards for each employee must be submitted to the Massachusetts Clean Energy Technology Center before work on this project is to begin and must be supplemented as new employees are hired or contracted to work on this project.

_____, as
Signature

_____, of
Position

_____, on
Company/Corporation/Joint Venture/Partnership/etc.

_____
Date

CERTIFICATION OF CONSTRUCTION EQUIPMENT STANDARD COMPLIANCE

The _____
(Name and Address of Bidder)

hereby certifies that all diesel construction equipment used in this Contract has emission control devices installed, such as oxidation catalysts or particulate filters on the exhaust system side of the diesel combustion engine equipment.

Date: _____ , 20 _____

_____
Signature of Authorized Representative of Bidder

_____
Name and Address of Bidder

CERTIFICATION OF DUMPING FACILITIES

I, _____

_____
(Name and Address of Bidder)

certify that I have adequate dumping facilities available at:

_____

_____
(Name and Address of Disposal Site)

and that these facilities are to be used in connection with work undertaken on this Contract and that such use is to be in a manner compliant with federal, state and local requirements.

Date: _____ , 20 _____

_____
Signature of Authorized Representative of Bidder

_____
Name and Address of Bidder

END OF SECTION

SECTION 00439

BIDDER'S CHECKLIST
(Submit this Checklist with your Bid Submittal)

_____
(Bidder/Company Name)

_____
(Date/Time Bid Received)

Submittal Items with Bid	Section/Page(s)		Check if Present
	Requirement	Form	
Bid Form with Valid Signature	00200-3,4	00400-5	
Acknowledgement of all Addenda	00200-3	00400-2	
Bid Guaranty (Performance Bond, Payment Bond, and Bid Bond)	00200-4,5,6,7	00430-1 00610-1 00614-1	
Bidder Status Identification	00200-8	00400-6,7	
Certification Pertaining to Ineligible Contractors	00200-8	00400-8	
Certification Pertaining to Undocumented Workers	(refer to form)	00400-9	
Non-Collusion and Tax Compliance Form	00200-3,5,8	00400-10	
Right-to-Know Law Certification	00200-9	00400-11	
OSHA Certification Requirement	00200-10 (refer to form)	00400-12	
Certification of Construction Equipment Standard Compliance	00200-10	00400-13	
Certification of Dumping Facilities	00200-9	00400-14	
Business References	00200-9	(Contractor)	
Project References	00200-9,10	(Contractor)	
Labor Resources/Major Equipment	00200-10	(Contractor)	
Qualifications/Experience/Safety Record	00200-10	(Contractor)	
Plant and Equipment Schedule	01 60 00-1	(Contractor)	
Deviations from Technical Specifications (if applicable)		(Contractor)	
Implementation Plan with Project Schedule	00200-10	(Contractor)	
ARPA Contractor's Certification	00200-9	Attachment 3	

SECTION 00525

AGREEMENT BETWEEN OWNER AND GENERAL CONTRACTOR

THIS AGREEMENT, entered into this ____ day of _____, 20_____, between the "Owner": MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER

Mailing Address: 294 Washington Street, Suite 1150, Boston, MA 02108

and _____,
(hereinafter the "Contractor"):

Mailing Address: _____

Representative:_____

For the following Project:

Contract No. **MACEC-FY25-02**, for construction of the project known as the New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project (hereinafter the "Project").

The Owner and Contractor agree as follows:

ARTICLE 1 – THE WORK

1.01 The Contractor agrees to furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished and delivered in and about the improvement and to do and perform all work for construction of the Project in strict conformity with the Contract Documents as herein defined.

ARTICLE 2 – THE PROJECT

2.01 The Project, for which the Work is to be performed under the Contract Documents, may be the whole or only a part, is the New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project.

ARTICLE 3 – THE ENGINEER

3.01 The Project has been designed by David Kelley, Civil & Environmental Consultants, Inc., 31 Bellows Road, Raynham, MA 02767, who shall act as the Engineer of Record and assume all duties, responsibilities, and have all rights and authority assigned to the Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – THE CONTRACT TIME

4.01 Time is of the essence of the Contract. The Owner anticipates that the schedule below will be followed, but reserves the right to change such dates:

Issue Notice of Award: **JUNE 23, 2025 (anticipated)**
Issue Notice to Proceed: **JULY 15, 2025 (anticipated)**

4.02 Substantial Completion

4.02.1 The Contractor shall commence the Work in accordance with Article 3.11 of the General Conditions. The Contractor shall Substantially Complete the Work within **130 calendar days** from the issuance of the Notice to Proceed, subject to adjustments to the Contract Time in accordance with the Contract Documents.

4.02.2 Final Acceptance shall occur **14 calendar days** following satisfactory completion of Owner submitted punch list items, as approved by the Owner.

ARTICLE 5 – DELAYS; LIQUIDATED DAMAGES

5.01 Time is of the essence of the Contract. Subject only to Section 5.06 below, Contractor's remedies for delays to the Work are governed by Article 6 of the General Conditions.

5.02 In the event of Contractor Delays to Substantial Completion of the Work, damages will be assessed not as a penalty, but as liquidated compensatory damages, in the amount of **$2,000.00 per calendar day**, in accordance with Article 6.02 of the General Conditions.

5.03 Notice to Proceed Condition

5.03.1 If the Notice to Proceed is issued subsequent to the date specified in the Contract Documents, liquidated damages will be adjusted accordingly on a day-for-day basis if the delay is caused by the Owner. If the Contractor causes the delay, no adjustment will be made in completion dates. Any approval issued by the Owner will not be considered as a basis for attributing cause for the delay to the Owner.

5.03.2 All other delays to the Work are subject to Article 6 of the General Conditions and applicable related provisions of the Contract Documents.

ARTICLE 6 – THE CONTRACT PRICE

6.01 The Owner shall pay the following as full and complete consideration to the Contractor for the performance of all obligations and performances under this Contract, subject only to additions or deductions which are set forth in properly executed Change Orders as provided for in the General Conditions, or additions or deductions in connection with the Owner's rights as set forth in the Contract Documents.

Total Contract Price:_____(dollars)

($_____)

Schedule(s) of Prices (if applicable): The Schedule(s) of Prices are as set forth in the Contractor's Bid dated: _____.

6.02 Unit Pricing

6.02.1 When compensation for any matter is based on unit pricing, the Owner shall pay only based on the actual quantities used or constructed in accordance with the Contract Documents. As provided in Article 7 of the General Conditions, the Owner will determine the actual quantities and classifications of unit price work, and pricing for unit price work shall include all costs. The Contractor shall execute a Change Order to account for any variations in the actual quantities or classifications of unit price work.

6.02.2 Contractor shall not be entitled to compensation for increased costs due to quantity increases or decreases relative to the estimated quantities listed in the Project bid documents except as provided in Article 2.05 of the General Conditions. Contractor shall be compensated only at the unit pricing contained in Contractor's bid multiplied by the actual quantities as determined by the Owner in accordance with the Contract Documents.

6.03 Extra Work

6.03.1 The Total Contract Price shall only be modified by a Change Order. No compensation will be paid for any new, additional, or extra work unless set forth in a Change Order. The Owner has the right, and without notice to any surety, to modify or amend the Contract Documents and the Total Contract Price by enlarging or restricting the scope of the Work.

6.04 No Compensation for Escalation Costs

6.04.1 Contractor shall not be entitled to compensation for any claimed additional costs related to escalation including but not limited to increased costs of materials, labor, deliveries, or other claimed cost increases due to unusual market conditions, however caused, including tariffs on imported or exported goods or materials that may be imposed by the United States government or other countries.

ARTICLE 7 – THE CONTRACT DOCUMENTS

7.01 The Contract Documents consist of the following, as amended:

1. Executed Change Orders or duly signed, mutual modifications
2. Addenda to Request for Proposals (if any)
3. Supplementary Conditions
4. General Conditions
5. Issued for Construction Drawings and Specifications
6. Instructions to Bidders
7. Bid Form/Proposal
8. Request for Proposals/Invitation for Bid
9. This Agreement
10. Performance Bond
11. Payment Bond

7.02 The order of precedence of the Contract Documents is set forth in Article 9 of the General Conditions.

ARTICLE 8– OWNER'S AND CONTRACTOR'S REPRESENTATIVES

8.01 The Owner's Representative is:

Jeannie Houde - Terminal Manager
Massachusetts Clean Energy Technology Center
jhoude@MassCEC.com
774-226-0066

8.02 The Program/Project Manager is:

Doug Ernst - Project Director
Foth Infrastructure & Environment, LLC
doug.ernst@foth.com
515-491-8852

WITNESS WHEREOF, Owner and Contractor have entered into this Agreement under seal as of the day and year first written above.

Owner:	Contractor:
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER	_____
_____	_____
Signature	Signature
_____	_____
By: Name & Title	By: Name & Title
_____	_____
Date	Date

VOTE OF CORPORATION AUTHORIZING EXECUTION OF CONTRACT

At a meeting of the Board of Directors of _____ duly called and held on _____ at which a quorum was present and acting throughout, the following vote was duly adopted.

VOTED: That _____ _____ of the corporation be and hereby is authorized to sign the contract and deliver in the name and on behalf of corporation a contract with:

MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER

For performing services, all in such form and on such terms and conditions as he/she, by the execution thereof, shall deem proper.

A true copy:

(Affix Corporate Seal)

_____

Clerk of the Corporation

END OF SECTION

SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Contractor, of _____, and _____, hereinafter called the "Surety," are held and firmly bound unto the Massachusetts Clean Energy Technology Center, hereinafter called the "Owner," and to such persons, firms and corporations which may furnish materials for or perform labor on the Work, construction, or improvements contemplated in the Agreement hereinafter mentioned, or which may have any suits or claims for injury or damage to persons or property resulting from or arising out of the Work done under this Agreement in the penal sum of Dollars ($_____) (lawful money of the United States of America) for the payment whereof the Contractor and the Surety or Sureties bind themselves and their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, WHEREAS THE Contractor has by means of a written agreement dated on the _____day of _____, 20_____ (the Agreement) entered into a written contract with the Owner for the New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project, and related work and other incidentals (the Project) for the sum of approximately ($_____) Dollars.

NOW, THEREFORE, the condition of this obligation is such that if the Contractor shall faithfully perform the Agreement on its part and during the life of any guarantee or warranty, including warranty for defective materials and workmanship required under this Agreement, and satisfy all claims and demands incurred for the same, including without limitation any claim for liquidated damages for delay; and shall fully indemnify and save harmless the Owner from all cost and damage which may suffer by reason of failure to do so, and shall fully reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any such fault, and shall promptly make payment to all persons supplying labor or materials for use in the prosecution of the Work provided for in said Agreement; and shall indemnify and save harmless the said Owner, its officers, agents, employees, and directors from any and all suits or claims for injury or damage to persons or property resulting from or arising out of work done under this Agreement, including without limitation reasonable attorney's fees and expenses incurred in any proceeding to enforce Owner rights under this Bond, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, THAT (except as to the Owner) no suit, action, or proceeding, by reason of any default whatever shall be brought on this Bond after two years from the day on which the final payment under the Agreement falls due.

AND PROVIDED, that any alterations which may be made in the terms of the Agreement or in the Work to be done under it, or any assignment, transfer, or subletting of any part of the Work, or the giving by the Owner of any extension of time for the performance of the Agreement or any other forbearance on the part of either the Owner or the Contractor to the other, shall not in any way release the Contractor and the Surety or Sureties, either or any of them, their heirs, executors, administrators, successors or assigns from their liability hereunder, notice to the Surety or Sureties of any such alterations, assignments, transfer, subletting, extension or forbearance being hereby waived.

AND PROVIDED FURTHER, the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Agreement, the Work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Agreement, the Work, or to the Specifications.

AND PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, where claim may be satisfied.

IN WITNESS WHEREOF, said Contractor and Surety have hereunto set their respective names this _____ day of _____, 20_____.

WITNESSES/ATTESTATION:

(Contractor Name) [Seal]
PRINCIPAL

_____ _____

Name: Title:

(Surety Name) [Seal]
SURETY

_____ _____

Name: Title:_____
Attorney-in-fact

[NOTARY REQUIRED]

POWER OF ATTORNEY

Any attorney-in-fact who signs Contract Bonds must file with each Bond a certified copy of their power of attorney to sign said Bonds.

NOTE: The date of the BOND must not be before the date of the Agreement. If Contractor is a Partnership, all partners should execute Bonds.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the Commonwealth of Massachusetts.

END OF SECTION

SECTION 00614

PAYMENT BOND

BOND NO. _____

KNOW ALL MEN BY THESE PRESENTS:

That we,_____**,** as **Principal**, and

_____, as **Surety**,

are held and firmly bound unto the Massachusetts Clean Energy Technology Center, New Bedford, Massachusetts (MA), as **Obligee,** in the sum of _____**dollars**

($_____)

to be paid to the Obligee, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said **Principal** has made a contract with the **Obligee,** bearing the date of _____ ___, 20_____ for the _____ in New Bedford, MA.
PROJECT TITLE

NOW the conditions of this obligation are such that if the **Principal** and all subcontractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the **Surety** of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, provisions of M.G.L. c.30 §39A, and M.G.L. c.149 §29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

IN WITNESS WHEREOF, the **Principal** and **Surety** have hereunto set their hands and seals this:

_____Day of _____20____

PRINCIPAL _____ **SURETY** _____

By:_____ By:_____
SEAL **ATTORNEY-IN-FACT**

Attest: _____ **Attest:**_____

The rate for this bond is: _____% for the first $_____ and ____% for the next $_____

The total premium for this bond is: $ _____

APPLICATION AND CERTIFICATE FOR PAYMENT

AIA DOCUMENT G702

TO OWNER: Massachusetts Clean Energy Technology Center

PROJECT: NBMCT - Phase 3
Terminal Heavy-Lift Expansion Project

APPLICATION NO.: 1
PERIOD TO:
APPLICATION DATE:

Distribution to:
- [ ] OWNER
- [ ] ENGINEER
- [ ] CONTRACTOR
- [ ]
- [ ]

FROM CONTRACTOR:

Via:
Foth Infrastructure & Environment, LLC
15 Creek Road
Marion, MA 02738

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Continuation Sheet, Pages 2 & 3 is attached.

1. **ORIGINAL CONTRACT SUM** ..... $ -

2. **Change Orders** **$0.00**

3. **CONTRACT SUM TO DATE (Line 1 + 2)**..... $ -

4. **TOTAL COMPLETED & STORED TO DATE** ..... $ -
(Column J - Sheet 2)

5. **RETAINAGE:**
   a. 5% of Completed Work..... $ -
   b. 0% of Stored Material.....

Total retainage (Line 5a + 5b) $ -

6. **TOTAL EARNED LESS RETAINAGE** ..... $ -
(Line 4 less Line 5 Total)

7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT**
(Line 6 from prior Certificate)..... ... .

8. **CURRENT PAYMENT DUE** ..... $ -

9. **BALANCE TO FINISH, INCLUDING RETAINAGE**..... $ -
(Line 3 less Line 6)

CHANGE ORDER SUMMARY	Eligible	Ineligible
TOTALS		-
NET CHANGES by Change Order	$0.00	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By:_____ Date:

State of: Massachusetts
County of: Bristol

Subscribed and sworn to before
me this_____day of_____2025.

Notary Public:
My Commission expires:

ENGINEER'S RECOMMENDATION

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Engineer recommends to the Owner that to the best of the Engineer's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT RECOMMENDED

AMOUNT RECOMMENDED **$** **-**

Attached explanation if amount recommended differs from the amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conforms to the amount recommended.
Engineer -

By:_____ Date: _____

By _____ _____

This Certificate is not negotiable. The AMOUNT RECOMMENDED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

OWNERS APPROVAL: In accordance with the contract documents, the Owner hereby approves this application for Payment. The amount of this payment is amount certified by the Engineer unless signified in writing differently by Owner.
OWNER: Massachusetts Clean Energy Technology Center

By_____ Date:_____

AIA DOCUMENT G702 • APPLICATION AND CERTIFICATE FOR PAYMENT • 1992 EDITION • AIA™
THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 NEW YORK AVE., N.W., WASHINGTON, D.C. 20006

CONTRACTOR: _____ **PAY REQ. No.** 1

THRU PERIOD:

Item No.	Description	Qty.	Unit	Unit Price	Extended Amount	Previous Quantity	Previous Total Amount	Quantity This Period	Amount This Period	Total Quantities to Date	Total Amount to Date
	SECTION 01 - GENERAL										
1	Mobilizatization and Demobilization	1	LS		$ -		$ -		$ -	0.00	$ -
2	Traffic Control	1	LS		$ -		$ -		$ -	0.00	$ -
	SECTION 02 - SOIL REMEDIATION / DISPOSAL										
3	Disposal of Unsuitable Soil (Environmental PCBs > 25 ppm)	260	TON		$ -		$ -		$ -	0.00	$ -
4	Disposal of Unsuitable Soil (Environmental PCBs >1ppm and <25 ppm)	820	TON		$ -		$ -		$ -	0.00	$ -
5	Disposal of Unsuitable Soil (Environmental PCBs <1 ppm)	7,200	TON		$ -		$ -		$ -	0.00	$ -
6	Disposal of Miscellaneous Contaminated Items	1	LS		$ -		$ -		$ -	0.00	$ -
	SECTION 03 - SITE DEMOLITION										
7	Erosion Control - Inlet Protection (silt socks)	8	EA		$ -		$ -		$ -	0.00	$ -
8	Erosion Control - Silt Fence	1500	LF		$ -		$ -		$ -	0.00	$ -
9	Erosion Control - Trackout Control Pad (stabilized construction entrance)	2	EA		$ -		$ -		$ -	0.00	$ -
10	Tree Protection	3	EA		$ -		$ -		$ -	0.00	$ -
11	Salvage Chain Link Fence, 6 ft (black vinyl salvaged reuse)	240	LF		$ -		$ -		$ -	0.00	$ -
12	Salvage Chain Link Fence, 6 ft (galvanized salvaged for construction fencing)	400	LF		$ -		$ -		$ -	0.00	$ -
13	Removal of Asphalt Pavement	2,100	SY		$ -		$ -		$ -	0.00	$ -
14	Removal of Concrete Pads	1	LS		$ -		$ -		$ -	0.00	$ -
15	Building Foundation & Footing Removal	1	LS		$ -		$ -		$ -	0.00	$ -
16	Removal of Curb	600	LF		$ -		$ -		$ -	0.00	$ -
17	Removal of Trees	1	LS		$ -		$ -		$ -	0.00	$ -
18	Removal of Water Line	250	LF		$ -		$ -		$ -	0.00	$ -
19	Removal of Abandoned Sewer Manhole	1	EA		$ -		$ -		$ -	0.00	$ -
20	Removal of Sewer Pipe	600	LF		$ -		$ -		$ -	0.00	$ -
21	Removal of Drainage Structure	3	EA		$ -		$ -		$ -	0.00	$ -
22	Removal of Drainage Pipe	100	LF		$ -		$ -		$ -	0.00	$ -
23	Excavation and Grading	5,100	CY		$ -		$ -		$ -	0.00	$ -
	SECTION 04 - SITE LAYOUT AND MATERIALS										
24	Heavy-Lift Section - Dense Graded Aggregate (furnish and place)	10,200	TON		$ -		$ -		$ -	0.00	$ -
25	Infiltration Trench Aggregate - 1-1/2" washed crushed stone (furnish and place)	100	TON		$ -		$ -		$ -	0.00	$ -
26	Geogrid - Tensar Interax NXF (furnish and place)	11,000	SY		$ -		$ -		$ -	0.00	$ -
27	Geotextile – Tensar Interax NXF Filtergrid (furnish and place)	11,000	SY		$ -		$ -		$ -	0.00	$ -
28	Geotextile - Mirafi 140 N (furnish and place)	100	SY		$ -		$ -		$ -	0.00	$ -
29	Preparation of Subgrade	11,000	SY		$ -		$ -		$ -	0.00	$ -
30	Timber Border (12"x10" pressure-treated pine timbers, painted yellow)	500	LF		$ -		$ -		$ -	0.00	$ -
31	Chain Link Fence, 6 ft - Salvaged Black Vinyl Coated	240	LF		$ -		$ -		$ -	0.00	$ -
32	Chain Link Fence, 6 ft - New Black Vinyl Coated	95	LF		$ -		$ -		$ -	0.00	$ -
33	Chain Link Fence, 6 ft - Temporary Construction	500	LF		$ -		$ -		$ -	0.00	$ -
34	Post-Construction Site Access	1	LS		$ -		$ -		$ -	0.00	$ -
	SECTION 05 - STORMWATER DRAINAGE IMPROVEMENTS										
35	Ferguson Waterworks, R-Tank 2.0 Stormwater Chambers (HD Heavy Duty)	340	EA		$ -		$ -		$ -	0.00	$ -
36	Ferguson Waterworks, R-Tank 1.5 Stormwater Chambers (HD Heavy Duty)	430	EA		$ -		$ -		$ -	0.00	$ -
37	Stormceptor Water Quality Units (Contech-STC900)	4	EA		$ -		$ -		$ -	0.00	$ -
38	Stormwater Backwater Valve (NAPCO 30" in-line)	1	EA		$ -		$ -		$ -	0.00	$ -
39	Stormwater Outlet Control Structure (special 48" precast concrete)	2	EA		$ -		$ -		$ -	0.00	$ -
40	Stormwater Drain Manhole (48" precast concrete)	1	EA		$ -		$ -		$ -	0.00	$ -
41	Stormwater System HDPE Piping (ADS N-12 Dual Wall varying sizes)	450	LF		$ -		$ -		$ -	0.00	$ -
42	Stormwater Landscape Drain (ADS Nyloplast)	8	EA		$ -		$ -		$ -	0.00	$ -

CONTRACTOR: _____ PAY REQ. No. 1

THRU PERIOD:

Item No.	Description	Qty.	Unit	Unit Price	Extended Amount	Previous Quantity	Previous Total Amount	Quantity This Period	Amount This Period	Total Quantities to Date	Total Amount to Date
	SECTION 06 - ELECTRICAL UTILITIES										
43	Conduit, Schedule 80 PVC (2.5-inch direct buried duct bank)	1000	LF		$ -		$ -		$ -	0.00	$ -
44	Conduit, Schedule 80 PVC (3.0-inch direct buried duct bank)	1000	LF		$ -		$ -		$ -	0.00	$ -
	SECTION 07 - LANDSCAPING										
45	Surface Restoration - Loam and Hydroseed	8,900	SF		$ -		$ -		$ -	0.00	$ -
46	Inlet Protection - Silt Sacks (on-site)	8	EA		$ -		$ -		$ -	0.00	$ -
	SECTION 08 - OFF-SITE IMPROVEMENTS										
47	Sewer Drain Disconnections	5	EA		$ -		$ -		$ -	0.00	$ -
48	Domestic Water Disconnections	2	EA		$ -		$ -		$ -	0.00	$ -
49	Storm Drain Connection	1	EA		$ -		$ -		$ -	0.00	$ -
50	Stormwater RCP Piping (30" Dia. Class V)	25	LF		$ -		$ -		$ -	0.00	$ -
51	HMA Pavement Restoration	1,700	SY		$ -		$ -		$ -	0.00	$ -
52	Cement Concrete Sidewalk	340	SY		$ -		$ -		$ -	0.00	$ -
53	Curb Replacement (Type VA1 vertical curb straight)	50	LF		$ -		$ -		$ -	0.00	$ -
	TOTALS				**$ -**		**$ -**		**$ -**		**$ -**

SECTION 00636

CHANGE ORDER

CHANGE ORDER NO._____

DATE:_____

The Contract shall change as described below (include reference to or attach specific exhibits necessary to describe the agreed-upon Change):

CONTRACT PRICE. The aggregate of the change in Contract Price by this Change Order is a net [ADDITION/DELETION] of **$ _____.**

The original Contract Price was	$_____
The net change by previously approved Change Orders	$_____
The Contract Sum prior to this Change Order	$_____
The Contract Sum will be [increased/decreased] by this	
Change Order in the amount of	$_____
The new Contract Price including this Change Order will be	$_____

Breakdown of Change Order:

Materials	$_____
Labor	$_____
Equipment	$_____
Administration	$_____
Subtotal	$_____
Overhead and Profit	$_____
TOTAL	**$_____**

CONTRACT TIME. The Contract Time for completion will be [increased/decreased] by [X] days as follows:

New Date for Substantial Completion: _____

New Date for Final Completion: _____

It is hereby mutually agreed upon the execution of this agreement that the sums and change in Contract Time provided herein are complete, whole, fair and reasonable, and that the Contractor hereby releases the Owner from any additional claims, demands, liabilities, payments, added compensation, or time extensions arising from, growing out of or in any way connected with Contractor's request for this Change Order or the work described herein. All other terms and conditions or provisions of the Contract Documents shall remain in full force and effect and shall be binding on the parties of this Contract.

APPROVED by
OWNER'S REPRESENTATIVE:

_____

By: _____

Title:_____

Date:_____

RECOMMENDED by
PROJECT/PROGRAM MANAGER:

_____

By: _____

Title:_____

Date:_____

RECOMMENDED by **ENGINEER:**

_____

By: _____

Title:_____

Date:_____

AGREED by **CONTRACTOR**:

_____

By: _____

Title:_____

Date:_____

SECTION 00700

GENERAL CONDITIONS

Index

ARTICLE NO. & TITLE		PAGE NO.
ARTICLE 1 - DEFINITION OF TERMS		**1**
1.01	DEFINITION OF TERMS	1
ARTICLE 2 - SCOPE OF WORK		**6**
2.01	INTENT OF THE CONTRACT	6
2.02	CHANGES IN THE WORK	6
2.03	EXTRA WORK	7
2.04	VALUE ENGINEERING - CONTRACTOR COST REDUCTION PROPOSALS	7
2.05	INCREASED OR DECREASED CONTRACT QUANTITIES	11
2.06	RIGHTS IN THE USE OF MATERIALS FOUND ON THE WORK	12
2.07	ARCHEOLOGICAL AND PALEONTOLOGICAL SALVAGE	12
2.08	WARRANTY OF WORK	12
2.09	CHANGED CONDITIONS	13
2.10	CONTRACTOR PROPOSED CHANGES (INTENTIONALLY OMITTED)	14
2.11	COMMUNITY RELATIONS	15
2.12	REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS	15
2.13	FINAL CLEANING UP	15
ARTICLE 3 - CONTROL OF WORK		**16**
3.01	AUTHORITY OF THE ENGINEER	16
3.02	CONTRACT DRAWINGS	16
3.03	CONFORMITY WITH DRAWINGS AND SPECIFICATIONS	18
3.04	COORDINATION OF CONTRACT DRAWINGS AND CONTRACT SPECIFICATIONS	18
3.05	COOPERATION BY CONTRACTOR	19
3.06	ADJACENT CONTRACTS	20
3.07	LINE AND GRADE	21
3.08	AUTHORITY AND DUTIES OF ENGINEER'S ASSISTANTS	22
3.09	INSPECTION OF WORK	22
3.10	REMOVAL OF DEFECTIVE OR UNAUTHORIZED WORK	23
3.11	SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE	23

ARTICLE NO. & TITLE **PAGE NO.**

ARTICLE 4 - CONTROL OF MATERIALS **25**

4.01 TRADE NAMES AND ALTERNATIVES 25
4.02 CERTIFICATE OF COMPLIANCE 26
4.03 MASSCEC FURNISHED MATERIALS 27
4.04 DEFECTIVE MATERIALS 27
4.05 ASBESTOS MATERIALS 28
4.06 BANNED MATERIALS 28
4.07 IDENTIFICATION OF MATERIAL AND EQUIPMENT 28
4.08 DELIVERY AND STORAGE OF MATERIALS 29

ARTICLE 5 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC **30**

5.01 LAWS TO BE OBSERVED 30
5.02 PERMITS AND LICENSES 33
5.03 MOTOR VEHICLES 33
5.04 INSURANCE REQUIREMENTS 34
5.05 PATENTED DEVICES, MATERIAL AND PROCESSES 40
5.06 RESTORATION OF SURFACES OPENED BY PERMIT 40
5.07 SANITARY PROVISIONS, PUBLIC SAFETY, AND TRAFFIC MANAGEMENT 40
5.08 RELATIONS WITH RAILROAD AND RESPONSIBILITY FOR DAMAGE TO RAILROAD (INTENTIONALLY OMITTED) 41
5.09 USE OF EXPLOSIVES 41
5.10 PROTECTION AND RESTORATION OF PROPERTY 42
5.11 PROTECTION OF PUBLIC LANDS 44
5.12 PROTECTION OF FENCES 45
5.13 SAFEGUARDING OF EXCAVATIONS 45
5.14 DISPOSAL OF MATERIALS OUTSIDE THE WORK SITE 46
5.15 SAFETY AND FIRST AID REQUIREMENTS 46
5.16 INDEMNIFICATION 47
5.17 CLAIMS AGAINST CONTRACTOR FOR PAYMENT OF LABOR AND MATERIALS 48
5.18 PAYMENT OF TAXES 48
5.19 CLAIMS OF CONTRACTOR FOR COMPENSATION 49
5.20 OPENING PORTIONS OF CONTRACT FOR OPERATION OR OCCUPANCY 50
5.21 CONTRACTOR'S RESPONSIBILITY FOR THE WORK 50
5.22 CONFLICT OF INTEREST 52
5.23 PERSONAL LIABILITY OF MASSCEC OFFICIALS 52
5.24 NO WAIVER OF LEGAL RIGHTS 52
5.25 LABOR, LODGING, BOARD, MAXIMUM HOURS OF EMPLOYMENT, KEEPING OF PAYROLL RECORDS 53
5.26 EQUAL OPPORTUNITY CLAUSE 54
5.27 RECORDS AND AUDITING 54

ARTICLE NO. & TITLE **PAGE NO.**

ARTICLE 6 - PROSECUTION AND PROGRESS **57**

6.01 SUBLETTING OR ASSIGNMENT OF CONTRACT 57
6.02 PROSECUTION OF WORK/CONTRACT TIME/LIQUIDATED DAMAGES 58
6.03 REMOVAL OR DEMOLITION OF BUILDINGS AND LAND TAKINGS 59
6.04 LIMITATIONS OF OPERATIONS 60
6.05 CHARACTER OF WORKMEN, METHODS AND EQUIPMENT 60
6.06 DELAY AND SUSPENSION OF WORK 62
6.07 CLAIM FOR DELAY OR SUSPENSION OF WORK 63
6.08 DETERMINATION AND EXTENSION OF CONTRACT TIME FOR DELAYS TO COMMENCEMENT OF THE WORK 65
6.09 FAILURE TO COMPLETE WORK ON TIME – NO WAIVER 65
6.10 TERMINATION OF CONTRACT 65
6.11 TERMINATION FOR CONVENIENCE 67
6.12 MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES 68

ARTICLE 7 - MEASUREMENT AND PAYMENT **69**

7.01 MEASUREMENT OF QUANTITIES 69
7.02 SCOPE OF PAYMENTS 69
7.03 COMPENSATION FOR ALTERED QUANTITIES 71
7.04 PAYMENT FOR EXTRA WORK 71
7.05 OMITTED ITEMS 73
7.06 PARTIAL PAYMENTS 73
7.07 PAYMENT FOR PRODUCTS/MATERIALS STORED ON OR OFF SITE 75
7.08 SEMI-FINAL ESTIMATE 76
7.09 FINAL ACCEPTANCE AND FINAL PAYMENT 77

ARTICLE 8 – DISPUTE RESOLUTION **79**

8.01 REFERRAL OF DISPUTES TO SENIOR MANAGEMENT 79
8.02 MEDIATION 79
8.03 VENUE; WAIVER OF JURY TRIAL 79
8.04 WORK UNDER PROTEST 80

ARTICLE 9 – ENTIRE AGREEMENT; PRIORITY OF CONTRACT DOCUMENTS **81**

9.01 ENTIRE AGREEMENT 81
9.02 PRIORITY OF CONTRACT DOCUMENTS 81

SECTION 00700

GENERAL CONDITIONS

ARTICLE 1 - DEFINITION OF TERMS

1.01 DEFINITION OF TERMS

A. Wherever in the Bid or Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be as follows:

1. Acceptance: Formal written acceptance by MassCEC of the completed Work.

2. Addenda: Written interpretation of and/or revisions to the Bid Documents issued by MassCEC prior to opening of Bids.

3. Alteration: A change or substitution in the form, character, or detail of the Work done or to be done within the original scope of the Contract.

4. Award: Award by MassCEC of a Contract

5. Bid: Offer of the Bidder for the Work when submitted on the prescribed Bid Form, properly signed, dated, and guaranteed, and which includes the Schedule of Bid Prices. Also referred to as a "Proposal."

6. Bid Bond: The Bidder's Bond accompanying the Bid submitted by the Bidder, as a guaranty that the Bidder will enter into a Contract with MassCEC for the performance of the Work and furnish acceptable bonds and insurance if the Contract is awarded to the Bidder.

7. Bid Documents: Documents provided by MassCEC for the purpose of soliciting Bids for the Work. Bid Documents will include, as applicable, Notice to Bidders, Instructions to Bidders, Contract Specifications, Contract Drawings, Geotechnical Data Reports, and Addenda.

8. Bid Form: Form(s) issued by MassCEC for the submittal of a Bid for a specific project and includes the Schedule of Bid Prices, certifications, affidavits and other forms.

9. Bidder: An individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work on the prescribed Bid Form. Also may be referred to as a Proposer.

10. Change Order: A document executed and issued to the Contractor by MassCEC amending the Contact.

11. Commonwealth: Commonwealth of Massachusetts

12. Contract or "Agreement": The Form of Agreement, General Conditions, Supplementary Conditions, and any attachments, addenda, all exhibits thereto, and all documents incorporated by reference therein. Also referred to as the "Agreement."

13. Contract Administrator: The Massachusetts Clean Energy Technology Center designee.

14. Contract Bonds:

    a. Performance Bond: A bond executed by the Contractor and the Contractor's Sureties in the full amount of the Contract to ensure the faithful performance of the Contract.

    b. Labor and Materials Payment Bond: A bond executed by the Contractor and the Contractor's Sureties in the full amount of the Contract to ensure the payment of labor, materials, and rental of equipment.

15. Contract Documents: As defined in the Form of Agreement and Article 9 of these General Conditions.

16. Contract Drawings (Drawings): Plans, profiles, typical cross sections, general cross sections, elevations, and details referenced in the Contract Documents, or Addenda thereto, and shop drawings approved by the Engineer, all of which show locations, character, dimensions, and details of the Work.

17. Contract Item: A specifically described unit of work for which a price is provided in the Contract.

18. Contract Price: The sum payable by MassCEC to the Contractor for completion of the Work in accordance with the Contract Documents as stated in the Form of Agreement subject to adjustment under the terms of the Contract Documents.

19. Contract Specifications: A set of documents issued by MassCEC for the intended Work which includes the Bid Form, Contract Forms, Contract Bonds, General Conditions, Supplementary Conditions, technical provisions including Divisions 01 through 33, and other requirements, forms and exhibits identified therein.

20. Contract Time: Number of calendar days allowed or specified date(s) for completion of the Contract.

21. Contract Unit Price: Price for portions of the Work to be performed on the basis of unit prices as set forth in the Bid Form.

22. Contract Lump Sum Price: Price for portions of the Work to be performed on a lump sum basis as set forth in the Bid Form.

23. Contractor: The individual, firm, partnership, corporation, or combination thereof, private, municipal or public, including joint ventures, which, as an independent contractor, has entered into a Contract with MassCEC, as Party or Parties of the Second Part, and who is referred to throughout the Contact Documents by singular number.

24. Days: Every day shown on the Calendar, Saturdays, Sundays and holidays included.

25. Director: Executive Director of the Massachusetts Clean Energy Technology Center.

26. Engineer: The Massachusetts Clean Energy Technology Center designee acting with the authority of the Owner, within the scope of the particular duties entrusted to this person, as outlined within the Contract Documents.

27. Engineer's Estimate of Quantities: List of quantities of work estimated to be performed as contained in the Schedule of Bid Prices in the Bid Form.

28. Extra Work: Work which is not included in the Contract Documents as awarded, but found to be necessary for the satisfactory completion of the Contract within its intended scope; and bears a reasonable subsidiary relation to the full execution of the Work originally described in the Contract.

29. Extra Work Order: An order in writing issued by the Engineer to the Contractor prior to performing the Extra Work, setting forth the Extra Work to be done, the basis of payment and time adjustments, if any. Following the issuance of an Extra Work Order, a Change Order will be executed to amend the Contract Documents.

30. Form of Agreement: The written "Agreement Between Owner and General Contractor," as Section 00525 of the Contract Documents.

31. General Terms: Wherever the words "required," "determined," "directed," "specified," "authorized," "ordered," "given," "designated," "considered

necessary," "deemed necessary," "permitted," "reserved," "suspended," "established," "approval," "approved," "disapproved," "acceptable," "unacceptable," "suitable," "accepted," "satisfactory," "unsatisfactory," "sufficient," "insufficient," "rejected," "condemned," or words with like import are used, they shall be understood to imply "by the Engineer" or "to the Engineer," unless the context clearly indicated a different meaning.

32. Indicated: A term meaning as shown on the Contract Drawings (Drawings), as described in the Specifications, or as required by other Contract Documents.

33. Instructions to Bidders: Explanation of procedures to be followed in preparing and submitting Bids.

34. MassCEC: The Massachusetts Clean Energy Technology Center. Also referred to as the "Owner."

35. Notice to Bidders: Advertisement for Bids for a specific Contract. Notice to Bidders will indicate time and place for submitting Bids, location of the Work, a brief description of the Work to be provided, and bid security required.

36. Notice to Proceed: Written notice from MassCEC to the Contractor to proceed with the Work.

37. Owner: The Massachusetts Clean Energy Technology Center or MassCEC.

38. Owner's Representative: The Massachusetts Clean Energy Technology Center designee acting with the authority of the Owner, within the scope of the particular duties entrusted to this person, as outlined within the Contract Documents.

39. Project: The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

40. Provide: In reference to Work to be performed by the Contractor, "provide" means furnish, install, and (as applicable) test complete in place.

41. Reference Utility Standards: Drawings and specifications, published by municipalities, utility companies, railroads and other responsible agencies/entities which are included or referenced in the Contract Documents.

42. Specifications: Directions, provisions, and requirements contained in the Contract Specifications.

43. Subcontractor: The individual, firm, partnership, corporation, vendor, supplier, or combination thereof to whom the Contractor, with written approval of MassCEC, sublets any part of the Contract. Such Subcontractor does not constitute a "Subcontractor" within the meaning of G.L. c. 30, section 39F, as this Project has not been awarded pursuant to G.L. c. 149, section 44 or G.L. c. 30, section 39M.

44. Substantial Completion: The term Substantial Completion, as applied to all or a part of the Work, shall mean either that the Work required by the Contract Documents has been completed except for Work having a Contract price of less than 1 percent of the then adjusted total Contract Price, or substantially all of the Work has been completed and is being or is ready to be used/occupied for its intended purpose, by MassCEC or an operating contractor except for minor incomplete or unsatisfactory Work items that do not materially impair the usefulness of the Work required by the Contract Documents.

45. Supplementary Conditions: Supplements and additions to the General Conditions.

46. Surety: Corporate body bound with and for the Contractor for the full and complete performance of the Contract and for the payment of all legal debts pertaining to the Work, and who executed the Contract Bonds.

47. Value Engineering: The systematic application of recognized techniques which identify the function of a product or service and provide the necessary function or service reliably at lower overall cost.

48. Work: All the construction, materials, equipment, and contractual requirements as specified, shown, or indicated in the Contact Documents, including all alterations, amendments, or extensions thereto made by authorized changes.

49. Shop Drawings: Supplementary drawings or similar data which the Contractor is required to submit to the Engineer for approval, including but not necessarily limited to erection, falsework, and formwork drawings; dewatering; bending diagrams and bar schedules for reinforcing steel; calculations; and manufacturers' catalog information and data.

END OF ARTICLE 1

ARTICLE 2 - SCOPE OF WORK

2.01 INTENT OF THE CONTRACT

A. Intent of the Contract is to provide all items necessary or reasonably inferable from the Contract Documents for the proper completion of the Work. Items omitted from the Contract shall be considered as included within the scope of the Work if they are required by applicable law, regulation, or code, if they are reasonably inferable from the intent of the Agreement or if they are necessary to produce the intended results. The Contractor shall complete the Work to the satisfaction of the Engineer at the prices set forth and agreed upon. Where portions of the Work are described in general terms, but not in complete detail, the best general practice shall be followed. Only materials and workmanship of best standard quality shall be used. The Contractor shall, unless otherwise specified, furnish all labor, superintendence, materials, tools, equipment and incidentals necessary to complete the Work in a proper, thorough, and workmanlike manner.

B. The Contractor shall remove all obstructions from within the limits of work; and shall do such additional, extra, and incidental work as may be considered necessary to complete the Work in a substantial and acceptable manner and within the time specified; and when it is so completed, shall leave the Work in a neat and finished condition.

All Work shall be done and furnished strictly pursuant to, and in conformity with the Contract Documents, and also, in accordance with the directions of the Engineer as given from time to time during the progress of the Work pursuant to the terms of the Contract Documents.

The Work shall include grading and drainage work, where indicated outside the limits of the Work, and other miscellaneous work as shown in the Contract Documents and as directed.

C. In the event that the Contractor discovers any apparent error or discrepancy in the Contract Documents, the Contractor shall call immediately upon the Engineer for its interpretation, and such interpretation or decision shall be final.

D. No action or failure to act by the Owner shall constitute a waiver of any right or duty afforded to it under this Agreement, nor shall any such action or failure to act constitute an approval of or acquiescence to any breach under this Agreement except as may be explicitly agreed to in writing by the Owner. The Contractor is not entitled to rely on waivers, consents, approvals or instruments received directly or indirectly from the Owner unless said waivers, consents, approvals or instructions are given in writing.

2.02 CHANGES IN THE WORK

A. MassCEC reserves the right at any time during the progress of the Work to make alterations to, deviations from, additions to, and deletions from the Contract Documents. Such changes shall not invalidate the Contract nor release the Surety. The Contractor agrees to accept the Work as changed, the same as if it had been a part of the original Contract. Such changes will be authorized in writing by the Engineer.

B. Wherever an alteration, deviation, addition, or deletion involves a change in the nature of design or in the type of construction which increases or decreases the cost of performance of the Work or requires the Contractor to furnish materials or provide work of a kind not susceptible of classification for payment under any of the items scheduled in the Bid, MassCEC and the Contractor may enter into a Change Order covering the Work to be done and the manner and method of payment therefore.

C. Changes to the Contract Price or the Contract Time shall only be effective upon execution of a Change Order by the Owner.

D. Where Contactor seeks additional compensation or time for claimed changes to the work, Contractor must submit a proposed Change Order in accordance with Section 5.19.

E. Payment for approved Change Orders shall be made in accordance with Article 7.04.

F. In the event of a disputed Extra Work Order, Contractor shall proceed with promptly performing the Work under protest, on a time and materials basis, while the parties negotiate cost or the Contractor submits a Claim under Article 5.19.

2.03 EXTRA WORK

A. The Contractor shall do any work not herein provided for when and as ordered in writing by the Engineer (via an Extra Work Order), such written order to contain particular preference to this Article and to designate the Work to be done as Extra Work.

B. Unless specifically noted in the Extra Work Order, Extra Work will not extend the time of completion of the Contract as stipulated in Article 6.08.A.6.

C. Determination of the Engineer will be final upon all questions concerning the amount and value of Extra Work, except as provided in Article 5.19.

D. Payment for Extra Work will be in accordance with Article 7.04.

E. Where all terms of the Extra Work including scope and cost are mutually agreed upon, a Change Order will be issued reflecting such terms. Otherwise, disputed

Extra Work Order will be subject to Contractor Claims, if properly made in accordance with Article 5.19.

F. In the event of a disputed Extra Work Order, Contractor shall proceed with promptly performing the Work under protest, on a time and materials basis, while the parties negotiate cost or work to resolve a Contractor Claim under Article 5.19.

2.04 VALUE ENGINEERING - CONTRACTOR COST REDUCTION PROPOSALS

A. This Article defines the conditions and requirements that apply to Value Engineering Cost Reduction Proposals (VECRP) that are initiated, developed and submitted by the Contractor to change the Contract Documents. The purpose of a VECRP is to encourage the Contractor to submit recommended changes to the requirements specified in the Contract Documents, based on the Contractor's experience and knowledge of alternative cost reducing means, methods, materials and technologies.

Value Engineering is the systematic application of recognized techniques that identify the function of a product or service, establish a value for that function, and provides the necessary function reliability at the lowest practical life-cycle cost.

A VECRP submitted under the Contract shall require a change to the Contract Documents. As described in paragraph D, the incentive to the Contractor provided under this Article is to share the net savings resulting from acceptance of a VECRP on the basis of 50 percent for the Contractor and 50 percent for MassCEC. In order to be considered for acceptance under this Article, each VECRP shall:

1 Be identified by the Contractor as a VECRP at the time of submittal to the Engineer as submitted pursuant to this Article.

2. Yield a net savings as defined in paragraph D, in excess of $10,000.

3. Maintain the specified items' required functions as to service life, reliability, economy of operation, ease of maintenance, and necessary standardized features and appearance.

4. Shall not require an unacceptable extension of Contract Time(s) or Contract Milestone(s).

B. A VECRP the Contractor submits shall be in sufficient detail to clearly define the proposed change. The Contractor's failure to provide material of the type, detail and in a format acceptable to the Engineer, and necessary to facilitate the Engineer's review, will be sufficient cause for rejection of the VECRP. Information provided by the Contractor shall include, but not be limited to, the following:

1. A description of the difference between the existing Contract requirements and the proposed Contract requirements, and the comparative advantages and disadvantages of each.

2. Contract requirements recommended to be changed if the VECRP is accepted.

3. A detailed estimate of the amount of anticipated gross savings resulting from, and the Contractor's costs incurred in, implementing and developing the VECRP, as defined in paragraph D.

4. Changes in the Contract Time(s) or Contract Milestone(s) that will result from acceptance of the VECRP.

5. A statement of the time by which the VECRP must be accepted so as to obtain the maximum price reduction, noting any effect upon Contract Time(s) or Contract Milestone(s).

C. The Engineer may accept or reject part or all of a VECRP by giving the Contractor written notice thereof. However, approval of the VECRP does not occur until a modification in the form of a Change Order incorporating the VECRP is issued by MassCEC. Until such Change Order is issued, the Contractor shall remain obligated to perform the Work in accordance with the terms of the Contract Documents. The VECRP will be processed expeditiously. MassCEC shall not be held liable for any delay in acting upon a VECRP submitted pursuant to this Article. The decision of the Engineer as to acceptance of a VECRP shall be final.

The Contractor has the right to withdraw part or all of a VECRP at any time prior to acceptance by the Engineer. The withdrawal of a VECRP by the Contractor shall be made in writing to the Engineer. The Contractor shall state the period of time from the date of submittal of the VECRP that the VECRP shall remain valid. Revision of this validity period shall be allowed only by mutual agreement of the Contractor, MassCEC and the Engineer. If the Contractor desires to withdraw the VECRP prior to the expiration of the validity period, the Contractor shall be liable for the costs incurred by MassCEC in reviewing the VECRP. The cost incurred by MassCEC will be recovered by the issuance of a Change Order to reimburse MassCEC from monies due the Contractor and payable to the Contractor as shown on the monthly payment application.

If the Contractor withdraws the VECRP, MassCEC reserves the right to proceed with the VECRP or any portion of the VECRP as a normal change and the Contractor waives any and all rights to share in net savings hereunder. For purposes of this provision, expiration of the time established by the Contractor for approval shall be considered as withdrawal by the Contractor if MassCEC requests an extension of that time and the Contractor does not provide a written extension.

D. When a VECRP submitted pursuant to this Article is accepted by the Engineer the following will occur:

1. A Change Order, covering an equitable adjustment in the Contract Price and modifications to other affected provisions of the Contract will be issued.

2. Any net savings in the cost of the VECRP to MassCEC, as determined by the Engineer, resulting from the VECRP will be shared between the Contractor and MassCEC on the basis of 50 percent for the Contractor and 50 percent for MassCEC.

3. Net savings in the cost of the VECRP will be determined by deducting from the estimated gross savings:

   a. The Contractor's costs of developing the proposal for the accepted VECRP.

   b. MassCEC's estimated additional costs incurred by processing and accepting the VECRP that includes, but is not limited to, anticipated increased costs to MassCEC on other contracts and anticipated follow-on increased costs to MassCEC.

   Estimated gross savings is the difference between the cost of implementing the requirements of the VECRP and the accepted changes. Gross savings shall include the Contractor's labor, material, equipment, overhead, profit and bonds. The Contractor's cost shall include additional costs including, but not limited to, amounts attributable to a subcontractor, such as preparation of design documents, incurred in developing and implementing the VECRP. MassCEC's costs will include, but not be limited to, additional costs incurred by the Engineer and its subconsultants or subcontractors in processing, reviewing and incorporating the VECRP into the Contract, all anticipated increased costs to MassCEC on other contracts and anticipated follow-on increased costs to MassCEC. MassCEC's costs may also include, but not be limited to, implementation, inspection, related items and MassCEC furnished material. The Contractor's share in the net savings to the Contract shall be affected by a change in the Contract Price that shall be reduced by the amount of MassCEC's share of the net savings and MassCEC's costs.

   Upon review of the VECRP, MassCEC and the Engineer may determine that the VECRP has sufficient merit that requires further development in order to permit a final approval or disapproval. In such instances MassCEC may request that the Contractor provide further development and/or design information. MassCEC, at its sole discretion, may decide to share in up to one-half of the Contractor's reasonable and actual development costs, but only for costs expressly preapproved by MassCEC in writing, incurred to

provide the additional development and/or design information. If the VECRP is approved, such development costs shall be included in the net savings calculation. If the VECRP is not approved by MassCEC, MassCEC will not require reimbursement for the share of development and/or design information costs it incurred.

Approval of the VECRP does not occur until a modification to the Contract Documents incorporating the VECRP is issued by MassCEC in the form of a Change Order. The estimated net savings determination, conditions placed on the VECRP by MassCEC, or the VECRP design or any other aspect of the VECRP may be changed at any time prior to approval, without obligation of MassCEC. If additional design development or additional time or cost impact analysis will be required after approval, the VECRP shall be included in the Contract Documents by Change Order, and it shall include statements identifying that the estimated net savings and the final design is subject to adjustment. If changes are required during the final design development that impact the estimated net savings, the net savings calculation shall be reviewed and adjusted. Increases to the net savings will be shared equally between MassCEC and the Contractor. Decreases in the net savings will also be shared equally, except the Contractor's share of decreased net savings will be limited to its share of the initially estimated total net savings.

4. The Contractor is entitled to share in VECRP savings only to the full extent provided for in this Article. The Contractor does not share in savings on follow-on contracts or in savings other than those of the VECRP, except to the extent such savings may decrease follow-on costs to MassCEC. For purposes of sharing under paragraph D.1, the term VECRP shall not include Change Orders to or other modifications to the Contract Documents, executed subsequent to acceptance of the particular VECRP, by which MassCEC increases the quantity of any item or adds any item of work.

E. The Contractor shall use its best efforts to include VECRP arrangements in subcontracts, which in the Contractor's judgement, appears to offer sufficient VECRP potential.

F. A VECRP identical to one submitted under any other contract, by this Contractor or any other contractor may be submitted under this Contract.

G. The Contractor may restrict MassCEC's right to use any portion of the Contractor's VECRP by marking it with the following statement:

This data furnished pursuant to Article 2.04 of the General Conditions of Contract No. MACEC-FY25-01 may not be duplicated, used or disclosed, except as required by the Massachusetts Public Records Law, in whole or in part, for any purpose except for evaluation, unless the VECRP is accepted

by MassCEC. This restriction does not limit MassCEC's right to use information contained in this data if it is or has been obtained, or is otherwise available, from the Contractor or from another source, without limitations. When this VECRP is accepted by MassCEC, MassCEC will have the right to duplicate, use, and disclose any data in any manner and for any purpose whatsoever, and have others do so whether under this or any other MassCEC contract.

2.05 INCREASED OR DECREASED CONTRACT QUANTITIES

A. When the accepted quantities of unit price Work vary from the quantities in the Bid Form, the Contractor shall accept as payment in full, so far as Contract Items are concerned, payment at the original Contract Unit Prices for the accepted quantities of Work done. An adjustment in any Contract Unit Price, as determined by the Engineer, will be made by means of a Change Order to credit MassCEC with any reduction in cost or to compensate the Contractor for any increase in cost resulting from such change in quantity only when the accepted quantities of work vary by an amount equal to or greater than plus 25 percent or minus 25 percent from the quantities in the Bid Form.

B. The Engineer may order omitted from the Work any items or portions of Work. Such omission shall not operate as a waiver of any conditions of the Contract nor invalidate any of the provisions thereof, nor shall the Contractor have any claim for lost profit on any part of the Work not performed. Also, see Article 7.05.

C. Except as specified herein, no allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased or decreased quantities or from unbalanced allocation, among the Contract Items of overhead expenses on the part of the Contractor and subsequent loss of expected reimbursement therefore, or from any other cause.

D. This section shall not apply to Lump Sum bid items, which are not subject to increases or decreases regardless of variations between actual quantities encountered in the performance of the Work and estimated or assumed quantities on which the lump sum bid price may have been based.

2.06 RIGHTS IN THE USE OF MATERIALS FOUND ON THE WORK

A. The Contractor, only with prior written approval of the Engineer, may take suitable ledge, gravel, sand, loam, clay, or other material from within the location lines of the Contract and use it on the same Contract for other purposes than for forming embankments. If such use necessitates securing additional material for forming embankments, the Contractor shall replace, at no additional expense to MassCEC, material of at least similar quality. The Contractor shall not excavate or remove any material that is not within the excavation as indicated by the Contract

Documents without written approval. Excavated material suitable for use shall not be wasted, unless otherwise directed.

2.07 ARCHEOLOGICAL AND PALEONTOLOGICAL SALVAGE

A. The Contractor's attention is directed to the United States Department of Transportation, Federal Highway Administration, Federal Aid Highway Program Manual, Volume 7, Chapter 7, Section 4, subject "Archaeological and Paleontological Salvage", incorporating Policy and Procedure Memorandum 20-7, dated March 31, 1979, and to the Commonwealth of Massachusetts, Acts of 1973, Chapter 1155.

B. In compliance with these procedures and legislation, the Contractor shall exercise special care during his operations to avoid injury to underground prehistoric and historic archaeological remains or paleontological remains. Should any archaeological or paleontological remains be encountered during any phase of construction, the Contractor shall immediately suspend all work in the area and shall notify the Engineer. The Engineer shall immediately notify the State Archaeologist and the Massachusetts Historical Commission. All construction work in that area will be temporarily delayed while the State Archaeologist and representatives of Massachusetts Historical Commission inspect the site to determine the importance of the discovery. Areas of prehistorical, historical, or paleontological significance shall be carefully protected in accordance with the above referenced manual and shall not be disturbed by the Contractor until so directed by the Engineer.

C. Contractor shall receive no extra compensation for such special care, unless said compensation is authorized in writing by the Engineer as provided for in Article 7.04. Material from such areas shall be carefully protected, and if necessary to remove specimens, the Contractor shall do so only at the Engineer's direction, and after an authorized agent has witnessed or otherwise referenced their locations.

2.08 WARRANTY OF WORK

A. Neither final acceptance, final payment nor any provision in the Contract Documents nor partial or entire operation or occupancy of the Work by MassCEC shall constitute an acceptance of the Work not done in accordance with the Contract Documents or relieve the Contractor of liability with respect to any express warranties or responsibility for faulty materials or workmanship.

B. Except where longer periods of warranty are specified for certain items, the Contractor warrants all Work done under the Contract to be free from faulty materials and workmanship for a period of one (1) year from MassCEC's final acceptance of the Work and for such longer times for specific parts of the work as may be required by the Contract Documents or applicable law.

C. Upon receipt of written notification from MassCEC during the warranty period described in Article 2.08B, the Contractor, at its sole cost, shall immediately correct or cause to be corrected all defective or improperly performed Work. If repairs or replacement are not started within ten (10) days from the date of notification and prosecuted to completion, MassCEC reserves the right to employ others to complete the Work. The Contractor agrees, upon demand, to pay MassCEC all amounts that it expends for such repairs or replacements.

D. All defective Work repaired or replaced by the Contractor pursuant to Article 2.08 shall carry the same warranty period as the original Work starting with the date of acceptable replacement or repair.

E. The warranty in this Section 2.08 shall not be exclusive and shall be in addition to all warranties and remedies otherwise available at law and equity, including but not limited to the Owner's right to recover damages and other remedies for defective or nonconforming work discovered after the warranty period but within applicable statutes of limitations and/or repose.

2.09 CHANGED CONDITIONS

A. If during the progress of the Work, the Contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those indicated in the Contract Documents either the Contractor or MassCEC may request an equitable adjustment in the Contract Price of the Contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a Contractor, or upon its own initiative, MassCEC will make an investigation of such physical conditions, and, if they differ substantially or materially from those indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, MassCEC will make an equitable adjustment in the Contract Price and the Contract will be modified in writing accordingly.

1. Filing, investigation, and settlement of all claims made under this Section shall be as follows:

a. The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing describing in full detail the subsurface or latent physical conditions at the site where it is maintained, that conditions differ substantially or materially from those conditions indicated in the Contract Documents. The

Engineer will promptly investigate the conditions and will promptly submit a written report of its findings and determinations to the Contractor, and if it is found that such conditions as have been described in detail by the Contractor do exist and in fact do so differ materially or substantially, an equitable adjustment will be made and the Contract modified in writing accordingly. No such claim of the Contractor will be allowed unless the Contractor has given the detailed notice specified, nor shall it be allowed if such conditions are disturbed prior to their investigation by the Engineer.

b. No adjustment or allowance of any kind except as provided in Article 6.08 will be made to the Contractor due to delay or suspension of the Work or any portion thereof where the actual subsurface or latent physical conditions encountered at the site differ substantially and materially from those indicated in the Contract Documents.

c. No claim will be approved, and no adjustment or allowance made when encountering subsurface or latent physical conditions at the site that differ substantially and materially from those indicated in the Contract Documents unless such conditions were in existence at the time of the Award of the Contract.

d. Any dispute concerning a question of changed conditions under this Article that is not disposed of by agreement shall be decided by the Engineer. The decision of the Engineer shall be final.

e. If as provided in "a" of this Subsection an equitable adjustment is to be made or contemplated, the Contractor shall submit promptly in writing to the Engineer an itemized statement of the details and amount of work together with his estimated costs for the same and the Engineer shall require the Contractor to keep actual costs and certify the same to MassCEC in writing.

B. If the Contractor and MassCEC fail to agree on an equitable adjustment to be made under this Article, then the Contractor shall accept as full payment for the Work in dispute an amount determined in accordance with Article 7.03.B.

2.10 INTENTIONALLY OMITTED

2.11 COMMUNITY RELATIONS

A. The Contractor shall establish and maintain a continuing liaison with persons residing or doing business in the vicinity of the Project site, for the purpose of minimizing inconveniences resulting from construction, and shall appoint a representative, acceptable to the Engineer, for community relations. The

representative shall have the authority to act directly, or through the Contractor's approved Superintendent, regarding all valid requests or complaints. Information as to their disposition by the Contractor shall be furnished to the Engineer. The name and telephone number of the Contractor's community relations representative shall be furnished to those residents or business owners in the community who might reasonably be expected to be affected by the construction.

2.12 REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS

A. Existing structures found within the limits of the Work, which are to be replaced or rendered useless by new construction, shall be removed by the Contractor at its own expense whether or not indicated on the Plans as existing unless otherwise provided in the Contract Documents. When such structures are situated so as not to interfere with the Work, the removal shall not be undertaken until the new replacement structures are ready for use or until the Engineer shall permit.

All material in existing structures requiring removal shall be removed as directed by the Engineer.

Unless otherwise provided, the material from any existing structures may be used temporarily by Contractor during construction. All discarded material, rubbish, or debris shall be removed from the Work area and MassCEC's property and properly disposed of (according to all laws, ordinances, regulations, orders and decrees) at the Contractor's expense. No foreign material or debris, except as directed within the Contract, shall be permitted to enter a waterway or drainage system.

2.13 FINAL CLEANING UP

A. Upon completion of the Work and before acceptance and final payment, the Contractor shall remove, at its own expense, from the Work area, from adjoining property, and from the Contractor's staging areas on MassCEC's property, all temporary structures and all surplus material and rubbish which may have accumulated during the prosecution of the Work and shall leave the Work in a neat and orderly condition. The Contractor shall insure that neither soil nor ground water have become contaminated from its activities. In the event of a "release to the environment", the Contractor shall ensure that appropriate notifications to the Engineer and the Massachusetts Department of Environmental Protection and other agencies with jurisdiction are made aware immediately and that all appropriate and required remedial actions are undertaken by the Contractor at its expense.

No equipment shall be left at the site of the Work or in the vicinity of the Work without the written permission of the Engineer.

END OF ARTICLE 2

ARTICLE 3 - CONTROL OF WORK

3.01 AUTHORITY OF THE ENGINEER

A. The Engineer will decide all questions relating to interpretation of the Contract Documents, and may alter, adjust, and approve same when necessary; all questions relating to quality, quantity, value, and acceptability of materials to be furnished and work provided or to be provided; all questions relating to progress of the Work and need for and manner of correcting same, and also the need for and time frames of delay and suspensions; all questions relating to the need for and terms of Extra Work; all questions relating to the supervision, control and director of Work on the site and the use thereof; and all questions as to the acceptable fulfillment of the Contract by the Contractor.

B. Attention of the Contractor is directed to the following limitations on the scope of the duties entrusted to the Engineer.

1. Engineer will not supervise, direct, control or have authority over or be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws and regulations applicable to the furnishing or performance of the Work. Engineer will not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

3.02 CONTRACT DRAWINGS

A. Contract Drawings showing the general arrangement and such details as necessary to give a comprehensive idea of the construction contemplated will be furnished by MassCEC. As work progresses, the Contract Drawings may be supplemented by the Engineer as required to amplify or control the Work. The Contractor shall perform the work required by such supplements without additional compensation, except as provided by the Contract Documents.

B. Approved drawings, details, profiles and sections on file in the office of the Engineer will show the location, details, and dimensions of the Work contemplated, and all Work shall be in strict conformity therewith and with the Specifications.

Supplemental, detail, and working drawings as required in the Specifications and furnished by the Contractor shall upon approval become a part of the complete Drawings. Such approval of supplemental, detail, and working drawings, however, shall not operate to relieve the Contractor of any of its responsibilities under the Contract Documents for the satisfactory completion of the Work, nor for the accuracy of the dimensions, details or quantities.

The detail drawings shall be of the same size as the original contract drawings, with margins and titles conforming thereto. When submitting detail drawings for approval, Contractor shall furnish an electronic copy (PDF) to the Engineer, who will review and either approve, reject, or provide comment with corrections marked thereon. Once final approval has been obtained by the Engineer, the Contractor shall furnish a PDF of the final corrected and approved As-Built Drawings to the Engineer. No changes shall be made in the approved drawings without the written consent of the Engineer.

The Contract Price shall include the cost of furnishing all working drawings and the Contractor will be allowed no extra compensation therefore.

Any work done or materials furnished by the Contractor prior to the approval of the working drawings shall be at its own risk. The words "approved as noted" or words of similar import placed by the Engineer on a contract or shop drawing submittal mean that all items and details of the drawing submitted are fully approved with the exception of those items or details that are specifically marked for further action. The withholding of an unqualified approval by the Engineer with respect to any contract drawing or shop drawing in its entirety shall under no circumstances constitute a basis for delay in arranging for and proceeding with the manufacturing, fabricating, delivering and installing, in accordance with the Contract Documents, of those items or details on such drawing which have been approved as aforesaid.

C. The Contractor shall maintain at the site, a set of Contract Drawings on which to record the as-built conditions. These As-Built Drawings shall be updated on a daily basis, as the Work progresses, showing what was actually constructed, the dimensions and grades of all Work, located horizontally and vertically to the nearest 0.1 of a foot, indicating thereon all exposed features uncovered during the Work and all other construction Work items completed under this Contract. The Contractor shall require the Subcontractors to participate daily in the As-Built Drawing updates, which shall show all Work, as it was built or discovered, including the Work of all Subcontractors. As-Built Drawings of hidden features shall be based upon measurements taken by the Contractor before covering them. These As-Built Drawings shall be kept current and available for review by the Engineer and MassCEC at all times.

The Contractor shall forward a copy of the current As-Built Drawings with each payment requisition to the Engineer. At the sole discretion of MassCEC, Contractor's application for payment may either be withheld or modified unless accompanied by complete and updated As-Built Drawings. At a minimum, for underground utilities (uncovered, existing or installed) the As-Built Drawings shall show the type of feature, material, size, elevation (top and/or flow line) and horizontal position by the project datum (northing, easting and elevation) at every change in direction and minimally every 50 feet.

D. Prior to final acceptance and payment by MassCEC, the Contractor must submit to the Engineer final As-Built Drawings. Each final As-Built Drawing must include the Contractor's certification that the Drawing completely and accurately represents the final as-built conditions. The Contractor's certification shall state: "This Drawing reflects As-Built Conditions as certified by (insert Contractor's name)." The Consultant shall then update the As-Built Drawings to provide electronic AutoCAD base Drawing files, along with Contractor final As-Built Drawings.

The Engineer will then deliver to MassCEC the certified As-Built Drawings.

3.03 CONFORMITY WITH CONTRACT DOCUMENTS

A. No willful and substantial deviation from Contract Documents shall be made unless directed in writing by the Engineer duly authorized by MassCEC to approve such deviation. Such deviation may be authorized by a written order of the Engineer authorized to approve such deviation, and that within 30 days thereafter such written order shall be confirmed by a certificate of MassCEC.

B. All Work provided and all materials furnished shall be in conformity with the lines, grades, cross sections, dimensions, details, gradations, physical, and chemical characteristics of materials and other specific requirements of the Contract.

C. Where definite tolerances are specified in the Contract, such tolerances shall fix the limits of conformity. Where tolerances are not specified in the Contract Documents, the Engineer will determine the limits of conformity in each individual case and such determination shall be final and conclusive and mutually accepted by all parties.

D. If materials or the finished product in which the materials are used are not within conformity with the Contract Documents, but acceptable work has been produced, the Engineer will make a determination whether the work shall be accepted and remain in place. The Engineer will document the basis of acceptance by Contract modification that will provide for an appropriate adjustment in the Contract Price for such work or materials as he deems necessary to conform to his determination based on engineering judgment, and in accordance with current construction practices.

E. If the Engineer finds the materials, or the finished product in which the materials are used or the Work provided, are not in conformity with the Contract Documents and have resulted in an inferior or unsatisfactory product, the Work or materials shall be removed and replaced or otherwise corrected by the Contractor, at no additional cost to MassCEC.

F. Deviations from the Contract Drawings and approved shop or working drawings that may be required by the need of the Work, will be determined and authorized by the Engineer in writing.

G. The Contractor shall, without extra cost, make necessary modifications to prevent conflicts with the existing work of others or as necessary to ensure a proper installation. This may require the preparation of composite drawings that are drawn to suitable scale and that show the necessary work to be done.

3.04 COORDINATION OF CONTRACT DRAWINGS AND CONTRACT SPECIFICATIONS

A. Contract Drawings, Contract Specifications and all other Contract Documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. The Contract Documents are intended to be complementary and to describe and provide for a complete Work. In the event of any discrepancy between a Drawing and figures written thereon, the figures, unless obviously incorrect, are to govern over scaled dimensions. Contract Drawings will govern over Contract Specifications. Where Work is to be accepted by a municipality, utility company, railroad or responsible agency/entity the Reference Utility Standards that apply to their materials and workmanship will govern.

B. The Contractor shall take no advantage of any apparent error or omission in the Contract Documents. The Contractor shall provide immediate written notice to the Engineer of any errors or omissions in the Contract Documents. The Engineer will then make such corrections and interpretations as may be deemed necessary to fulfill the intent of the Contract Documents.

3.05 COOPERATION BY CONTRACTOR

A. The Contractor will be given an electronic copy (PDF) of the Contract Documents. The Contractor shall have the Contract Documents available for reference at all times during the prosecution of the Work. Hard copies of the Contract Documents may be requested by the Contractor and will be furnished by MassCEC at the expense of the Contractor.

B. Prior to starting Work the Contractor shall designate in writing the name, title, qualifications, and experience of its proposed representative (job superintendent) who, upon approval by MassCEC, shall have complete authority to represent and to act for the Contractor. A facsimile of the authorized representative's signature shall be furnished to the Engineer. The authorized representative or a substitute acceptable to the Engineer shall be present at the work site at all times while work is actually in progress on the Project. Arrangements for responsible supervision acceptable to the Engineer shall be made for emergency work that may be required during periods when Work is suspended. The Contractor shall notify the Engineer,

in writing, of any proposed change of his representative, and shall provide identical information for approval of the new representative.

1. The job superintendent shall have the following minimum qualifications and experience:

   a. A Commonwealth of Massachusetts, Department of Public Safety, License for Construction Supervisor without any restrictions.
   b. A minimum of 10 years of related construction experience.

   The requirements for a licensed construction supervisor and the number of years of related construction may be waived or modified only by the Executive Director of MassCEC.

C. The Contractor shall ensure that the materials and workmanship are in accordance with the Contract Documents. The Contractor shall preserve baseline monuments, benchmarks, and other controls for the Work.

D. The Contractor shall perform the Work under the direction of the Engineer such that representatives of utility owners, state, or municipal departments may enter on the work site without interference to make changes in their facilities which may be affected by the Work. The Contractor shall have no claim for, or because of any delay that may be due to or result from work of utility owners, state or municipal departments. No allowance of any kind will be made except as provided in Article 6.08. Nothing contained herein shall be construed to hold the Contractor responsible for any acts or omissions by such utility owners, state or municipal departments, or their contractors.

E. At the Contractor's discretion, the Owner will designate an area near the Project site if the Contractor wishes to maintain and staff a field office from the time of commencement of the Work under this Contract until such time as the Work has been completed and finally accepted. The Contractor is solely responsible for set up and take down with no expense to the Owner.

F. The Contractor shall confine its equipment, the storage of materials and the operation of his workmen to limits shown on the Contract Documents, established by law, ordinances, permits or directions of the Engineer. The Contractor shall not unreasonably encumber the project site with their materials. All flammable or combustible materials shall be properly stored using OSHA approved containers to prevent, by effective measures, fire.

G. This Contract is expected to be proceeding concurrently with others in the vicinity and within the limit of the Contract. The Contractor shall cooperate fully with the other contractors in expediting the work of all. The Contractor shall secure and anchor the work and avoid damage to the work of the other contractors.

3.06 ADJACENT CONTRACTS

A. MassCEC reserves the right at any time to contract for and perform other or additional work on or near the Work covered by the Contract Documents. The intent of this Article is to provide for the cooperation of contractors where MassCEC deems it expedient or necessary and in the best interest of MassCEC to let separate contracts for the performance of other work on or near the location of the Work being performed under the Contract Documents, but it is not intended to indicate an intention on the part of MassCEC to let separate contracts for work within the scope of or necessary for the successful completion of the Work.

B. When separate contracts are let within the limits of any one project (either prior to award of Contract, as specified in the Bid, or as specified above), each contractor shall conduct its work so as not to interfere with or hinder the progress or completion of the work being performed by other contractors.

1. Contractors working within the same area shall cooperate with each other as directed and shall coordinate work schedules through the Engineer to minimize conflicts.

C. Each contractor involved shall assume all liability, financial or otherwise, in connection with its contract and shall protect and save harmless MassCEC from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced because of the presence and operations of other contractors working within the limits of the same project. No allowance of any kind will be made except as provided in Article 6.08.

1. Work beyond the limits of the Project site that is reasonably related to or inferred from the Work required by the Contractor that is due to the work of adjacent contractors within the limits of the project shall be performed by the Contractor, at no additional cost to MassCEC.

D. The Contractor shall arrange the Work and shall place and dispose of the materials being used so as not to interfere with the operations of other contractors within the limits of the Project site. The Contractor shall join the work with that of others in an acceptable manner and perform the Work in proper sequence to that of others.

E. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless MassCEC from and against all claims, costs, losses and damages (including, but not limited to, fees and charges of architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor to the extent said claim is based on or arises out of an act or omission of the Contractor in the performance of the Work.

3.07 LINE AND GRADE

A. The Contractor will be responsible to provide benchmark and basic control points on or near the construction site for the primary vertical and horizontal control as shown in the Contract Documents. The Contractor shall be required to set all base lines and grade stakes from these basic control points and benchmarks. The Contractor shall employ a surveyor or engineer registered in the Commonwealth of Massachusetts for this purpose. The Contractor shall be responsible for the preservation of these control points and if they are destroyed or disturbed the Contractor shall replace them, at no additional cost to MassCEC. The Contractor shall also establish field ties to the critical points of the base line in order that these can be reproduced after the subgrade work is complete. Information on the field ties shall be submitted to the Engineer. Monuments, stakes, and marks set by MassCEC shall be preserved by the Contractor. If such monuments, stakes, or marks are destroyed or damaged, they may be replaced by MassCEC. The Contractor will be charged the cost of replacing monuments, stakes, or marks destroyed or damaged by reason of its operations. The replacement cost will be deducted from amounts otherwise due and payable to the Contractor for the Work.

B. The Contractor shall proceed from the controls established by MassCEC to make all surveys and layouts necessary to conform all of the work to the requirements of the Contract Documents; shall provide qualified engineering and other personnel for the purpose; and shall be solely responsible for the accuracy of the line and grade features of his Work.

C. MassCEC will make such checks, as necessary, of the control work established by the Contractor as the Work progresses. The Contractor will be informed of results of such checks, but MassCEC by so doing will in no way relieve the Contractor of responsibility for accuracy of the Contract control. The Contractor shall provide such assistance, at no cost to MassCEC, as may be required for checking purposes when requested by MassCEC.

D. The Contractor shall notify MassCEC a reasonable time in advance of his needs, of the time and place the Contractor plans to provide the Work for which such primary control will be needed. MassCEC will furnish the Contractor with such primary lines, grades, and elevations as it deems necessary by such time so as not to delay the Contractor's operations. MassCEC, however, will not be held responsible for any delay resulting from lack of such information if the Contractor fails to notify MassCEC sufficiently in advance of the Contractor's needs.

3.08 AUTHORITY AND DUTIES OF ENGINEER'S ASSISTANTS

A. The Engineer may appoint assistants and representatives. The assistants and representatives are authorized to inspect work and materials, to give directions pertaining to the Work or to the safety and convenience of the public, to approve or reject materials and to make measurements of quantities.

B. In case of any dispute arising between the Contractor and the Engineer's assistants, as to materials furnished or the manner of providing work, the Engineer's assistants are authorized to reject materials or to suspend work until the dispute is referred to and decided by the Engineer.

C. The Engineer's assistants are not authorized to revoke, alter, enlarge, relax, or release any requirements of these Specifications nor to issue instructions contrary to the Contract Drawings and Specifications.

D. The Engineer's assistants will not act as foremen or perform other duties for the Contractor.

E. MassCEC will not accept responsibility whatsoever for Extra Work performed for which there is no specific proper written authorization.

3.09 INSPECTION OF WORK

A. All materials and each part or detail of the Work shall be subject to inspection by the Engineer. The Engineer shall at all times have access to the Work and be furnished with information and assistance by the Contractor as required, at no additional cost to MassCEC, to make a complete and detailed inspection.

B. The Contractor, if requested by the Engineer, shall before acceptance of the Work, remove or uncover such portions of the finished work as directed. After examination, the Contractor shall restore said work to the standard required by the Contract Documents. Should work exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as Extra Work. Should work exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed, will be at no additional cost to MassCEC.

C. The Engineer may order that any Work done or materials used not in conformance with the requirements of the Contract Documents be removed and replaced, at no additional cost to MassCEC.

D. The Contractor shall furnish written information to the Engineer stating the original sources of supply of all materials manufactured away from the Work site. This information shall be furnished at least two weeks (or as otherwise required by the Engineer) in advance of the incorporation in the Work of such materials.

E. When any unit of government or political subdivision is to pay a portion of the cost of the Work, its respective representatives shall have the right to inspect the Work. Such inspection shall in no sense make any unit of government or political subdivision a party to this Contract and shall in no way interfere with the rights of either party hereunder.

F. Inspection of Work shall not relieve the Contractor of any of his obligations to fulfill the requirements of the Contract Documents.

G. Failure to reject any defective work or materials shall not in any way prevent later rejection when such defect is discovered, nor obligate MassCEC to make final acceptance.

H. The Contractor shall give prior notice to the Engineer when work on the various items is to be performed by him or his subcontractors. If work is suspended on any item, prior notice shall be given to the Engineer before resumption of such work. Except in the case of an unforeseen emergency, neither the Contractor nor any subcontractor shall perform any Work requiring inspection at hours other than during the normal work day without prior approval of the Engineer.

3.10 REMOVAL OF DEFECTIVE OR UNAUTHORIZED WORK

A. The Contractor shall immediately repair, remove and replace, at no cost to MassCEC, any Work found to be defective notwithstanding that such Work has previously been inspected and approved or estimated for payment.

B. Work performed beyond the lines and grades shown on the Contract Documents or established by the Engineer, and Extra Work done without written authorization, will be considered unauthorized Work and the Contractor will receive no compensation therefor. If required by the Engineer, unauthorized Work shall be remedied, removed, or replaced, at no additional cost to MassCEC.

C. Upon failure of the Contractor to remedy, remove, or replace defective or unauthorized Work, or to comply promptly with any requirement of the Engineer made under this Article, MassCEC may cause defective or unauthorized work to be remedied, removed, or replaced by others and deduct the costs thereof from any monies due or to become due the Contractor.

3.11 SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE

A. Upon Substantial Completion of the Work, the Contractor shall present to MassCEC and the Engineer its written certification that the Work has been Substantially Completed. Within 10 days thereafter, the Engineer shall inspect the Work and present to the Contractor and MassCEC either a written declaration that the Work has been Substantially Completed ("Declaration of Substantial Completion"), or else shall present to Contractor an itemized list of incomplete, defective, or unsatisfactory Work items that must be completed or corrected before the Work can be deemed Substantially Completed. The Engineer may include with such list a notice setting forth a reasonable time, which shall not in any event be prior to the Contract completion date, within which the Contractor must achieve Substantial Completion of the Work. If based on this inspection, the Engineer issues a Declaration of Substantial Completion and MassCEC fails to approve or

reject the Declaration in writing within 10 days of receipt, the Work shall be effectively deemed to have been Substantially Completed. Any such rejection shall be accompanied by an itemized list of incomplete, defective, or unsatisfactory Work items that MassCEC determines are not sufficiently resolved to warrant the Declaration of Substantial Completion.

B. Following the inspection described in Article 3.11A, if the Engineer determines that the Work is not Substantially Complete and provides to the Contractor an itemized list of incomplete, defective, or unsatisfactory Work that must be completed or corrected before Substantial Completion, the Contractor shall immediately commence and continue to complete and correct those items of the Work within the time specified by the Engineer. MassCEC may, without further notice and without in any way affecting the Contract, make such other arrangements as may be considered necessary to insure satisfactory completion of the Contract. The cost of completing such Work will be deducted from any money due or which may become due to the Contractor under the Contract.

C. Within10 days of the effective Declaration of Substantial Completion, MassCEC shall present to the Contractor a list of incomplete and defective Work that must be completed or corrected before final acceptance of the Work (the "Punch List"). MassCEC, with the assistance of the Engineer shall assign a reasonable value to the items on the Punch List in an amount up to 150% of the estimated cost to MassCEC to complete or correct such items. Unless otherwise agreed by MassCEC and the Contractor, the Contractor shall complete all items of Work on the Punch List within 14 days of the date of the approved (whether explicit or effective pursuant to Article 3.11 A.) Declaration of Substantial Completion. If the Contractor fails or neglects to complete the Punch List in such time, MassCEC may provide written notice of such failure or neglect to the Contractor. If the Contractor fails to commence and continue to perform the Punch List work within 7 days of such written notice, MassCEC may complete the Punch List itself or through separate contractors at the Contractor's expense.

D. Also, see Article 5.24.

E. Also, see Article 7.09.

END OF ARTICLE 3

ARTICLE 4 - CONTROL OF MATERIALS

4.01 TRADE NAMES AND ALTERNATIVES

A. An item equal to that named or described in the Contract Documents may be furnished by the Contractor, and the naming of any commercial name, trademark, or other identification shall not be construed to exclude any item or manufacturer not mentioned by name or as limiting competition but shall establish a standard of equality only. An item will be considered equal to the item so named or described if all of the following requirements are met:

1. It is at least equal in quality, durability, appearance, strength, safety, reliability, operability, maintainability, and design.

2. It will perform at least equally the function imposed by the general design for the Work being contracted for.

3. It conforms substantially, even with deviations, to the detailed requirements for the item specified.

B. For each item of material, the specifications shall provide for either a minimum of three brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials.

C. Burden of proof as to the quality and suitability of alternatives shall be upon the Contractor. The Contractor shall furnish, in writing, all information necessary as required by the Engineer, at no additional cost to MassCEC. Requests for review of alternative materials will not be accepted by the Engineer from anyone other than the Contractor. The Engineer will be the sole judge as to the quality and suitability of alternative materials and the Engineer's decision will be final.

D. Information furnished shall state whether or not acceptance of the alternative material for use in the Work will require a change in the Contract Documents to adapt the design to the alternative and whether or not incorporation or use of the alternative in connection with the Work is subject to payment of any license fee or royalty. MassCEC does not pay license fees and royalties. Where use of an alternative material involves redesign of or changes to other parts of the Work, the cost and the time required to affect such redesign or changes will be considered in evaluating the suitability of the alternative material and the Contractor shall pay charges incurred by MassCEC for such redesign or change.

E. No tests nor action relating to the approval of alternative materials will be made until the request for substitution is made in writing by the Contractor accompanied by complete data as to the equality of the materials proposed. Such request shall

be made in ample time to permit approval without delaying the Work, but such requests need not be made less than 30 days after receipt of Notice to Proceed.

F. Whenever classification, rating, or other certification by a body, such as Underwriters Laboratories, Inc. (UL), or National Electrical Manufacturers Association (NEMA) is a part of the specification for any material, proposals for use of alternative materials shall be accompanied by reports from the listed or equivalent independent testing laboratory indicating compliance with specification requirements.

G. The Contractor shall pay costs of testing required to prove equality of the material proposed.

H. Approval of an alternative material shall be only for the characteristics or use named in such approval and shall not be used to change or modify any Contract requirement, or to establish a basis for subsequent approval for material to be used on any other phase of the Work.

4.02 CERTIFICATE OF COMPLIANCE

A. The use of certain products/materials on the basis of a notarized Certificate of Compliance may be allowed under the following conditions:

Before such products/materials are incorporated into the Work, the Contractor shall submit to the Engineer, for approval, copies of the manufacturers or supplier's statement for each kind of such product/material furnished. The statement shall contain the following information:

1. Contract to which the product/material is consigned.

2. Name of the Contractor to which the product/material is supplied.

3. Kind of product/material supplied.

4. Quantity of product/material represented by the certificate.

5. Means of identifying the consignment including, but not limited to, labeling, marking or seal number.

6. Date and method of shipment.

7. Statement to the effect that the product/material has been tested and found in conformity with the pertinent parts of the Contract.

8. Results of all required tests including the chemical analysis in the case of metal; or in lieu of furnishing the results a statement that the results of all

required tests pertinent to the certificate and not submitted shall be maintained and available by the undersigned for a period of not less than 3 years from date of final acceptance.

9. Signature of a person having legal authority to bind the manufacturer or supplier.

B. If the Contractor has new products/materials purchased for use on a previous MassCEC contract which have never been used and which comply with the Contract Documents, these products/materials may be furnished and installed in the Work provided the Contractor submits his own sworn statement certifying that such products/materials were purchased for use on a previous contract (name and identifying such contact) and that Certificates of Compliance were furnished for such products/materials on the previous contract, to which reference can be made.

1. Costs involved in furnishing the certificates shall be borne by the Contractor.

2. Products/materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that a product/material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating products/materials in the Work which conforms to the requirements of the Contract Documents and Specifications any such products/materials not conforming to such requirements will be subject to rejection, whether in place or not.

3. The Engineer reserves the right to refuse to permit the use of products/materials on the basis of a Certificate of Compliance alone.

4.03 MassCEC FURNISHED MATERIALS

A. Materials furnished by MassCEC will be available at locations designated in Supplementary Conditions or, if not so designated, they will be delivered to the Work site or such other place as the parties may agree. MassCEC furnished materials shall be stored and transported to the place of use by the Contractor at the Contractor's expense, including all necessary loading and unloading. The Contractor's costs of storing, handling, and installing MassCEC furnished material are included in the Contract Price.

B. Contractor shall be responsible for all materials furnished by MassCEC and shall pay all demurrage and storage charges as a result of the Contractor's failure to take delivery of MassCEC furnished material. The Contractor shall be liable to MassCEC for the cost of replacing or repairing MassCEC furnished material lost or damaged from any cause whatsoever after receipt by the Contractor. Such costs will be deducted from any amounts due or to become due the Contractor, except those amounts covered under insurance policies furnished by MassCEC. In the

event that such amounts are covered by an insurance policy furnished by MassCEC, the Contractor shall be responsible for paying any deductible.

4.04 DEFECTIVE MATERIALS

A. Contractor furnished materials not conforming to the requirements of the Contract Documents will be rejected, whether in place or not. Rejected material shall be removed immediately from the site of the Work unless otherwise permitted by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the Work unless approved in writing by the Engineer. If the Contractor fails to comply promptly with a request by the Engineer, made under the provisions of this Article, the Engineer may cause the removal and replacement of rejected material and the cost thereof will be deducted from any moneys due or to become due the Contractor.

4.05 ASBESTOS MATERIALS

A. The Contractor shall not furnish or install asbestos or materials containing asbestos under this Contract.

4.06 BANNED MATERIALS

A. Lead Paint

1. The Contractor shall not furnish or apply lead containing paint on surfaces within the limits of the Contract.

a. A lead containing paint is defined by the Consumer Product Safety Commissions' Lead Containing Paint Poisoning Prevention Act of 1979 as any coating whose dried film contains greater than 0.06 percent by weight of lead.

4.07 IDENTIFICATION OF MATERIAL AND EQUIPMENT

A. No materials manufactured or produced by convict labor shall be used on Work financed, either wholly or in part, with federal funds.

B. The source of supply of each material shall be approved in writing by the Engineer before delivery is started. Materials furnished by the Contractor which do not conform to the Contract Documents at the time of incorporation into the Work shall not be deemed acceptable simply because they were obtained from a source of supply that had been approved by the Engineer.

C. The Contractor shall furnish all materials required for the Work specified in the Contract Documents and said materials shall meet the requirements of the Specifications for the kind of work involving their use.

D. Only new and first quality materials, conforming to the requirements of the Contract Documents and approved by the Engineer, shall be used in the Work. If it is found that approved sources of supply do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish material from other approved sources approved by the Engineer.

E. The Contractor shall give a preference in the purchase of supplies and materials, other considerations being equal, in favor, first, of supplies and materials manufactured and sold within the Commonwealth, and second, of supplies and materials manufactured and sold within the United States.

F. The Contractor may be required to furnish sworn certificates as to quality and quantity of material before said materials are incorporated in the Work.

G. All electrical, mechanical and HVAC equipment shall be properly identified including manufacturer's name plates, serial number, model, capacity, size, etc. as appropriate for the equipment. Contractor shall also furnish the manufacturer's operating instructions and preventive maintenance manual and recommendations.

H. Where products or materials are specified by the manufacturers' name, or catalog reference, the words "or approved equal" shall be understood to follow. An item shall be considered equal to the item so named or described if: (1) It is at least equal in quality, durability, appearance, strength, and design; (2) It performs at least equal to the function imposed by the general design for the work; and (3) It conforms substantially, even with deviations, to the detailed requirements for the item as indicated by the Specifications. The Contractor's proposal, however, shall be based on the use of any products or material specified, and where two or more products or materials are specified, the choice of these shall be optional with the Contractor.

I. All materials, services, equipment, and workmanship furnished shall be guaranteed for a period of one year after the date of acceptance unless otherwise specified elsewhere in the Contract Documents. All Work rejected must be redone at the Contractor's expense.

4.08 DELIVERY AND STORAGE OF MATERIALS

A. Materials and equipment shall be delivered to the site so that there will be neither delay in the progress of the Work nor an accumulation of material that is not to be used within a reasonable time. Stockpiling of materials and storage of any construction equipment shall be as far away from the edge of any body of water as is practical, however, in any case, it should not be within one hundred (100) feet of wetlands or the edge of any body of water.

B. Materials shall be stored at the expense of the Contractor so as to ensure the preservation of their quality and fitness for the Work. When considered necessary

by the Engineer, they shall be placed on wooden platforms or other hard clean surfaces, and not on the ground, and shall be placed under cover when directed. The ground and ground water shall be protected by the Contractor in order to avoid contamination, the Contractor's expense, to the satisfaction of the Engineer. Stored materials shall be located to facilitate prompt inspection.

END OF ARTICLE 4

ARTICLE 5 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

5.01 LAWS TO BE OBSERVED

A. The Contractor shall keep fully informed concerning all requirements of law, including all state and federal laws, county and municipal ordinances, and regulations which in any manner affect those engaged or employed in the Work, or the materials used, in the Work, or such orders and decrees of bodies or tribunals having jurisdiction or authority over the same. The Contractor shall at all times observe and comply with and shall cause all agents and employees to observe and comply with, all such existing and future laws, ordinances, regulations, orders and decrees. The Contractor shall protect, indemnify and hold harmless MassCEC and the Engineer, and all of their officers, agents, and employees against all claims and liabilities arising from or based on the violation of any such requirement of law whether by the Contractor, his employees, agents, or subcontractors. If any discrepancy or inconsistency is discovered in the Contract Documents in relation to any such requirements of law, the Contractor shall immediately report the facts to the Engineer in writing. The Contract shall be governed by the laws of the Commonwealth.

B. The Contractor, if a foreign corporation (a corporation established, organized, or chartered under laws other than those of the Commonwealth) shall comply with the provisions of Chapter 156D of the General Laws as amended. The Contractor shall file with MassCEC a certificate of the State Secretary stating that such corporation has complied with Chapter 156D and the date of such compliance.

C. Other out-of-state business organizations, such as individual proprietorship, partnership and joint ventures, shall appoint an agent in this Commonwealth for the service of legal process and furnish a copy of such appointment to the State Secretary prior to the issuance of a contract by MassCEC.

D. Work shall be in accordance with the Massachusetts State Building Code.

1. The Contractor shall protect and indemnify MassCEC and its representatives against any claim or liability arising from or based on the violation of any law, ordinance, safety code, regulation, order or decree whether caused by the Contractor, its employees or its subcontractors employed on the Project.

2. Such laws, ordinances, codes, regulations, orders, or decrees may restrict and limit the Contractor's working hours or use of certain types of equipment on the Project. The Contractor acknowledges and agrees that it is familiar with such restrictions and limitations which shall not be the grounds for an increase in the Contract Price.

3. The Contractor shall give all necessary notices, obtain all permits as required and pay all government taxes, fees, and other costs in connection with the Work. The Contractor shall file all necessary drawings, prepare all documents, and obtain all necessary approvals of all governmental departments that have jurisdiction. The Contractor shall obtain all required Certificates of Inspection prior to acceptance and final payment for the Work. Compensation for conforming to all provisions of this Article, except as may be provided otherwise in Supplementary Conditions, is included in the Contract Price.

E. Without limiting the Contractor's responsibility for ascertaining and complying with all applicable laws, ordinances, regulations, orders, and decrees, the Contractor's attention is called particularly to the requirements stated in the Sections of Division 1, General Requirements, specifying the general requirements for furnishing, installing and operating temporary controls during construction.

F. The Contractor shall comply with the following legal requirements for any and all employees to be employed in the Project who are required to be listed in the certified payroll reports for the Project:1) Federal Department of Homeland Security Requirements in hiring such employees including, but not limited, to the faithful completion of the Federal Department of Homeland Security Form I-9 process by Contractor; 2) proper classification of individuals employed on the project; 3) all laws concerning workers' compensation insurance coverage, unemployment insurance, social security taxes, and income taxes; and 4) all laws concerning hospitalization and medical benefits that meet the minimum requirements of the connector board established in chapter 176Q of the General Laws. The Contractor shall execute a Workforce Certification form with the execution of its contract. The Contractor shall require each of its subcontractors and sub subcontractors to execute and provide to Contractor such Workforce Certification form with the execution of each subcontract, and Contractor shall immediately provide a copy to the Owner. Contractor acknowledges that with the weekly workforce reports that must be submitted on a weekly basis, in the form and format required by the Owner, including but not limited to, by electronic reporting, Contractor and all of its subcontractors are required to certify that the Form I-9 process was faithfully completed and that all other legal requirements related to its workforce referenced above were followed for all employees listed on each certified payroll report when submitted. The Contractor and all of its subcontractors must: comply with the legal requirements of this section; must not knowingly use undocumented workers in connection with the performance of this contract; pursuant to federal requirements must verify the immigration status of all workers assigned to the contract without engaging in unlawful discrimination; and must not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker. Breach of any of the terms of the Workforce Certification legal requirements during the period of the Contract may be regarded as a material breach, subjecting the Contractor and its subcontractors to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or

termination. Contractor must require each of its subcontractors to execute and provide to Contractor a Workforce Certification form with the execution of each subcontract, and Contractor must require each subcontractor to forward a copy of each such Workforce Certification to the Construction Manager for filing with the Owner.

G. The Contractor shall comply with M.G.L. c. 149, § 26- 27H. The Prevailing Wage Schedule is provided as **Attachment 4 of the Request for Proposal (RFP),** listing the prevailing minimum wage rates that must be paid to all workers employed in the Work. The Owner is not responsible for any errors, omissions, or misprints in the said schedule. Such Schedule shall continue to be the minimum rate wages payable to workers employed in the Work throughout the term of this Contract, subject to the exceptions provided in M.G.L c.149, § 26-27H. The Contractor shall not have any claim for extra compensation from the Owner if the actual wages paid to workers employed in the Work exceeds the rates listed on the schedule or as otherwise provided by law. The Contractor shall cause a copy of said Schedule to be kept in a conspicuous place at the Site during the term of the Contract. If reserve police officers are employed by the Contractor, they shall be paid the prevailing wage of regular police officers. (See M.G.L c.149, § 34B) Mass General Laws c. 149, section 27 as amended on August 8, 2008, requires annual updates to prevailing wage schedules for all public construction projects lasting longer than one year. The Contractor is required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The Contractor and all subcontractors are required to anticipate such annual updated prevailing wage schedules and neither the Contractor nor any subcontractors shall be entitled to claim additional compensation for base contract work due to updated prevailing wage schedules.

H. The Contractor shall comply and shall cause its Subcontractors to comply with Massachusetts General Law c. 149, § 27B, which requires that a true and accurate record be kept of all persons employed on the project for which the prevailing wage rates have been provided. The Contractor and all Subcontractors shall keep these records and preserve them for a period of three years from the date of completion of the Contract. Such records shall be open to inspection by any authorized representative of the Owner at any reasonable time, and as often as may be necessary. The Contractor shall, and shall cause its Subcontractors to, submit weekly copies of their weekly payroll records to the Owner. In addition, the Contractor and each Subcontractor shall furnish to the Executive Department of Labor within 15 days after completion of its portion of the Work a signed statement in the form required by the Owner.

I. If the Director of the Department of Labor and Workforce Development has established a Schedule of wage rates to be paid to the operators of trucks, vehicles or equipment for the Work, the Contractor shall be obligated to pay such operators at least the minimum wage rate contained on such Schedule. (See M.G.L. c.149, § 26-27H).

J. The Contractor shall comply with and shall cause its Subcontractors to comply with M.G.L. c. 149, § 148 which requires the weekly or biweekly payment of employees within six days of the end of the pay period during which wages were earned if employed for five or six days of a calendar week, and within other periods of time under certain circumstances as set forth therein.

K. The use by the Contractor of trucks or other motor vehicles hired from either common or contract motor carriers in the course of performance of this Contract is subject to such minimum rates and charges, and rules and regulations as may from time to time be promulgated by the Department of Public Utilities of the Commonwealth of Massachusetts or other agency of the State of Federal government which may be authorized by law to set rates or otherwise regulate the use of such vehicles. The Contractor expressly assumes the risk of any additional expense that may arise by reason of any change in such minimum rates and charges, and rules and regulations, and shall be entitled to no additional compensation or reimbursement by reason thereof.

L. Northern Ireland - M.G.L. c. 7 § 22C. Pursuant to G.L. c. 7 § 22C for state agencies, state authorities, the House of Representatives or the state Senate, the Contractor certifies that it does not employ ten or more employees in an office or other facility in Northern Ireland and if the Contractor employs ten or more employees in an office or other facility located in Northern Ireland the Contractor certifies that it does not discriminate in employment, compensation, or the terms, conditions and privileges of employment on account of religious or political belief; and it promotes religious tolerance within the work place, and the eradication of any manifestations of religious and other illegal discrimination; and the Contractor is not engaged in the manufacture, distribution or sale of firearms, munitions, including rubber or plastic bullets, tear gas, armored vehicles or military aircraft for use or deployment in any activity in Northern Ireland.

M. Contractor shall comply with provisions set forth in the **"American Rescue Plan Act (ARPA) Contract Addendum,"** included as **Attachment 3 of the RFP**, which contains additional federal requirements applicable to the Project, including Equal Employment Opportunity requirements.

5.02 PERMITS AND LICENSES

A. The Contractor shall give all notices necessary and due in connection with the lawful prosecution of the Work, shall procure all permits and licenses from Federal, State and local authorities as MassCEC may deem necessary or appropriate and shall pay all expenses, charges, and fees in connection therewith. No work shall be undertaken or materials ordered without obtaining such permits, licenses and approvals. Proof of acceptance by the above authorities shall be submitted by the Contractor to MassCEC upon completion of the Work. Originals of these

documents shall be submitted to MassCEC for permanent retention, with a copy of each available at the project site.

B. Contractor must consult with the local authority having jurisdiction to confirm local permitting requirements, including those that may be more stringent than state and/or federal requirements.

C. Permits and licenses shall be in the name of MassCEC, where applicable.

5.03 MOTOR VEHICLES

A. Motor vehicles (except vehicles used solely for transporting employees to and from the Work site) used wholly or in part within the Commonwealth by the Contractor or a subcontractor, or by a person directly or indirectly employed by them in the execution of the Contract, shall be registered in the Commonwealth and bear Massachusetts registration plates.

B. Motor vehicles used solely for transporting employees to and from the Contract location shall be registered as required under Chapter 90, Section 3, of the General Laws of the Commonwealth, as amended.

C. A vehicle shall not be driven on any way, as defined in Section 1 of Chapter 90 of the General Laws of the Commonwealth, unless it is constructed or loaded so as to prevent any of its load from dropping, shifting, leaking, or otherwise escaping therefrom, except that sand may be dropped for the purpose of securing traction, or water or other substance may be sprinkled on such a way in cleaning or maintaining the same. (Chapter 85, Section 30, of the General Laws of the Commonwealth as amended.)

D. All diesel construction equipment shall have emission control devices installed, such as oxidation catalysts or particulate filters on the exhaust system side of the diesel combustion engine equipment.

5.04 INSURANCE REQUIREMENTS

A. The Contractor shall purchase and maintain, and shall cause any subcontractor to purchase and maintain in amounts not less than the Minimum Insurance Limits set forth below during all times that the Contractor is performing the Work, including any Work performed prior to the date hereof, and for a minimum of six (6) years following the latest of completion of Work or expiration or termination of this Agreement:

i. Commercial General Liability Insurance for personal injury, bodily injury and property damage with limits not less than $1,000,000 per occurrence, $2,000,000 aggregate per project; $2,000,000 products completed operation; $1,000,000 personal and advertisement injury

covering Bodily Injury, Property Damage, Personal Injury, and Completed Operations.

B. Commercial General Liability insurance shall be written on an Occurrence form issued on the most recent edition of the ICO CG 00 01 form with terms and conditions acceptable to Owner. Such policy shall include Blanket contractual liability insurance covering all liabilities assumed under the Contract Documents, including, but not limited to, the Contractor's obligations under all indemnity provisions of the Contract Documents and shall not be subject to any exclusion or limitation for liability resulting from "your work" as defined by the ISO CG form. Such policy shall be endorsed to have the General Aggregate on a per project basis and include Owner and other entities otherwise defined as Additional Insureds on a primary and non-contributory basis. Products and Completed Operations insurance shall be maintained for a minimum period equal to the period under which a claim can be asserted under the applicable statutes of repose.

C. Automobile Liability Insurance

1. Commercial Automobile Liability in the amount of $1,000,000 per occurrence Covering Bodily Injury and Property Damage.

   Commercial Automobile Liability insurance coverage is required for Owned, Non-owned, or Hired Vehicles if vehicles are used in the provision of services under this Agreement. Loading and unloading of any motor vehicle must be covered.

   For Transporters of Hazardous Materials (whether Contractor or Subcontractor), if vehicles are used for transporting hazardous materials, Contractor's Automobile Liability insurance, or the insurance carried by Contractor's hazardous waste transporter shall meet, at minimum limits of $5,000,000 "each accident" – Combined Single Limit for Property Damage and Bodily Injury. Such policy shall be endorsed to provide pollution liability broadened coverage (endorsement CA 99 48) and also include an MCS-90 endorsement.

D. The Contractor shall carry Worker's Compensation Insurance, including Employers Liability Insurance as provided by Chapter 152, as amended, of the General Laws of the Commonwealth covering all work performed by him under the Contract. The Worker's Compensation Liability insurance shall be compliant with the jurisdiction in which the accident occurs, the jurisdiction in which any employee resides and any other states which may claim jurisdiction and in amounts not less than those required by law and Employer's Liability insurance in an amount not less than $1,000,000 bodily injury by accident – each accident, $1,000,000 bodily injury by disease – each employee, and $1,000,000 bodily injury by disease - policy limit, or such greater amounts as may be required by Contractor's umbrella or excess liability policy in order to affect such coverage.

Such insurance shall be endorsed to include Longshore and Harbor Workers' Compensation Act Coverage and Jones Act Coverage, if applicable, and shall cover all operations of Contractor. Such insurance shall be endorsed to include Other States Coverage and to include a Waiver of Our Right to Recover from Others Endorsement in favor of the Owner.

E. The Contractor shall carry Umbrella Excess Liability Coverage with limits of not less than $10,000,000 per occurrence, covering all work performed by him under this Contract in excess of Commercial General Liability, Auto Liability and Employer's Liability. The Contractor must provide follow form coverage for each of the underlying policies and each of the policies which fall under the umbrella must be listed on the Certificate of Insurance.

F. The Contractor shall carry Professional Liability with limits of not less than $1,000,000 per claim and in the aggregate. (including contractual liability coverage).

G. The Contractor shall carry Pollution Liability with limits of not less than $15,000,000 per incident/Aggregate. The Contractor and any and all subcontractor(s) shall maintain such policy to cover any sudden and gradual pollution incidents that may arise out of, under, or in connection with this Agreement including any and all Work and/or Services to be performed by or on behalf of Contractor, including but not limited to: (a) bodily injury, sickness, disease, mental anguish or shock sustained by any person, including death; (b) property damage including physical injury or destruction of tangible property including resulting loss of use thereof, clean-up costs, and the loss of use of tangible property that has not be physically injured or destroyed; and (c) defense including costs, charges and expenses incurred in the investigation, adjustment or defense of claims for such compensation damages. There should be no exclusions or coverage restrictions related to asbestos, lead paint, silica or mold/fungus/legionella. Such policy shall be continuously maintained as to completed operations coverage with respect to liability arising out of the Work or services for a minimum period of not less than the greater of three (3) years after final completion of the Work or services or the greater time under which a claim may be properly asserted under the applicable statute of limitations or repose and shall include coverage for loss of, damage to, or loss of use of property directly or indirectly arising out of the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, any liquid or gas, waste materials or other irritants, contaminants or pollutants, into or upon the project, any other land, the atmosphere, or any water course or body of water (collectively, a "Release"), whether such Release is gradual or sudden and accidental.

If Contractor's work includes the treatment, storage, and disposal of contaminants, then in addition to the CPL requirement above, the policy shall also include enhancements for Pollution Legal Liability, Transportation Pollution Liability, and

Owned/Non-Owned Disposal Site. If treatment, storage or disposal of contaminants does not apply to the scope of work of Contractor, then Contractor would only be required to evidence a Contractor's Pollution Liability (CPL) policy.

Should coverage(s) be written on a claims-made form, the retroactive date shall be no later than the effective date of this Agreement and Contractor and/or its subcontractors shall maintain coverage continuously for the duration of this Agreement and for at least three (3) years after Final Completion or applicable state statute of repose. In the event the Contractor is unable to secure and/or maintain any or all of this Pollution Liability coverage, the Contractor agrees to indemnify and hold the Owner's Insured Parties harmless against any and all liability resulting from any coverage deficiency that is out of compliance with this insurance requirement.

H. The Contractor shall, at its own expense, purchase and maintain in full force and effect a cybersecurity insurance policy with a minimum limit of $1,000,000 per occurrence and $1,000,000 in the aggregate. This policy must cover risks arising from data breeches, network security failures, cyberattacks, and any other cyber-related incidents that could affect the services or systems provided by the Contractor under this agreement. The Contractor shall provide the Company with a certificate of insurance evidencing the required coverage and shall ensure the policy remains in effect throughout the term of this Agreement.

I. **[This Paragraph I. is not applicable to this contract].** At Owner's election, the Contractor shall carry property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the replacement cost of the Project, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis with a deductible not exceeding $5,000. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.2 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

1. Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured-loss. The Owner's property insurance will not cover hoists, tools, or other equipment belonging to the Contractor or any Subcontractor.

2. The Contractor shall be responsible for the deductible portion of all losses covered by its property insurance.

3. The Contractor's property insurance will cover portions of the Work stored off-site and in transit, with sub limits of $100,000.

4. Upon request, the Contractor will furnish the Owner a certificate evidencing the Contractor's property insurance. Property insurance for losses to materials or equipment stored off-site or in transit in excess of the coverage provided by the Contractor's property policy shall be procured by the Contractor at its cost. The Contractor and Subcontractors waive all rights they may have against the Owner for damage to tools, equipment, materials, supplies, temporary structures or other property owned or rented by the Contractor or Subcontractors which is not to be incorporated in the Work, and any policies of insurance covering the Contractor's or Subcontractors' own tools, equipment, facilities and other property against loss by physical damage shall include provisions or endorsements providing that the underwriters waive their rights of subrogation against the Owner.

5. In lieu of the Contractor providing Property Insurance, Owner may elect to provide Property Insurance substantially in conformance with the terms and conditions of this Section.

J. Contractor shall provide Payment and Performance Bonds in the forms required by the Owner and in the amount of 100% of the Contract Price, as adjusted by any approved Change Orders. Contractor shall also provide a Lien Prevention Bond upon request by Owner.

K. The required insurance coverages hereinbefore specified shall be placed with insurance companies licensed by the Massachusetts Division of Insurance to do business in the Commonwealth of Massachusetts and having a Best's rating of A or better, shall be taken out before the Contract is commenced and be kept in full force and effect throughout the term of the Contract, shall be primary to and non-contributory to any coverages maintained by MassCEC, and shall require that MassCEC be given at least 30 days advance written notice in the event of any cancellation or materially adverse change in coverage. All such required insurance, shall be written on an occurrence basis form, as opposed to a claims-made basis form. **MassCEC and Foth Infrastructure & Environment, LLC shall be named as additional insureds**, on a primary and non-contributory basis, under the Commercial General Liability, Automobile Liability, Umbrella, Pollution Liability, and Builder's Risk Insurance Policies. The standard for the AI Form shall be ISO CG20 10 ed. 10/01 or its equivalent. The Workers' Compensation, Automobile Liability Insurance, Commercial General Liability, and Employers' Liability Insurance Policies shall include a waiver of subrogation in favor of MassCEC. All such insurance as is required of the Contractor shall be provided by or in behalf of all subcontractors to cover their operations performed. The Contractor shall be held responsible for any modifications, deviations or omissions in the compliance with

these requirements by the subcontractors. At the inception date of the Contract and throughout the term of the Contract, MassCEC shall be provided with certificates of insurance evidencing that such insurance policies are in place and provide coverage as required. The following statement affirming that coverage completely complies with contract requirements shall be included in the special items section of the certificate or in an attached special items addendum page:

> The aforementioned insurance coverages completely comply with Article 5.04, Insurance Requirements, paragraphs A through J, inclusive, of Massachusetts Clean Energy Technology Center Contract No. MACEC-FY25-01

L. In the event it is determined during excavation or construction that an asbestos condition does exist, a licensed asbestos specialist shall be employed by the Contractor to perform the asbestos containment and abatement work. Prior to asbestos containment and abatement work, the Contractor shall, through the licensed asbestos specialists, obtain insurance in amounts and types specified by MassCEC, **naming MassCEC and Foth Infrastructure & Environment, LLC as additional insureds** on a primary and non-contributory basis as its interest appears under this Contract. Payment for this work will be made in accordance with Article 7.04.

M. BEFORE COMMENCING PERFORMANCE OF THE WORK AND PRIOR TO THE RENEWAL OF EACH RESPECTIVE POLICY, CONTRACTOR SHALL FURNISH CERTIFICATES OF INSURANCE EVIDENCING INSURANCE COVERAGE AS REQUIRED HEREIN, TOGETHER WITH EVIDENCE THAT ALL PREMIUMS FOR SUCH INSURANCE HAVE BEEN PAID TO THE OWNER AND THE OWNER'S REPRESENTATIVE.

Contractor must provide 30 days written notice of cancellation, non-renewal, material changes to Owner and all other such entities as may be reasonably requested. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage. A waiver of subrogation endorsement in favor of Owner and Additional Insureds shall be attached to all policies required herein with the exclusion of professional liability, and the Certificate of Liability Insurance shall reflect that such waivers of subrogation are in place. A copy of the additional insured coverage endorsement must be attached to the Certificate of Liability Insurance. The Certificate of Liability Insurance shall show Owner as the Certificate Holder and shall be delivered to Owner seven (7) days after receiving the Notice of Award. Prior to expiration of such required insurance, and otherwise as requested by Owner, renewal certificates and endorsements will be provided to Owner, at no expense to Owner, until such insurance is no longer required pursuant

to the terms of the Agreement. At the Owner's request, the Contractor shall furnish redacted copies of the insurance policies including all endorsements required to provide the coverage set forth in the Contract Documents.

N. Additional Insureds. The policies of insurance required hereunder shall be endorsed to name the Owner and such and other such entities required herein and hereafter as may be reasonably requested by Owner, as additional insureds (hereinafter "Additional Insureds") on the Comprehensive General Liability, Automobile Liability, umbrella and/or excess policies. Owner requires a copy of the Additional Insured endorsement. Said Additional Insured coverage shall be primary and non-contributory insurance as respects the Additional Insureds and any insurance maintained by the Additional Insureds shall be excess or contingent and shall not contribute with it. The Contractor shall waive all rights and shall cause its Subcontractors of all tiers to waive all rights against the Additional Insureds, Owner and its officers, directors, employees and those for whom they are liable, for any damage or loss to the extent covered by insurance (except professional liability insurance), and to the extent of actual recovery of insurance proceeds. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity has an insurable interest in the property damaged. In the event that the Contractor maintain limits greater than set forth herein, Owner and the Additional Insureds shall be included therein as additional insureds to the fullest extent of all such insurance in accordance with all terms and provisions herein. Any language with respect to 'the limitation of coverage to the limits required' must be removed.

O. Deductibles. Maximum deductible on any policy required herein shall not exceed $25,000 per occurrence, incident or event, unless otherwise approved in writing by Owner. Owner and Additional Insureds will not be responsible for any deductible or self-insured retention amounts and the same will in no event be deemed a cost of the Work. The Contractor's deductible or self-insurance retentions applicable to any insurance required to be provided by the Contractor must be listed below or on the certificates of insurance required herein:

Amount of Deductible or Self-Insured Retention: _____

The Contractor shall be completely responsible for the proper care, protection, and (where necessary) repair of the Work. The Contractor shall be responsible, for all at fault losses within the deductible specified above, and the Contractor shall promptly, and in any event so as not to delay the progress of the Work, replace any damaged property or reimburse the Owner for any damaged property including to the extent the loss or damage to such property is within the deductible.

5.05 PATENTED DEVICES, MATERIAL AND PROCESSES

A. The Contractor shall indemnify and save harmless MassCEC and all persons acting for or on behalf of MassCEC from all claims and liability of any nature or kind, and all damages, cost and expenses, including attorney's fees, arising from or occasioned by an infringement or alleged infringement of any patents or patent rights on any invention, process, material, equipment, article, apparatus, or any part thereof, furnished and installed by the Contractor, or arising from or occasioned by the use of manufacture thereof, including their use by MassCEC. In case such materials, equipment, devices, or processes are held to constitute an infringement and their use enjoined, the Contractor, at his expense, shall:

1. Secure for MassCEC the right to continue using said materials, equipment, devices, or processes by suspension of the injunction or by procuring a license or licenses;

2. Replace such materials, equipment, devices, or processes with non-infringing materials, equipment, devices, or processes; or

3. Modify them so that they become non-infringing, or remove the enjoined materials, equipment, devices, or processes and refund the sums paid therefore without prejudice to any other rights of MassCEC or the Engineer.

5.06 RESTORATION OF SURFACES OPENED BY PERMIT

A. Contractor shall not allow any party to make an opening in a street or highway for any purpose except upon the direction of the Engineer and the presentation of a duly authorized permit or other instrument. The holder of such a permit or instrument shall be considered in the same class as a contractor on an adjacent contract and the provisions of Articles 3.05 and 3.06 shall apply.

5.07 SANITARY PROVISIONS, PUBLIC SAFETY, AND TRAFFIC MANAGEMENT

A. The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of its employees as may be necessary to comply with the requirements of the Department of Public Health, local health officials or of other authorities having jurisdiction.

D. The Contractor shall be responsible for the maintenance of traffic over, through, or around the Work included in its Contract with the maximum of safety and practicable convenience to such traffic during the life of the Contract, and whether or not work thereon has been suspended temporarily. The Contractor shall take all precautions for preventing injuries to persons or damage to property in or about the Work. If the Contractor constructs temporary bridges or provides temporary crossings of streams, its responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.

The Work shall be carried on in such a manner as to provide safe passage at all times for public travel and with least obstruction to traffic. The Contractor shall provide and maintain at its own expense (except as otherwise provided herein) in a safe and passable condition, such temporary by-passes and temporary bridges as may be necessary to accommodate traffic. Roads shall be closed to travel only as directed by the Engineer. The Contractor shall so carry on its work that travel will not be obstructed. The Contractor shall at all times so conduct the Work that the abutters shall have reasonable access to their property as directed by the Engineer. When it is necessary to leave materials and equipment upon the site of the Work or in the vicinity thereof, they shall be placed so as to cause the least possible obstruction to pedestrians and other travel.

E. The Contractor shall, at its own expense, provide, place, and erect all barricades and warning signs, and furnish and keep lighted all lights that are necessary in the opinion of the Engineer to protect the Work from traffic, pedestrians and animals and to assure public convenience and safety. The Contractor shall also furnish at its own expense a sufficient number of watchmen at all times to protect the Work.

F. When, in the opinion of the Engineer, it is necessary that uniformed police be used to protect and control pedestrian traffic, to direct vehicular traffic during construction and to keep the traffic off any part of the work, or to protect the public safety, the Contractor will obtain a police detail for this purpose.

All customary expenses for uniformed police required for the protection and control of pedestrian and vehicular traffic during construction, or to provide protection of the health and safety of persons or property from routine and anticipated construction activities, shall be assumed by the Contractor.

All expenses for uniformed police required for the protection of persons and property arising out of activities not ordinarily encountered by the Contractor during construction, including, but not limited to, labor difficulties, crowd control, etc., shall be at the sole cost of the Contractor.

5.08 INTENTIONALLY OMITTED

5.09 USE OF EXPLOSIVES

A. Explosives, when necessary for use in the Work, shall not be brought within the Contract limits or onto property under the jurisdiction of MassCEC, without the prior approval of MassCEC.

B. Explosives shall be stored safely under lock and key. The storage places shall be marked conspicuously DANGEROUS - EXPLOSIVES and be in the care of a competent watchman at all times. Storage, handling, and use of explosives shall

conform to the regulations of the Massachusetts Department of Public Safety, federal regulations and local ordinances relating thereto.

C. The Contractor shall be responsible for all damages resulting from the use of explosives. The Contractor shall exercise care not to endanger life and property, including new Work. When directed, the number and size of the charges shall be reduced. Flagmen shall be provided, when directed, to warn and keep traffic from the danger area. All persons within the danger area shall be warned and given time to withdraw.

D. Prior to start of the blasting, the Contractor shall give at least a 48 hour notice and a schedule of their operations thereof to the operating official, company, or companies leasing, owning, or responsible for pipes, conduits, poles, wires, railroad tracks, or any other public or private utility which may be endangered by the blasting in order that a representative of said owner or lessee may be present at the site. The Contractor shall take proper precautions to prevent injury to said properties during all blasting operations.

5.10 PROTECTION AND RESTORATION OF PROPERTY

A. Compensation for conforming to all provisions of this Article, unless compensation is authorized in writing by the Engineer, as specified in Article 2.03, or as may be provided otherwise in the Supplementary Conditions, shall be considered as included in the Contract Price and no additional compensation will be allowed therefor.

B. Prior to commencing Work, the Contractor shall record the existing condition of abutting property. The Contractor shall obtain the necessary permission for entry and cause a detailed examination to be made of such abutting property as the Contractor deems necessary, as required in the Supplementary Conditions, or as directed by the Engineer. The Contractor shall invite MassCEC, in writing by certified mail with return receipt, to be present during the examination. A representative of MassCEC shall also be invited. A complete report of the existing conditions, including photographs and video tapes, if required, shall be made in triplicate, and signed by the Contractor. One copy shall be delivered to the owner, one to MassCEC, and one shall be retained by the Contractor. If at any time thereafter a claim for damages or alleged damages is filed by the owner or tenant, the Contractor shall make further detailed examinations. A representative of MassCEC shall be invited to attend. All facts as to changes between the then existing conditions of said property and those which existing at time of the original examination shall be noted and recorded in triplicate. One copy of this report shall be delivered to the owner, one to MassCEC, and one shall be retained by the Contractor.

1. In the event that the Contractor cannot obtain from the owner of such abutting property permission to enter upon the property for such examination, the Contractor shall immediately notify MassCEC.

2. For these detailed examinations, the Contractor shall employ an independent person who has had previous experience in examining or surveying the conditions of the property and who shall be approved by MassCEC.

C. The Contractor shall confine his movements and operations insofar as possible to the area within the limits of the Work, and the area outside the limits of the Work shall not be disturbed except as directed.

D. The Contractor shall, at no additional cost to MassCEC, preserve and protect from injury all property either public or private along and adjacent to the proposed Work. The Contractor shall be responsible for and shall repair, at no additional cost to MassCEC, any and all damage and injury thereto, arising out of or in consequence of any act or omission, neglect or misconduct in the execution of the Work, or in consequence of the non-execution thereof by the Contractor or his employees or subcontractors in the performance of the Work covered by the Contract prior to completion and acceptance thereof. The Contractor shall be solely responsible for any trespass upon adjacent property or injury thereto, resulting from or in connection with his operations. The Contractor shall be liable for any claims that may be made on account of the felling of trees or the deposit of debris of any kind upon private property. Special care shall be exercised during blasting operations to avoid injury to underground structures and utilities.

E. Although the Contract Documents may indicate the approximate location of existing subsurface utilities in the vicinity of the Work, accuracy and completeness of the information is not guaranteed by MassCEC. Before commencing any work or operations that may endanger or damage subsurface structures, the Contractor shall carefully locate all such structures and conduct his operations in such manner as to avoid damage thereto. When necessary, the Contractor shall cooperate with representatives of public service and utility companies in order to avoid damage to their structures by furnishing and erecting suitable supports, props, shoring, or other means of protection. The Contractor shall not interrupt live services until new services have been provided. All abandoned services shall be plugged or otherwise made safe and secure.

F. If the Contractor desires to temporarily relocate a utility, other than those contemplated by MassCEC, he shall make the necessary arrangement with the appropriate utility company and make reimbursement for the cost thereof, at no additional cost to MassCEC.

G. Access to fire hydrants and fire alarm boxes shall be maintained by the Contractor throughout the prosecution of the Work. Hydrants, alarm boxes, and standpipe

connections shall be kept clear of obstructions and kept visible at all times. If visibility cannot be maintained, the Contractor shall provide clearly visible signs and lights showing the locations of fire hydrants, fire alarm boxes, or standpipe connections. Utility companies and municipal agencies having facilities within the limits of the Work shall have access to their facilities at all times for inspection and repair.

H. All equipment used by the Contractor which could create potential fire hazard such as steam-generating or steam-operated machinery, heaters, gas generators, and the like shall be equipped with spark arresters and/or other safety devices and utmost precaution will be exercised by the Contractor in the use of such equipment.

I. Land monuments and property marks shall be carefully protected by the Contractor and if necessary to remove the same, they shall do so only at the Engineer's direction and after a registered land surveyor has witnessed or otherwise referenced their location. If land monuments and/or property marks are removed by the Contractor, they shall be replaced by a registered land surveyor.

1. All costs associated with the removal, witnessing and replacement of land monuments and/or property marks shall be borne by the Contractor, at no additional cost to MassCEC.

J. The Contractor shall protect and preserve natural surroundings and roadside growth either within or adjacent to the project site from damage or injury due to these operations. The Contractor shall not, except by written permission of the Engineer, remove, destroy, or trim roadside trees or shrubs. Trees or landscape features carelessly scarred or damaged by the Contractor's operations shall be removed and replaced or neatly trimmed and restored to their original condition as required by the Engineer. The Contractor shall be responsible for all damage to roadside growth due to his operations and shall, without compensation, satisfactorily repair or replace all such damaged growth. Scars on trees shall be painted as soon as possible with an approved tree paint.

K. The Contractor shall protect existing structures, shall provide lights and fences and take all other precautions that may be necessary to protect life and property, at no additional cost to MassCEC. The Contractor shall carry on all operations and use equipment of such types that noise resulting from construction operations will be kept to a minimum. Barriers and bridges shall be provided for the protection and use of the public and for the protection of the Work as necessary. The Contractor shall provide and maintain access for occupant and customer entrance to and exit from all adjacent buildings and property at all times. All temporary facilities required for the general protection of the public and the Work shall be subject to approval of MassCEC.

L. Written notice shall be given by the Contractor to all utility owners or officials and to all others concerned with or having charge of public or private owned utilities,

of his intention to commence operations affecting such utilities at least 1 week in advance of the beginning of such operations. The Contractor shall at the same time file a copy of said notices with the Engineer.

M. The Contractor shall confine its operations to the actual work sites, access routes, and storage areas designated by MassCEC or the Engineer. The Contractor shall have sole responsibility for providing all materials, equipment, or tools and any storage required will be at the Contractor's own risk. MassCEC will not assume responsibility for any loss of materials, equipment, or tools stored on its property.

N. All roads and haul routes used by the Contractor shall be maintained and kept clean during the course of the work. Any damage to existing surfaces, caused by the Contractors operations shall be repaired and the areas involved restored to their previous condition, without cost to MassCEC.

O. The Contractor is responsible for controlling dust at all times during this Contract, including all work shifts, non-working hours, weekends, and holidays. Fugitive dust shall be controlled through wetting, sweeping, and other suppression techniques. Contractor shall maintain on-site water trucks. Trucks hauling materials shall be covered.

P. Designated wash-down areas shall be established by the Contractor on site for the control of dust tracking from vehicles leaving the site. All trucks or other vehicles leaving the site shall be hosed and washed clean of mud clinging to the wheels.

Q. The Contractor shall ascertain boundaries of site within which Work must be confined and agree to said limits with MassCEC prior to starting any Work.

5.11 PROTECTION OF PUBLIC LANDS

A. In the execution of any Work within or adjacent to any state or national forest, park, or other public or private lands, the Contractor shall comply with all of the regulations of the appropriate authorities having jurisdiction over such forest, park, or lands. The Contractor shall keep the areas in his construction operations in an orderly condition and properly dispose of all refuse and discarded materials.

B. The Contractor shall obtain construction permits that may be required for Contract operations, not a part of the Contract, in accordance with the requirements of the regulations of the appropriate authorities.

C. The Contractor shall take all reasonable precautions to prevent and suppress open fires in any area involved in his construction operations or occupied by him as a result of such operations. The Contractor shall cooperate with the proper authorities of the state and federal governments in reporting, preventing, and suppressing any open forest fires.

5.12 PROTECTION OF FENCES

A. By constructing temporary fences, or by other adequate means, the Contractor shall restrain stock from leaving the lands wherein they are confined or from trespassing which would be made possible by, or which might result from, the removal or destruction of existing fences or the carrying out of any part of the Work under the Contract. The Contractor shall be responsible for all loss, injury, or damage that may result from the Contractor's failure to restrain stock as above provided. Compensation for erecting and maintaining temporary fences and for otherwise providing for the restraint of stock shall be considered as included in the prices for the various Contract Items and no additional compensation will be allowed therefor.

B. If the Contractor is ordered by the Engineer to construct new right-of-way fences or to move and reconstruct existing fences, such Work shall be paid for at the unit price bid for same, or as Extra Work.

C. The Contractor shall use care to avoid damaging existing fences. The Contractor shall repair or replace, at no additional cost to MassCEC, and to the satisfaction of the Engineer, all fences that are in any way damaged by Contract operations.

D. Tearing down and removal of fences occurring within the right-of-way limits shall be considered to be a part of the clearing and grubbing work as set forth in the Contract Specifications, and payment therefor included in the payment for clearing and grubbing.

5.13 SAFEGUARDING OF EXCAVATIONS

A. Contractor shall provide safeguards and protections around and in the vicinity of excavations necessary to prevent and avoid the occurrence of damage, loss, injury, and death to property, animals, and persons because of such excavations. Liability for any such damage, loss, injury, or death shall rest with the Contractor.

5.14 DISPOSAL OF MATERIALS OUTSIDE THE WORK SITE

A. Unless otherwise specified in the Contract Specifications, the Contractor shall make their own arrangements for disposing of waste and excess materials outside the work site, at no additional cost to MassCEC.

B. Prior to disposing of material outside the Work site, the Contractor shall obtain written permission from the owner on whose property the disposal is to be made. The Contractor shall file with the Engineer the permit, or a certified copy thereof, together with a written release from the property owner absolving MassCEC from any and all responsibility with the disposal of material on said property.

C. Unless otherwise provided in the Contract Specifications, full compensation for all costs involved in disposing of materials as above specified, including all costs of

hauling, shall be considered as included in the price paid for the Contract Item involving such materials and no additional compensation will be allowed therefor.

D. In the disposal of excavated material, and other waste and excess materials, the Contractor shall adhere to all applicable laws of the Commonwealth of Massachusetts and to municipal and local ordinances and regulations. All routes to be used by the Contractor for hauling excavated and other materials shall be approved in advance by applicable agencies having jurisdiction. Excess excavated material stockpiled at the site after the demands of this Contract have been fulfilled shall be removed from the site by the Contractor and legally disposed of off-site. The Contractor shall restore the site to its original condition, prior to stockpiling, subject to direction by the Engineer, at no additional cost to MassCEC.

5.15 SAFETY AND FIRST AID REQUIREMENTS

A. The Contractor shall adhere to all precautions necessary to the safety and health of the work crew in accordance with provision of Federal Regulation 29 CFR Parts 1926.58 and 1910.1001, and Massachusetts Regulations 453 CMR 6.00.

B. The Contractor's safety program shall be submitted in writing to the Engineer for review within five (5) days after receipt of a Notice of Award. The proposed safety program shall include the name, experience, and qualifications of the Contractor's proposed safety representative. No work at the job site shall begin until the Engineer has reviewed the Contractor's safety program and safety representative. Implementation and enforcement of the safety program for the forces of the Contractor and all subcontractors shall be the responsibility of the Contractor.

C. The Contractor's full-time safety representative shall have a thorough knowledge of construction safety and OSHA regulations. If, in the opinion of the Engineer, the Contractor's safety representative is not effective in carrying out the duties assigned and as described below, the Engineer may request, in writing, that the Contractor replace the safety representative.

D. The duties of the safety representative shall include maintenance of the Contractor's safety program, enforcement of safe practices, and the use of safety equipment and personal protection equipment, and other such activities as may be required by OSHA to maintain job safety and accident prevention. The safety representative shall not be changed, terminated, nor reassigned without the written approval of the Engineer.

E. The Contractor shall not require any laborer or mechanic employed in performance of the Contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to health or safety, as determined under construction safety and health standards (Title 29, Code of Federal Regulations, Part 1518, Published in the Federal Register on April 17, 1971) promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract

Work Hours and Safety Standards Act (83 Stat. 96). The Contractor shall ensure that the language set forth in this Article 5.15E is included in all agreements between the Contractor and any of its Subcontractors.

F. MassCEC may stop any work that it considers to be unsafe, in its sole discretion.

5.16 INDEMNIFICATION

A. To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold harmless MassCEC and all its managers, officers, directors, representatives, agents, and employees from and against claims, damages, losses and expenses, including but not limited to attorneys' fees and court costs, (a) arising out of or resulting from performance of the Work, including but not limited to claims for damage, loss, or expense attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder; (b) any claims, damages, losses and expenses caused by or alleged to be caused by a breach of any duty owed by the Contractor to the Owner under this agreement, or (c) citations, fines, penalties, assessments, or other levies made against the Owner as a result of the Contractor's failure to observe any applicable law, regulations or applicable permits, including any failure of the Contractor to comply with the terms and conditions of the Contract Documents, and, including further without limitation any breach of the warranties set forth herein. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this provision.

B. The Contractor shall be held responsible for and shall indemnify and hold MassCEC harmless from and against, any and all claims for damage to underground structures and utilities arising out of the operations of the Contractor or any of its Subcontractors.

C. In claims against any person or entity indemnified under this Article 5.16 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligations under Article 5.16 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts regardless of any provisions of the applicable workers' compensation laws, and in particular regardless of the exclusive remedy and/or employees' immunity provisions of those laws, all of which are hereby expressly waived.

D. These provisions of Section 5.16 shall survive the termination of this Agreement and shall apply to Liabilities to the extent not paid to Owner by insurance carried by Contractor or by project-specific professional liability or wrap-up insurance covering the Project, if any, and shall not be limited by the amount of types of damages, compensation or benefits payable by the Contractor under workers' compensation. The Owner shall have no indemnity obligation, whatsoever, to the Contractor.

5.17 CLAIMS AGAINST CONTRACTOR FOR PAYMENT OF LABOR AND MATERIALS

A. The Contractor shall be responsible for prompt payment for all services, labor, equipment, and materials furnished by or through the Contractor for purposes of the Contract.

1. Forthwith after the Contractor receives payment for a periodic estimate, the Contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the Contractor. By submitting a periodic payment application, Contractor certifies that all payments to Subcontractors are current for work performed to date as a condition precedent to receiving further payment.

2. Owner has the right to pay Subcontractors directly in the event Contractor has failed to make timely payment, and in such event, Owner will offset any such Subcontractor payments against amounts otherwise owed to Contractor. Contractor shall indemnify and hold harmless Owner for all costs, including attorneys' fees, incurred in resolving or addressing claims for payment made by Subcontractors, including mechanic's liens, where such claims are due to Contractor's failure to pay amounts properly due, or in connection with any lien filed by a Subcontractor that Contractor fails to resolve as required by the Contract Documents.

3. Where a Subcontractor files a mechanic's lien (unperfected or otherwise), Contractor shall promptly cause the lien to be discharged, through payment to the Subcontractor and filing of a statutory dissolution of lien or by bonding off the lien. Contractor's indemnity obligations set forth in Article 5.17 2. shall apply to costs Owner incurs in connection with such liens.

5.18 PAYMENT OF TAXES

A. The Contract Price paid for the Work shall include full compensation for all taxes which the Contractor is required to pay whether imposed by federal, state, or local government, including, without being limited to, federal excise tax.

1. Fines and penalties, including interest, are the responsibility of the Contractor and all costs associated therewith shall be borne by the Contractor, at no additional cost to MassCEC.

B. The Massachusetts Sales Tax, Chapter 64H, Section 6 and the Massachusetts Use Tax, Chapter 64I, Section 7, states that these taxes are not applicable to the sales of construction materials and supplies incorporated, consumed, employed or expended in construction projects of MassCEC. This exemption is also applicable to rental charges for construction vehicles, equipment, and machinery rented, specifically for use on the site of MassCEC's construction projects. Bidders are directed to exclude any allowance for Sales or Use Tax from their Bid Form as said tax would relate to the foregoing specific categories.

5.19 CLAIMS OF CONTRACTOR FOR COMPENSATION

A. No person or corporation, other than the Contractor, now has any interest hereunder, and no claim shall be made or be valid; and neither MassCEC nor any member, agent, or employee thereof, shall be liable for, or be held to pay, any money except as provided in Articles 2.02, 2.03, 2.04, 2.05, 7.02 and the Agreement.

B. Contractor shall notify Owner in detail in writing of any and all claims within ten (10) calendar days of the occurrence of any event, circumstance or condition which Contractor claims as the basis for an increase in the Contract Price or the time for performance or both, or such claim shall be waived. In addition, any claim for concealed or unforeseen conditions shall be made before such condition is disturbed and while it can still be viewed by the Owner. Such written statement shall contain a description of the nature of the work provided or damage sustained; and the Contractor, shall on or before the fifteenth day of the month succeeding that in which such work is performed or damage sustained file with the Engineer an itemized statement of the details and amount of such work or damage. Unless such statement shall be made as required, the claim for compensation shall be forfeited, waived and invalidated, and the Contractor shall not be entitled to payment due to any such work or damage. Such notice by the Contractor and the keeping of costs by the Engineer shall not in any way be construed as proving the validity of the claim. The provisions of this paragraph shall not apply to changes in quantities as provided under Article 2.05, or to Extra Work ordered by the Engineer in writing, but shall otherwise apply to claims for an increase in the Contract price or time for completion that Contractor alleges are due to changes in the work for which it is not responsible and which are not part of an Extra Work Order.

C. On the basis of information provided in writing by the Contractor's employees, servants, or agents, the Contractor shall certify, in writing, that the work for which it is claiming payment, other than as provided for in the Contract Documents, is work actually performed, and the costs as shown are the amounts legally due for providing such work for which payment is claimed.

D. The Engineer will determine all questions as to the amount and value of such work, and the fact and extent of such damage and will notify the Contractor in writing of this determination.

E. Acceptance by the Contractor of the final payment made under the provisions of Article 7.09 shall operate as and shall be a release to MassCEC and every member, agent, and employee thereof, from all claim and liability to the Contractor for anything done or furnished for, or relating to, the Work, or for any act or neglect of MassCEC or of any person relating to or affecting the Work except the claim against MassCEC for the remainder, if any there be, of the amounts kept or retained as provided in Article 5.17. For claims for extensions of time, see Article 6.08.

F. No payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this Contract or the Performance Bond, or under applicable law or in equity.

5.20 OPENING PORTIONS OF CONTRACT FOR OPERATION OR OCCUPANCY

A. Any portion of the Work which is in acceptable condition for operation or occupancy may be opened for operation or occupancy as directed in writing by MassCEC, but such operation or occupancy shall not be construed as an acceptance of the Work or part thereof, nor shall it act as a waiver of any of the provisions of the Contract Documents; provided, however, that on such portions of the Work as are opened for such use, the Contractor shall not be required to assume any expense entailed in maintaining that portion of the Work opened for operation or occupancy. MassCEC will be responsible for maintenance and any damage to the Work caused solely by the operation or occupancy of any portion of the Work which has been opened to operations or occupancy as stipulated above, and it may order the Contractor to repair or replace such damage, whereupon the Contractor shall make such repairs at Contract Unit Prices so far as the same are applicable, or as Extra Work under the provisions of Article 2.03, if there are no applicable items in the Contract.

B. If the Contractor is dilatory in completing shoulders, drainage structures or other similar items of the Work, the Engineer may order all or a portion of the Work open to traffic, but in such event the Contractor shall not be relieved of his liability and responsibility during the period the Work is so opened prior to final acceptance. The Contractor shall conduct the remainder of his construction operations so as to cause the least obstruction to traffic. Additional costs incurred by the Contractor in conducting the remainder of his operations due to his being dilatory with parts of the Work shall be assumed by the Contractor, at no additional cost to MassCEC.

5.21 CONTRACTOR'S RESPONSIBILITY FOR THE WORK

A. Until final written acceptance of the Work, the Contractor shall have the charge and care of the Work. The Contractor shall take every necessary precaution against injury or damage to the Work by action of the elements, or from any other cause, whether arising from the execution of the non-execution of the Work, and especially when blasting is to be done.

B. Except as provided in Article 2.09, the Contractor shall bear all losses resulting from or due to the amount or the character of the Work or because the nature of the land in or on which the Work is done is different from that which was estimated or expected, or due to bad weather or other causes.

C. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and final acceptance, including damage to the Work due to war, whether or not declared, civil war, insurrection, rebellion or revolution, or to any act or condition incident to any of the foregoing, or to "Acts of God" (limited to hurricane, tornado, cyclone and earthquake as classified by the United States Weather Bureau for the particular locality and for the particular season of the year, and in addition thereto, damages resulting directly from flooding from any of the aforementioned "Acts of God") (collectively, "Force Majeure Events"). The Contractor shall bear the expense of injuries and damages to the Work caused by its acts or omissions, or the acts or omissions of those for whom the Contractor is responsible. In any case in which the estimate for replacing such Work or repairing such damage caused by <u>one or more Force Majeure Events</u> results in a change of such magnitude as to be incompatible with competitive bid status including where the replacement cost for such damage exceeds 30% of the initial Contract Price, MassCEC reserves the right to terminate the Contract and to call for new bids and award a new Contract for such Work. In the event a Contract is terminated for such reason, MassCEC will pay the Contractor such sum as may be due for Work performed up to the date of the "Act of God," or of damage directly due to war, whether or not declared, civil war, insurrection, rebellion or revolution, or to any act or condition incident to any of the foregoing and will also take over and pay for any material stored at the site of the Work provided said material was intended to be and could have been incorporated into the Work; MassCEC will also take over and pay for any material which was being especially fabricated for incorporation into the Work, provided, however, that as a condition precedent to MassCEC's liability for such material, the Contractor is legally liable therefore and the material was intended to be and could have been incorporated in the Work.

D. Issuance of an estimate of any part of the Work done will not be construed as final acceptance of any Work completed up to that time.

E. Should the Contractor fail to take prompt action whenever conditions make it necessary, MassCEC will make emergency repairs or cause the same to be made, with the stipulation that the costs for such repairs shall be charged against the Contractor and deducted from money due the Contractor.

F. In case of suspension of Work from any cause whatever, the Contractor shall be responsible for the Contract and shall take such precautions as may be necessary to prevent damage to the Work, provide suitable drainage, and shall erect any necessary temporary structures, signs, or other facilities, at no additional cost to MassCEC. The Contractor shall also maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under the Work, and take adequate precautions to protect new tree growth and other important vegetative growth against injury.

G. The Contractor shall reimburse MassCEC for all expenses, losses or damages, as determined by the Engineer, incurred by or in consequence of any defect, act, omission or mistake of the Contractor or any Subcontractor.

H. The Contractor will be held responsible for any and all claims for damage to underground structures such as water or gas mains, pipes, conduits, manholes, or catch basins, due to the Contractor's operation or to the operations of any of its Subcontractors.

I. The Contractor shall not discontinue the service of water, electricity, steam, gas or any other utility, without first obtaining the approval in writing of the Engineer and the manager of the facility where the Work is being performed, and the Contractor shall cause the resumption of said service at the earliest practicable time. Approval of the Engineer shall not be necessary in case of an emergency, but the Contractor shall notify the Engineer of any discontinuance and resumption of service.

5.22 CONFLICT OF INTEREST

A. It is understood and agreed that no gift, loan, or other thing of value has been or shall be given to any employee, agent, or officer of MassCEC in connection with the award or performance of the Contract. Also, no employment shall be given to and no renting, leasing, or purchasing of equipment, supplies, or materials shall be arranged or made with or through any employee, agent, or office of MassCEC by the Contractor.

B. No board member, officer or employee of MassCEC, officer or employee of any independent authority, political subdivision of the Commonwealth of Massachusetts, officer, employee or elected official or any city, county, or town authority within the Commonwealth of Massachusetts, during his/her tenure and for 1 year thereafter shall have any interest, direct or indirect, in this Contract or the proceeds thereof.

C. No member of or delegate to the Congress of the United States shall be admitted to any share or part of this Contract or to any benefit arising therefrom.

5.23 PERSONAL LIABILITY OF MASSCEC OFFICIALS

A. In carrying out any of the provisions of the Contract Documents, or in exercising any power or authority granted to them by or within the scope of the Contract, there shall be no liability upon the Executive Director of MassCEC, Engineer, or their authorized representatives, either personally or as officials of MassCEC, it being understood that in all such matters they act solely as agents and representatives of MassCEC.

5.24 NO WAIVER OF LEGAL RIGHTS

A. MassCEC shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the Work and payment therefor, from showing the true amount and character of the Work provided and materials furnished by the Contractor, nor from showing that any such measurement, estimate, or certificate is untrue or is incorrectly made, nor that the Work or materials do not in fact conform to the Contract. MassCEC shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the Contractor or the Contractor's Surety, or both, such damage as it may sustain by reason of the Contractor's failure to comply with the terms of the Contract Documents. Neither the acceptance by MassCEC, or any representative of MassCEC, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by MassCEC, shall operate as a waiver of any portion of the Contract Documents or of any power herein reserved, or of any right to damages. A waiver of any breach of the Contract shall not be held to be a waiver of any other or subsequent breach. Any remedy provided in the Contract Documents shall be taken and construed as cumulative, that is, in addition to each and every other remedy herein provided; and MassCEC shall also be entitled as of right to writ of injunction against any breach of any of the provisions of the Contract Documents.

5.25 LABOR, LODGING, BOARD, MAXIMUM HOURS OF EMPLOYMENT, KEEPING OF PAYROLL RECORDS

A. No laborer, workman, mechanic, foreman, or inspector working within this Commonwealth, in the employ of the Contractor, subcontractor, or other person doing or contracting to do the whole or a part of the Work contemplated by the Contract, shall be required or permitted to work more than 8 hours in any one day or more than 48 hours in any one week, or more than six days in any one week, except in cases of emergency. MassCEC or the Contractor or any subcontractor may employ laborers, workmen, mechanics, foremen, and inspectors for more than 8 hours in any day in the work to be done or under the Contract when, in the opinion of the Director of the Department of Labor and Workforce Development, public necessity so requires.

B. Upon request of the Engineer or the Massachusetts Department of Labor and Industries, the Contractor shall furnish certified copies of any or all payrolls for the Contract, showing the name, address, and occupational classification of each employee on said Works, and the hours worked by, and the wages paid to each such employee. Such payroll shall also include the rates paid for rented trucks or rental equipment of any kind used on the Work. This requirement shall also apply to the work of any subcontractor, having a subcontract for any of the Work performed on the Contract. Such records shall be kept in such manner as the Director of the Department of Labor and Workforce Development shall prescribe and shall be open to inspection by MassCEC or the Engineer or any authorized representative of the Department of Labor and Workforce Development at any reasonable time and as often as may be necessary.

C. The Contractor and all its Subcontractors shall keep true and accurate registers of all mechanics, teamsters, chauffeurs, and laborers employed thereon, showing the name, address, and occupational classification of each employee on the Work, the hours worked by, and the wages paid to each such employee, and shall furnish each week to the Engineer a true statement of the same covering the previous week.

D. The Contractor and all of its Subcontractors shall comply with Federal Department of Homeland Security Requirements in hiring any and all "Employees" to be employed on the Work who are required to be listed in the certified payroll reports required to be submitted under this Contract. Such compliance shall include, but not be limited to, the faithful completion of the Federal Department of Homeland Security Form I-9 and processed by the Contractor and all of their Subcontractors for each of their employees.

5.26 EQUAL OPPORTUNITY CLAUSE

A. During the performance of the Contract, the Contractor shall comply with the "Equal Employment Opportunity" (EEO) provisions set forth in the "American Rescue Plan Act (ARPA) Contract Addendum", which is made part of these General Conditions by Section 5.29 of Section 00800, Supplementary Conditions, in addition to complying with all EEO requirements contained in **Attachment 3 of the RFP,** to the extent they impose additional obligations.

5.27 RECORDS AND AUDITING

A. The words defined below shall have the meaning stated whenever they appear in this subsection:

1. "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract.

2. "Contract" means any contract awarded or executed.

3. "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

4. "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of this person's residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

5. "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

6. "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he/she has made and sets forth his/her opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the Contractor.

7. "Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

8. Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

B. The following requirements shall apply:

1. The Contractor shall make, and keep for at least 6 years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor,

2. Until the expiration of 6 years after final payment, the awarding authority, and the office of inspector general shall have the right to examine any books, documents, papers or records of the Contractor or his/her subcontractors that directly pertain to, and involve transactions relating to, the Contractor or his/her subcontractors,

3. If the agreement is a contract as defined herein, the Contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his/her description the date of the change and reasons therefore, and shall accompany said description with a letter from the Contractor's independent certified public accounting approving or otherwise commenting on the changes,

4. If the agreement is a contract as defined herein, the Contractor has filed a statement of management on internal accounting controls as set forth in paragraph "C" below prior to the execution of the contract, and

5. If the agreement is a contract as defined herein, the Contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph "D" below.

C. Every Contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

1. Transactions are executed in accordance with management's general and specific authorization.

2. Transactions are recorded as necessary:

   a. To permit preparation of financial statements in conformity with generally accepted accounting principles, and
   b. To maintain accountability for assets;

3. Access to assets is permitted only in accordance with management's general or specific authorization; and

4. The recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every Contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he/she has examined the statement of management on internal accounting controls, and expressing an opinion as to

5. Whether the representation of management in response to this paragraph and paragraph "B" above are consistent with the result of management's evaluation of the system of internal accounting controls; and

6. Whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

D. Contractor shall annually file with the awarding authority during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report.

Note: The record retention aspects of this subsection apply to all contracts awarded by MassCEC regardless of value. The requirements relative to the internal auditing and management controls, including the filing of an annual statement, apply to contracts awarded with a value greater than $100,000.

END OF ARTICLE 5

ARTICLE 6 - PROSECUTION AND PROGRESS

6.01 SUBLETTING OR ASSIGNMENT OF CONTRACT

A. The Contractor shall continuously attend to the faithful prosecution of the Work, shall keep the same under its personal control, and shall not assign by power of attorney or otherwise, or sublet, the Work or any part thereof without the previous written consent of MassCEC and shall not, either legally or equitably, assign any of the money payable under the Contract, or its claim thereto, unless by and with the like consent of MassCEC. The Contractor's failure to obtain the previous written consent of MassCEC shall constitute a waiver of payment for the Work or any part thereof that may be furnished without such previous written consent. The Contractor shall be responsible for the acts and omissions of its subcontractors, if any, and of all persons directly or indirectly employed by the Contractor or its subcontractors in connection with the Work.

B. The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of the Contractor's right, title, or interest therein, without written consent of MassCEC. If consent is given, the Contractor shall be permitted to sublet a portion thereof, but shall provide with the Contractor's own organization, Work amounting to not less than 30% of the original total Contract amount. No subcontracts, or transfer of contract, shall in any case release the Contractor from liability under the Contract and bonds.

C. Consent to sublet any part of the Work shall not be construed to be an approval of the said subcontract or of any of its terms but shall operate only as an approval of the making of a subcontract between the Contractor and subcontractor.

D. A subcontractor (vendor, or supplier) will be recognized only in the capacity of an employee or agent of the Contractor, and the subcontractor's removal may be required as in the case of an employee.

E. As soon as practicable after execution of the Contract, the Contractor shall submit to MassCEC applications for approval of subcontractors for any part of the Work it is proposed to subcontract. In addition to stating the name and address of the proposed subcontractor, each application shall give the items, or any portions thereof, proposed to be sublet by item number and description, and the total value of the Work proposed to be sublet based on the primary Contract Unit Prices where established, or, where not established, on the approved breakdown estimate of a lump sum price required under Article 7.06 and not on the amount of the subcontract. The application shall also show pertinent information in order to enable MassCEC to ascertain whether the proposed subcontractor is reliable and able to perform the work.

F. The Contractor shall direct the attention of subcontractors to the requirements of:

1. Article 5.04 regarding insurance requirements, the minimum wage rates as determined by the Division of Occupational Safety of the Department of Labor and Workforce Development, and the provisions of Articles 5.25 and 5.26.

2. Chapter 156D of the General Laws of the Commonwealth requires foreign corporations to appoint the Secretary of the Commonwealth as an attorney for service of process and requires foreign corporations to file certain documents with the Secretary of State which will permit them to do business in Massachusetts.

G. The Contractor shall direct the attention of subcontractors and all suppliers of material to the requirements of Article 3.09.

H. By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by the Contract Documents, assumes toward the Owner and Engineer. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with sub-Subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed sub-Subcontractors.

6.02 PROSECUTION OF WORK/CONTRACT TIME/LIQUIDATED DAMAGES

A. Notice to Proceed/Contract Time. Following the Contractor's execution of the Contract, MassCEC shall issue a written Notice to Proceed with the Work. Alternatively, MassCEC may issue a Partial Notice to Proceed, applicable to a portion of the Work as may be required to accommodate the completion of precedent work performed by others. The Contractor shall commence and continue performance of the Work within seven (7) days of its receipt of MassCEC's written Notice to Proceed with the Work unless otherwise ordered in writing by MassCEC. The Contractor shall achieve Substantial Completion of the Work within 130 days of MassCEC's Notice to Proceed.

B. If the Engineer determines that the Work has fallen behind the rate of progress as reflected by the Contractor's Critical Path Method (CPM) schedule submitted and approved in accordance with the requirements specified in the Sections of Division 01, General Requirements, MassCEC, instead of notifying the Contractor to

discontinue the Work or any part thereof, may notify the Contractor from time to time to increase the force, equipment, and plant, or any of them, employed on the whole or any part of the Work, stating the amount of increase required; and unless the Contractor shall, within five (5) days after such notice, increase such force, equipment, and plant to the extent required therein, and maintain and employ the same from day to day until the completion of the Work or such part thereof or until the conditions as to the rate of progress shall, in the Engineer's judgment, be fulfilled ("Catch-Up Work"); or unless the Contractor submits and receives approval of a revised CPM indicating the Work being completed on time, MassCEC may employ and direct the labors of such additional force, equipment, and plant as may, in the Engineer's judgment, be necessary to insure the completion of the Work or such part thereof within the time specified, or at the earliest possible date thereafter, and charge the expense thereof to the Contractor. Contractor's right of recovery, if any, for Catch-Up Work shall be in accordance with Section 6.07 C.

C. Liquidated Damages

1. Prior to commencing the Work, the Contractor shall provide the Owner with a Project Schedule reflecting all milestones (if applicable), substantial completion, and final completion, which shall become the Project schedule. The Owner shall review and, if acceptable, approve the Project schedule. In the performance of the Work, the Contractor shall adhere to the Project schedule as it may from time to time be adjusted with the written approval of the Owner. The Contractor shall make no adjustment to the Project Schedule that alters the Contract Times (or milestones) except by a Change Order.

2. MassCEC and the Contractor agree that time is of the essence of the Contract. Contractor shall continuously perform the Work in accordance with the Project schedule, as such schedule may be modified, if applicable, by approval of the Owner.

3. Contractor acknowledges that it will be difficult to quantify the amount of damage and loss to MassCEC that will result from the Contractor's failure to achieve Substantial Completion of the Work within the Contract Time, due to various factors including that MassCEC has scheduled another significant project to start work at the Project location on January 20, 2026. Since delay of completion of the Works puts MassCEC at risk for substantial financial losses and costs if the Project site is not usable by the scheduled completion date, Contractor shall pay to MassCEC as Liquidated Damages and not as penalty, the sum of Two Thousand and 00/100 Dollars ($2,000) per calendar day that Substantial Completion is delayed commencing on the calendar day after the date of Substantial Completion as adjusted by any approved time extensions. The Contractor agrees that MassCEC may deduct such Liquidated Damages from any sums that may be otherwise due and payable to Contractor.

6.03 REMOVAL OR DEMOLITION OF BUILDINGS AND LAND TAKINGS

A. When the removal or demolition of buildings within the Work limits is done under other and separate contracts, the provisions of Article 3.06 ("Adjacent Contracts") shall apply. MassCEC will not be held liable for any expense to the Contractor due to any delay or interference with its Work, due to removal or demolition of the buildings, or due to any failure to remove or demolish any buildings, or due to the necessary land takings.

B. No allowance of any kind will be made except as provided in Article 6.08.

6.04 LIMITATIONS OF OPERATIONS

A. The Contractor shall conduct the Work at all times in such a manner and in such sequence as will assure the least interference with vehicular, marine, and pedestrian traffic, operations of railroads, and occupant and consumer entrance to and exit from adjacent buildings and property. The Contractor shall have due regard to the location of detours and to the provisions for handling traffic. The Contractor shall not open up work to the prejudice or detriment of work already started.

B. Public ways shall be maintained clean and clear of spillage from trucks hauling concrete, excavated material, fill, and other construction materials to and from the construction site. Demolition materials, excavation, and other materials hauled to and from the site shall be contained in enclosed vehicles that will prevent spillage onto streets.

1. The Contractor shall make maximum effort to minimize the amount of traffic to and from the site, which may include scheduling of deliveries, maximizing loads per delivery or other measures as may be required to avoid public nuisance.

2. Maintain the existing pedestrian crosswalks and pedestrian sidewalk circulation.

C. MassCEC reserves the right to limit the prosecution of the Work to such points and in such order as the Engineer may direct.

6.05 CHARACTER OF WORKMEN, METHODS AND EQUIPMENT

A. The Contractor shall at all times employ sufficient labor and equipment to prosecute the several classes of work to full completion in the manner and time required by the Contract Documents.

B. The Contractor shall provide all cutting, fitting, and patching of the work that may be required to make its several parts fit together properly, and shall not endanger any work by cutting, excavating, or otherwise altering the work in any part thereof.

C. The Contractor shall employ only competent persons and subcontractors to do the Work. In addition, the Contractor shall hire persons, who, in the opinion of the Engineer are well qualified to direct, advise or perform certain specialized types of work as described in the Specifications.

D. All workmen shall have sufficient skill and experience to perform the Work assigned to them. Workmen engaged in special work or skilled work shall have sufficient experience in such work and in the operations of the equipment required to perform all work properly and satisfactorily.

E. Any person employed by the Contractor or by any subcontractor who, in the Engineer's judgment, does not perform the work in a proper and skilled manner or is intemperate or disorderly or otherwise unsatisfactory or not employed in accordance with the provisions of Article 5.25, shall at the written request of MassCEC or the Engineer, be removed by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the Work without the approval of the Engineer.

F. Should the Contractor fail to take the necessary action to remove such person or persons as required above or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Engineer may suspend the Work by written notice until such orders are complied with.

G. The Contractor shall employ engineers registered in the Commonwealth of Massachusetts, qualified superintendents, foremen, and other supervisory employees to plan all construction operations and to represent the Contractor at all of the several parts of the Work and they shall be present at all times while the Work entrusted to them is in progress and shall be informed thoroughly regarding the Work.

H. All equipment used on the Work shall be of sufficient size and in such mechanical condition as to meet the requirements of the Work and to produce Work in accordance with the Contract Documents. Equipment used on any portion of the Work shall be such that no injury to city streets, highways, or adjacent property will result from its use.

I. When methods and equipment to be used by the Contractor in accomplishing the construction are not prescribed in the Contract, the Contractor may use any methods or equipment that demonstrate to the satisfaction of the Engineer the ability to accomplish the Work in conformity with the requirements of the Contract.

J. When the Contract Documents specify the means, methods and equipment by which the construction shall be performed, such means, methods and equipment shall be used unless otherwise authorized in writing by the Engineer. If the Contractor desires to use a method or type of equipment other than that specified, such approval should be requested in writing from the Engineer. The request shall include a full description of the means, methods and equipment proposed to be used as an explanation of the reasons for desiring to make the change. If written approval is given, it will be on the condition that the Contractor shall be fully responsible for producing construction work in conformity with the Contract requirements. If after trial use of the substituted methods or equipment, the Engineer determines that the Work produced does not meet Contract Documents, the Contractor shall discontinue the use of the substitute means, methods or equipment and shall complete the remaining construction with the specified methods and equipment. The Contractor shall remove the deficient Work and replace it with Work of specified quality or take such other corrective action as the Engineer may direct. No changes will be made in basis of payment for the construction items involved nor in Contract Time as a result of authorizing a change in methods or equipment under these provisions.

K. In the employment of labor, the Contractor and his/her Subcontractors shall give preference to qualified individuals who are citizens of the United States, Citizens of the Commonwealth of Massachusetts, and Citizens of the City of New Bedford.

L. All equipment furnished by the Contractor shall be maintained in good condition and shall be subject to the approval of the Engineer prior to and during its use in connection with the Work.

M. The Contractor shall submit each week to the Engineer, on a form approved by the Engineer, a listing of all equipment (other than small tools) used in or charged to the Work during the previous week, including equipment rented by the Contractor from others, which listing shall include the following information as to each piece of equipment:

1. Identification thereof by the number assigned and by the firm name appearing on the equipment;

2. Designation of the equipment's capacity and weight (and, when deemed applicable by the Engineer, such other information, e.g. size, number of wheels, etc., as may be helpful in defining the equipment's reasonable rental rate);

3. Hours used on the Contract, and hours idle;

4. Hours down for repairs or for maintenance;

5. Whether it was rented from others or is owned by the Contractor or a Subcontractor, and, if rented, from whom.

6.06 DELAY AND SUSPENSION OF WORK

A. The Engineer has the authority to delay the commencement of the Work and delay or suspend any portion thereof, for such period or periods as it may be deemed necessary, because of conditions beyond the control of MassCEC or the Contractor, for the failure of the Contractor to correct conditions unsafe for the general public; for failure to carry out provisions of the Contract; for failure to carry out orders; for causes and conditions considered unsuitable for the prosecution of the Work; for acts of third persons not a party to the Contract; or for any other cause, condition, or reason deemed to be in the public interest.

B. Upon receipt of written order of the Engineer, the Contractor shall immediately delay the commencement of the Work or delay or suspend any portion thereof in accordance with said order. Work shall not be suspended or delayed without prior written approval or order of the Engineer. The work shall be resumed when conditions warrant or deficiencies have been corrected and the conditions of the Contract satisfied as ordered or approved in writing by the Engineer. The Contractor's attention is also directed to the requirements of Article 5.21 and the public safety and convenience requirements of Sections of Division 1, General Requirements, that shall govern during any period of temporary or partial suspension of work.

6.07 CLAIM FOR DELAY OR SUSPENSION OF WORK

A. The Contractor shall have no claim for damages of any kind due to any delay in commencement of the Work or any delay or suspension of any portion thereof, except as hereinafter provided.

B. Subject to the other provisions of this Section, if the Contractor is delayed at any time in the progress of the Work by (1) a negligent act or omission by of the Owner or Architect, an employee of either, or by a Separate Contractor; (2) changes ordered in the Work; (3) area-wide labor disputes not directed expressly at Contractor or any Subcontractor, fire, extraordinary delay in deliveries, unavoidable casualties, or Force Majeure Events (as defined in Section 5.21 C.); (4) delay authorized by the Owner; (5) delays caused solely by public or private utility owners or municipal departments (see Article 3.05); or (6) other causes that the Contractor reasonably asserts, and the Architect determines, justify delay; and provided that the Contractor has given timely notice of such delay as set forth in this Section and otherwise in accordance with the requirements of the Contract Documents, then the Contract Time shall be extended by Change Order or Construction Change Directive for such reasonable time not to exceed the period of delay so caused, net of any delay caused by or attributable to the acts or

omissions of the Contractor, any Subcontractor or others for whom they are responsible.

1. The Contractor acknowledges and agrees that (a) no adjustments to the Contract Time shall be made unless the events described above shall have the effect of actually delaying completion of components of the Work on the critical path indicated in the Schedule and (b) adjustments to any Milestone Dates and/or the Contract Time will be permitted in connection with any such delay only to the extent Contractor demonstrates with data and documentation that such delay (i) is not caused, or could not have been avoided, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (iii) has an impact to the critical path of at least one (1) day and (iv) has no concurrent or contributing cause for which the Contractor would not be entitled to an extension of the Contract Time.

2. Notwithstanding anything to the contrary, the Contractor shall not be entitled to any extension in the Contract Time for delays in receiving required licenses, permits, inspections or approvals unless the Owner is required to provide or obtain such licenses, permits, inspections or approvals. Any extension of the Contract Time shall be granted only to the extent that the effect of such delay cannot be (or could not have been) avoided or mitigated by the exercise of all reasonable precautions, efforts and measures (including planning, scheduling and rescheduling), whether before or after the occurrence of the cause of delay. No extension of the Contract Times shall be granted for delays affecting portions of the Work that are not critical activities or not on the critical path of the latest Project Schedule.

3. Subject to the following sentence, no extension shall be granted for any delay (a) which, in whole or in part, results from or arises out of the breach or negligence of the Contractor or of those for whom the Contractor is responsible, or (b) for which the Contractor is not entitled to an extension of the Contract Times hereunder. In the event the Contractor is responsible for a delay that does not entitle it to an extension of the Contract Time, but which is concurrent with another delay that would otherwise entitle the Contractor to an extension thereof ("Concurrent Delay"), the Contractor shall be entitled to an extension of the Contract Time for the amount of the demonstrated concurrency period, but no increase to the Contract Sum, for such concurrency period or otherwise. Any extension of the Contract Time allowed hereunder shall be net of the Contractor-caused delay and any "float" time included in the Project Schedule.

4. **No Damages for Delay.** The Contractor hereby agrees that the Contractor shall have no claim for increase in the Contract Sum or additional direct or indirect costs or damages of any kind against the Owner or the Engineer on account of any delay in the commencement of the Work, and/or any claim

based on alleged delay, hindrance, loss of productivity, acceleration including but not limited to Catch-Up Work, or suspension of any portion of the Work ("Delay"), whether such Delay is caused in whole or in part by the Owner, the Engineer, or otherwise. The Contractor acknowledges that the Contractor's sole remedy for any such Delay will be an extension of time as provided in this Section.

5. Notwithstanding any provision in the Contract Documents to the contrary, Contractor shall not be entitled to any extension of time because of the impacts of any pandemic known or knowable as of the Date of Commencement of the Work, tariffs imposed on United States imports or exports, seasonal variations in temperature, humidity or precipitation, which conditions shall be wholly at the risk of the Contractor, whether occurring within the time originally scheduled for completion or within the period of any extension granted. There shall be no increase in the Contract Sum on account of any additional costs of operations or conditions resulting therefrom.

   a. The probable slow-down or curtailment of Work during inclement weather and winter months has been taken into consideration in determining the total time required to complete the Contract; hence no extension of time will be allowed due to this reason. No extension of time will be allowed for winter conditions and weather conditions, unless they qualify as a Force Majeure Event.

C. If the Owner determines that the rate of progress of the Work has been delayed and it appears that the Work or any portion thereof will not progress to completion in accordance with the Project schedule, the Owner shall have the right, but not the obligation, to require the Contractor to take all necessary action to recover or to prevent such delay ("Catch-Up Work"). In the event that any such delay does not otherwise entitle the Contractor to an extension of the Contract Time, all costs associated with such Catch-Up Work shall be borne by the Contractor. In the event that any such delay entitles the Contractor to an extension of the Contract Time, the Owner shall reimburse Contractor for all costs associated with such Catch-Up Work, but only to the extent of Owner's approval of a valid and properly substantiated Claim submitted by the Contractor pursuant to all applicable provisions of these General Conditions.

D. An extension of time will not be granted for any excusable delay or any suspension of the Work if a written request for an extension of time on account of delay due to any of the causes described in this Article 6.07 is not filed within fifteen (15) days of the date of the commencement of the delay, together with data and documentation substantiating the claimed period of recoverable delay. Notwithstanding any provision in these provisions or the Contract Documents to the contrary, no extension of time will be granted if the request is based on any claim that the Contract Time as originally established was inadequate.

6.08 DETERMINATION AND EXTENSION OF CONTRACT TIME FOR DELAYS TO COMMENCEMENT OF THE WORK

A. The Contract Time for completion shall be adjusted for delays to the commencement of the Work, if applicable, as follows:

B. If the Contract is not awarded as contemplated by the Instructions to Bidders, then the number of days allowed for the completion of the Work will be computed from the date of transmission (by electronic mail) of the executed Contract to the Contractor or the date on which the Contractor was directed to commence Work whichever is later. If the Contract specifies a specific calendar date for completion and the Contract is not awarded as contemplated by the Instructions to Bidders, then the Contractor will be entitled to an extension of time equivalent to the number of days elapsed from 60 days (45 days if Federal funds are involved) after the opening of bids up to and including the day of mailing of the executed Contract by MassCEC or the date on which the Contractor was directed to commence Work whichever is later.

C In case commencement of Work is delayed or any part thereof is delayed or suspended by MassCEC (except for unsuitable weather, winter months, or reasons caused by the fault or neglect of the Contractor), the Contractor will be granted an extension of time in which to complete the Work or any portion of the Work required under the Contract equivalent to the duration of the delay or suspension less a reasonable period of time within which the Contractor could have done necessary preliminary work.

6.09 FAILURE TO COMPLETE WORK ON TIME – NO WAIVER

A. Permitting the Contractor to continue and finish the Work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall not operate as a waiver on the part of MassCEC of any of its rights under the Contract.

6.10 TERMINATION OF CONTRACT

A. Should Contractor at any time: (i) fail to supply the labor, materials, equipment, supervision and other things required of it in sufficient quantity to perform the Work with the skill, conformity, promptness, and diligence required hereunder, (ii) cause stoppage or unreasonable delay of or interference with the Work, (iii) become insolvent, or (iv) materially fail in the performance or observance of any of the covenants, conditions, or other terms of this Contract, then in any such event, each of which shall constitute a default hereunder by the Contractor, MassCEC shall, after giving Contractor notice of default and seven (7) days within which to cure, have the right to remedy the default by terminating the Contractor and/or

completing the Work or any portion of the Work. Contractor shall be liable for all damages to MassCEC caused by such default.

B. If a termination by MassCEC for default under Section 6.10A is determined to be unjustified then such a termination shall be deemed a termination for convenience pursuant to Section 6.11.

C. In the event of termination, whether of this Contract or of an Assignment, the Contractor shall promptly deliver to the Owner all documents, work papers, studies, calculations, computer programs, data, drawings, plans, specifications and other tangible work product or materials pertaining to the Work performed under this Contract or Assignment, as applicable to the time of termination, and shall assist the Owner in the orderly transition of the work. Thereupon the Owner shall pay to the Contractor any unpaid and undisputed balance owing for Work rendered prior to the date of termination. Any termination of this Contract shall not affect or impair the right of the Owner to recover damages occasioned by any default of the Contractor or to set off such damages against amounts otherwise owed to the Contractor.

D. If the Contractor shall be adjudged bankrupt, or make a general assignment for the benefit of creditors, or if a receiver shall be appointed of the Contractor's property, or if the work to be done under the Contract shall be abandoned, or if the Contract or any part thereof shall be sublet without the previous written consent of MassCEC, or if the Contract or any claim thereunder shall be assigned by the Contractor otherwise than an herein specified, or at any time the Engineer certifies in writing to MassCEC that the Work, or any part thereof, is unnecessarily or unreasonably delayed, or that the Contractor has violated any of the provisions of the Contract, MassCEC may, by written notice, instruct the Contractor to discontinue the Work, or any part thereof, and thereupon the Contractor shall discontinue such Work or such part thereof, as MassCEC may designate, and MassCEC will require the Surety or Sureties to complete the Contract.

E. Neither a notice under Article 6.02 B. from MassCEC to the Contractor to perform Catch-Up Work nor MassCEC's employment of such additional force, equipment, or plant pursuant to that Article shall be held to waive or prevent a subsequent notice of termination from MassCEC under the provisions this Article 6.10, for the reasons prompting the notice or action by MassCEC under Article 6.02 B. or otherwise.

F. MassCEC may exercise the rights under this paragraph to rectify adverse conditions described in Article 3.10 and Article 4.04, and/or notify the Contractor's surety to take the necessary appropriate action to remedy the situation.

G. All expenses incurred by MassCEC in exercising its rights under this Article may be deducted from any amounts then due or to become due the Contractor under the Contract Documents. If MassCEC's expenses are less than the sum which would have been payable under the Contract Documents, the Contractor will be entitled to receive the difference; and in case such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to MassCEC upon completion of the Work without further demand being made therefor.

6.11 TERMINATION FOR CONVENIENCE

A. MassCEC may in its sole discretion and without cause notify the Contractor to discontinue all work, or any part thereof. Such notice shall be given to the Contractor in writing and thereupon the Contractor shall discontinue such work, or such part thereof, as MassCEC may designate.

B. If MassCEC notifies the Contractor to discontinue all work, or any part thereof pursuant to this Section, MassCEC shall pay and the Contractor shall accept, as full payment for all work done and materials provided, the following sums:

1. For all completed and approved items of work that the Contract provides are payable by unit prices:

   a. The original Contract Unit Prices.

2. For all partially completed work items to the date of termination:

   a. A sum agreed to by the Contractor and the Engineer; or

   b. The sum of the following items i through vi.:

      i. The actual cost for direct labor, materials (less salvage value, if any) and use of equipment plus 10 percent of this total for overhead.

      ii. The actual cost for Worker's Compensation and Employer's Liability Insurance, Health, Welfare and Pension Benefits, Social Security Deduction, and Employment Security Benefits.

      iii. Six (6) percent of the total of i and ii for profit.

      iv. The estimated proportionate cost of surety bonds.

      v. The actual cost to the Contractor for approved work performed by a subcontractor plus 10 percent of such cost.

vi. No allowance will be made for general superintendence and the use of small tools and manual equipment.

3. For costs of settlement as:

a. Reasonable and necessary storage, transportation and other costs incurred for the preservation, protection or disposition of the discontinued work.

b. When requested by MassCEC, the Contractor shall furnish itemized statements of the cost of the work performed and shall give MassCEC access to all accounts, bills and vouchers relating thereto and unless the Contractor, when requested, shall furnish such itemized statements and access to all accounts, bills and vouchers, he shall not be entitled to payment for the work for which such information is sought by MassCEC.

b. The Contractor shall not be paid, shall not have, and waives unconditionally any claims for any consequential damages, for loss of anticipated profits (on this or any other Project), and for loss of expected reimbursement or for any increased expenses resulting directly or indirectly from the discontinuance of any or all work except as stated in this article with respect to work completed as of the date of termination.

d. The Contractor shall incorporate the provisions of this Article and provisions in its contracts with each of its subcontractors.

6.12 MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES

A. MassCEC and the Contractor waive claims against each other for consequential damages arising out of or relating to the performance of the Work. This mutual waiver includes damages incurred by MassCEC for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons, and damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work. This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with the Contract Documents. Nothing contained in this Paragraph 6.12A shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

END OF ARTICLE 6

ARTICLE 7 - MEASUREMENT AND PAYMENT

7.01 MEASUREMENT OF QUANTITIES

A. Quantities of various items of work that are payable as unit prices pursuant to the Contract Documents shall be determined, for purposes of payment, by the Engineer and by the Contractor. Measurements will be made according to United States standard units of measurement.

B. Upon completion of the Work and before final payment is made the Engineer will make final measurements to determine quantities of various items of work performed as the basis for final settlement. Measurements will be made according to United States standard units of measurement.

C. Method of measurement and computations to be used in determination of quantities of material furnished and of work provided under the Contract will be those methods generally recognized as conforming to good engineering practice.

D. The Contractor shall provide assistance to the Engineer, as requested by the Engineer, for the purpose of the measurement of quantities, at no additional cost to MassCEC.

G. Where Work done under modification to the Contract is to be paid for by units of length, area, or volume, only the net amount of work actually done, as it shall appear in the finished Work, and measured as hereinafter specified, shall be paid for, local customs to the contrary notwithstanding.

H. All materials, which are specified for measurement by weight, shall be weighed on standard scales furnished by and at the expense of the Contractor. Such scales shall be sealed at the expense of the Contractor as often as is necessary to ensure their accuracy. A sworn weigher as provided under Section 85, Chapter 41 of the General Laws of the Commonwealth of Massachusetts shall weigh all materials required to be weighed as above provided. If materials are shipped by rail or truck, the car weights or quarry weights may be accepted, but scales shall be used as above, if so directed.

G. This Section shall not apply to items of Work performed pursuant to a lump sum bid price that was derived from estimated quantities of such items indicated in the Bid Form for bid comparison purposes only, as set forth in the Bid Form.

7.02 SCOPE OF PAYMENTS

A. Owner shall pay to Contractor for the satisfactory performance and completion of the Work and all the duties, obligations and responsibilities of Contractor under this Contract, the compensation as set forth above as the Contract Price which shall be deemed to include all Contractor's costs, overhead and profit for the performance

of the Work. The Contract Price shall be full compensation for all Work provided by Contractor and is conclusively presumed to cover all costs, expenses or damages arising out of the nature of the Work.

B. For all lump sum payment items, the Contract Price includes payment for all actual quantities of materials encountered by Contractor on the Project regardless of whether those quantities vary substantially from the estimated quantities used in the RFP/Bid Form and Contractor's Proposal, which were for bid comparison purposes only. Contractor is presumed to have accounted for the possibility and potential magnitude of any such quantity variation in preparing its Proposal, and the Contract Price for lump sum items of work calculated based on estimated unit quantities shall not be changed or modified on account thereof.

C. **No Compensation for Cost Escalation.** Notwithstanding anything in these General Conditions or the Contract Documents to the contrary, Contractor shall have no right to additional compensation for labor or material escalation or costs related to market volatility, the potential for which is deemed to have been fully accounted for in Contractor's Proposal and the agreed Contract Price set forth in the Agreement. Costs for labor or material escalation (including but not limited to building materials, products and supplies required to be furnished under the Agreement, and equipment rental costs), whether due to unusual market forces, geopolitical events or issues, or any other cause, including tariffs imposed or to be imposed on United States imports or exports, shall be at the risk of the Contractor. Contractor shall include a provision to the same effect in all agreements with its subcontractors.

D. Prior to submission of the first Progress Payment, the Contractor shall deliver to the Owner, for review and approval, a detailed breakdown of the Contract Price showing a Schedule of Values for the various parts of the Work, including any reimbursable expenses agreed to by the Owner. Once accepted, this Schedule of Values will be used as a basis for payment of the Contractor's monthly requisition. The Owner will accept the Schedule of Values if it is prepared with sufficient detail to serve as the basis for progress payments and is supported by such data necessary to substantiate its accuracy as Owner may reasonably require.

E. Payment of any current estimate or any retainage percentage shall in no way constitute an acknowledgement of the acceptance of the Work or in no way or degree prejudice or affect the obligation of the Contractor, at his own cost and expense, to repair, correct, renew or replace any defects and imperfections in the construction of, or in the strength of, or quality of materials used in or about the construction of the Work under Contract and its appurtenances, as well as damages due or attributable to such defects; which defects, imperfections or damages shall have been discovered on or before the expiration of the guaranty period specified in Article 2.08. The Engineer shall be the sole judge of such defects, imperfections, or damages and the Contractor shall be responsible for the cost to correct the same. Also, see Article 5.24.

F. If the requirements of the Measurement and Payment Part or Article in the Contract Specifications relating to any price in the Schedule of Bid Items requires that said price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Specifications.

G. Except as specifically provided otherwise, no separate payment will be made for any work in fulfillment of the requirements specified in the Sections of Division 01, General Requirements, and all costs thereof shall be included in the various prices bid or the pay items shown in the Schedule of Bid Items.

7.03 UNIT PRICE ITEMS – COMPENSATION FOR ALTERED QUANTITIES

A. When the accepted quantities of Work (that is payable by Unit Price and not on a lump sum basis pursuant to the Contract Documents) vary from the estimated quantities set forth in the Contract, and whether or not there have been any changes to the Contract Documents, the Contractor shall accept as payment in full, so far as Contract items are concerned, payment at the original Unit Price for the accepted quantities of work done. No allowance or other adjustment except as provided in Article 2.05 shall be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the Contract items of overhead expense on the part of the Contractor and subsequent loss of expected reimbursements therefor or from any other cause except the said payment for the actual quantity done at the original Contract Unit Price.

B. Alteration of the Contract Documents or of the character of work involving Extra Work Orders as provided in Article 2.02 and 2.03 will be paid for at the prices for such items set forth therein. If prices cannot be agreed upon, the Contractor shall proceed with the performance of the work on a force account basis in accordance with the Article 7.04.B.

C. This section shall not apply to items of work that are payable on a lump sum basis, whether or not their bid price was calculated based on estimated quantities listed in the Bid Form for bid comparison purposes.

7.04 PAYMENT FOR CHANGED OR EXTRA WORK

A. Payment for work for which there is a Contract Unit Price:

1. Where the Contract provides that the work is payable by specified Unit Price and the Engineer orders Extra Work for work of the same kind as other work contained in the Contract and it is provided under similar physical

conditions, the Contractor shall accept full and final payment at the Contract Unit Prices for the accepted quantities of Extra Work done.

2. No allowance will be made for any increased expenses or any damages incurred by the Contractor on account of the changes in quantities except as may otherwise be set forth in the Contract Documents.

B. Work performed will be paid for based on expended labor, equipment, and materials plus overhead and profit, neither of which are to exceed the amounts specified in paragraph C below.

C. Work performed will be paid for in an amount equal to the following:

1. Unless Owner and Contractor agree upon unit prices or a lump sum change in the Contract Price, the Contract Price shall be adjusted by the net amount of any direct savings and actual direct additional costs plus overhead and profit to Contractor of no more than a total of 10% as described in Section 2.02(D). If the changes, in the opinion of the Engineer, are of sufficient magnitude as to require additional time to complete the Contract, such time adjustment may be made in accordance with the provisions of Article 6.08.

2. For Extra Work or Change Orders where the work is self-performed by Contractor, it shall be entitled to a total mark-up for overhead and profit of 10% of its actual cost for the performance of such extra work. For extra work or Change Order work that is not self-performed by Contractor, it shall be entitled to a total mark-up for overhead and profit of 5% of the actual cost for the performance of such Change Orders. Subcontractors shall be entitled to a mark-up on Change Orders of 10% for overhead and profit for self-performed work and 5% for non- self-performed work. In no circumstances shall the mark-ups by the Contractor and all of the Subcontractors and vendors exceed 20% in the aggregate.

3. No allowance shall be made for general superintendence and the use of small tools, incidental items and manual equipment.

The Contractor shall only be entitled to additional compensation for changed work if the Owner has ordered such changes in writing prior to the commencement of the changed work by the Contractor.

Requests for a Change Order shall be made on the Change Order Request Form agreed to by the parties and provided in **Attachment 1 (Contract Documents) of the RFP**. Likewise, agreed upon changes shall be reflected on the Change Order Request Form agreed to by the parties.

The Contractor shall furnish such information as to the cost of such Extra or changed work as the Engineer may request. The Contractor shall also, upon request

by the Engineer, give the Engineer access to and copies of accounts, bills and vouchers relating to such work (all of which shall be kept in a manner satisfactory to the Engineer), and if the Contractor shall not do so, it shall not be entitled to payment for any items of such work concerning which the Engineer's request has not been granted.

Prior to the commencement of such work, the Contractor shall submit to the Engineer a written certificate showing the rates or percentages of all assessments against wages paid by the Contractor, including Federal Social Security and state unemployment compensation assessments, insurance, health and welfare payments and other assessments which the Contractor actually pays as an employer pursuant to contractual obligation upon the basis of such wages. The determination of the Engineer shall be final upon all questions as to the amount or value of extra work.

7.05 OMITTED ITEMS

A. Should any item or items of the Work be determined unnecessary for the proper completion of the Work, MassCEC may, upon written notice to the Contractor, eliminate such item or items from the Contract and allowance will not be made for such items so eliminated in making final payment to the Contractor, except for such actual Work as shall be done and materials purchased, including the cost of moving in and out the special equipment necessary for Work on the eliminated item or items, prior to notification of the elimination of such item or items. The amount of the credit to MassCEC shall be determined in a similar manner as described in Article 7.04.

7.06 PARTIAL PAYMENTS

A. Monthly, the Engineer will make an estimate in writing of the total amount of the work done to the date of such estimate and the value thereof, including advance payments on products/materials stored or on hand but not yet incorporated in the Work which may be made as provided in Article 7.07. MassCEC will retain the following from these payments:

1. Five (5) percent of the approved amount of the payment as retainage to secure satisfactory performance of the Contract Work.

2. An amount sufficient to cover claims it has against the Contractor.

3. Five (5) percent of the value of all items to be planted in the ground.

4. Any amounts that may be subject to validly disputed payment claims by subcontractors, pending satisfactory resolution of such dispute.

MassCEC will pay monthly to the Contractor while carrying on the Work the balance not retained as hereinbefore provided. No such estimates or payment shall

be required to be made when, in the Engineer's judgement, the Work is not proceeding in accordance with the provisions of the Contract, or when in the Engineer's judgement the total value of the Work done since the last estimate amounts to less than $500.00.

B. MassCEC may, at its option, after 50 percent of the Work has been completed and (1) if the Work is proceeding in accordance with the approved CPM Construction schedule submitted under the requirements specified in the Sections of Division 01, General Requirements, and (2) is being performed in accordance with the Contract Documents, not retain the 5 percent to secure satisfactory performance of the Contract Work as provided in Article 7.06.A on any subsequent payments. However, if MassCEC does not retain these monies, it will reimpose this 5 percent retainage on all subsequent payments should the Contractor fail to maintain progress in accordance with the Contract and approved schedule or fail to execute the Work as required by the Contract Documents. Retainages withheld under Articles 7.06.A.2 and 7.06.A.3 will remain in effect throughout the Contract Work period as detailed therein. Retainage withheld under Article 7.06.A.4 for plantings will be retained until Final Acceptance (see Article 7.09).

C. Partial payments will be made on lump sum contracts and on lump sum items of a contract if the Contractor requests partial payment of such an item, in accordance with a schedule of the quantities and unit prices for the major components of a lump sum contract or of the lump sum items of a contract to be submitted by the Contractor and approved by the Engineer prior to making partial payments for such contract or for such items.

1. For lump sum contracts, this schedule of major components shall approximate the activities shown on the CPM Construction Plan required under the Sections of Division 01, General Requirements.

2. Each component part shall be considered as including all its concomitant parts so that the total cost listed for the components is the contract cost for the item.

3. Approval of the schedule by the Engineer shall not be considered as a guarantee to the Contractor that the quantities shown on the schedule are the approximate quantities actually included in the lump sum item.

4. The schedule is only for the purpose of estimating partial payments and it shall not affect the Contract terms in any way.

D. The Contractor shall certify in writing by means of a Certification of Work that the work for which payment is included in the estimate in question has in fact been done. The Certification of Work form shall be developed by the Contractor and approved by the Engineer. The Certification of Work form shall be completed and

signed by an authorized representative of the Contractor, and it shall be submitted to MassCEC with each payment request.

E. Whenever the Work is substantially complete, MassCEC may, if it considers the amount retained to be in excess of the amount adequate for its protection, at its discretion, release to the Contractor all or a portion of such excess amount and may cause the Contractor to be paid such portion of the retainage as it deems prudent.

F. When the first partial payment estimate is prepared, the Contractor shall submit to the Engineer a cash drawdown forecast indicating the estimated amount of each partial payment by month, projected through completion of the project. The Contractor shall, with each succeeding partial payment estimate, submit updated cash drawdown forecasts to the Engineer. The forecast is for the purpose of estimating cash requirements.

G. The Contractor shall develop a Statement of Payment to Subcontractor Form and the Engineer shall approve the form. The Statement of Payment to Subcontractor Form shall be completed and signed by an authorized representative of the Contractor and it shall be submitted to MassCEC with each payment request.

7.07 PAYMENT FOR PRODUCTS/MATERIALS STORED ON OR OFF SITE

A. When requested in writing by the Contractor allowance may be made on partial payments for certain products/materials stored at the Work site, but not incorporated in the Work, subject to the following terms and conditions:

1. Upon presentation to the Engineer by the Contractor of copies of paid invoices, advance payments may be made for acceptable reinforcing steel, structural steel, piles, pipe, guard rail, precast concrete items, costly machinery items and other similar non-perishable products/materials purchased expressly for the Work and delivered to and stored in the approved storage places at the site, but which products/materials are not considered as installed, erected or complete in place under the terms of the Contract and for which partial payment would not otherwise be made until such items were installed, erected or complete in place.

2. The amount to be included in the estimate will be the value of the products/materials as shown on the certified copies of paid invoices including transportation and handling costs. However, the Engineer may limit payment for such products/materials when payment is based upon a standard unit of measure. When Contract payments are made on the basis of estimated quantities, payment for products/materials stored or on hand may be limited to an amount not to exceed the value of 90% of the estimated quantity.

3. Before any advance on products/materials is made as hereinbefore provided, MassCEC will require, as security for the incorporation of the products/materials in the Work, documents from the Contractor transferring to MassCEC the absolute legal title to such products/materials.

4. However, the transfer of title and the partial payment for such products/materials shall not in itself constitute acceptance of same nor void the right to reject products/materials subsequently found unsatisfactory as provided in Article 4.04, nor in any way relieve the Contractor of his responsibility for satisfactorily furnishing and installing/placing the products/materials in the Work in accordance with the terms of the Contract.

5. In the event any of such products/materials subsequently becomes lost, stolen, impaired or damaged the monetary value of the lost, stolen, impaired or damaged products/materials as may have been paid for in a current estimate will be deducted from the next estimate and no further payment will be made therefor until such products/materials have been satisfactorily replaced with products/materials conforming to the Contract Documents.

6. If it is impossible due to lack of area on the site or other valid reason, the Contractor may request in writing permission from the Engineer to store products/materials off the site and still have the products/materials paid for as products/materials on hand and the Engineer may approve payment. However, no advance payment for products/materials stored off the site will be made until written approval of the Engineer has been given. This request will state the reason(s) for the request, location of the storage area(s), and shall also state the methods that will be employed to ensure that the products/materials are properly protected, and the products/materials will be used on the Contract that the request is made for. The amount to be included in the estimate for products/materials stored off site will be limited to 80% of the value of the products/materials as shown by the certified copies of paid invoices including transportation and handling costs.

7. In the case of property not owned or controlled by MassCEC, the Contractor shall also lease, or procure a lease, free from encumbrances to MassCEC, such lease to be in a form approved by MassCEC and to contain provisions for the protection and indemnification by the Contractor of MassCEC, its employees and agents, against all claims by reason of such lease or by reason of anything done or permitted in or upon the leased site(s). The Contractor shall also take such steps as MassCEC may require for the purpose of security and assuring MassCEC the control of such products/materials, particularly the right to enter upon the property, take possession of such products/materials and use the same.

   a. No advance payment for products/materials stored or on hand, but not incorporated in the Work, will be made in an estimate when the

value therefore amounts to less than $10,000 per Contract Bid Item and represents the value of at least 50% of the estimated quantity involved as shown on the Schedule of Bid Items or as determined by the Engineer.

b. Deductions at rates and in amounts that are equal to the advance payments will be made under the appropriate Contract Pay Items in estimates as the products/materials are incorporated in the Work.

7.08 SEMI-FINAL ESTIMATE

A. A semi-final estimate may be made, at the discretion of MassCEC, under the following conditions:

1. If, after final inspection has been made, there are any payments or Extra Work items that are still in dispute between the Contractor and MassCEC, either as to the quantity or value of Work provided thereunder, such items or claims may be excluded from the final estimate, and payment for such disputed items may be deferred until such time as agreement has been reached between the Contractor and MassCEC or until such claim has been adjudicated. In such case, a semi-final estimate shall be prepared within a period of 65 days after Substantial Completion of the Work covering the value of Work provided and retained percentage on items of the Contract that are not in dispute and with disputed items or claims excluded but subject to deduction and retention of a sum sufficient to satisfy any and all outstanding claims or liens that have been duly filed by subcontractors and materialmen against the Contractor, or to cover amount of such claims or liens that may have been paid by MassCEC directly to others for the Contractor's account , and subject to deduction and retention from such payment any other amounts to be deducted and retained in accordance with the terms of the Contract Documents.

2. In the event the Work has been Substantially Completed and the Work has been opened for operation or occupancy as directed in writing by MassCEC, but final acceptance of the Work is subject to delay because of minor uncompleted items which do not impair the usefulness of the Contract, a semi-final estimate shall also be prepared within a like period of sixty-five (65) days after the Work has been Substantially Completed and opened for operation or occupancy. Such semi-final estimate shall include an estimate of the value of all Work provided in accordance with the terms of the Contract Documents, including the amount of retained percentage withheld by MassCEC from previous periodic payments, but excluding (a) the same deductions and retainage sufficient to cover subcontractors' and materialmens' claims and other amounts to be deducted and retained in accordance with the terms of the Contract Documents as provided by the first paragraph of this Article; (b) an amount equal to the estimated value of

the work remaining to be performed; and (c) any items or claims for Extra Work, or parts thereof, that may be in dispute; and payment for such excluded items or portions thereof, may be deferred until such remaining Work has been satisfactorily completed, or in the case of disputed items or claims until such time as agreement has been reached thereon or such claims have been adjudicated.

7.09 FINAL ACCEPTANCE AND FINAL PAYMENT

A. When all of the Work covered by the Contract, including those items of Work set forth on the Punch List (see Article 3.11), has been completed and accepted, MassCEC will inform the Contractor in writing of the date of such final acceptance.

B. The Engineer shall, as soon as practicable after the satisfactory completion of the Work including the Punch List, make a final estimate of the amount of non-Punch List Work done thereunder and the value of such Work. Within 65 days from and after the date the Work has been accepted by the Engineer, MassCEC will forward to the Contractor a copy of the final estimate or semi-final estimate, which will include an agreement form for the Contractor's acceptance. This estimate will be the balance due the Contractor minus a one percent retention for final completion of Project deliverables, plus the reasonably estimated value of amounts to cover any outstanding claims. After such acceptance has been filed with the Engineer, payments of the estimate will be made, so found to be due thereunder after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payments will be subject to correction in the final estimate and payment. If within six (6) months from the date the final estimate is forwarded to the Contractor, the Contractor has not filed a valid, as determined by the Engineer, written reason(s) for not accepting the final estimate, the final estimate will be considered acceptable to the Contractor and payment of final estimate made.

C. Acceptance by the Contractor of the final payment shall operate as and will be a release to MassCEC and every member, agent and employee thereof, from all claims and liability to the Contractor for anything done or furnished for, or relating to, the Work, or for any act or neglect of MassCEC or of any person relating to or affecting the Work, except the claim against MassCEC for the remainder if any there be, of the amounts kept or retained to satisfy liens or claims pending against the Contractor.

END OF ARTICLE 7

ARTICLE 8 – DISPUTE RESOLUTION

8.01 CHOICE OF LAW; REFERRAL OF DISPUTES TO SENIOR MANAGEMENT

A. This Agreement is to be construed in accordance with the laws of the Commonwealth of Massachusetts without regard to its conflict of laws rules. This Agreement is intended to incorporate by reference all applicable provisions of law which by law are required to be incorporated into the Agreement.

B. Claims, disputes, or other matters in controversy arising out of or related to the Agreement, except those waived as provided in the Agreement, shall be subject to the following procedures as conditions precedent to litigation.

C. The parties shall first attempt to resolve any dispute arising out of or relating to a Claim under the Agreement through negotiations between senior executives or other principals of the parties, who have authority to settle the same, with such negotiations to take place within 15 days of either party providing the other with a request for direct discussions (which request shall be submitted within seven (7) days of the other party's rejection of the Claim) ("Senior Management Negotiations").

8.02MEDIATION

A. The parties further agree that any claim, dispute or other matter arising out of or related to this Agreement, which is not resolved by Senior Management Negotiations, shall be subject to non-binding mediation, at the sole election of Owner as described in this Section 8.02.

B. If the dispute has not been settled by Senior Management Negotiations within fifteen (15) days of a request for direct discussions, at the sole election of the Owner, the parties shall endeavor to resolve their Claims by mediation using a third party mediator mutually approved by the parties. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The parties shall endeavor in good faith to settle the dispute in an amicable manner within 45 days of submission to mediation.

C. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in Boston, Massachusetts, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

8.03VENUE; WAIVER OF JURY TRIAL

A. All disputes arising out of or in connection with the Agreement that are not resolved by Senior Management Negotiations or, where the Owner has so elected,

mediation, shall be brought in the Massachusetts Superior Court in Bristol County, Massachusetts, or in federal court in Boston, Massachusetts. Owner and Contractor agree to expressly waive their rights to a trial by jury regarding any disputes arising out of the Agreement as the disputes would, in most instances, be too complex for presentation to a jury and would be best served by a jury-waived proceeding.

8.04 WORK UNDER PROTEST

A. Pending final resolution of any dispute between the parties, including disputes over the scope of Work or payment for proposed but unapproved Change Orders or Extra Work, the Contractor shall proceed diligently with the performance and completion of the Work (including Extra Work directed by the Owner but disputed by Contractor), and record all work and costs on a time and materials basis or other method approved by the Owner, and the Owner shall continue to make payment of undisputed amounts for approved Work in accordance with the provisions of the Agreement. Contractor's failure to comply with this "work under protest" requirement shall constitute a material breach of the Agreement.

END OF ARTICLE 8

ARTICLE 9 – ENTIRE AGREEMENT; PRIORITY OF CONTRACT DOCUMENTS

9.01 AGREEMENT

The Agreement, including all Attachments and Exhibits, represent the entire and integrated Agreement between the Owner and the Contractor with respect to the subject matter hereof and supersedes all prior negotiations, representations, proposals or agreements, either written or oral. The Agreement may be amended only by written instrument signed by both the Owner and Contractor. The Contract Documents shall not be construed to create a contractual relationship of any kind between any persons or entities other than the Owner and the Contractor.

9.02 PRIORITY OF CONTRACT DOCUMENTS

The following list comprises the Contract Documents. In the event of conflicts or discrepancies among the provisions of the Agreement and any other Contract Documents, the documents shall be interpreted on the basis of the following priorities:

(1) Executed Change Orders/Modifications - later date to take precedence

(2) Supplemental Conditions, if any

(3) General Conditions, as amended, including any Contract Addenda added by the Supplemental Conditions or otherwise

(4) Plans and Specifications

(5) Instructions to Bidders

(6) Contractor's Proposal

(7) Request for Proposals/Invitation to Bid

END OF SECTION

SECTION 00800

SUPPLEMENTARY CONDITIONS

Index

TITLE	PAGE NO.
GENERAL	**2**
ARTICLE 1 - DEFINITION OF TERMS	**2**
1.01 DEFINITION OF TERMS	2
ARTICLE 2 - SCOPE OF WORK	**3**
2.01 INTENT OF THE CONTRACT	3
2.02 CHANGES IN THE WORK	3
ARTICLE 3 - CONTROL OF WORK	**3**
3.06 ADJACENT CONTRACTS	3
ARTICLE 5 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC	**4**
5.10 PROTECTION AND RESTORATION OF PROPERTY	4
5.18 PAYMENT OF TAXES	5
5.28 PERFORMANCE STANDARDS	5
5.29 ARPA CONTRACT ADDENDUM	6
ARTICLE 7 - MEASUREMENT AND PAYMENT	**6**
7.06 PARTIAL PAYMENTS	6

SECTION 00800

SUPPLEMENTARY CONDITIONS

GENERAL

A. Further supplementing the General Conditions, the following Supplementary Conditions will apply.

B. References to Article Numbers in the following Supplementary Conditions unless otherwise stated are to the General Conditions. In case of conflict between these Supplementary Conditions and the General Conditions, these Supplementary Conditions will take precedence and shall govern. Otherwise, these Supplementary Conditions are in addition to, and shall not supersede, the relevant provisions of the General Conditions.

C. The Supplementary Conditions are included herein to augment the General Conditions, with additional requirements/information that is applicable to the Work.

D. The enforcement of the requirements of any of the following Supplementary Conditions shall not be construed as waiving any of the rights of Massachusetts Clean Energy Technology Center ("MassCEC") contained elsewhere in the Contract Documents.

ARTICLE 1 - DEFINITION OF TERMS

1.01 DEFINITION OF TERMS

A. Add the following terms to the list of definitions:

26.a. Owner's Representative: The MassCEC designee, acting on their behalf, as the Owner's Representative for New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project is: **Jeannie Houde – Terminal Manager, Massachusetts Clean Energy Technology Center, 4 Wright Street, New Bedford, MA 02740**

26.b. Program & Project Manager: The Program & Project Manager for the construction of the New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project is: **Doug Ernst – Project Director, Foth Infrastructure & Environment, LLC, 15 Creek Road, Marion, MA 02738**

26.c. Design Engineer & Engineer of Record: The Design Engineer & Engineer of Record for the New Bedford Marine Commerce Terminal Phase 3 Terminal Heavy-Lift Expansion Project is: **David Kelley – Principal, Civil & Environmental Consultants, Inc., 31 Bellows Road, Raynham, MA 02767**

ARTICLE 2 - SCOPE OF WORK

2.02 - CHANGES IN THE WORK

Add the following new paragraph:

G. The Change Order Form, provided in the Contract Documents (Attachment 1 of the Bid Package), will be used by MassCEC for Change Orders.

ARTICLE 3 - CONTROL OF WORK

3.06 - ADJACENT CONTRACTS

Add the following new paragraphs:

F. Listing of Adjacent Construction Contracts and Contracts Requiring Coordination

1. The Contractor's attention is drawn to adjacent construction contracts that may be on going simultaneously with the Work. These ongoing Contracts are as follows:

Contract Name and Number	Description
None at this time.	

2. In addition to the above contracts, MassCEC may put out for bid while the Work is being performed, other contracts to be coordinated with this Contract, including but not limited to, the following:

Contract Name and Number	Description
None at this time.	

G. The Contractor shall attend weekly coordination meetings with the contractors of the adjacent contracts and contracts requiring coordination. The weekly coordination meetings will be held in conjunction with the weekly construction meeting(s). The purpose of these meetings is to inform each contractor of the upcoming work by other contractors and to coordinate the overall maintenance and

protection of pedestrian and vehicular traffic in the project area(s). The content of these meetings will include the following:

1. An overview of the progress of each contract and the anticipated major items of work to occur in the upcoming months.

2. Maintenance of pedestrian and vehicular traffic, including existing and proposed lane closing and detours, hauling routes, and other related issues.

3. Other items of concern to the Contractors, MassCEC, and other interested parties.

ARTICLE 5 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

5.10 - PROTECTION AND RESTORATION OF PROPERTY

A Add the following new subparagraph to paragraph L:

1. The written notice to be served to utility owners or officials and to all others concerned with or having charge of public or private owned utilities shall include, but not be limited to, the following:

UTILITIES, DIGSAFE 1-800-344-7233
1-800-DIGSAFE

TELECOMMUNCIATIONS

Verizon
1116 Shawmut Avenue, 2nd Floor
New Bedford, MA 02746

EVERSOURCE (Electric and Gas)

180 Macarthur Dr.
New Bedford, MA 02740

WATER – SEWER - HIGHWAYS

City of New Bedford
Department of Public Infrastructure
1105 Shawmut Avenue
New Bedford, MA 02746

BUILDING DEPARTMENT

City of New Bedford
Department of Inspectional Services
133 William Street, Room 308
New Bedford, MA 02746

The Contractor is responsible to repair any utilities that are damaged as a result of its activities (negligent or otherwise) within four (4) hours of the damage occurring, or within a period as determined by, or otherwise negotiated with, MassCEC and/or the City of New Bedford. Should MassCEC and/or the City of New Bedford deem it necessary to repair the damaged utility – either because the Contractor cannot or will not respond and/or otherwise repair the damage within the allotted or determined time frame, or because the City of New Bedford and/or MassCEC represents either a safety or environmental hazard and/or represents an emergency condition – the City of New Bedford and/or MassCEC may act to repair the damage utilizing either its own personnel and equipment or an independent Contractor of the City of New Bedford's or MassCEC's choosing. Should MassCEC and/or the City of New Bedford find it necessary to take such action to repair or otherwise respond to the damage incident (including overseeing or inspecting the Contractor's investigation and repair), the Contract shall reimburse the City of New Bedford and/or MassCEC for an amount not less than two times (2x) the City of New Bedford's and/or MassCEC's cost (including the cost of City labor, equipment, subcontractors, and any other direct costs associated with the incident).

B. Add the following new paragraphs:

R. The Engineer reserves the right, at no additional cost to MassCEC, to direct the Contractor to modify construction means and methods, that in the opinion of the Engineer indicate a significant risk of damage to adjacent structures, utilities, roadways, and other facilities.

S. The Contractor shall assure that no exits from adjacent buildings are obstructed, that appropriate safety barriers are established to prevent access, and that work areas are kept neat, clean and safe.

T. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

U. All surrounding work including, but not limited to, fixtures, sewers, drains, water pipes, telephone lines, signal lines, gas pipes, electrical conduit and utilities that are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the Engineer, at no additional cost to MassCEC.

V. Existing (exposed or concealed) sewers, drains, water and gas pipes, signal, telephone and electric conduits and wires, or similar utilities of every description which are disturbed or damaged due to the performance of the Work of the Contractor shall be repaired or replaced to original conditions, at no additional cost to MassCEC.

W. Any damage which occurs to structures, walls, ceilings, floors, furnishings or items as a result of the Contractor's work shall be repaired as directed by the Engineer, at no additional cost to MassCEC.

5.18 - PAYMENT OF TAXES

A. Add the following new paragraph:

C. The MassCEC's Sales Tax Exemption Number is 263-851-659.

5.28 – PERFORMANCE STANDARDS

A. Add the following new article:

5.28 PERFORMANCE STANDARDS

A. The Contractor shall comply with the Performance Standards for this project and other restrictions and requirements placed on the Work. Refer to Section 01 35 43, Environmental Protection.

5.29 – ARPA CONTRACT ADDENDUM

A. The "**American Rescue Plan Act (ARPA) Contract Addendum**", is hereby made a part of the General Conditions**.** Contractor shall be responsible for compliance with all requirements therein in addition to all other federal and state requirements applicable to the Project, which is funded with ARPA grants. **See Attachment 3 to the RFP.**

B. The Contractor's attention is also directed to the Equal Employment Opportunity (EEO) requirements included in the ARPA Contract Addendum and Section 5.26 of the General Conditions.

ARTICLE 7 - MEASUREMENT AND PAYMENT

7.06 - PARTIAL PAYMENTS

A. Add the following new paragraphs.

H. An Application and Certification for Payment Form, provided by MassCEC, will be used for payment application and certification of work.

I. Field notes, bills of lading, photographs, and other supporting field documentation slides and videotapes shall be submitted with each payment application.

1. The Engineer will review the Contractor's survey records as-built drawings for completeness to date and the procedures being used to show changes.

2. If the field notes, bills of lading, photographs, and other supporting field documentation are not submitted with the payment application, the Engineer will not approve the payment application and MassCEC will not approve and process the payment application for payment.

3. The requirement for the submittal of the field notes, bills of lading, photographs, and other supporting field documentation may be waived by MassCEC, at its discretion, on a monthly basis.

ATTACHMENT 2: TECHNICAL SPECIFICATIONS

SECTION 01 00 00

BIDDING SCHEDULE

PART 1 - GENERAL

1.1 INSTRUCTIONS

The Bidder shall submit the following information as listed below:

A. Complete all information to be provided by bidders as described in Section 00200, Instructions to Bidders.

B. Submit all forms included in Section 00400, Bid Form.

C. Provide the additional information requested below.

D. Ensure your bid submission is complete by using Section 00439, Bidder's Checklist, to verify all items. Remember to include the checklist with your Bid.

1.2 ADDITIONAL INFORMATION

The following information is to be submitted with the bid (see also Section 00200, Instructions to Bidders):

A. Contractor Qualifications and Experience as per Article 28 of Section 00200, Instructions to Bidders:

1. Summary of your company's experience including details of representative projects specifically, preparation and installation of similar specified products in a similarly situated facility including the total number and type along with overall construction cost and date of completion. Provide any other ancillary information relative to overall firm qualifications specific to the work contemplated within this project.
2. Qualifications of personnel assigned to this project, if awarded to your company.
3. All other qualifications and experience information required in Section 00200, Instructions to Bidders, with written references.

END OF SECTION

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. The "Work" or "work" that is required by this Contract is set forth in the following documents:

1. Technical specifications titled:

   NEW BEDFORD MARINE COMMERCE TERMINAL PHASE 3 – HEAVY-LIFT EXPANSION PROJECT (SITE 1), CONTRACT NO. MACEC-FY25-02

2. Contract Drawings titled:

   NEW BEDFORD MARINE COMMERCE TERMINAL PHASE 3 – TERMINAL HEAVY-LIFT EXPANSION PROJECT (SITE 1), CONTRACT NO. MACEC-FY25-02

G-001	Cover Sheet
G-002	Drawing Index
G-003	Legend & Abbreviations
G-004	Key Map
C-001	General Notes
C-100	Overall Existing Conditions
C-101	18 & 54 Wright Street Existing Conditions
C-110	18 & 54 Wright Street Demolition and Erosion Controls
C-200	Overall Layout Plan
C-201	18 & 54 Wright Street Layout Plan
C-301	18 & 54 Wright Street Grading and Drainage Plan
C-401	18 & 54 Wright Street Contour Plan
C-501	18 & 54 Wright Street Utilities Plan
C-600	Sections Sheet 1
C-601	Sections Sheet 2
C-800	Details Sheet 1
C-801	Details Sheet 2
C-802	Details Sheet 3
CF-1	Overall Site Cut/Fill Exhibit
CF-2	Unsuitable Material Cut/Fill Exhibit

3. Bid addenda shall take precedence over specifications and Contract Drawings. Contract Drawings shall take precedence over specifications, except where noted on the Contract Drawings.

4. The Contractor shall furnish all supervision, plant, labor, equipment, appliances and materials, and carry out all operations, including monitoring and other field engineering, as necessary to accomplish the Work, complete. The Contractor shall perform the Work in strict accordance with these specifications and the Contract Drawings, and subject to the terms and conditions of the Contract and all applicable permits, certifications, codes and regulations and in accordance with the schedules for completion set forth herein.

B. General Description of the Work

1. The general description below is given to indicate the approximate scope of this project only. It does not limit the work required under the project Drawings and specifications. For reference, the word "Site" shall mean the New Bedford Marine Commerce Terminal and the adjacent water (specifically work at 18 and 54 Wright Street for this project), in New Bedford, MA.

2. The scope of work generally includes the demolition of structure footing/foundations and utilities, removal and disposal of unsuitable material to an approved offsite facility and site construction for the properties located at 18 Wright Street and 54 Wright Street, located in New Bedford, MA.

3. A more detailed breakdown of individual tasks can be found in 01 22 00, Measurement and Payment.

C. Quantity Determination and Breakdown

1. A quantity breakdown of estimated material is included in Section 00400, Bid Form. This breakdown is furnished to show the approximate distribution of material to be installed only and shall not otherwise be used to calculate payment.

2. The actual quantities for measurement and payment will be calculated based on the quantities of materials installed. The Contractor will also be responsible with providing a copy of the invoices and shipping receipts for each delivery of material to the site. The shipping receipts should be provided as each truck arrives, or at the end of the workday.

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Progress Schedule:

In accordance with the requirement of Section 01 32 16, Construction Progress Schedule, the Contractor shall, within 10 days after receipt of Notice to Proceed or as otherwise determined by the Owner's Representative, submit for approval a progress schedule. If changes are authorized that result in contract time changes, the Contractor shall submit a modified chart for approval by the Owner's Representative.

B. Contractor Work Plan:

In accordance with Section 02 81 00, Transportation and Disposal of Hazardous Materials Within Structures, and within 10 days after receipt of the Notice to Proceed or as otherwise determined by the Owner's Representative, the Contractor shall submit for approval a work plan outlining any deviations, comments, and/or additional hazardous materials sampling differing from the abatement work plans provided. If changes are authorized that result in additional work, the Contractor shall submit a modified chart for approval by the Owner's Representative.

1.3 PROJECT/SITE CONDITIONS

A. Physical Data

Data and information furnished or referred to below is for the Contractor's information. Neither the Owner nor the Engineer shall be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

1. Site Conditions: The indications of physical conditions on the Drawings and in the specifications are the result of limited site investigations and surveys. The conditions represented prevailed at the time the investigations and surveys were made. Before commencing work at the Site, the Contractor shall verify the conditions indicated on the existing conditions plan, drawings and in the specifications and perform all other surveys as needed or as required in the contract documents.

2. Weather Conditions: The monthly normal mean temperature and the monthly normal mean precipitation for the site may be obtained by the Contractor from the nearest U.S. National Weather Service Office.

3. Transportation: The Contractor shall make his own investigation on the use of municipal, State and Federal highways, roads, bridges, railroads and water transport. Absent Contractor's objection, all such infrastructure shall be deemed sufficient to accomplish the work as set forth herein.

4. Height Limitations: The Contractor shall coordinate his construction activities with the FAA and New Bedford Airport Operations Unit as necessary. Height limitations of crane booms, hoisting equipment or other equipment used by the Contractor to complete the work shall conform to the ceiling heights established by the FAA. The FAA may require the Contractor to stop work in the event declining weather conditions hinder visibility to the extent that the Contractor's equipment becomes a hazard to flying aircraft.

1.4 SEQUENCING AND SCHEDULING

A. Hours of Operations

1. The Contractor may be allowed to perform operations Monday through Friday from 7:00AM-7:00PM. The Contractor may request written permission from the Owner to expand these operations. Refer to other sections of these specifications for environmental requirements and for temporary suspension of the work, if required.

B. Weekly Progress Schedules

1. Weekly progress schedules shall be in the form of a chart graphically indicating the sequence proposed to accomplish each work feature or operation. Contractor shall indicate on the chart the important work features or operations that are critical to the timely overall completion of the project. Key dates for such important work features and portions of work features are milestone dates and shall be so indicated on the chart. This schedule will be the medium through which the timeliness of the Contractor's construction effort is appraised. Anticipated adverse weather delay days shall be included in the schedule. Preparation of the weekly progress schedules shall be completed in accordance with Section 01 32 16, Construction Progress Schedule. Progress meetings with the Owner’s Representative are anticipated to occur once weekly (at a minimum) in order to go over problems, issues, questions, etc.

C. Organization at the Site

1. General: The Contractor shall employ ample personnel and sufficient equipment to accomplish the Work within the timeframes specified herein.

2. Work Limits: The work shall be restricted to the areas as shown on the Contract Drawings.

1.5 COORDINATION

Numerous businesses and government agencies have activities within or near the project area. The Contractor is required to coordinate its activities with the Owner’s Terminal Manager and affected parties within New Bedford Harbor and adjacent to the site. This may include Owner’s Tenants and other licensed Terminal users. The Contractor may need to temporarily relocate their work area to another section of the Terminal in order to accommodate an arrival or berthing of a vessel. Contractor shall have 24 hours of notice at a minimum. Coordination and relocating installation operations shall not be a basis for a change in price or schedule.

The Owner may, from time to time, contract with an outside firm to conduct work on the site that is outside of the scope of this project. The Owner will give the Contractor at least 48 hours’ notice prior to the arrival of any firm hired to conduct work at the site. The Contractor shall coordinate its activities as appropriate. Coordination of its activities with an outside firm shall not be a basis for a change in price or schedule for the Work.

1.6 SECURITY

A. Equipment Security

The Contractor will be responsible for security of plant and equipment while that equipment is onsite. This includes 24-hour security for all equipment. The security measures required include:

1. Lighting must meet OSHA requirements for safe working conditions and safe egress;

2. At all times, the Contractor is responsible to ensure that public access to the site and related equipment is precluded, except for authorized personnel.

B. Electronic Security

The Contractor shall implement and maintain such security measures and programs so as to protect its own electronic data and that of Owner's and Owner's Representative or Engineer during the course of the Project. Upon receipt of Owner's written request, the Contractor shall provide the Owner and the Engineer or Owner's Representative with a complete written description of its information technology systems including any and all security measures that it employs in the operation and maintenance of such systems. The Contractor, upon receipt of Owner's written request, shall provide reasonable access to its information technology systems to allow Owner's staff, consultants, agents or designees the opportunity to inspect and audit the Contractor's systems.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUBMITTALS

Submittals shall be in accordance with Section 01 33 00, Submittal Procedures.

1.2 LUMP SUM PAYMENT ITEMS

Payment items for the Work for which contract lump sum payments will be made are listed in Section 00400, Bid Form, and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full and final compensation for furnishing all supervision, plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.3 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in Section 00400, Bid Form, and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all supervision, plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.4 BIDDING SCHEDULE – BASE BID ITEMS

Payment Items for the work of this contract on which the contract progress payments will be based are listed in Section 00400, Bid Form, and are described below. All costs for items of work, which are not specifically mentioned to be included in a particular Bidding Schedule payment item, shall be included in the listed item most closely associated with the work involved.

1.5 CONSTRUCTON STANDARDS AND SPECIFICATIONS

The following current edition standard specifications shall apply to construction on this project: City of New Bedford - Department of Public Infrastructure Construction Standards and Specifications (governing) and MassDOT Standard Specifications including construction & materials manuals (secondary where applicable).

1.6 GENERAL WORK ITEMS

If there is a specific Work Item for any of the following items, then the work item shall be included with that specific Item. If there is not a unit line item, the work shall be considered as incidental to the contract, such as but not limited to:

A. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site.

B. Management of stockpiles, dewatering, and loading of excess unclassified (uncontaminated) excavated materials and excavated materials requiring Special Handling.

C. Maintenance, protection, replacement and/or repair of facilities and utilities not designated for alteration on the Site.

D. Site clearing, grubbing, removal and disposal of surplus excavated material and surface materials, abandon utility materials and structures to a legally approved disposal facility.

E. Utility exploration and locating, as required for project construction perform exploratory locating, potholing and trenching including backfilling to locate unknown and discovered utilities.

F. Dewatering.

G. Excavation.

H. Pipe bedding and backfill.

I. Surface Restoration - turf establishment surface restoration and trees and bushes damaged during construction.

J. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site.

K. Site access requirements including temporary aggregate material as required for local traffic access.

L. If crossing or undermining of existing public or private utility, then include: maintaining the utility in service, replacing of existing utilities, if damaged and providing support and bedding material, as required.

M. Flowable fill for in-place abandonment of existing utility pipe and structure bases, excavation void areas and other ancillary construction backfill.

N. Protection of construction site from erosion.

O. Ground freezing.

P. Compaction or stabilization of the site for Contractor's equipment use.

Q. Dust control (construction site and adjacent streets).

R. Traffic control.

S. Erosion control including permitting, monitoring and agency coordination.

T. Suppression of dust onsite, as necessary.

U. Management of odors and noise, as necessary.

V. Easement and right-of-way requirements.

W. Regulatory requirements.

X. Construction surveys, staking, and other field survey work (not provided by Owner, Owner's Representative and Owner's Engineer).

Y. Quality assurance and quality control testing and inspections (by independent third-party contractor).

Z. Shop Drawings and other submittals.

AA. Temporary facilities and utilities.

BB. Excavation sheeting, shoring, falsework and formwork.

CC. Pile driving templates and survey as required to ensure accuracy of pile locations during installation.

DD. Final cleanup and restoration of project site to preconstruction conditions.

EE. Project close-out requirements including but not limited to warranties, operational manual's, close-out inspections and building occupancy permits.

SECTION 01 – GENERAL

Bid Item No. 1 "Mobilization and Demobilization"

A. Payment for this item will be limited to 10% of the Total Contract Price or the Sub-Total of the Base Bid Items, whichever is lower. Mobilization and demobilization will be measured as the lump sum to include compensation for project preparations, procurement and assembly of all equipment, materials, supplies and labor and bonds required for the prosecution of the work not otherwise included in other pay items and upon completion of the work as specified and directed, the clean-up of the work areas, removal of equipment, materials and supplies from the work area. Payment will be made for costs associated with mobilization and demobilization for operations

including all incidental work described in the specifications and contract documents. Mobilization shall include the completion of pre-construction submittals, placement and transportation of all equipment to the site, support equipment purchase of materials needed for construction, temporary facilities, and construction of environmental controls.

B. Demobilization shall include complete restoration of all areas disturbed by the Contractor's operations to their pre-construction conditions, submittal of a complete set of record As-built Drawings and removal of all equipment and temporary construction facilities from the site.

C. 60% of the lump sum price for mobilization/demobilization unit will be paid to the Contractor upon completion of their mobilization. 30% will be paid upon completion of demobilization and the remaining 10% will be paid upon submission of accepted As-built Drawings for the project. Payment for this item will be limited to 5% of the Total Contract Price or the Sub-Total of the Base Bid Items, whichever is lower. In the event that the Owner considers the lump sum price for the bid item does not bear a reasonable relationship to the cost of the work in this contract, the Owner may require the Contractor to produce cost data to justify the price bid to the satisfaction of the Owner. If the Contractor fails to substantiate the price bid, then payment will be made for actual mobilization and demobilization costs as determined by the Owner. Payment for this item will be considered full compensation for all labor, materials, off-site disposal, and other fees, equipment, supervision, and supplies required for the work. Payment for this item shall be made on the percentage of lump sum of work completed, as determined by the Engineer.

D. Payment for this item shall include all costs in connection to all preparatory actions associated with work designated on plans including but not limited to: obtaining any necessary permits and approvals not already in place for the work specified in accordance with the Contract, full reimbursement for the premiums actually paid for Performance and Payment Bonds, all costs connected with the mobilization and coordination of the Contractor's equipment (barges, floating platforms, etc.) submittals, materials and equipment furnished for this project moving the Contractor's equipment to the site, accomplishing the work required by the Permits with respect to protection of the environment, and the coordination with the regulatory agencies.

E. If, for any other reason, the Contractor must shut down and remove his equipment from the site, then remobilize, Owners will not be responsible for payment of additional costs associated with such work. Demobilization shall include general preparation for transfer of equipment to its home base, removal of equipment, and environmental restoration as required from construction, earthwork, and utility construction.

F. This item includes all onsite work not covered within another Base Bid Item. Costs include, but are not limited to:

1. Oversight and security.

2. Management of odors and noise, as necessary.

3. Demolition water supply, including coordination, metering and payment to the with City for water for demolition/ abatement activities.

4. Coordination of construction with Owner's Terminal Manager, tenants and licensed users of the New Bedford Marine Commerce Terminal, as well as abutters and New Bedford Port Authority.

5. Construction, demolition and utility permitting – this shall include coordination and securing any and all associated state and local governmental permits prior to construction activities. Including but not limited to construction inspections, traffic, stormwater, sewer and water, driveway, sidewalk, erosion control/ disturbance, etc.

6. Construction access and traffic control shall be in accordance with Section 01 57 00, Traffic Regulations. The contract price shall include all coordination activities, temporary signing and barricades necessary to control traffic during construction, including maintaining facility operations access, construction material and equipment deliveries, construction personnel and all traffic safety entering/existing public streets. This includes periodic adjustments, minor/major modifications and temporary flagging necessary to safely maintain construction access and traffic control throughout the duration of the project. All traffic control shall be in accordance with the local jurisdiction, Massachusetts Department of Transportation (MassDOT) and current Manual on Uniform Traffic Control Devices (MUTCD).

7. Construction Survey. Perform all construction survey control network establishment, field staking, all form/grade/quantity verifications, and providing all measurements and field markers for record survey of constructed facility showing horizontal and vertical location of buried utilities, structures, and other features. Includes all as-built grades and elevations of structures, finish surface grading, and providing a complete as-built record drawing for the project.

G. Unit of measure: Lump Sum (LS)

Bid Item No. 2 "Traffic Control"

A. The Contract price includes all costs associated with providing all required traffic control measure for the project construction and will be measured as Lump Sump. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes written traffic control plan and procedure, forms, and contact lists for notification of stakeholders, public notifications/communications per City of New Bedford requirements.

C. Provide all coordination activities, temporary signing and barricades necessary to control traffic during construction, including maintaining facility operations access,

construction material and equipment deliveries, construction personnel and all traffic safely entering/exiting Wright Street. This item also includes periodic adjustments, minor/major modifications and temporary flagging necessary to safely maintain construction access and traffic control throughout the duration for of the project.

D. All traffic control shall be in accordance with City of New Bedford requirements, including MassDOT standards and the current MUTCD.

E. Unit of measure: Lump Sum (LS)

SECTION 02 – SOIL REMEDIATION/DISPOSAL

Bid Item No. 3 "Disposal of Unsuitable Soil (Environmental PCBs > 25 ppm)"

Bid Item No. 4 "Disposal of Unsuitable Soil (Environmental PCBs >1 ppm and <25 ppm)"

Bid Item No. 5 "Disposal of Unsuitable Soil (Environmental PCBs <1 ppm)"

A. The Contract price includes all costs associated with the removal and disposal of unsuitable soils and will be measured as Ton. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. The Contractor shall dispose of material (as directed within the Contract Documents and otherwise directed by the Owner's Representative) at the least expensive disposal option that will accept the material (subject to review and approval by the Owner's Representative), based on pre-disposal characterization to be conducted by the Contractor as stipulated under Section 02 11 10, Excavation and Handling of Contaminated Material.

C. The Contract price per ton for this item shall include all cost of removal of all material that requires excavation and offsite disposal deemed geotechnically unsuitable by the Owner's Representative. Contaminated material shall be handled as specified in Section 02 11 10, Excavation and Handling of Contaminated Material. Contractor shall particularly note the holding time, and process for sampling and analysis required for "upper existing material" that is deemed geotechnically unsuitable for reuse and that must be disposed offsite. Transportation and disposal offsite shall be handled as stipulated in Section 02 11 10, Excavation and Handling of Contaminated Material, and related sections. This item includes all costs, direct and indirect, associated with the incidental to, excavation and removal of the material, segregation of debris unsuitable for offsite disposal, environmental protection, meeting the relevant permitting standards, segregation and appropriate stockpiling of the material,

dewatering of the material, and treatment of dewatering fluids. Protective measures to protect existing structures and utilities shall be included.

D. The total amount of material removed and paid for under the contract for this item, will be measured by the ton as measured by the scale of the disposal facility.

E. Unit of measure: Ton (TON)

Bid Item No. 6 "Disposal of Miscellaneous Contaminated Items"

A. The Contract price includes all costs associated with removal and disposal of miscellaneous contaminated items and will be measured as Lump Sum. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. The Contractor shall dispose of miscellaneous materials (as directed within the Contract Documents and otherwise directed by the Owner's Representative) at the least expensive disposal option that will accept the materials (subject to review and approval by the Owner's Representative).

C. The Contract lump sum price for this item shall include all costs of removal of all materials that requires offsite disposal as deemed contaminated by the Owner's Representative. Contaminated materials shall be handled as specified in Section 02 11 10, Excavation and Handling of Contaminated Material. Transportation and disposal offsite shall be handled as stipulated in Section 02 11 10, Excavation and Handling of Contaminated Material, and related sections. This item includes all costs, direct and indirect, associated with the incidental to, removal of the materials, environmental protection, meeting the relevant permitting standards, separation and appropriate stockpiling of the miscellaneous materials, miscellaneous dewatering and treatment of dewatering fluids. Protective measures to protect existing structures and utilities shall be included.

D. Unit of measure: Lump Sum (LS)

SECTION 03 – SITE DEMOLITION

Bid Item No. 7 "Erosion Control - Inlet Protection (silt socks)"

A. The Contract price includes all costs associated with installation, maintenance, replacement, removal/disposal upon project site stabilization and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Each (EA)

Bid Item No. 8 "Erosion Control – Silt Fence"

A. The Contract price includes all costs associated with installation, maintenance, replacement, removal/disposal upon project site stabilization and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified silt fence material is Mirafi Environfence (Mirafi 100X as manufactured by TenCate Geosynthetics) or Amoco 1380 Silt Stop

C. Unit of measure: Linear Feet (L.F.)

Bid Item No. 9 "Erosion Control – Trackout Control Pad (stabilized construction entrance)"

A. The Contract price includes all costs associated with stabilized construction entrance, including stone and geotextile material and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all trackout control pad installation, maintenance during the duration of the project, and removal at the end of the project item.

C. Unit of measure: Each (EA)

Bid Item No. 10 "Tree Protection"

A. The Contract price includes all costs associated tree protection per drawing detail will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Each (EA)

Bid Item No. 11 "Salvage Chain Link Fence, 6 ft (black vinyl salvaged reuse)"

Bid Item No. 12 "Salvage Chain Link Fence, 6 ft (galvanized salvaged for construction fencing)"

A. The Contract price includes all costs associated with salvaging of existing chain link and stockpiling at an onsite location as determined by Owner and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. The Contractor shall dispose of miscellaneous fence materials not salvageable for reuse (as directed within the Contract Documents and otherwise directed by the Owner's Representative).

C. Unit of measure: Linear Feet (L.F.)

Bid Item No. 13 "Removal of Asphalt Pavement"

A. The Contract price includes all costs associated with removal of all designated pavement of various depths and composition of materials including required saw cutting and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all stockpiling, sorting of recyclables, testing/characterization, hauling and disposing of materials to a legally approved facility.

C. Unit of measure: Square Yards (S.Y.)

Bid Item No. 14 "Removal of Concrete Pads"

A. The Contract price includes all costs associated with excavation, removal and disposal of all miscellaneous concrete foundation pads and will be measured as Lump Sum. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all stockpiling, sorting of recyclables, testing/characterization, hauling and disposing of materials to a legally approved facility.

C. Unit of measure: Lump Sum (LS)

Bid Item No. 15 "Building Foundation & Footing Removal"

A. The Contract price includes all costs associated demolition, removal and disposal of all building foundations and footings that will be measured as Lump Sum. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all footings and foundations, surrounding support utilities and all ancillary demolition items shall be considered incidental to this Bid Item.

C. Includes all stockpiling, sorting of recyclables, testing/characterization, hauling and disposing of materials to a legally approved facility

D. Unit of measure: Lump Sum (LS)

Bid Item No. 16 "Removal of Curb"

A. The Contract price includes all costs associated with saw-cutting, removal, disposal of existing curb section and will be measured as Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. All curb and pavement removals shall be double saw-cut to full depth and damages beyond those shown in the plans shall be replaced by the contractor without adjustment

C. Unit of measure: Liner Feet (LF)

Bid Item No. 17 "Removal of Trees"

A. The Contract price includes all costs associated with removing and disposing of roots, stumps and all removed tree debris, and will be measured as Lump Sum. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Lump Sum (LS)

Bid Item No. 18 "Removal of Water Line"

A. The Contract price includes all costs associated with excavation, removal, disposal backfilling, trench compaction of existing abandoned utility service and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Linear Feet (L.F.)

Bid Item No. 19 "Removal of Abandoned Sewer Manhole"

A. The Contract price includes all costs associated with excavation, removal, disposal backfilling, trench compaction of existing abandoned utility manhole and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Each (EA)

Bid Item No. 20 "Removal of Sewer Pipe"

A. The Contract price includes all costs associated with excavation, removal, disposal backfilling, trench compaction of existing utility service and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to,

furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Linear Feet (L.F.)

Bid Item No. 21 "Removal of Drainage Structure"

A. The Contract price includes all costs associated with excavation, removal, disposal backfilling, trench compaction of existing abandoned drainage structure and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Each (EA)

Bid Item No. 22 "Removal of Drainage Pipe"

A. The Contract price includes all costs associated with excavation, removal, disposal backfilling, trench compaction of existing abandoned drainage pipe and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Linear Feet (L.F.)

Bid Item No. 23 "Excavation and Grading"

A. The Contract price includes all costs associated with performing all site excavation and on-site grading for the project construction and will be measured as Cubic Yards. Includes excavation to subgrade as shown on the Drawings, hauling of excavated material, placement and compaction of fill excavation meeting the specification requirements, test rolling, off-site disposal of surplus and unsuitable material not incorporated into the project construction. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. All existing topsoil is scheduled to be stripped and disposed of off-site (included in earthwork calculations)

C. Unit of measure: Cubic Yards (C.Y.).

D. Measurement shall not be made for this item and payment. The estimated quantity represents the computed volume (includes all site excavation and grading) shown on the Drawings and will be the basis for payment.

SECTION 04 – SITE LAYOUT AND MATERIALS

Bid Item No. 24 "Heavy-Lift Section - Dense Graded Aggregate (furnish and place)"

A. The Contract price includes all costs associated with preparation of subgrade, placement and compaction to the thickness shown on the drawings, maintenance until project closeout and will be measured as Tons. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Conform to requirements of MassDOT Standard Specification gradation requirements for processed gravel for subbase aggregate as specified in Table M1.03.1-1.

C. Unit of measure: Tons (TON)

D. Measurement for payment will be the actual amount of material required and incorporated in the work verified by submitting to the Engineer delivery tickets provided with each load showing the weight measured on a certified scale, type of material, the date delivered and the project name.

Bid Item No. 25 "Infiltration Trench Aggregate – 1-1/2" washed crushed stone (furnish and place)"

A. The Contract price includes all costs associated with preparation of subgrade, placement and compaction to the thickness shown on the Drawings, maintenance until project closeout and will be measured as Tons. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Tons (TON)

C. Measurement for payment will be the actual amount of material required and incorporated in the work verified by submitting to the Engineer delivery tickets provided with each load showing the weight measured on a certified scale, type of material, the date delivered, and the project name.

Bid Item No. 26 "Geogrid - Tensar Interax NXF (furnish and place)"

Bid Item No. 27 "Geotextile – Tensar Interax NXF Filtergrid (furnish and place)"

Bid Item No. 28 "Geotextile - Mirafi 140 N (furnish and place)"

A. The Contract price includes all costs associated with placement and installation of geogrid and geotextile for subgrade reinforcement and will be measured as Square

Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified heavy-lift geogrid material is Tensar Interax NXF Geogrid

C. Specified heavy-lift geotextile material is Tensar Interax NXF Filtergrid

D. Specified infiltration trench geotextile material is Mirafi 140 N.

E. Unit of measure: Square Yards (S.Y.)

F. Measurement for payment will be the actual square yards installed per manufacturer's product specifications (not including overlap).

Bid Item No. 29 "Preparation of Subgrade"

A. The Contract price includes all costs associated with preparation of the subgrade under the proposed aggregate heavy-lift section area and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Work requires a uniform composition of at least 12 inches below the top of subgrade under the new aggregate section, plus 2 feet on each side to compaction requirements as specified. Includes, but is not limited to, excavating, manipulating, replacing, compacting, and trimming to the proper grade.

C. Unit of measure: Square Yards (S.Y.)

Bid Item No. 30 "Timber Border (12"x10" pressure-treated pine timbers, painted yellow)

A. The Contract price includes all costs associated with installation of timber border delineating the heavy-lift terminal limits and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes 12"x10" pressure-treated pine timbers in minimum 8-foot length, painted with two (2) coats of yellow all-weather paint (exterior 100% acrylic latex). Provide timber paint pre-construction mockup for approval prior to material procurement.

C. Unit of measure: Linear Feet (L.F.)

Bid Item No. 31 "Chain Link Fence, 6 ft – Salvaged Black Vinyl Coated"

Bid Item No. 32 "Chain Link Fence, 6 ft –New Black Vinyl Coated"

Bid Item No. 33 "Chain Link Fence, 6 ft - Temporary Construction"

A. The Contract price includes all costs associated with installation of chain link fencing and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. For salvaged black vinyl chain link fencing permanent reinstallation, this item includes supply and installation of the site security fencing as defined in Section 32 31 13, Chain Link Fences and Gates, and otherwise indicated on the Drawings. All security fencing shall include three-strand barb wire to match existing terminal fencing.

C. For salvaged permanent fencing reinstallation, item shall include installation of salvaged chain link fence fabric and providing new posts, concrete foundations, rails, bracing and fittings/couplings as indicated on the Drawings.

D. For salvaged temporary construction fencing, item shall include installation of salvaged chain link (6-foot height) and salvaged/or new posts, rails, bracing and fittings/couplings, including new industrial chain link fence panel barrier base for connecting two panels and include four (4) 50 lb. sandbags placed on each base. Also fence panels shall be 12' x 6' with top/bottom rails with one vertical and one horizontal brace. Contractor shall have option to furnish new industrial chain link temporary fence panels (10 gauge) that shall be the property of the Owner following project closeout.

E. Unit of measure: Linear Feet (L.F.)

Bid Item No. 34 "Post-Construction Site Access"

A. The Contract price includes all costs associated with stabilized construction entrance, including stone and geotextile material and will be measured as Lump Sum. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all trackout control pad installation, salvaged timbers for base support over stormwater chambers, steel plates and maintenance during the duration of the project.

C. Unit of measure: Lump Sum (L.S.)

SECTION 05 – STORMWATER DRAINAGE IMPROVEMENTS

Bid Item No. 35 "Ferguson Waterworks, R-Tank 2.0 Stormwater Chambers (HD Heavy Duty)"

Bid Item No. 36 "Ferguson Waterworks, R-Tank 1.5 Stormwater Chambers (HD Heavy Duty)"

A. The Contract price includes all costs associated with installation of underground stormwater modules providing storage depth and footprint as shown on the Drawings and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, geotextile fabric, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

C. Bid Item includes: R-Tank modules, ACF N-series medium-weight (8 oz) non-woven geotextile (M200) for tank modules and excavation including top and 1.5" washed crushed stone aggregate

D. Unit of measure: Each (EA)

Bid Item No. 37 "Stormceptor Water Quality Units (Contech-STC900)"

A. The Contract price includes all costs associated with water quality unit installation and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified water quality unit is Contech-STC900.

C. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

D. Unit of measure: Each (EA)

Bid Item No. 38 "Stormwater Backwater Valve (NAPCO 30" in-line)"

A. The Contract price includes all costs associated with stormwater backwater valve installation and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified backwater valves is NAPCO 30” in-line. Requires concrete collar connection to reinforced concrete pipe (RCP).

C. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections, installation certification and testing and all other incidentals as required for complete installation.

D. Unit of measure: Each (EA)

Bid Item No. 39 “Stormwater Outlet Control Structure (special 48” precast concrete)”

A. The Contract price includes all costs associated with stormwater outlet control structure and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified stormwater outlet control structure as detailed on the Drawings.

C. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

D. Unit of measure: Each (EA)

Bid Item No. 40 “Storm Drain Manhole (48” precast concrete)”

A. The Contract price includes all costs associated with storm drain manholes and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified stormwater outlet control structure as detailed on the Drawings.

C. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

D. Unit of measure: Each (EA)

Bid Item No. 41 “Stormwater System HDPE Piping (ADS N-12 Dual Wall varying sizes)”

A. The Contract price includes all costs associated with stormwater piping and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited

to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, pipe, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

C. Specified pipe material is ADS N-12 Dual Wall HDPE smooth wall interior for all pipe sizes as noted on the Drawings.

D. Unit of measure: Linear Feet (L.F.)

E. Measurement will be per actual horizontal length along the centerline of the pipe, not including structures or flared end sections.

Bid Item No. 42 "Stormwater Landscape Drain (ADS Nyloplast)"

A. The Contract price includes all costs associated with stormwater landscape drain and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Specified stormwater landscape drain is ADS Nyloplast drainage structures.

C. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

D. Unit of measure: Each (EA)

SECTION 06 – ELECTRICAL UTILITIES

Bid Item No. 43 "Conduit, Schedule 80 PVC (2.5-inch direct buried duct bank)"

Bid Item No. 44 "Conduit, Schedule 80 PVC (3.0-inch direct buried duct bank)"

A. The Contract price includes all costs associated with direct buried PVC conduit and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, bedding and backfill of native material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

C. Unit of measure: Linear Feet (L.F.)

SECTION 07 – LANDSCAPING

Bid Item No. 45 "Surface Restoration - Loam and Hydroseed"

A. The Contract price includes all costs associated with stabilized surface restoration and will be measured as Square Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, deep de-compaction of work areas, finish grading and surface preparation, furnishing and placement of suitable borrow loam material to depth as specified on the Drawings, seed fertilizing, mulching, erosion matting, watering and maintenance/repair until vegetative surface has become well established following construction.

C. Surface Restoration requirements and seeding season (planting dates) shall be evaluated as construction progresses to determine the need for interim restoration measures (dormant seeding or temporary stabilization crop) prior to final surface restoration, as determined by the Engineer.

D. Unit of measure: Square Feet (S.F.)

Bid Item No. 46 "Inlet Protection - Silt Sacks" (on-site)

A. The Contract price includes all costs associated with installation, maintenance, replacement, removal/disposal of inlet protection upon project site stabilization and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Unit of measure: Each (EA)

SECTION 08 – OFF-SITE IMPROVEMENTS

Bid Item No. 47 "Sewer Drain Disconnections"

A. The Contract price includes all costs associated with utility disconnections (storm and sanitary) per City requirements and will be measured as Each. Payment shall be made

for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, waste utility pipe/excavation material removal and disposal, sheeting and shoring, miscellaneous concrete, pipe section replacement, crushed stone bedding and trench backfill material, flowable fill, backfill and trench compaction, gaskets, fittings and adaptors for disconnections connections and all other incidentals as required for complete drain disconnection.

C. Unit of measure: Each (EA)

Bid Item No. 48 "Domestic Water Disconnections"

A. The Contract price includes all costs associated with water service disconnections per standard City construction requirements and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, waste utility pipe/excavation material removal and disposal, sheeting and shoring, miscellaneous concrete, pipe section replacement, crushed stone bedding and trench backfill material, backfill and trench compaction, gaskets, fittings and adaptors for disconnections connections and all other incidentals as required for complete drain disconnection.

C. Unit of measure: Each (EA)

Bid Item No. 49 "Storm Drain Connection"

A. The Contract price includes all costs associated with storm drain connection to existing system per standard City construction requirements and will be measured as Each. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, waste utility pipe/excavation material removal and disposal, sheeting and shoring, miscellaneous concrete, pipe/manhole section replacement, crushed stone bedding and trench backfill material, backfill and trench compaction, gaskets, fittings and adaptors for disconnections connections and all other incidentals as required for complete drain disconnection.

C. Unit of measure: Each (EA)

Bid Item No. 50 "Stormwater RCP Piping (30" Dia. Class V)"

A. The Contract price includes all costs associated with stormwater piping and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited

to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, pipe, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections and all other incidentals as required for complete installation.

C. Specified pipe material is RCP Class V.

D. Unit of measure: Linear Feet (L.F.)

E. Measurement will be per actual horizontal length along the centerline of the pipe, not including structures or flared end sections.

Bid Item No. 51 "HMA Pavement Restoration"

A. The Contract price includes all costs associated with all required street replacement repairs (all elements of removal and replacement) per City of New Bedford construction requirements and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Furnish and install asphalt pavement base and surface course, as specified on the Drawings or as approved by the Construction Project Manager or the Engineer.

C. Includes all required ancillary materials, including but not limited to, excavation, base course gravel, HMA pavement, pavement milling and removal, compaction, subgrade preparation, saw cutting of damaged pavements designated to be preserved and all other construction aspects as required per the City of New Bedford construction standards.

D. Unit of measure: Square Yards (S.Y.)

Bid Item No. 52 "Cement Concrete Sidewalk"

A. The Contract price includes all costs associated with removal and replacement of concrete sidewalk and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation, base course gravel, cement concrete, compaction, subgrade preparation, saw cutting of damaged pavements designated to be preserved and all other construction aspects as required per the City of New Bedford construction standards.

C. Unit of measure: Square Yards (S.Y.)

Bid Item No. 53 "Curb Replacement (Type VA1 vertical curb straight)"

A. The Contract price includes all costs associated with removal and replacement of street curb and will be measured as Linear Feet. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. Includes all required ancillary materials, including but not limited to, excavation, base course gravel, vertical granite curb, cement concrete, HMA gutter surface pavement, compaction, subgrade preparation, pavement milling, saw cutting of damaged pavements designated to be preserved and all other construction aspects as required per the City of New Bedford construction standards.

C. Unit of measure: Linear Feet (L.F.)

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division I Specification Sections, apply to this section.

1.2 SUMMARY

A. Contractor shall prepare and submit to Owner's Representative for review and approval within 10 days after the Notice to Proceed the following:

1. A practicable and feasible schedule, on a bar-chart form in Microsoft Project or similar format, showing the order in which the Contractor proposes to carry on the salient components of the Work, the dollar value of each respective component of the Work, the dates on which the Contractor will start each, and the contemplated dates for completing the same, and a projection of each month's pay requisition, such schedule to be prepared in a manner prescribed by the Engineer based on money values of the various items of Work;
2. The scheduling of the Work shall be by the Critical Path Method at the expense of the Contractor; and
3. A written chronological statement of the order in which the Contractor proposes to perform the salient components of the Work, indicating in detail the date of starting work on each such component and the contemplated completion date for each.

The above bar-chart schedule and chronological statement shall be compatible in all respects and shall be consistent with all Contract requirements. It will be reviewed for reasonableness and conformity with the Contract and upon approval by the Engineer will be used to evaluate general job progress and to forecast periodic pay estimate requirements. The Engineer shall designate the salient components of the Work to appear on such schedule and statement.

No physical construction work shall be performed on the Work site until the above schedule and statement have been submitted in proper form and have been approved by the Engineer, and MassCEC shall not be liable for any delays or increased costs to the Contractor resulting from the Contractor's failure to meet this requirement. Prompt review will be made of any proposed schedule and chronological statement submitted by the Contractor. Prior to the Engineer's approval thereof, the Contractor may commence all aspects of the Work other than physical construction work at the site, including but not limited to the placing of material orders, preparation of shop drawings, making of field survey layouts,

assembly of equipment, and other work in preparation for the commencement of physical construction at the site.

B. If in the opinion of the Engineer, the Contractor's operations have been or will be materially affected by changes in the Plans or in the amount of Work, or if the Contractor's performance has materially failed to conform to the approved schedule and chronological statement, the Contractor shall, upon request by the Engineer, submit to the Engineer within 10 days after such request, for his/her approval, a revised schedule and chronological statement of the types specified above, which shall indicate how the Contractor proposes to prosecute the balance of the Work.

Approval of any such schedule or chronological statement by the Engineer shall not be construed as releasing the Contractor from any of its responsibilities or obligations under the Contract. Such approval shall be a condition precedent to the processing and payment of any monthly pay estimate.

C. Hours of operation are as noted in Section 01 11 00, Summary of Work.

1.3 FORM OF SCHEDULES

A. Prepare schedules in the form of a horizontal bar chart.

1. Provide separate horizontal bar for each trade or operation.
2. Horizontal time Scale: Identify first work date of each week.
3. Scale and spacing to allow space for notations and future revisions.

B. Format of Listings: Chronological order of start of each item of work

C. Identification of Listings: By work area

1.4 CONTENT OF SCHEDULES

A. Construction Progress Schedule

1. Show complete sequence of construction by activity.
2. Show dates for beginning and completion of each major element of construction and installation dates for major equipment items. Elements shall include, but not be limited to, the following:
   a. Receipt of submittal data from supplier/manufacturer submitted to Owner’s Representative, review and return to supplier/manufacturer. Review of Contractor submittals by Owner’s Representative. Allowance for revision of submittals by Contractor to address concerns of Owner’s Representative.
   b. Material and equipment order, manufacturer, delivery and installation, and checkout.
   c. Each mobilization or demobilization event.
   d. Installation of site security measures.
   e. 25, 50, 75 and 100 percent complete of Mandatory Schedule Milestones as specified in Section 01 11 00, Summary of Work.

f. Subcontractors items of work.
g. Final cleanup.
h. Allowance for inclement weather.
i. Allowance to address punch list items from Owner's Representative or Owner.

3. Show projected percentage of completion for each item as of first day of each month.

1.5 SCHEDULE REVISIONS

A. Every 15 days, Contractor shall revise construction schedule to reflect changes in progress of work and to indicate progress of each activity at date of submittal.

1. Changes occurring since previous submittal of schedule shall be indicated including:
   a. Changes in scope.
   b. Activities modified since previous submittal.
   c. Revised projections of progress and completion.
   d. Other identifiable changes.

2. Provide a narrative report as needed to define:
   a. Problem areas, anticipated delays, and impact on schedule.
   b. Corrective action recommended and its effect.
   c. Effect of changes on schedules of other affected parties.

1.6 SUBMITTAL REQUIREMENTS

A. For initial submittal of construction schedule and subsequent revisions thereof, furnish an electronic copy of the schedule to Owner's Representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

This section specifies the general methods and requirements of submissions applicable to the following work-related submittals.

A. Product Data

B. Planning Documents

C. Equipment Specifications

D. Progress Schedules

E. Construction Photographs

Detailed submittal requirements are specified in the technical specifications section.

1.3 SUBMITTALS

A. Submittal Register

The Contractor shall provide a complete list of all submittals included in the technical specifications for use as a submittal register to track the dates for submission, comment, resubmission and final acceptance of the project submittals.

1.4 CONTRACTOR'S RESPONSIBILITIES

The Contractor shall review product data, including those by subcontractors, prior to submission to determine and verify the following.

A. Field measurements

B. Field construction criteria

C. Catalog numbers and similar data

D. Conformance with the Specifications

1. Each submittal shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor. Certification Statement: "By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved submittals and all Contract requirements." Submittals and product data sheets 11-in X 17-in and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Owner's Representative a copy of each submittal transmittal form for product data and samples at the time of submittal of said product data and samples to the Owner's Representative.

    a. Submittals received "WITHOUT" Certification Statement shall not be reviewed.

2. If a submittal shows any deviation from the requirements of the Contract Documents, the Contractor shall make specific mention of the deviations in the Transmittal Form furnished by the Owner's Representative and provide a description of the deviations in a letter attached to the submittal.

3. The review and acceptance of samples or product data by the Owner's Representative shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Owner's Representative will not have responsibility therefore.

4. No portion of the work requiring a submittal shall be started nor shall any materials be fabricated, placed or installed prior to the acceptance or qualified acceptance of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to accepted submittals and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

5. Project work, materials, fabrication, and installation shall conform with approved applicable samples and product data.

    a. Manufacturer's printed installation instructions, a part of product data submitted to the Owner's Representative will not be reviewed and are for informational purposes <u>only.</u>

1.5 SUBMISSION REQUIREMENTS

Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.

A. All complete submittals shall be submitted sufficiently in advance of construction requirements to provide no less than five (5) days, excluding Saturdays, Sundays and legal holidays for review from the time received at the Owner's Representative's reviewing office. For submittals of major equipment, that require more than five (5) days to review, due to its sheer complexity and amount of detail and also requiring review by more than one engineering discipline, a letter will be sent by the Owner's Representative or his/her designee to the Contractor informing him/her of the circumstances and the date it is expected the submittal will be returned to the Contractor.

1. Number of submittals required
   a. Shop Drawings: Unless otherwise stated in the respective Specifications Sections, submit three (3) copies.
   b. Product Data: Unless otherwise stated in the respective Specifications submit three (3) copies.

2. Submittal Content
   a. The date of submission and the dates of any previous submissions.
   b. The Project title and number.
   c. Contractor identification.

3. The names of:
   a. Contractor
   b. Supplier
   c. Manufacturer

4. Identification of the product, with the specification section number, page and paragraph(s)

5. Field dimensions clearly identified as such.

6. Relation to adjacent or critical features of the Work or materials.

7. Applicable standards, such as ASTM or Federal Specification numbers.

8. Identification of deviations from Contract Documents.

9. Identification of revisions on resubmittals.

10. An 8-in. X 3-in blank space for Contractor and Owner's Representative stamps.

11. Each shipment of drawings shall be accompanied by a transmittal form furnished by the Owner's Representative giving a list of the drawing numbers and the names mentioned above.

1.6 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

A. The Owner's Representative's review is for general conformance with the design concept and contract drawings. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract plans and specifications or from departures therefrom. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

B. The review of shop drawings, data, and samples will be general. They shall not be construed:

1. as permitting any departure from the Contract requirements.
2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
3. as approving departures from details furnished by the Owner's Representative, except as otherwise provided herein.

C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirement which the Owner's Representative finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Owner's Representative may return the reviewed drawings without noting an exception.

D. One (maximum) copy of shop drawings or product data will be returned to the Contractor.

E. Submittals will be returned to the Contractor under one of the action codes indicated and defined on the transmittal form furnished by the Owner's Representative.

F. Resubmittals will be handled in the same manner as first submittals. The Contractor shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Owner's Representative, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done because of this type of revision that is not in accordance to the Contract Documents as may be required by the Owner's Representative.

G. Partial submittals may not be reviewed. The Owner's Representative will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Rejected" until resubmitted. The Owner's

Representative may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents the Contractor shall give written notice thereof to the Owner's Representative at least 7 working days prior to release for manufacture.

I. When the shop drawings have been completed to the satisfaction of the Owner's Representative, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Owner's Representative.

1.7 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times

Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections of the Specifications so that the installation will not be delayed by processing times including disapproval resubmittal (if required), coordination with other submittals, inspection, testing (off-site and on-site), purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

1.8 CERTIFICATION FORMS

If specified in other sections of these Specifications, the Contractor shall submit the applicable certification form for each item required, and in the form attached to this section completely filled in and stamped.

1.9 PRECONSTRUCTION SUBMITTALS

At a minimum, the following submittals shall be provided in sufficient time to support the scheduled date for mobilization:

A. Certificates of insurance

B. Surety bonds

C. List of proposed subcontractors

D. List of proposed products and equipment. This includes, but is not limited to, the detailed requirements and items including, but not limited to materials and methods as set forth in the project plans and specifications.

E. Construction progress schedule

F. Submittal register

G. All planning documents referenced in other sections, including, but not limited to:

1. Field Data, Survey Data, Survey Personnel, and Survey Plans as described in Section 01 71 23, Field Engineering
2. Detailed Construction Progress Schedule as described in Section 01 32 16, Construction Progress Schedules
3. Environmental Protection Plan as described in Section 01 35 43, Environmental Protection
4. Equipment including applicable inspections and certification as described in Section 01 60 00, Plant and Equipment
5. Health and Safety Plan as described in Section 01 90 00, General Safety Requirements

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 43

ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 REFERENCES

A. The publications listed below are incorporated into these Technical Specifications by reference. The publications are referred to in the text by basic designation only.

1. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 129	Toxic Pollutant Effluent Standards
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171-178	Hazardous Materials Regulations

1. Draft Release Abatement Measure Plan (RAM)/EPA Self Implementing Plan (SIP) (This Draft RAM/SIP is provided as an **Attachment** to this Request for Proposal.)

2. Soil Management Plan
(This Plan is provided as an **Attachment** to this Request for Proposal.)

1.2 DEFINITIONS

A. Environmental Pollution

Environmental pollution is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

B. Environmental Protection

Environmental protection is the prevention/control of environmental pollution and habitat disruption that may occur to the environment during the Work. The control of environmental pollution requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid,

chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

C. Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of Hazardous Wastes as defined by MassDEP regulation 310 CMR 30. These waste streams could consist of material brought on site by the Contractor to execute work but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents and sediment admixtures. Reasonable efforts should be made to re-use these materials for other applications on other projects. if possible, before the Contractor determines that partially consumed materials are waste and must be disposed of as hazardous waste. Materials determined to be hazardous waste must be managed in accordance with MassDEP regulations at 310 CMR 30.0000; including requirements for storage, transport, disposal, and obtaining a Generator Identification Number.

D. Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

E. Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Refer to the definition of Wetlands in MassDEP regulations at 310 CMR 10.

1.3 ENVIRONMENTAL PROTECTION REQUIREMENTS

A. General

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

B. Performance Standards

This section supplements the Contractor's responsibility to the extent that the Owner has already obtained approval under the State Enhanced Remedy (SER) through the New Bedford Harbor Superfund remedy. The Contractor shall comply with the terms

and conditions of the Performance Standards and the included Performance Standards that are applicable to the work. Such applicable terms and conditions are specified in the various sections of these specifications and on the Contract Drawings. The above referenced documents shall not be relied on for contract requirements. In the event that a discrepancy is discovered between the reference documents and these specifications or the Contract Drawings, the Contractor shall notify the Owner's Representative for clarification. The Owner's Representative will rely on requirements and conditions of the Performance Standards to resolve perceived conflicts.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Preconstruction Submittals

B. Environmental Protection Plan

The Environmental Protection Plan shall include the following plans as further described herein:

A. Spill Control Plan Contaminant Prevention Plan

1.6 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Owner's Representative. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during the Work. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to the submittal of the Environmental Protection Plan, the Contractor shall meet with the Owner's Representative for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

A. Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying,

implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

B. Contents

The Environmental Protection Plan shall include, but shall not be limited to, the following:

1. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
2. Name(s) and qualifications of person(s) responsible for managing waste to be removed from the site, if applicable.
3. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
4. Description of the Contractor's environmental protection personnel training program.
5. Work area plan showing the proposed activity in each portion of the site and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
6. The Spill Control Plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations (such as 310 CMR 40.0000, The Massachusetts Contingency Plan). Any spill above a reportable quantity should be reported to MassDEP at (888) 304-1133. The proper notifications need to comply with 310 CMR 40. This plan shall include as a minimum:

    a. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Owner's Representative in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.
    b. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.
    c. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
    d. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
    e. The methods and procedures to be used for expeditious contaminant cleanup.

C. A Contaminant Prevention Plan that identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with

Federal, State, and local laws and regulations for storage and handling of these materials. A copy of the Safety Data Sheets (SDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the Contaminant Prevention Plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

1.7 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Owner's Representative and may require an extended review, processing, and approval time. The Owner's Representative reserves the right to disapprove alternate methods, even if they are more cost effective, if the Owner's Representative determines that the proposed alternate method will have an adverse environmental impact.

1.8 NOTIFICATION

The Owner's Representative will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, project Performance Standards, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Owner's Representative of the proposed corrective action and take such action when approved by the Owner's Representative. The Owner's Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Owner's Representative may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

The Contractor shall be responsible for complying with all environmental regulations required by Federal, State, Regional, and local environmental laws and regulations.

3.2 LAND RESOURCES

A. The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area.

B. The following additional specific erosion control measures (in addition to those measures shown on the Contract Drawings) shall be performed as needed by the Contractor to control erosion and sedimentation from exposed areas and from:

1. All unused debris, soil, and other material shall be stockpiled in locations of relatively flat grades, away from any trees identified to be saved and upgradient of the erosion control sock and generally in the locations shown on the Construction Drawings. Stockpile side slopes shall not be greater than 2:1. All stockpiles shall be surrounded by erosion control sock and shall be placed outside the 100-foot buffer to any bordering vegetated wetland. Surrounding erosion control sock shall be inspected and maintained on a daily basis in accordance with the 'Erosion Control Sock' requirements described above.

2. When stockpiles are not anticipated to be disturbed for long periods of time or left bare for more than 7 days, they should be covered in jute netting and/or watered on a regular basis to prevent dust from forming and potentially blowing off site. Should the surfaces of the piles appear to be dry and dust is being created, the piles should be covered or watered immediately.

3. In addition, areas identified by the Owner's Representative as requiring treatment to control erosion and sedimentation controls shall be treated in accordance with the above notes and Construction Drawings.

C. The Contractor shall immediately comply with any order from the Owner's Representative for the installation of additional erosion/sediment/turbidity controls to protect resource areas beyond what is shown on the plans if field conditions or the Owner's Representative's judgment dictate that additional protection is necessary.

D. Contractor Facilities and Work Areas

The Contractor shall propose locations for field offices, staging areas, stockpile storage, and temporary buildings for approval by the Owner/Owner's Representative. Temporary movement or relocation of Contractor facilities shall be made only when approved by the Owner's Representative.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water as required by the Clean Water Act.

A. Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands. The Contractor shall be responsible for the protection of wetlands in accordance with applicable regulations. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

A. Particulates

Dust particles; aerosols and gaseous by-products from construction activities shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain the work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. The Contractor must have sufficient, competent equipment available to accomplish these tasks. The Contractor shall implement particulate control measures whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations. Refer to MassDEP regulations at 310 CMR 7.00.

B. Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a nuisance or health hazard and shall be in compliance with State regulations at 310 CMR 7.02 and/or more stringent local ordinances.

C. Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environmental damage by noise. The Contractor shall comply with the provisions of the Commonwealth of Massachusetts rules and policy DAQC 90-01 “Allowable Sound Emissions.” The Contractor shall also comply with City of New Bedford noise regulations and requirements. Sound measurements at the property line shall not exceed 90 dBA. The Contractor shall implement measures to mitigate noise pollution if the Contractor exceeds this standard and shall consider, at a minimum, the following mitigation measures to reduce site noise:

1. Staging of site works to maximize use of the existing site features/facilities as acoustic barriers where possible.
2. Noise and vibration awareness training for all site staff including subcontractors as part of general site induction and tailgate talk activities.
3. Strict adherence to approved works times. In the event that out of hours delivery activities are required.
4. Works shall be scheduled, where practical, to avoid simultaneous noisy activities occurring on site.
5. Vehicles shall not be left turned on or idling at the site for longer than minimum amount of time required completing site activities.

6. Should the above-listed activities prove ineffective, the Contractor shall halt work until the Contractor is able to propose an effective solution to control site noise.

D. Additional Dust, Odor and Noise Control

Specific dust and odor details can be found in Section 8.0 in the Draft Release Abatement Measure Plan (RAM)/EPA Self-Implementing Plan (SIP) and in Section 4.0 of the Soil Management Plan. If, in the opinion of the Owner's Representative, the dust, odor and noise control measures are inadequate or insufficient to meet the intent of the specification, the Contractor shall be requested to implement additional measures to control dust, odor and noise at no additional cost to the Owner. Refer to MassDEP regulations at 310 CMR 7.09. Action levels for airborne particulates, airborne PCBs, airborne asbestos and lead are listed in the table below. The Contractor shall implement best management practices onsite to minimize the potential for exceedances of air quality standards onsite. Actions to control impacts to air shall not be cause for additional compensation to the Contractor. The air quality standards are as follows:

Constituent	Air Quality Standard	Required Action
Airborne Particulates (PM_{10})	Any visible dust emissions from Work activities.	Implement corrective measures to control dust (e.g., water sprays).
Airborne Particulates (PM_{10}) – (5-minute average TEOM data or equivalent)	Not to Exceed 75 ug/m^3	Increase application of dust controls
Airborne Particulates (PM_{10}) – (5-minute average TEOM data or equivalent)	Not to Exceed 150 ug/m^3	Halt Work and Notify Owner's Representative and EPA
Airborne Particulates (PM_{10}) – 10 Hour Time Weighted Average	Not to Exceed 100 ug/m^3	Halt Work and Notify Owner's Representative and EPA
Airborne PCBs	Not to Exceed 0.10 ug/m^3	Halt Work and Notify Owner's Representative and EPA
Airborne Asbestos	Not to Exceed 0.1 fiber/ cubic centimeter	Halt Work and Notify Owner's Representative and EPA
Lead	Not to Exceed 50 ug/m^3	Halt Work and Notify Owner's Representative and EPA

Should the levels in the table above be exceeded, the Contractor shall immediately suspend all Work (except where noted in the table above) and implement whatever control measures are necessary to abate the condition. If the levels exceeded indicate a threshold that requires the halt of work, the Contractor shall halt work immediately and prepare and submit a Corrective Action Plan to the Owner's Representative for

review and approval. The Owner's Representative shall submit the Corrective Action Plan to EPA for review and approval. Work shall not resume until EPA has approved the Correction Active Plan and until the plan has been implemented by the Contractor. Delays associated with the halt of work, preparation of a Corrective Action Plan, or review by EPA shall not be cause for a change in cost or schedule for the Work.

E. Diesel Exhaust

Any stationary emergency or standby engine installed at the site shall comply with the requirements of 310 CMR 7.02(8)(i) and 310 CMR 7.26(40) and (44) as applicable. Any engine that is mobile in nature shall comply with federal standards with regards to limitation on the sulfur content of fuel. Construction equipment used for this project shall comply with federal off road diesel emission standards including the use of ultra low sulfur diesel fuel (15 ppm sulfur content) in all diesel engine powered equipment. All equipment shall meet the Tier 1-3 emission standards for off-road diesel equipment and to the extent practicable; all diesel-powered equipment shall meet the Tier 4 emission standards (the final deadline for which is 2015), per 40 CFR Part 89.

Contractors are encouraged to use diesel oxidation catalyst retro-fitted vehicles and equipment, and projects are directed to MassDEP for retrofitting guidance. Diesel-powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters.

The Contractor shall not cause, suffer, allow or permit visible emissions including smoke from any marine vessel, spark-ignited internal combustion engine or non-stationary diesel engine as per 310 CMR 7.06.

To the extent any activities may include Groundwater/Soil venting systems, Conveyors and dry material storage silos, and rock crushing/processing as part of the construction or reconstruction of the site, they shall comply with the requirements of 310 CMR 7.03.

3.5 MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of waste shall be as directed below, unless otherwise specified in other sections and/or shown on the Drawings.

A. Solid Waste

Solid waste shall be managed in accordance with applicable regulations.

B. Contractor Management of Hazardous Waste/Excess Hazardous Materials and Spill Response

1. Contractor Management of Hazardous Waste/Excess Hazardous Materials

   Hazardous waste is defined by applicable MassDEP regulations at 310 CMR 30.0000 and more stringent local regulations, if any. Hazardous materials are defined in M.G.L. Chapter 21E and 49 CFR 171 - 178. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during performance of the work. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take appropriate precautionary measures to prevent accidental spillage. The Contractor shall be responsible for storing, describing, packaging, labeling, marking, and placarding hazardous waste and hazardous material in accordance with all appropriate, relevant and applicable Federal, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 30 days in accordance with MassDEP regulations at 310 CMR 30.0000 and Department of Transportation laws and regulations.

2. Contractor Response to a Spill or Release of Hazardous Materials

   A spill or release of hazardous or toxic materials resulting from Contractor activities shall be immediately reported to the Owner's Representative. Appropriate regulatory authorities shall be notified in a timely fashion in accordance with MassDEP regulations at 310 CMR 40.0000. All associated cleanup activities and cleanup costs due to such spills shall be the Contractor's responsibility. The Contractor shall coordinate the disposition of hazardous materials unearthed as a result of the dredging activity that can be attributed to prior disposal activities by a third party(ies) with the Owner's Representative. The Contractor shall provide to the Owner's Representative three quotes for the disposal of such hazardous materials for consideration of payment as a changed condition. All cleanup activities shall be conducted in conformance with the Massachusetts Contingency Plan regulations at 310 CMR 40.0000 as administered by MassDEP.

C. Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.7 BIOLOGICAL RESOURCES

The Contractor shall make every reasonable effort to minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.8 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil or sediment residuals, egg deposits from plant pests, noxious weeds, and plant seeds.

3.9 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control, and in accordance with the provisions contained in Section 00700, General Conditions, and in Section 00800, Supplementary Conditions. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.10 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for Construction (“Construction Areas” shall be defined as any area used by the Contractor) to their pre- construction condition. The Contractor shall, unless otherwise instructed in writing by the Owner's Representative, obliterate all signs of temporary construction facilities such as work areas, structures, construction trailers, staging areas, stockpiles of excess or waste materials, and all other vestiges of construction prior to final acceptance of the work.

END OF SECTION

SECTION 01 41 29

EPA NPDES CONSTRUCTION GENERAL PERMIT

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for the individuals that are in control of the site to implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall be completed by the Contractor as part of the filings for a National Pollution Discharge Elimination System (NPDES) Construction General Permit for Discharges from Construction Activities. The Contractor shall submit to the Owner's Representative for review prior to submittal.

B. The stormwater pollution prevention measures contained on the site drawings and contained within the SWPPP are the minimum required by the City of New Bedford. The Contractor is required to provide additional measures to prevent pollution from stormwater discharges in compliance with the Federal Environmental Protection Plan (EPA) NPDES permit and all other local, state and federal requirements.

C. For construction areas greater than one acre in size, the Contractor shall not begin construction without submitting evidence that a "Notice of Intent (NOI) for Stormwater Discharge Associated with Construction Activity under NPDES Permit" has been filed and has been acknowledged by EPA (or designated state) at least 14 days prior to construction. It is the Contractor's responsibility to maintain and complete the SWPPP, file an NOI, assist the Owner in filing a separate NOI, and receive a copy of the EPA acknowledgements of the NOI's at least 14 days prior to commencing work on the site.

The EPA requires the use of the electronic system, or "eNOI" system, to prepare and submit your NOI. However, if you are given approval by the EPA Regional Office to use a paper NOI form and you elect to use it, you must complete and submit the NOI form provided at: https://www.epa.gov/npdes/

D. The Contractor shall conduct the stormwater management practices in accordance with local regulations and governing authorities, the Federal NPDES Construction General Permit requirements, and any enforcement action taken or imposed by Federal, State, or local agencies. The cost of any fines, construction delays and remedial actions resulting from the Contractor's failure to comply with all provisions of state and local regulations and Federal NPDES permit requirements shall be paid for by the Contractor at no additional cost to the Owner.

E. As a requirement of the EPA's NPDES permitting program, each Contractor and Subcontractor shall execute a Contractor's Certification form indicating that they have read and understand the regulations.

F. When the site is stabilized and no additional exposed soil will occur, the respective Contractor(s) who filed an NOI, shall prepare and file a Notice of Termination (NOT) form.

The EPA requires the use of the electronic system, or "eNOI" system, to prepare and submit the NOT form. However, where your EPA Regional Office specifically authorizes you to use a paper NOT form, you are required to complete and submit the NOT form provided at: https://www.epa.gov/npdes/.

1.2 RELATED DOCUMENTS

A. Sections which directly relate to the work of this Section include:

1. Section 02 41 10 – Site Demolition
2. Section 02 11 05 – Site Clearing
3. Section 31 14 00 – Earth Stripping
4. Section 31 20 00 – Earth Moving
5. Section 31 25 00 – Erosion and Sedimentation Controls
6. Section 31 50 00 – Excavation Support and Protection
7. Section 32 92 00 – Turf and Grasses
8. Section 33 41 00 – Storm Utility Drainage Piping
9. Section 33 49 00 – Storm Utility Drainage Structures

1.3 REFERENCES

A. Guidance Manual – "Developing Your Stormwater Pollution Prevention Plan – A Guide for Construction Sites" (EPA 833-R-06-004), May 2007.

B. Massachusetts Stormwater Handbook and the Stormwater Management Standards issued by the Massachusetts Department of Environmental Protection, January 2, 2008.

C. Notice of Intent Form and Instructions.

D. Notice of Termination Form and Instructions.

E. City of New Bedford Department of Public Infrastructure Stormwater Management Permit Number SMP-25-3.

1.4 SUBMITTALS

A. Copy of the NOI form filed with the EPA.

B. Copy of the NOT form filed with EPA – at completion of the project.

1.5 INSPECTIONS

A. The Contractor shall conduct a site inspection at least once every 7 days; or once every 14 days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. Such inspections may be performed in conjunction with the provisions for the maintenance of Erosion Control Measures in Section 31 25 00, Erosion and Sedimentation Controls.

B. A maintenance inspection report shall be prepared after each inspection. The Contractor shall identify a qualified individual who will be responsible for conducting inspections and preparing the reports. The Contractor shall also designate an additional qualified person who will fill in for the inspector during absences. These qualified individuals shall be trained in all maintenance and inspection practices necessary for keeping the sediment and erosion control measures in proper working order and have read and understood the SWPPP.

PART 2 - PRODUCTS (NOT USED

PART 3 - EXECUTION

3.1 EROSION CONTROL DEVICES

A. Erosion control devices shall be constructed as shown on the Contract Drawings and the SWPPP and as specified in Section 31 25 00, Erosion and Sedimentation Controls.

3.2 STORMWATER POLLUTION PREVENTION PLAN

A. The SWPPP template contract drawings and specifications identify a portion of the required facilities and temporary erosion and sedimentation control devices. The Contractor shall adhere to the SWPPP template in accordance with NPDES requirements which identifies the location of construction facilities and proposes additional erosion and sedimentation control measures as required to minimize pollution. The Contractor's SWPPP includes provisions for, but not be limited to, the following:

1. Project Construction and Sequencing
2. Construction Trailers
3. Laydown Areas
4. Equipment Storage Areas
5. Stockpile Areas
6. Spill Response Procedure
7. Inspection and Maintenance
8. Corrective Actions
9. Staff Training
10. Buffer Documentation

B. Reproducible copies of one or more of the Contract Drawings will be provided to the Contractor to serve as a base for the Contractor to develop a SWPPP and modify as necessary as construction proceeds.

END OF SECTION

SECTION 01 45 16.13

CONTRACTOR QUALITY CONTROL

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 329 (2011a) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Owner's Representative for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest-level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Owner's Representative, and shall be responsible for all construction and construction related activities at the site.

3.2 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, the Contractor shall meet with the Owner's Representative and discuss the Contractor's quality control system. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Owners' Quality Assurance. Minutes of the meeting shall be prepared by the Owner's Representative and signed by both the Contractor and the Owner's Representative. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by

either party to reconfirm mutual understandings and/or address deficiencies in the quality control system or procedures which may require corrective action by the Contractor.

3.3 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the Contractor for each definable feature of work as follows:

A. Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

1. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Owner's Representative until final acceptance of the work.

2. A review of the Contract Drawings.

3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

4. Review of provisions that have been made to provide required control inspection and testing.

5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

7. A review of the appropriate activity hazard analysis to ensure safety requirements are met.

8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Owner's Representative.

10. Discussion of the initial control phase.

11. The Owner shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting attended by the superintendent, and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the Contractor and attached to the Contractor's daily report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

B. Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

1. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards.

4. Resolve all differences.

5. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

6. The Owner's Representative shall be notified at least 48 hours in advance of beginning the initial phase.

7. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

C. Follow-up Phase

Daily checks shall be performed to ensure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the Contractor's daily report. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

D. Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.4 COMPLETION INSPECTION

A. Pre-Final Inspection

The Owner will perform the pre-final inspection to verify that the work is complete. An Owner Pre-Final Punch List may be developed as a result of this inspection. The Contractor shall ensure that all items on this list have been corrected before notifying the Owner, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

B. Final Acceptance Inspection

The Contractor's superintendent or other primary management person, and the Owner's Representative's shall be in attendance at the final acceptance inspection. Additional Owner personnel may also be in attendance.

3.5 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

1. Contractor/subcontractor and their area of responsibility.

2. Operating plant/equipment with hours worked, idle, or down for repair.

3. Work performed each day, giving location, description, and by whom.

4. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

7. Offsite surveillance activities, including actions taken.

8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

9. Instructions given/received and conflicts in plans and/or specifications.

10. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Owner daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the Contractor. The report from the Contractor shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.6 NOTIFICATION OF NONCOMPLIANCE

The Owner's Representative will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Owner's Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

END OF SECTION

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Site Plan

The Contractor shall propose a location for temporary construction facilities, Contractor's temporary project field office, staging areas, areas for staging materials, areas for staging debris, as necessary, or staging of equipment for the review and approval by the Owner's Representative. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

B. Identification of Employees

The Contractor shall be responsible for furnishing to each employee, and for requiring each employee engaged on the work to display identification as approved and directed by the Owner's Representative. Prescribed identification shall immediately be delivered to the Owner's Representative for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.2 AVAILABILITY AND USE OF UTILITY SERVICES

A. Temporary Electrical Service

The Contractor, at its expense and in a manner satisfactory to the Owner's Representative, shall provide and maintain necessary temporary connections, distribution lines and disconnects, and other equipment to provide temporary electrical service for site needs. The Contractor shall coordinate with the Owner and the New Bedford electrical inspector to obtain, operate, meter, and pay for, the necessary electrical connection and permits. All electrical work shall conform to applicable federal, state and local electrical code requirements.

B. Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Owner's Representative.

At its discretion, the Contractor may, at its expense and in a manner satisfactory to the Owner's Representative, provide and maintain necessary temporary connections, distribution lines and disconnects, and other equipment to provide temporary sanitary

service for site needs. The Contractor shall coordinate with the New Bedford Department of Public Infrastructure to obtain, operate, and pay for, the necessary sanitary connection and permits. All sanitary work shall conform to applicable federal, state and local requirements.

C. Telephone/Internet

The Contractor shall make arrangements and pay all costs for telephone and internet facilities desired for Contractor's own operations.

D. Project Lighting

MassCEC's Marine Commerce Terminal is equipped with high-mast lighting on the upland of the site. MassCEC shall enable nighttime high-mast lighting at Contractor's request and pro-rata expense. Contractor shall provide, at Contractor's sole expense, all other lighting needs.

E. Water Service

At its discretion, the Contractor may, at its expense and in a manner satisfactory to the Owner's Representative, provide and maintain necessary temporary connections, distribution lines and disconnects, and other equipment to provide temporary water service for site needs. The Contractor shall coordinate with the Owner to obtain, operate, and pay for, the necessary water connection and permits. All water work shall conform to applicable federal, state and local requirements.

1.3 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

A. Bulletin Board

Upon beginning of work, the Contractor shall provide a bulletin board for displaying all applicable postings as required by Federal, State and local regulations. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Owner's Representative. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

B. Project and Safety Signs

The Contractor will be required to construct a project sign to be displayed on any temporary structures. The sign shall contain three logos (Owner Representative and Contractor) of a maximum of three colors each. The specific wording and layout of the sign will be provided by the Owner's Representative at the time of award. The sign shall be erected within 15 days after receipt of the notice to proceed. Upon completion of the project, any signs shall be removed from the site.

The Contractor is responsible to provide sufficient safety signage at the entrance to the site in accordance with MA State Highway and other applicable regulations. Safety

and other signs shall be provided as required to support the Contractor's work on the site.

1.4 SECURITY PROVISIONS

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall establish fencing around land-based portions of work associated with the project and shall maintain adequate security measures to prevent unauthorized entry. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.5 COMMUNICATION

Whenever the Contractor has the individual elements of its vehicles and/or equipment so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. One such device shall be made available for use by the Owner's Representative.

1.6 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away twice daily or more frequently, if requested by the Owner. Stored material, not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.7 RESTORATION OF PROJECT AREA

Areas used by the Contractor for the storage of equipment or material, debris handling, sediment offloading, dewatering or other use, shall be restored to the original or better condition.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 57 00

TRAFFIC REGULATION

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. The Contractor shall furnish, install, operate and maintain equipment, services and personnel with traffic control and protective devices, as required by the agencies responsible for the roads to expedite vehicular traffic flow on haul roads, at site entrances, on-site access roads and parking areas.

B. Prior to performing any work on public roads or thoroughfares, the Contractor shall obtain a permit from the City of New Bedford. The Contractor shall perform all work in accordance with the obtained permits. The Contractor is responsible for maintaining traffic control with police officers, signs, etc., as required by the permit.

C. The Contractor shall notify all property owners at least 48 hours in advance of any work which will interfere with access to their residence or place of business.

D. No road shall be closed to traffic without the prior consent of the Owner's Representative, the agency responsible for the road and the local police department.

E. Traffic control including, but not restricted to, signing and devices shall be provided for all openings in roads in accordance with standards described in the latest edition of the Massachusetts Department of Highways Manual on Uniform Traffic Control Devices.

F. If roads are disturbed during construction, the Contractor shall restore the road base and surface to the satisfaction of the City of New Bedford.

1.2 TRAFFIC SIGNALS AND SIGNS

A. The Contractor shall provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under the Contractor's control or affected by the operations.

B. The Contractor shall provide and operate traffic control and directional signals. Mounted on barricades or standard posts at the following locations:

1. Each change of direction of a roadway and each crossroads.
2. Detours.
3. Parking areas.

C. Existing permanent traffic control signing and devices, including guard rails, shall not be removed without the prior consent of the agency responsible for the road.

1.3 FLAGMEN

A. The Contractor shall provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic.

1.4 FLARES AND LIGHTS

A. The Contractor shall provide flares and lights during periods of low visibility to clearly delineate traffic lanes and to guide traffic and for use by flagmen in directing traffic.

B. The Contractor shall provide illumination of critical traffic and parking areas.

1.5 CONSTRUCTION PARKING CONTROL

A. The Contractor shall control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, any utility's operations or construction operations.

B. The Contractor shall monitor parking of construction personnel's private vehicles, maintain free vehicular access to and through parking areas and prohibit parking on or adjacent to access roads or in non-designated areas.

1.6 HAUL ROUTES

A. The Contractor shall consult with governing authorities to establish those public thoroughfares which will be used as site access and haul routes.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 60 00

PLANT AND EQUIPMENT

PART 1 - GENERAL

1.1 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Plant and Equipment:

Submit a schedule of the plant and equipment, which hereby includes all vehicles, vessels, plant(s), equipment, the Contractor intends to employ in the performance of the work of this contract. See Section 01 00 00, Bidding Schedule, where this schedule is required as part of the Bid Form. Changes proposed by the Contractor to the plant and equipment schedule considered for award of the bid are subject to the approval of the Owner’s Representative.

1.2 PLANT AND EQUIPMENT

A. Sufficient Capacity

The Contractor shall keep on the job sufficient plant and equipment to meet the requirements of the work and to meet the schedule milestones. The plant and equipment shall be in satisfactory operating condition and be capable of safely and efficiently performing the work. The plant and equipment shall be subject to inspection by the Owner's Representative at all times.

B. Minimum Capacity

The plant and equipment listed on the Plant and Equipment Schedule submitted with the Contractor's bid is the minimum which the Contractor shall place and keep on the job unless otherwise determined by the Owner's Representative. The listing of plant and equipment is not to be construed as an agreement on the part of the Owner that the equipment is adequate to perform the required work.

C. Reduction in Capacity

No reduction in the capacity of the plant and equipment employed on the work shall be made except by written permission of the Owner's Representative. The measure of the capacity of the plant and equipment shall be its actual performance on the work covered by this contract.

D. Inspections and Certifications

Prior to commencement of work at the site, the Contractor shall submit to the Owner's Representative for review, copies of all applicable inspections and certifications of plant and equipment as required by Federal, State and local laws and regulations. Such inspections and certifications shall be current and maintained in force for the duration of this Contract. The Contractor shall have on land a fuel and waste oil management plan which details the method for protecting fuel and waste oil from unintended releases, including secondary containment structures, and also details intended disposal method for waste oil and fuel. All equipment used in the prosecution of the work that uses fuel, oil or hydraulic fluid shall be inspected daily for leakage.

1.3 LICENSE REQUIREMENTS (NOT USED)

1.4 PERMIT REQUIREMENTS

The Contractor's plant and equipment employed on the work shall meet the requirements of all applicable permits, certifications, and performance standards issued for the project as specified in these specifications.

1.5 HEIGHT LIMITATIONS

Height limitations for equipment shall conform to the FAA requirements for the various areas of the project. The Contractor is responsible for coordinating these height limitations prior to commencing with the work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 23

FIELD ENGINEERING

PART 1 - GENERAL

1.1 SUMMARY

A. Engineering Services

The Contractor shall provide and pay for field engineering services required for the project, including:

1. Survey work required in execution of this project, including land surveys, except for surveys performed by the Owner's Representative as indicated in these specifications.
2. Civil, geotechnical, structural or other professional engineering services specified, or required to execute Contractor's construction methods.

B. Existing Control Points

The Owner's Representative will identify existing control points as required.

C. Survey Datum

Some of the Contract Drawings refer to National Geodetic Vertical Datum (NGVD) and some Contract Drawings refer to Mean Lower Low Water (MLLW). The elevation of some benchmarks within the harbor will be in NGVD 29 and some benchmarks will be in NAVD88. In all cases, the Contractor shall determine the elevation of any datum or benchmark in NAVD88 and shall convert that elevation to MLLW. The Contractor shall then base all elevations when performing land surveys in MLLW.

1.2 SUBMITTALS (NOT USED)

1.3 EXAMINATION

A. Examination of Site and Verification of Conditions

1. Before starting operations, the Contractor shall examine site to become acquainted with conditions to be encountered.
2. The Contractor shall verify the exact locations of all above and below ground and submerged utilities including sewers, water mains, gas mains, telephone/communications lines, above or below ground and submerged electrical wires, other utilities, conduits and structures which may interfere with work.

B. Utility Company Contacts

The named area utility companies are included in Section 00800, Supplementary Conditions. Additional utility companies, appurtenances, and municipal and private utilities may be present in the work areas. It is the Contractor's sole responsibility to conduct its own due diligence concerning the presence of utilities within the work area, and to protect all utilities from damage (of any kind) as a result of any of the Contractor's activities. The Contractor is responsible to contact DigSafe prior to the start of any on site work of any kind and to implement all necessary and appropriate safeguards to prevent damage or disturbance to buried utilities and appurtenances.

1.4 EASEMENTS AND RIGHTS-OF-WAY

A. Easements and rights-of-way reasonably necessary for performance of the work, unless otherwise specified herein, will be provided by the Owner.

B. The Contractor shall confine construction operations within limits indicated on Drawings and/or within limits of approved easements or public ways.

C. The Contractor shall place construction tools, equipment, materials and supplies, so as to cause least possible damage to property and interference with traffic.

1.5 LAYOUT OF WORK

A. The Owner's Representative will furnish one control point to the Contractor. The Contractor must supply additional control points as may be required in the performance of the Work. The Contractor shall ensure that all additional control points are tied into at least three known fixed points and located within the Contractor's survey book.

B. From these control points the Contractor shall lay out the work by establishing all lines and grades at the site necessary to control the work and shall be responsible for all measurements that may be required for the execution of the work as prescribed in the specifications and/or shown on the contract drawings. The Contractor shall place and establish such stakes and markers as may be necessary for control and guidance of their operations. All survey data shall be recorded in accordance with standard and approved methods. All field notes, sketches, recordings and computations made by the Contractor shall be available at all times during the progress of the work for ready examination by the Owner's Representative.

C. The Contractor shall furnish, at their own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, tools and material and all labor as may be required in laying out any part of the work from the control point established by the Owner. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other markers established by them until authorized to remove them. If the control point(s) established at the site by the Owner are destroyed by or through the activities of the Contractor (prior to their authorized removal), said point shall be replaced by the Owner or the Owner's Representative. The expense of replacement will be

deducted from any amount due or which may become due the Contractor. The Owner's Representative may require work be suspended at any time when horizontal and vertical control points established at the site by the Contractor are not reasonably adequate to permit checking the work. Such suspension will be withdrawn upon proper replacement of the control points.

1.6 CONTRACTOR SURVEYS

A. Personnel

The Contractor survey work to be performed under this Contract shall be accomplished by, reviewed and approved by survey personnel familiar with and having personal experience with land and surveys, as appropriate.

B. Survey Plans

Prior to the start of any work at the site, the Contractor shall prepare a plan describing the survey method(s) to be used:

1. to complete the layout and sequencing of the work
2. to conduct the progress surveys
3. to conduct the quality control surveys

C. Quality Control Surveys

The Contractor shall examine their work by conducting surveys whenever progress payments are requested by the Contractor, upon completion of separable portions of the work, and upon completion of the entire work. The Contractor shall prepare survey maps based on the results of these surveys. These maps shall be used, by the Contractor, to satisfy themself of the effectiveness of their operations.

The Contractor shall forward a copy of such survey (or electronic data representative of the soundings collected during these surveys) to the Owners' Representative. Submit sufficient field data electronically and at a minimum include either (1) X, Y, and Z ASCII files containing Easting, Northing, and true Elevations and any field survey notes specific to the collection of and the QA/QC of field data acquired. The files shall be positioned on state plane coordinates, North American Datum of 1983 (NAD83) Massachusetts Mainland Zone 2001 and vertical datum referenced to New Bedford / Fairhaven Harbor MLLW.

D. Method of Surveying

1. Land Survey Elevations

   To ensure that the method of surveying is acceptable, the Contractor shall submit a detailed survey plan setting out the proposed method of surveying. Elevations shall be referenced to MLLW and shall be performed with survey equipment having a vertical accuracy of +/- 0.10 foot.

Control points used for the surveys shall be occupied and proven by checking reference angles in the field.

The Contractor will be required to submit to the Owner's Representative sufficient field data, including X, Y, and Z locations in a usable format, so that the Contractor's submitted survey plot may be reproduced by the Owner by referring only to this field data.

After completion of the Contractor's survey, the results will be plotted and reviewed by the Contractor to ensure that all work was completed in accordance with contract requirements and submitted to the Owner's Representative on a CD-ROM, DVD-ROM or by electronic transfer in digital ASCII format. If deficiencies are noted, a re-survey of the area after correction of deficiencies will be required to ensure that correction has been achieved. Upon completion of the project, sufficient surveys will have been performed and plots submitted to ensure that the proper grade has been achieved throughout the entire project.

Submission of all Contractor quality control survey data, including plots, is required prior to performance of final examination and acceptance surveys by the Owner. The results of quality control survey should be utilized by the Contractor to ensure that work was performed in accordance with contract requirements. Final acceptance by the Owner's Representative will be in accordance with Section 01 22 00, Measurement and Payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 FINAL EXAMINATION AND ACCEPTANCE

A. Final Examination

As soon as practicable after the completion of the entire Work, or completion of pre-approved acceptance sections and after examination by the Contractor of the entire work area, the work will be thoroughly examined by the Owner's Representative. Examinations by the Owner's Representative will be made at the expense of the Owner.

Should any survey positions or elevations be found to not meet the final positions or elevations noted on the contract drawings within areas above or below MLLW by this examination, the Contractor shall remove the misplaced works, restore the area to pre-installation conditions, and install the works in the specified location, at no additional fee, as directed by the Owner's Representative.

The Contractor or their authorized representative will be notified when positions and elevations are to be taken. One individual will be allowed to accompany the survey party during the final examination survey(s). When the area is found to be satisfactorily cleared, it will be accepted finally. Should more than one final examination survey of an area be required, the cost of all additional surveys of that area will be deducted from amounts due or to become due the Contractor. These survey costs will be based upon a rate of $7,000.00 per day for each day in which the Owner's Representative is engaged in conducting surveys, and/or is enroute to or from the site, or held at or near the site for such operations.

B. Final Acceptance

Final acceptance of the whole or any part of the Work, and the deductions or corrections of deductions made thereon, will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error.

END OF SECTION

SECTION 01 90 00

GENERAL SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for Construction

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2011) National Electrical Code

NFPA 241 (2009) Standard for Safeguarding Construction, Alteration, and Demolition Operations

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

NIOSH Pub No. 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

1.2 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with OSHA requirements in 29 CFR 1910 and 29 CFR 1926 (especially OSHA's Hazardous Waste Operations and Emergency Response Standard 29 CFR 1926.65/29 CFR 1910.120, state specific OSHA requirements (where applicable), and in accordance with the provisions contained in Section 00700, General Conditions, and in Section 00800, Supplementary Conditions. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

The Marine Commerce Terminal and the parcels where the work is taking place are in and adjacent to the New Bedford Harbor Superfund Site, which is under active remediation. At a minimum, all work must be completed under the direction of a 40-Hour OSHA Hazardous Waste Operations (29 CFR 1910.120) trained individual. All personnel coming in contact with sediment or soil contaminated with hazardous materials shall have, or obtain, similar OSHA training.

1.3 SUBMITTAL

Submit the following for acceptance by the Owner's Representative. Follow the administrative procedures for making submittals as specified in Section 01 33 00, Submittal Procedures.

A. Statements – Health and Safety Plan meeting the criteria of 29 CFR 1926.65/29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard), and also including:

1. Site Specific Accident Prevention Plan.

2. Phased Job Activity Hazard Analysis.

3. Machinery Inspection Certification:

   Submit certifications that earth moving equipment, cranes, trucks, vehicles, machinery, floating plant and other mechanized equipment is in safe operating condition.

4. Modification to Equipment:

   Submit manufacturer's written approval of modifications or additions to vehicles, machinery, floating plant, or hoisting equipment. Owner acceptance of submittal must be attained before such equipment can be brought on the job site.

5. Safety Meeting Report:

   Submit safety meeting reports detailing the subjects discussed at safety meetings within three days after each meeting.

B. Accident Prevention Plan Submittal

Submit a plan outlining Contractor proposals for accident prevention.

1. List all major definable features of work to be completed under this contract.

2. Accident Reporting
   a. All accidents shall be investigated and a report prepared that outlines basic causes and proposed actions to prevent future occurrence.

3. Submit an "Activity Hazard Analysis" for each definable feature of the work identified in paragraph A above. Submit each "Activity Hazard Analysis" a minimum of 15 days prior to the start of that phase of work. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. The analysis shall define all activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be

implemented to eliminate or reduce each hazard to an acceptable level. The activity hazard analyses shall be continuously reviewed with the quality control definable features of work and when appropriate, modified to address changing site conditions or operations.

1.4 UNFORESEEN HAZARDOUS MATERIAL

If unanticipated hazardous materials are encountered during construction operations that may be dangerous to human health upon disturbance, stop that portion of work and notify the Owner's Representative immediately.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 WEEKLY SAFETY MEETINGS

Prior to the start of construction and at least once a month, the Contractor shall conduct a safety meeting for all supervisors and foremen. Additionally, prior to the start of construction and at least once per day, the foremen of the Contractor shall conduct a safety meeting for all workers. After each safety meeting, a safety meeting report shall be completed. A copy of a suggested weekly safety meeting form is attached at the end of this section.

END OF SECTION

WEEKLY SAFETY MEETING

Date Held _____
Time_____

CLIENT: _____ CONTRACT: _____

PROJECT: _____

PERSONNEL PRESENT: _____

_____

CONDUCTED BY: _____

All persons attending the meeting must sign the bottom or back of this form.

Subjects discussed (Note, delete, or add)

Accident Prevention Plan ___

Prevention of Falls ___

Fire Prevention ___

Tripping Hazards ___

Individual Protective Equipment ___

Back Injury/Safe Lifting Techniques ___

Sanitation, First Aid, Waste Disposal ___

Clean-up - trash, nails in lumber ___

Staging, Ladders, Concrete Forms, Safety Nets ___

Hand Tools, Power Tools, Machinery, Chain Saws ___

Equipment Inspection & Maintenance (Zero Defects) ___

Hoisting Equipment, Winch and Crane Safety ___

Ropes. Hooks, Chains and Slings ___

Vehicle Operation Safety ___

Electrical Grounding, Temporary Wiring, GFCI ___

Lockouts/Safe clearance procedures (electrical, pressure, moving parts)

Welding, Cutting ___
Loose Rock/Steep Slopes ___
Water Safety ___

Excavation Hazard/Rescue ___
Explosives ___
Boat Safety ___

HAZMAT, Toxic hazards, SDS, respiratory, ventilation ___

Other items of concern specific to this Contract: _____

SECTION 02 11 00

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Site Preparation

B. Protection

C. Clearing

D. Grubbing

E. Disposal of Waste Materials

1.2 RELATED SECTIONS

A. Additional requirements relative to specifications of unsuitable materials are provided in Section 02 11 10, Excavation and Handling of Contaminated Material, Section 02 20 00, Earthwork; in the Draft Release Abatement Measure Plan (RAM)/EPA Self Implementing Plan (SIP); and in the Soil Management Plan. The Draft RAM/SIP and Soil Management Plan are provided as **Attachments** to this Request for Proposal.

1.3 SITE PREPARATION

A. Examine the site thoroughly and determine the existing conditions and difficulty of work to be performed.

1.4 PROTECTION

A. Locate, protect and support existing utilities which may be encountered during the course of the work and which are not designated for relocation or removal.

B. Locate, protect and support trees and underbrush which are outside of the construction area and are therefore designated for preservation.

C. Protect benchmarks, baseline monuments, and survey control points from disturbance or destruction.

D. Use qualified surveyors to immediately replace any such point disturbed or destroyed.

E. Accomplish work to avoid damage to the site and existing site appurtenances not designated for removal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CLEARING

A. Clear debris, rubble, and materials unsuitable for reuse. Crush rubble, rock, or concrete for reuse at site, if feasible, as stipulated within Section 02 20 00, Earthwork. Dispose of debris offsite.

B. Clear cut trees, brush and shrubs as necessary to complete the work as shown on the Contract Documents. Contractor shall not clear trees, brush, or shrubs that are outside of the work area and are therefore designated for preservation. As necessary, chip brush, shrubs and tree debris or otherwise set aside for offsite disposal. Any materials that are located within the PCB contaminated areas as shown in the Draft RAM/SIP, shall be cleared and disposed of in accordance with Section 02 11 10, Excavation and Handling of Contaminated Material, and the Draft RAM/SIP.

C. Cut up, chip or otherwise set aside snags, brush, grass, floatable material, weeds, rubbish, roots, and other objectionable vegetation growth.

D. Contractor shall identify any and all overhead electric lines prior to the start of construction and determine appropriate safe distances that must be maintained during construction. Contractor shall abide by those safe distances during tree felling or other operations at the site. Contractor shall not damage or come into contact with any existing electric transmission line during tree felling or other operations.

3.2 GRUBBING

A. Grub only in Work Areas, as noted on the Contract Documents, as necessary to complete the Work. Additional grubbing may be authorized, if requested by Contractor.

B. Remove and dispose of all stumps and large roots, and other objectionable buried and/or decayed vegetative matter within the Work Areas as necessary to complete the Work. Note that stumps and other material removed from below ground may be impacted with PCB contamination and will need to be treated and disposed of as such by the Contractor in accordance with Section 02 11 10, Excavation and Handling of Contaminated Material, and the Draft RAM/SIP.

C. Protect topsoil from contamination from other materials.

3.3 STOCKPILING

A. Keep stockpiles of materials from clearing and grubbing activities clear of active Work Areas.

3.4 DISPOSAL

A. Trees, grass, floatable material, weeds, rubbish, snags, roots, brush, trash, unsuitable construction debris, unstable material, topsoil and other vegetation and material generated during clearing and grubbing operations shall be taken off-site and disposed of in accordance with local and state regulations and/or in accordance with Section 02 11 10, Excavation and Handling of Contaminated Material, and the Draft RAM/SIP.

END OF SECTION

SECTION 02 11 05

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 01 41 29 – EPA NPDES Construction General Permit for Construction Activities
2. Section 02 20 00 – Earthwork
3. Section 02 11 10 – Excavation and Handling of Contaminated Material
4. Section 02 41 10 – Site Demolition
5. Section 31 14 00 – Earth Stripping
6. Section 31 25 00 – Erosion and Sedimentation Control
7. Section 32 31 13 – Chain Link Fences and Gates

1.2 SUMMARY

A. This Section specifies requirements for site clearing.

B. The work includes:

1. Clearing and grubbing
2. Protection of existing vegetation to remain
3. Selective clearing and thinning
4. Disposal of debris and material from clearing, grubbing and thinning in approved off-site disposal areas

1.3 SITE CONDITIONS

A. Site conditions existing during the bidding period will be maintained by the Owner insofar as practical.

B. Actual site condition variations that differ from those of the bidding period that affect site preparation operations shall be brought to the attention of the Owner prior to the commencement of any site work.

1.4 ACTION SUBMITTALS

A. The Contractor shall submit the following information to the Owner's Representative for review before commencing any site or demolition work:

1. All permits and notices authorizing site clearing and earthwork.
2. Permits for transport and disposal of debris.
3. Site clearing procedures and operational sequence.
4. Calculations.
5. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 TREE PROTECTION FENCING

A. Tree protection fencing shall be orange plastic web fence, 6 feet high minimum. Wood stakes shall be 8-foot long by 1-inch by 1-inch square driven a minimum of 2 feet into the ground. Posts shall be spaced 4 feet (maximum) on center.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Protect and maintain benchmarks and survey control points from disturbance.

B. Clearing shall include cutting, removal, and off-site disposal of trees, bushes, shrubs, grass, stumps, fallen timber, refuse, trash, fencing and other incidental materials not required for reuse on the site.

C. The Contractor shall grub the area within the clearing limits to completely remove stumps and root systems, except for those to remain or to be transplanted.

D. Depressions, excavations and voids resulting from the removal of stumps or roots shall be filled with suitable material and compacted as specified under Section 312000 – Earth Moving.

E. Burning of materials from clearing and grubbing operations will not be allowed.

F. Minimize production of dust due to clearing operations and do not use water if that will result in ice, flooding, sedimentation of waterways or storm drains, or other pollution.

3.2 SELECTIVE CLEARING AND THINNING

A. Selective clearing and thinning shall be completed as directed by the Landscape Architect or Arborist. Approximate limits of selective clearing and thinning are

shown on the Drawings. Do not remove or damage vegetation beyond the limits indicated on the Drawings.

B. The work shall include the removal of dead and diseased tree limbs and plants and pruning and removal of live vegetation that interferes with the growth of other trees and plants. Areas of dense growth shall be thinned to provide room for healthy growth.

3.3 PROTECTION

A. The Contractor shall flag the limits of clearing shown on the drawings by accurate field survey with marked stakes or other means acceptable to the Owner's Representative. Trees to remain and trees to be saved and transplanted shall be clearly identified during this staking process. The Owner's Representative shall be notified a minimum of 5 working days prior to scheduled commencement of clearing operations to review the flagged limits. Adjust the clearing limits as directed by the Owner's Representative.

B. Before clearing begins, protect designated trees to remain with tree protection fencing to the approximate diameter of foliage to prevent damage to the trunk, foliage and root system by construction equipment and procedures. Trees to be transplanted shall be protected in similar fashion as the trees to remain as described above.

C. Place tree protection fencing as required to protect other plants, adjacent property areas to remain uncleared, monuments and existing improvements from damage.

D. The Contractor shall repair or replace immediately any damage to existing trees or root systems that are to remain and to trees that are to be transplanted. The Contractor shall employ an arborist licensed in the Commonwealth of Massachusetts to determine the repair and replacement needs and methods for approval by the Owner's Representative.

E. Replace damaged shrubs and other vegetation designated to remain with the same size and species.

F. The tree protection fencing shall be maintained for the duration of construction operations. The work shall include immediate replacement of any damaged fence. Fencing shall be removed from the site at the completion of construction operations. The fencing disposal shall be in accordance with local, state and federal laws and regulations for the disposal of the material.

G. Protect existing utility lines that are indicated to remain. Notify the Owner's Representative and utility Owner immediately of damage to or an encounter with an unknown existing utility line. The Contractor shall be responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, notify the Owner's

Representative and utility Owner in ample time to minimize interruption of the service.

3.4 DEBRIS

A. Remove debris, junk, and trash from the site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 02 11 10

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section details proper handling, stockpiling, excavation, and grading procedures to be undertaken upon generation of contaminated material in upland areas. Soil contamination exist onsite within site material (particularly within the vicinity of the southern property line adjacent to the main terminal on 54 and 18 Wright Street) that the Contractor will be excavating, staging onsite, and backfilling. The Contractor shall assume that any site material (see Section 02 20 00, Earthwork, and Part 1.1, C of this specification) is contaminated, and shall handle such site material accordingly. This includes tree stumps and other debris removed from below grade.

B. The Owner's Representative may direct the Contractor to segregate contaminated materials during the course of the Work, including soils deemed to be geotechnically unsuitable for reuse but may also be contaminated. A plan of action for final disposition of such soils will be developed by the Owners Representative.

C. The Contractor is directed to utilize materials from utility or other excavation activities as compacted site backfill material, if possible, prior to ground improvement options. As per the Draft Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP) and Soil Management Plan (provided as **Attachments** to this Request for Proposal), this shall apply to soils where polychlorinated biphenyls (PCB) concentrations are <1 milligrams per kilogram (mg/kg), and all reuse of soils on site shall be reviewed and approved by the Licensed Site Professional of Record.

1.2 RELATED SECTIONS

A. Requirements relative to sediment dewatering and stockpiling.

B. Additional requirements relative excavation, backfilling and fill materials are specified in Section 02 20 00, Earthwork.

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D5434 (2010) Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 302
40 CFR 761
29 CFR 1910.120

Designation, Reportable Quantities, and Notification

POLYCHLORINATED BIPHENYLS (PCBs) MANUFACTURING, PROCESSING, DISTRIBUTION IN COMMERCE, AND USE PROHIBITIONS

Occupational Safety and Health Standards, Hazardous Waste Operations and Emergency Response

CODE OF MASSACOUSETTS REGULATIONS (CMR)

310 CMR 40.0000 Massachusetts Contingency Plan

B. Compliance with PCB regulations at 40 CFR Part 761 shall be required during all phases of work involving PCB-contaminated soils and/or sediments, including, but not limited to:

1. 40 CFR 761, Subpart C - Marking of PCBs and PCB Items
2. 40 CFR 761.65 - Storage for Disposal
3. 40 CFR 761.79 - Decontamination Standards and Procedures
4. 40 CFR 761.180 - Records and Monitoring
5. 40 CFR 761, Subpart K - PCB Waste Disposal Records and Reports
6. Draft Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP)
7. Soil Management Plan

*The Draft RAM/SIP and Soil Management Plan are provided as **Attachments** to this Request for Proposal.

1.4 SUBMITTALS

A. Excavation and Handling Work Plan: The Contractor shall submit to the Owner's Representative an Excavation and Handling Work Plan that will include the following:

1. Documentation that the Contractor will utilize appropriately trained staff to excavate potentially contaminated materials if encountered on site and that the staff is informed of procedures to be followed to protect the Health and Safety of all on-site workers as it relates to possible contaminated materials to be handled. Documentation must show that workers involved in these activities have completed Health and Safety Training per Hazardous Waste Operations and Emergency Response (HAZWOPER) Regulation 29 CFR 1926.65, and

Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1910.120, as appropriate. The Contractor is entirely responsible for the Health and Safety of their own employees and subcontractors.

2. Locations and methods, including drainage, for on-site stockpiling of excavated potentially contaminated soils as specified in this Section. Describe methods to keep different classifications of material segregated during processing operations.
3. Procedure for decontamination of tools and equipment.
4. Methodology for on-site soil tracking, including methodology to ensure cross contamination does not occur.

1.5 RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor is responsible for adhering to regulations, Specifications, and recognized standard practices related to the management of contaminated and potentially contaminated material during excavation and re-use activities. The Owner and Owner's Representative will not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers, passersby or any others.

B. The Owner will not be held negligent or liable for any inadequacies or deficiencies in the Contractor's site-specific worker Health and Safety Plan or for any oversight or inadequacies in the Contractor's implementation of the Health and Safety Plan.

C. Provide labor, materials and equipment necessary to complete the work including:

1. Excavation, backfilling, on-site transportation, stockpiling, and maintenance of excavated material.
2. The Contractor is responsible for all construction, protection and maintenance of soil stockpiles from excavation through chemical testing and on-site re-use. Contractor shall stockpile material only in areas designated by the Owner.
3. The Contractor is responsible for providing all documentation to track potentially contaminated material from the time of excavation until it is re-used onsite.
4. The Contractor shall backfill excavations with suitable materials in accordance with Section 02 20 00, Earthwork, to the limits and elevations shown on the Contract Drawings.

1.6 REGULATORY REQUIREMENTS

A. Permits and Licenses

1. The Contractor shall obtain required federal, state, and local permits for excavation and storage of contaminated material. Permits shall be obtained at no additional cost to the Owner.
2. During removal and reuse of site materials, the Owner's Representative may identify material that is unsuitable for reuse due to geotechnical reasons (i.e., "geotechnically unsuitable, or because the material is excess and cannot be reused at the site. That material shall be separated from other stockpiled material

(but shall not be removed physically from the site), and be assumed by the Contractor to be hazardous, until and unless analytical results indicate otherwise. The Owner's Representative shall prepare and submit a Sampling and Analysis Plan to EPA for their approval and then shall collect sufficient samples (if required) to fully characterize this material, before the Owner's Representative shall develop a plan to reuse or dispose of the material. If PCB concentrations in the soils are determined to be greater than 1 mg/kg, but less than 50 mg/kg, EPA approval shall be required prior to disposal of these soils offsite. The Contractor shall not dispose of this material offsite until such time as the material has been fully characterized in compliance with EPA regulations and EPA approval has been received; notwithstanding these characterization requirements by EPA, the Contractor shall comply with 40 CFR 761.65(a)(9) and shall not allow PCB containing soil stockpiled onsite to remain onsite for longer than 180 days. If the concentration of PCBs in these soils is greater than or equal to 50 mg/kg, the soils will need to be disposed of in accordance with 40 CFR 761.61(c). The Contractor shall take into account the possible length of time associated with the Owner's Representative completing this task when situating the stockpile associated with the geotechnically unsuitable or excess material. Delays in the Contractor's operations associated with time needed to complete these tasks shall not be a basis of any change in the cost of the work or a change in the Contract Time for the work. Costs for characterization and preparation of the Sampling and Analysis Plan will be borne by the Owner. Additional details are included within the Draft RAM/SIP and Soil Management Plan, which are provided as **Attachments** to this Request for Proposal.

1.7 SCHEDULING

A. The Contractor shall notify the Owner's Representative prior to the start of excavation of contaminated material.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIAL

A. Approved backfill materials are specified in Section 02 20 00, Earthwork, and shall be placed to the limits and elevations as shown on the Contract Drawings.

2.2 SPILL RESPONSE MATERIALS

A. The Contractor shall provide spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials/wastes are being handled or transported. Appropriate spill response materials shall be available at all times to respond to a leak of fuel or other hazardous material from Contractor's vehicles or other mechanical devices. Spill response materials shall be compatible with the type of materials and contaminants being handled.

2.3 POLYETHYLENE BARRIER

A. Polyethylene barrier for use in protecting stockpiles from spreading contamination or for protecting truck bodies shall be minimum 6-mil (0.006 inches) thick. At least two (2) layers of polyethylene shall be used beneath stockpiles of impacted materials to protect the ground surface. At least one (1) layer of black, 6-mil polyethylene will be used to cover stockpiles of impacted material at all times except when modifying stockpiles. Notwithstanding these stockpile requirements (as well as the requirements of PART 3.5 of this specification), the Contractor shall ensure compliance with storage requirements for PCB impacted soil as outlined within 40 CFR 761.65(c) (9).

PART 3 - EXECUTION

3.1 EXISTING STRUCTURES AND UTILITIES

A. No excavation shall be performed until site utilities have been “field” located. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor’s operations shall be repaired at no additional cost to the Owner. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without written approval from the Owner’s Representative.

3.2 CONTAMINATED MATERIAL REMOVAL

A. Excavation

Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. A log of the materials and any visible signs of contamination encountered during excavation shall be maintained for each area of excavation. Additional details are included within the Draft RAM/SIP and Soil Management Plan.

B. Dewatering and Discharge of Dewatering Effluent

Contractor shall follow all pertinent local, State, and Federal Regulations for dewatering techniques, upland storage, and treatment of dewatering liquids.

3.3 BACKFILLING

A. As needed and if required by EPA or MassDEP, if an excavated area is determined to contain contaminated material, prior to backfilling the Contractor shall provide access to the bottom and side walls of excavations for pre-subgrade and side walls. Results shall be made available to the Contractor 14 days after sample collection. Backfilling may not commence prior to written approval of the Owner’s Representative based on confirmatory sample test data.

B. It is the Contractor's Responsibility to protect the subgrade prior to backfilling. Additional excavation and backfilling requirements are specified in Section 02 20 00, Earthwork.

3.4 SOIL TRACKING

A. For upland soils identified as exhibiting olfactory or visual evidence of potential contamination or identified in the Draft RAM/SIP, or containing >1 mg/kg of PCBs, provide soil tracking system to track all excavated soils between excavation and final disposition.

1. A soil tracking system shall include identification of the source of material (area, depth, date of excavation, etc.). The system shall be designed by the Contractor and shall be submitted to the Owner's Representative for review and acceptance. The system should include daily log sheets for tracking all soils from excavation through final disposition.
2. Provide to the Owner's Representative on a daily basis, copies of field records documenting the location of stockpiled material, and stockpile identification data. This documentation shall be provided on a daily basis when stockpiles are present on-site.

3.5 CONTAMINATED MATERIAL STORAGE

A. The Contractor is responsible for the construction, protection and maintenance of temporary stockpiles and through the final re-use of those stockpiles by the Contractor.

1. Stockpile areas will be graded such that storm water runoff is diverted from stockpiled soils: berms (i.e., hay bales, silt fencing, gravel) as specified in the Contract Drawings will be placed around the perimeter of the area to prevent contact of runoff with contaminated soils.
2. The area will be blocked off to minimize worker and passersby contact with stockpiled soils. The area will be visibly marked with appropriate warning signs of potential hazards.
3. For soils identified by the Owner as contaminated, or for potentially contaminated soils, the first lift of stockpiled soil materials will be placed on a minimum of two layers of 6-mil-thick (0.006") or one layer of 20-mil-thick (0.020") polyethylene barrier.
4. The size of the individual stockpiles will be limited such that no individual stockpile is larger than 500 cubic yards. Total dimensions and locations of the stockpile areas will be at the discretion and approval of the Owner's Representative.

B. The transfer of soil materials from the excavation to the stockpile areas will be conducted by the Contractor in such a manner as to prevent the spread of contaminated or potentially contaminated materials across the site and to minimize the mixing of soils from different areas of the excavation in different stockpiles.

C. The Contractor will place stockpiled soils within a designated stockpile area, graded to shed water, and shall cover the stockpiled soils prior to inclement weather and at the end of each work day with a minimum 6-mil-thick (0.006") black polyethylene cover overlapped and weighted to form a continuous waterproof barrier over the soil. The cover will be maintained by the Contractor throughout the stockpile period to prevent water from entering the soils and to prevent blowing dust. The cover will be suitably weighted to prevent the soil from being exposed by wind.

D. Excavation and soil handling will be performed in a manner which limits mixing of soils with different levels and types of contamination to the highest degree possible. Final disposition of soil which is contaminated as a result of the Contractor's careless or unauthorized procedures for excavation or soil handling and stockpiling will be at their own expense. All stockpiles will be located within the Project limits.

E. Water-tight roll-off units may be used to temporarily store contaminated material. An impermeable cover shall be placed over the units to prevent precipitation from contacting the stored material.

F. For soil to be disposed of by others, the soil may not be stockpiled longer than allowed by federal, state or local law or regulations.

G. The Contractor is responsible for the construction, protection and maintenance of temporary stockpiles. Stockpiles shall not contain solid waste material.

3.6 SPILLS

A. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), or a Release of oil or hazardous material as defined under 310 CMR 40.0000 (Massachusetts Contingency Plan or MCP) the Contractor shall notify the Owner’s Representative immediately. If the spill exceeds the reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting and containment. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the Owner’s Representative, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Owner or the Owner’s Representative.

3.7 DISPOSAL REQUIREMENTS

A. This work shall consist of the transport and disposal of impacted soil and miscellaneous materials (including but not limited to PPE, wooden stakes, used polyethylene sheeting, and/or rinsate generated during the project, etc.) as required to be disposed of in compliance with the Draft RAM/SIP, Soil Management Plan, and in accordance with the conditions of the USEPA PCB Cleanup and Disposal Approval under 40 CFR §§ 761.61(a) and (c) letter, which is provided as an **Attachment** to this

Request for Proposal. (If not available by date of proposal, this approval letter will be provided via an Addendum.)

B. With respect to miscellaneous materials that come in contact with soils containing PCBs >1 mg/kg, these materials shall be disposed of with contaminated soil only after consultation with the Owner's Licensed Site Professional.

END OF SECTION

Section 02 20 00

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work covered by this specification consists of furnishing all plant, labor, equipment and materials and performing all operations in connection with clearing, grubbing, pulling of stumps, excavation, subgrade preparation and placement and compaction of fill materials required for site development.

B. In addition to regular and typical dust suppression procedures, the Contractor is advised that dust suppression is paramount, and the Owner will continuously monitor dust levels at various locations throughout the site to document and comply with dust level limits during construction.

C. Refer to Project Drawings for final grades.

1.2 CODES AND STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D422-63(R90)	Standard Test Method for Particle-Size Analysis of Soils
ASTM D1556-92	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557-91	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft (2700 kN-m/m))
ASTM D2216-92	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock
ASTM D2922-91	Standard Test Methods for Density of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D3017-88	Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D4318-93	Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4643-93	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method

1.3 SUBMITTALS

A. Testing of Off-Site Sources - Submit gradation and moisture-density compaction laboratory test reports on each type of off-site fill material to be used for backfilling. Perform gradation test for soil and crushed stone materials in accordance with the standards described on the Contract Drawings.

The following additional tests shall be performed on a sample of material from each off-site source from which the material is derived: VOCs, SVOCs, TPH, PCBs and total and TCLP RCRA 8 metals. Results of Contractor testing from each source of material shall be made available to the Owner's Representative for approval one week prior to its use. Off-site materials shall meet the Massachusetts (MA) Department of Environmental Protection RCS2 criteria. Contractor shall not bring material on site until approval is given.

B. Product Data Sheets for Geosynthetic Products – Submit data sheets from the product manufacturer for each type of geosynthetic to be used during construction.

C. Contractor shall note the characterization procedure for geotechnically unsuitable material contained in Section 02 11 10, Excavation and Handling of Contaminated Material, PART 1.5.

D. Earthwork Operation and Sequence Plan

1. Submit an Earthwork Operation and Sequence Plan outlining types of equipment, daily volumes, and grading, excavation, subgrade preparation, proof compacting, backfilling, and compaction sequence to the Owner's Representative for review at least 10 working days prior to commencement of construction. The Earthwork Operation and Sequence Plan shall be coordinated with the work of other trades as necessary to complete the earthwork. Owner will not allow the work to start without a satisfactorily detailed Earthwork Operation and Sequence Plan.

1.4 DEFINITIONS

A. SOURCE shall mean those areas from which any material brought to the site is derived. All material brought to the site shall be certified in writing as clean and free from environmental contaminants. The sources and test results shall meet with the approval of the Owner's Representative before any material is delivered to the project. The following tests shall be performed on a sample of material from each source from which the material is derived: Sieve Analysis, VOCs, SVOCs, TPH, PCBs and total and TCLP RCRA 8 metals.

B. UPPER EXISTING MATERIAL shall mean existing fill material on site.

C. ORGANIC MATERIAL shall mean fibrous mats of roots, decaying vegetation, organic silt, peat, garbage and sanitary wastes.

D. UNSTABLE MATERIAL shall mean organic debris, frozen materials, topsoil, and organic silts.

E. SUITABLE CONSTRUCTION DEBRIS shall mean on-site concrete, brick, or asphalt debris, processed to be less than 6 inches in size that is suitable for compaction when mixed with granular material.

F. UNSUITABLE CONSTRUCTION DEBRIS shall mean on-site organic debris such as wood, stumps, organic material, roofing debris, or other miscellaneous debris that is unsuitable for compaction when mixed with granular material.

G. TRENCH AND CULVERT EXCAVATION shall consist of the excavation of all culverts, utility trenches, infiltration trenches, pipelines, and other minor structures including but not limited to leaching basins, catch basins, field inlets, manholes and drop inlets.

H. Refer to Part 2 – PRODUCTS of this specification for additional definitions of soil fill materials.

1.5 RELATED WORK SPECIFIED ELSEWHERE

A. Additional requirements relative to site preparation are specified in Section 02 11 00, Clearing and Grubbing.

B. Additional requirements relative to erosion control and prevention of sedimentation are contained in Section 01 35 50, Environmental Protection.

C. Additional requirements relative to on-site soils are contained in Section 02 11 10, Excavation and Handling of Contaminated Material.

D. Additional requirements relative to placement and compaction of backfill materials around utilities are contained in Section 02 22 20, Excavation, Trenching, and Backfilling for Utility Systems.

1.6 PREPARATION

A. Examine the site thoroughly and determine the existing conditions and difficulty of work to be performed.

B. Before commencing earthwork operations, determine that preparatory work has been completed.

C. Perform field surveys required to accomplish the work.

1.7 DEGREE OF COMPACTION

A. Expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D1557 Modified Proctor Test.

B. Abbreviated in this Specification as a percent of laboratory maximum dry density.

1.8 FIELD QUALITY CONTROL

A. Quality control compaction testing of material placed during construction will be provided by the Owner's Representative. The Owner's Representative shall be notified 48 hours prior to any excavation, fill, backfill, or compaction operations.

1. Permit the Owner's Representative to observe all subgrades for each layer of fill or backfill. Additional fill or backfill shall not be placed unless the Owner's Representative has approved the subgrade and/or previous layer of fill.
2. When required or requested by the Owner's Representative, the Contractor shall provide field elevations of the compacted subgrade or fill layer.

B. Compacted materials that are below specified density shall be re-compacted at no additional expense to the Owner.

C. The Contractor shall bear the cost of removal of all unsuitable material placed without approval by the Owner's Representative that fail to conform to the specifications.

PART 2 - PRODUCTS

2.1 GRANULAR FILL

A. GRANULAR FILL shall be free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter. The gradation results of GRANULAR FILL shall classify as GW, GP, GM, SW, SP, or SM (or combinations thereof) according to USCS, with a maximum particle size of 6 inches.

2.2 DENSE GRADED AGGREGATE

A. DENSE GRADED AGGREGATE (also called out "gravel base" or "gravel borrow") shall meet the requirements specified in section M1.03.1-1 in the MA Highway Department, Standard Specifications for Highways and Bridges Manual, 2025 edition.

2.3 CRUSHED STONE

A. CRUSHED STONE (also called out "double washed stone", "screened gravel", "crushed rock") shall consist of one or the other of the following material:

1. Durable crushed rock consisting of the granular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated*, or other objectionable pieces.

   *Thin or elongated pieces are defined as follows: Thin stones shall be considered to be such stones whose average width exceeds 4 times their average thickness. Elongated stones shall be considered to be such stones whose average length is in excess 4 times their average width.

2. Durable crushed gravel stone obtained by artificial crushing of cobbles, boulders, or field stone with a minimum diameter before crushing of 8 inches.
3. The crushed stone shall be reasonably free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.
4. Crushed stone shall be uniformly blended according to the following grading requirements: SEE CONTRACT DRAWINGS.

2.4 OFF-SITE TOPSOIL

A. Topsoil shall be free from refuse or any material toxic to plant growth. Topsoil shall also be free from subsoil, woody vegetation, stumps, roots, brush, stones, clay lumps, or similar objects larger than 2 inches in greatest dimension except in lawn areas where maximum size shall be 1 inch. The soluble salt contents of the soil shall be between 750 to 1,500 parts per million (ppm) as determined by conductivity measurements. The soil shall be considered acceptable if the conductivity measurement is between 0.5 and 1.0 milli-mhos/centimeter for a 1:2 soil/water ratio. Topsoil shall be free from invasive plant species. Topsoil shall meet the following requirements unless otherwise specifically stated on the plans or proposal:

   The pH of the material shall be between 5.5 and 7.0.

   The organic content shall be not less than 3% nor more than 20%.

2.5 FLOWABLE FILL

A. Flowable Fill shall meet the requirements for Controlled Low Strength Material as specified in section M4.08.0 in the MA Highway Department, Standard Specifications for Highways and Bridges Manual, 2025 Edition.

2.6 GEOSYNTHETICS

A. Non-woven filter fabric shall be Mirafi 140N or approved equal, as specified on the Drawings.

B. Woven filter fabric shall be ACF M200(US Equivalent US 1540) or approved equal, as specified on the Drawings.

C. Geogrid at the base of the heavy lift shall be Tensar Interax NXF Filtergrid or approved equal, as specified on the Drawings

D. Geogrid in the middle of the heavy lift shall be Tensar Interax NXF Geogrid or approved equal, as specified on the Drawings.

PART 3 - EXECUTION

3.1 PROTECTION

A. Contact all utility companies and property owners which might have installations in the area to determine location of all utilities and structures.

B. Locate and mark existing drainage culvert located within the drainage easement shown on the Contract Drawings. Locate and mark the existing electrical conduit shown on the Contract Drawings. Protect above and below grade utilities which are to remain.

C. Protect plant life, trees, lawns, and other features remaining as a portion of final landscaping.

D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

E. Implement temporary erosion control measures such as silt fencing, hay bales, sediment traps, etc. as required to minimize the effects of erosion and sedimentation in excavations. Refer to Section 01 35 50, Environmental Protection, for additional requirements.

3.2 GRUBBING

A. Pull all stumps within the site boundary. All stumps shall be removed to a minimum of 2 feet below the existing ground surface.

B. Detailed requirements for clearing, grubbing, and disposal of stumps are contained in Section 02 11 00, Clearing and Grubbing.

3.3 EXCAVATIONS

A. Work shall be scheduled so the deepest elements are completed first when undermining of shallower elements could occur.

B. Excavation cut shall be sloped sufficiently to prevent material from sliding into the excavation and to comply with local, state, and Federal codes and regulations. Sheeting and bracing shall be placed as dictated by conditions.

C. The bottom of excavations shall be protected from frost action and surface drainage. Frozen material shall be removed and replaced with granular fill or concrete. Protect

excavation bottoms against freezing when the atmospheric temperature is less than 35 degrees F.

D. All rock surfaces shall be level and cleaned of loose materials.

E. Slope side of excavations to comply with OSHA requirements and local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions, stability of material excavated, or where shoring and bracing is more economical than sloping. Shoring and bracing shall be designed by a Professional Engineer, Registered in the Commonwealth of MA. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

F. If requested by the Owner's Representative, the Contractor shall place a 12- to 18-inch layer of Granular Fill or 6 inches of crushed stone and a layer of non-woven filter fabric over the natural underlying soil to stabilize areas which may become disturbed.

3.4 DISPOSAL

A. Remove all unsuitable and organic materials (as determined by the Owner's Representative) from the property and dispose of offsite as required by local, State, and Federal codes, rules and regulations. Remove existing foundations, demolition debris, abandoned utility piping, slabs, pavements, and other debris encountered in areas of construction. Dispose of excess or unsuitable material as part of the Contract price.

3.5 DRAINAGE

A. Direct surface water away from excavations, existing buildings, roadways and construction sites to prevent erosion and undermining adjacent structures.

B. Provide diversion ditches, dikes and grading and maintain as required during construction.

C. Protect excavated slopes and backfill surfaces to prevent erosion and sloughing.

D. Perform excavation so that the site and the area immediately surrounding the site shall be continually and effectively drained.

3.6 DUST SUPPRESSION

A. Owner's Representative shall determine if dust generated at the site is significant enough to require dust suppression.

B. Dust suppression shall require application of water by Contractor, notwithstanding requirements of the Draft Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP) and the Soil Management Plan (provided as **Attachments** to this Request for Proposal) and the erosion and sedimentation requirements identified in Section 31 25 00, Erosion and Sedimentation Controls. Contractor shall at all times

keep machinery, and a sufficient supply of water onsite to suppress dust generated at the site, as necessary.

C. Contractor shall suppress dust as necessary throughout construction, and until vegetation or other surface treatments have been established, if necessary.

D. Uniformly apply water to surface, subgrade or layer of soil material requiring dust suppression.

3.7 SITE SUBGRADE PREPARATION

A. Proof Rolling

1. Clear and grub wood and brush vegetation in accordance with Specification Section 02 11 00, Excavation and Handling of Contaminated Material.
2. Any soft or weak spots that are identified during the proof rolling process shall be overexcavated and replaced with compacted "Granular Fill" placed in accordance with Paragraphs 3.8 and 3.9 (below).

3.8 COMPACTION

A. Heavily surface compact subgrade with a minimum of 6 passes of a vibratory roller having a drum weight of at least 10,000 pounds and a dynamic force of at least 20,000 pounds prior to placing fill.

B. Soft areas shall be excavated and filled with compacted granular fill.

C. Subgrade shall be uniform throughout. There shall not be hard spots or soft spots.

D. Prevent free water from appearing on surface during or subsequent to compaction operations.

E. Soil material too wet to permit compaction to specified density shall be excavated and spread for drainage and air drying or shall be scarified in-place and air dried. All temporarily excavated material shall be placed on-site and compacted after it has been dried to a workable moisture content.

3.9 FILLING AND BACKFILLING

A. Fill material placement shall begin after approval of the subgrade by the Owner's Representative.

B. Place "Suitable Native Material" or "Granular Fill" as backfill.

C. Place satisfactory materials in horizontal layers not exceeding 12 inches in loose thickness where self-propelled or towed mechanical compaction equipment is used, or 9-inch loose lift thickness when hand-operated compactors are used.

D. Place and compact fill and backfill to indicated finish grade within a tolerance of 1 foot horizontally and 1 inch vertically.

E. Do not place successive layers of earth fill material until the compaction requirements of the previous layer have been met and have been documented.

F. Maintain positive drainage on the surface of unfinished earth fills. Blade the unfinished surfaces smooth to a crown at the conclusion of each day's work.

G. Uniformly grade the finished earth fill surfaces such that they are smooth, compacted, and free from irregular surface changes.

H. Unless otherwise noted compact all fill and backfill material to a minimum of 95 percent of the maximum dry density, within 3 percent of the option moisture content per ASTM D1557 Modified Proctor, and to a firm, stable, and non-yielding condition.

I. Moisture control:

1. Where subgrade or layer of soil material must be moisture-conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material as needed to obtain optimum moisture content.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density and moisture requirements.

J. The Contractor shall use extra care when compacting adjacent to walls. Where walls are buried on both sides, backfill and compaction shall proceed on both sides of the wall so that the difference in top of fill level on either side of the wall shall not exceed 2 feet at any stage of construction. Where backfill of a buried wall is only on one side, only hand-operated roller or plate compactor shall be used within a lateral distance of 5 feet of back of wall.

K. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

L. The Contractor shall not place a layer of compacted fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Owner.

M. Once the Contractor has completed filling to subgrade elevation in accordance with Contract Drawings, and prior to placement of Dense Graded Aggregate, the Contractor shall provide an as-built survey (stamped by a MA Professional Land Surveyor [MA PLS]) of the sub-grade surface. The as-built plan shall be based on spot grades obtained on a grid spacing no greater than 50 feet x 50 feet and shall show said spot grades and topographical lines.

3.10 HEAVY LIFT SECTION PLACEMENT, SPREADING, AND COMPACTION

A. Spread Tensar Interax NXF Filtergrid or approved equivalent over prepared subgrade. Before fully unrolling the geogrid, anchor the beginning of the roll to the underlying surface in the center and at the corners of the roll's edge.

B. Unroll the geogrid. Align it and pull it taut to remove wrinkles and lay down slack with hand tension, then secure it in place. Overlap a minimum of 2 feet at roll ends.

C. Spread first lift of Dense Graded Aggregate over geogrid or geofabric.

D. Compact to a dry density of not less than 95 percent of the maximum density as determined by the Modified Proctor ASTM D1557, unless otherwise noted. Alternate blading and rolling will be required to obtain a smooth, even, and uniformly compacted course.

E. Repeat Part A and B with the placement Tensar Interax NXF geogrid or approved equal. Then, repeat Part C and D with the second lift of Dense Graded Aggregate.

F. The final surface compaction shall be with a smooth wheeled power roller to obtain a firm and smooth surface finish.

G. Level and contour surfaces to elevation and gradients indicated.

H. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

I. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

J. Once the Contractor has completed installation and compaction of dense grade aggregate to the final elevation in accordance with Contract Drawings, the Contractor shall provide an as-built survey (stamped by a MA PLS) of the final grade surface. The as-built plan shall be based on spot grades obtained on a grid spacing no greater than 50 feet x 50 feet and shall show said spot grades and topographical lines.

3.11 MAINTENANCE

A. Protect newly graded areas from traffic and erosion and keep them free of trash and debris. Repair and reestablish grades in settled, eroded and rutted areas to specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, remove to sound material, reshape and compact to required density prior to further construction.

3.12 EROSION CONTROL

A. Protect disturbed areas from erosion.

3.13 DAMAGE

A. Any damage resulting from excavation, backfill and compaction shall be repaired by the Contractor to the satisfaction of the Owner's Representative and at the Contractor's expense.

END OF SECTION

SECTION 02 22 20

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavating trenches for buried utilities.

B. Backfilling and compaction of trenches.

1.2 RELATED SECTIONS

A. Additional requirements for earthwork activities are specified in Section 02 20 00, Earthwork.

1.3 CODES AND STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D422-63(R90)	Standard Test Method for Particle-Size Analysis of Soils
ASTM D1557-91	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft (2700 kN-m/m))
ASTM D2922-91	Standard Test Methods for Density of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D3017-88	Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

1.4 DEFINITIONS

A. Degree of Compaction:

1. Expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D1557.
2. Abbreviated in this Section as a percent of laboratory maximum density.

1.5 SUBMITTALS

A. Soil Compaction Results: Submit results of the soil backfill compaction tests conducted by an independent testing firm as required.

1.6 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. Protect and support existing structures and utilities where adjacent excavation is likely to cause damage or settlement.

B. Immediately report to Owner's Representative any sewers, water lines, electric power, telephone conduits or cables, or any other utility lines not indicated on the drawings that are encountered during excavation.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Bedding and backfill material above the installed utility shall meet the requirements of Crushed Stone, Dense Graded Aggregate, or Granular Fill as specified in Section 02 20 00, Earthwork, and on the Contract Drawings, unless approved otherwise by Owner's Representative.

2.2 PLASTIC MARKING TAPE

A. Plastic Marking Tape:

1. Acid and alkali-resistant polyethylene film.
2. Provide tape type specifically manufactured for marking and locating underground utilities.
3. Provide tape with the metallic core encased in a protective jacket or with other means to protect it from corrosion.

PART 3 - EXECUTION

3.1 EXCAVATION

A. General:

1. Perform work in accordance with OSHA requirements.
2. Perform excavation of trenches to the lines and grades indicated on drawings.
3. During excavation, stockpile material satisfactory of backfilling in an orderly manner at a distance no closer than 2 feet.
4. Provide grading that will prevent surface water from flowing into the excavation.
5. Remove water accumulating in the excavation as necessary to maintain the stability of the bottom and sides of the excavation.
6. Place and compact backfill material in unauthorized over-excavations in accordance with Section 02 20 00, Earthwork.

B. Trench Excavation:

1. Trench width and profile below the top of the buried commodity:
   a. Conform to the buried commodity manufacturer's recommendations.
   b. Where manufacturer recommendations are not available, follow the guidelines on the Project Drawings.
2. Give special attention to trench side slopes that may be adversely affected by weather or moisture content.

C. Bottom Preparation:

1. Accurately grade the bottoms of trenches to provide uniform bearing and support of the bottom quadrant of each section of the pipe.
2. Excavate bell holes to the required size at each joint or coupling to eliminate point bearing.
3. Remove stones of 3 inches or greater in any dimension or as recommended by the pipe or cable manufacturer, whichever is smaller, to avoid point bearing.

D. Removal of Unyielding Material: Where unyielding material is encountered in the bottom of the trench, remove material at least 4 inches below the required grade and replace with suitable materials as directed by the Owners Representative.

E. Removal of Unsuitable Construction Debris and Unstable Material: Where unsuitable construction debris or unstable material, as specified in Section 02 20 00, Earthwork, is encountered in the bottom of the trench, remove material to the directed depth and replace to the proper grade with approved backfill material as directed by the Owners Representative.

3.2 BEDDING AND BACKFILL

A. Bedding

1. Place approved backfill material in maximum 12-inch loose layers (depending on equipment used) and mechanically compact to not less than the 95 percent laboratory maximum density (ASTM D1557) if within 15 feet of the heavy lift area, and to not less than 90 percent laboratory maximum density if more than 15 feet from the heavy lift area. Compact within 3 percent of the optimum moisture content per ASTM D1557. Besides meeting the compaction and moisture content requirements, each lift or backfill shall be compacted to a firm, stable, and non-yielding condition.
2. Minimum final compacted thickness: 4 inches.

B. Backfill

1. Place approved backfill material around and to a depth 1/2 of the diameter of the pipe.

2. Spread material uniformly along each side of the pipe in loose layers not exceeding 6 inches and compacted to not less than the 95 percent laboratory maximum density if within 15 feet of the heavy lift area, and to not less than 90 percent laboratory maximum density if more than 15 feet from the heavy lift area.

3.3 PLASTIC MARKING TAPE

A. Install plastic marking tape directly above the top of pipe.

3.4 TESTING AND INSPECTION

A. Visually inspect pipe joints for displacement or improper fit of the gasket material.

B. Follow pipe and gasket manufacturer's recommendations for rejection due to non-watertightness of the joint.

C. Remove and re-install defective sections of the pipe with rejected joints.

D. The Contractor shall contact the Owner's Representative when the pipe bedding is prepared. The Contractor shall grant the Owner's Representative 12 hours to conduct testing to determine the relative degree of compaction of trench backfill materials. The Owner's Representative will conduct soil density tests to determine the relative degree of compaction for pipe bedding and trench backfill materials. Contractor shall re-compact any soil that does not meet the minimum soil density. Soil density testing frequency will, at a minimum, be as follows:

1. One test each 100 linear feet of trench backfill placed and compacted or one test for each 250 cubic yards of trench backfill placed and compacted.
2. Not less than one test for each shift.
3. Additional testing may be conducted at the Owner's Representative's discretion.

3.5 PROTECTION FROM EROSION

A. Implement temporary erosion control measures (i.e., silt fencing, hay bale sediment traps, etc.) to minimize the effects of erosion and sedimentation.

B. Utility trenches should be protected from stormwater run-on during construction activities.

C. Utility trenches, particularly drainage and infiltration trenches shall be protected during all construction activities. Trenches shall be protected from construction vehicle traffic, run-on, sedimentation and stormwater infiltration until the project has been accepted by the Owner. Any sedimentation or impact from any of these activities shall be remedied by the Contractor at no expense to the Owner. No dewatering discharge shall be allowed to be directed into the infiltration trenches.

END OF SECTION

SECTION 02 26 00

GEOSYNTHETICS

PART 1 - GENERAL

1.1 SCOPE

The following describes parameters for the manufacture, supply, and installation of geosynthetics.

1.2 DEFINITIONS

Geosynthetics herein refer to both filter fabric and geogrid. Filter fabric consists of non-woven and woven materials which are generally used for separation purposes. Geogrid for this project consists of Tensar Interax geogrid and Tensar Interax Filtergrid as noted on the Contract Drawings, which is a geogrid with sewn filter fabric for both stabilization and separation.

1.3 QUALIFICATIONS

The geosynthetic manufacturer shall have successfully manufactured 5,000,000 square feet of geosynthetic product.

1.4 SUBMITTALS

The Contractor shall provide the following information to the Owner's Representative:

A. Method of Placement Plan

B. List of material properties

C. Quality control certificate for the filter fabric, upon request

PART 2 - PRODUCTS AND MATERIAL SPECIFICATIONS

2.1 MATERIALS

A. Filter Fabric

Non-woven filter fabric as identified on the Contract Drawings or approved equal and shall meet the criteria of Paragraph 2.3. Woven filter fabric shall be ACF M200 (US Equivalent US 1540) or approved equal and shall meet the criteria of Paragraph 2.3.

B. Geogrid

Geogrid as identified on the Contract Drawings or approved equal and shall meet the criteria of Paragraph 2.4.

2.2 MANUFACTURER'S QUALITY CONTROL TESTING

The filter fabric shall be tested by its manufacturer once every 100,000 square feet except for AOS and permittivity, which shall be tested once every 500,000 square feet and UV stability, which shall be per manufacturer historical data.

Any rolls not meeting the requirements of the specification shall be rejected. The manufacturer shall prepare a quality control report to be submitted to the Owner's Representative upon request.

2.3 ADDITIONAL GEOSYNTHETIC CRITERIA

A. The filter fabric shall meet the minimum physical requirements listed in Table 3 of these Specifications. Consultation with the manufacturer is recommended.

B. The filter fabric must be permitted to function properly by allowing relief of hydrostatic pressure; therefore, fine soil particles shall not be allowed to clog the filter fabric.

C. The filter fabric shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The edges of the filter fabric shall be finished to prevent the outer fiber from pulling away from the filter fabric.

D. The geogrid shall be manufactured from a coextruded, composite polymer sheet.

E. The Contractor shall furnish the Owner's Representative, in duplicate, manufacturer's certified test results for all geosynthetics showing actual test values obtained when the physical properties are tested for compliance with the specifications.

F. During all periods of shipment and storage, all geosynthetics shall be protected from direct sunlight, ultraviolet rays and temperatures greater than 140 degrees Fahrenheit. To the extent possible, the geosynthetics shall be maintained wrapped in its protective covering. The geosynthetics shall not be exposed to sunlight, ultraviolet rays until the installation process begins.

Table 3

Physical Requirements

Physical Property	Test Procedure	Minimum Value
Grab Tensile Strength (Unaged Filter Fabric)	ASTM D4632	120 lbs. (in any principal direction)
Breaking Elongation (Unaged Filter Fabric)	ASTM D4632	50% max. (in any principal direction)
Burst Strength	ASTM D3786	400 p.s.i
Puncture Strength	ASTM D4833	115 lbs.
A.O.S., U.S. Std. Sieve	ASTM D4751	see Design Manual
% Open Area	CWO-22125-86	See Design Manual
Permittivity	ASTM D4491	See Design Manual

G. Final acceptance of the filtration filter fabric by the Owner's Representative shall be dependent upon the filter fabric performance when tested in accordance with ASTM D5101, Standard Test Method for Measuring the Soil-Geotextile System Clogging by the Gradient Ratio test or the Hydraulic Conductivity Ratio test. Soil characteristics such as grain size distribution and plasticity shall be determined for every 200,000 square feet of filter fabric installed or for each source of borrow material used during construction. Significant differences in soil characteristics shall require further performance testing by either the Gradient Ratio or the Hydraulic Conductivity Ratio tests at the discretion of the Owner's Representative. The locations for which the material to be tested are extracted and shall be approved by the Owner's Representative. The Contractor shall provide the site-specific soil and modified proctor curves for the site-soil, at their own expense, to the manufacturer. Also, the Contractor shall be responsible for the performance of the test by a certified independent laboratory experienced in performing such test. The test shall be performed under the actual field soil conditions or as otherwise required by the Owner's Representative.

H. At the time of installation, geosynthetics shall be rejected if it has been removed from its protective cover for over 72 hours or has defects, tears, punctures, flow deterioration, or damage incurred during manufacture, transportation or storage. With the acceptance of the Owner's Representative, placing a geosynthetic patch over the damaged area prior to fill placement shall repair a torn or punctured section of the geosynthetic. The patch shall be large enough to overlap a minimum of 3 feet in all directions.

I. In the event pre-assembled panels of fabric are required, the panels of filter fabric shall be sewn together at the manufacturer or another approved location.

PART 3 - EXECUTION AND FILTER FABRIC INSTALLATION

3.1 TRANSPORTATION AND ON-SITE STORAGE

The geosynthetic rolls shall be wrapped in a plastic cover. The rolls shall be shipped to the job site in a manner not to damage the rolls.

3.2 METHOD OF PLACEMENT

The Contractor shall submit to the Owner's Representative a plan describing a suitable method of placement for geosynthetics. The subgrade shall be free of foreign and organic material, sharp objects, or debris of any kind, which could potentially damage the geosynthetic. On side slopes, the rolls shall be deployed in the general direction of the maximum slope. The deployment equipment shall not damage the underlying subgrade. Geosynthetics shall be properly secured. An extra layer of geosynthetic may be required at the intersection of any two side slopes to cover the area where the panels are staggered. The Contractor shall submit a proposed method for installing and securing geosynthetic where it is placed within tidal or sub-tidal locations.

3.3 FIELD SEAMING

On slopes, the spacing of ties across the roll end shall be 6 inches. The upper geosynthetic flaps of the adjacent panels shall be heat-bonded or sewn on all sides in accordance with the project specification.

3.4 COVER MATERIAL

The geosynthetic shall be covered as soon as possible. The covering operation shall not damage the geosynthetic. The cover soil material shall be free of foreign and organic material, sharp objects, or debris of any kind, which could potentially damage the geosynthetic. No construction equipment or machinery shall operate directly on the geosynthetic. The use of lightweight machinery (i.e., generator, etc.) with low ground pressure is allowed.

3.5 REPAIRS

All panels shall be inspected for damage. Any damaged area shall be repaired by a patch of the same material. Filter fabric repair shall extend 1 foot beyond the edges of the damaged area and geogrid repair shall extend 2 feet beyond the edge of the damaged area.

END OF SECTION

SECTION 02 41 10

SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section. Refer also to the following specifications:

1. Section 02 11 00, Clearing and Grubbing
2. Section 02 20 00, Earthwork
3. Section 01 35 50, Environmental Protection

1.2 DESCRIPTION OF WORK

A. Provide all materials, equipment and labor necessary to complete the work as indicated on the drawings or as specified herein.

B. The principal work of this section includes, but may not be limited to, the following:

1. Identifying and Disconnecting Existing Utilities
2. Selective Demolition and removal of former other associated materials, building slab, building foundations if encountered.
3. Removal of existing site items such as bituminous concrete pavement and fencing
4. Dust Control

C. The Contractor shall take every precaution necessary to protect adjacent structures, pavements, etc. and shall be responsible for making all repairs/replacements as may be necessary due to damage caused by site operations, negligence, etc.

D. The Contractor shall be responsible for the removal of all materials from the site except as specifically provided; the removal of subsurface masonry as provided; the removal of paved surfaces, as provided; and entire portions of all designated storm and drainage structures to be removed; filling, the smooth grading of land within the demolition area to a safe, clean, sanitary and non-hazardous condition.

E. Install fences and safety control devices as necessary or as directed by plans, and maintain in a neat, functioning manner on a daily basis.

F. Utilize temporary access to site as directed by Owner.

G. The Contractor shall take every precaution and action necessary to protect, if necessary, adjacent structures, pavements, utilities, etc. and shall be responsible for

making all repairs/ replacements as may be necessary due to damage caused by site operations, negligence, etc.

1.3 EXISTING CONDITIONS

A. Grades and other available survey data of the site have been included in the drawings for reference only. Contractor shall be deemed to have inspected the site and satisfied themself as to actual grades and levels, and the true conditions under which the work is to be performed.

B. The Contractor shall verify dimensions and elevations on the ground and report any discrepancies immediately to the Owner. Any discrepancies not reported prior to the start of work shall not be the basis for claims for extra compensation. Adjustments shall be made at no additional cost to the Owner.

1.4 SUBSURFACE INFORMATION

A. The Owner assumes no responsibility for the Contractor's failure to examine all available subsurface information and/or failure to make their own site investigation and makes no representation regarding the character of soil and/or structures which may be encountered during the performance of the work. The Owner assumes no responsibility for unforeseen conditions on or near the site for buildings, structures or the site itself.

1.5 FINISHED GRADES

A. The words "finished grades" as used herein mean the required final grade elevations indicated on the drawings. Where not otherwise indicated, areas shall be given uniform slopes between points, for which finished grades are given, or between such points and existing grade, except that vertical curves or rounding shall be provided at abrupt changes in slope.

1.6 PROTECTION

A. All rules and regulations governing the respective utilities shall be observed in executing all work under this section. All work shall be executed in a manner as to prevent any damage to existing streets, paving, utility lines, structures, and adjoining property. Monuments and benchmarks shall be carefully maintained, and if disturbed or destroyed, replaced as directed.

B. The furnishing of all facilities and materials necessary to prevent the earth at the bottom of excavation from becoming frozen or unsuitable to receive fill materials shall be included by the Contractor.

C. The Contractor shall provide, at their own expense, adequate pumping and drainage facilities to keep the excavation sufficiently dry as not to affect adversely, the quality or time of placement of materials to be installed in the excavated areas. The drainage

of all water resulting from pumping shall be arranged so as to cause no damage to adjacent properties.

D. The Contractor shall assume full responsibilities for damages caused by them or their Subcontractor's equipment and their personnel to any adjoining properties.

E. The work of this Section shall be performed in such a manner as to cause no interference with access by Subcontractor's or Owner's personnel to all portions of the site as is necessary for the normal conduct of their work.

F. All existing vegetation outside the Limit of Work shall be protected from physical injury and from harm to roots due to chemicals, run-off of water, excessive silting, erosion, or excavation.

1.7 UTILITIES

A. Before starting demolition/site preparation, the Contractor shall confirm, in writing, that all utility cutoff work has been accomplished with verification through appropriate agencies / departments, as required.

B. No wires, conduits, pipes or other connections shall be removed until the applicable services have been disconnected as herein before described.

C. It shall be the responsibility of the Contractor to protect and preserve in operating condition, all utilities that traverse the site, protect manholes, including frames and covers, catch basins, including frames and grates, valve boxes and other appurtenances, unless otherwise noted on the plans.

D. Damage done to any utility due to work under this contract shall be repaired to the satisfaction of the Agency and the respective utility company. The Contractor shall not disturb utilities serving buildings / areas not released to the Contractor for demolition.

1.8 DEMOLITION AND REMOVAL

A. Except as otherwise shown or specified, the Contractor shall remove and properly dispose of all materials entirely whether above or below grade. All appurtenances are to be completely removed, no matter depth, or thickness, to limits established on the drawings, all subject to exceptions defined and described in subsequent sections of these specifications, and further delineated on the site drawings, which forms part of these technical specifications.

B. Hand labor shall be employed to facilitate final clearing of wood, debris, combustible materials, pipes, rods, etc.

C. Adjacent streets and other improvements shall be protected from any damage or displacement during the demolition process.

D. The Contractor shall take all procedures and precautions necessary to prevent excessive spread of dust during the demolition / site preparation procedure.

E. No blasting shall be permitted on the project site.

F. No material or debris shall be burned on the site.

G. All voids shall be backfilled with approved / required fill to obtain an elevation to conform with required subgrade or finished grade work, existing surrounding elevations adjacent to the work, filling and grading shall be performed in a manner to prevent settlement of proposed site improvements and to prevent the collection of stagnant water. All finished grading shall be performed so as to allow proper drainage away from adjacent properties.

H. The Contractor shall remove and dispose from the site, all brush, bushes, hedges, tree stumps, rubbish, trash and garbage, tires, etc., found on the site. Except as otherwise specified, all materials and debris resulting from the demolition shall also be removed from the project site.

I. All excess masonry, concrete, brick, etc., shall be removed from the site unless otherwise approved by the Owner's Representative for selective backfilling. The site shall be left in a safe, clean sanitary and non-hazardous condition upon completion.

J. The Contractor shall protect and maintain all sidewalks and streets in a safe, clean, and passable condition at all times.

K. Adequate protection of persons and property shall be provided by the Contractor at all times. The Contractor shall execute the work so as to 1) keep all standing equipment and crews off the right-of-way unless specifically authorized by the City; and 2) avoid interference with the use of or passage to and from adjoining buildings and facilities.

L. The Contractor, or a competent supervisory employee, shall be present at the site while all operations are in process.

M. The methods to be used in demolition shall not involve undue hazards or unnecessary danger to work men and women and shall be in accordance with good practices. All persons actively engaged in demolition operations on the project site shall wear required protective clothing, safety hardhat and other safety equipment as required by law.

1.9 REGULATORY REQUIREMENTS

A. Conform to all applicable codes for disposal of debris.

PART 2 - PRODUCTS

2.1 CALCIUM CHLORIDE FOR DUST CONTROL

A. Calcium chloride shall meet the requirements of Massachusetts Highway.

B. Calcium chloride shall have weights marked on the shipping containers to be used, or if directed by Owner's representative, scales shall be furnished by and at Contractor's expense to measure calcium chloride by the ton.

2.2 FILL MATERIALS

A. Refer to Section 02 20 00, Earthwork.

PART 3 - EXECUTION

3.1 IDENTIFYING EXISTING UTILITIES

A. Consult with appropriate engineering department regarding location of underground utilities prior to start of construction.

B. Disconnect, remove and cap designated utility lines within demolition areas.

C. Mark location of disconnected utilities. Provide information on "as built" drawings for Owner.

3.2 RULES, PERMITS, AND CERTIFICATES

A. The Contractor shall pay all fees, give all notices, file all necessary documents and obtain all permits and Certificates of Approval required in connection with the work of this contract. The Contractor shall comply with all laws, ordinances, rules, and regulations of the Commonwealth of Massachusetts, City of New Bedford, and all other authorities having jurisdiction over this project.

3.3 SUBSURFACE SOIL CONDITIONS

A. In the demolition operation of this work, the Contractor shall have filled, compacted and graded all voids and other openings with specified fill and removed unoccupied able debris. The Contractor is responsible for subsurface conditions being suitably compacted and stable and free of obstructions for performance of work in accordance with these contract documents. Subsurface removal of footings and slabs shall be done prior to the Contractor's method and implementation of Ground Improvements specified under Section 02 20 00, Earthwork.

3.4 PROTECTION AND COORDINATION

A. Properly protect persons and property at all times against harm or damage of any kind during all construction and operations. Provide substantial barricades around all openings as soon as they are uncovered to block access and afford protection to work men and women and the public. Provide lanterns and other signalization, as may be required by law or directed by the Owner, in the vicinity of any open excavations or other unsafe areas and be certain that such devices are operable at all times during the hours of darkness or when the work is left unattended.

B. Preserve in operating condition, any active utilities indicated on the Contract drawings to remain, which traverse the site or exist in the immediate vicinity of the site, including, but not limited to mains, sewers, manholes, catch basins, poles, etc.

C. Damage to any utility lines or related appurtenances resulting from the work under this Contract shall be repaired by and/or at the expense of the Contractor to the satisfaction of the Owner, utility company, or local authority. If any active utility lines are broken or damaged during any site improvement operations, take all necessary steps immediately, to avoid endangering persons or property.

D. Notify all utility companies, the appropriate officials and respective water and sewer departments prior to the commencement of any operations on the site. Confirm locations with all utility companies involved of all live or active utilities / water / sewer within or immediately adjacent to the Contract Limit Lines of this project.

E. Remove, plug or cap as required, any inactive and abandoned utilities or other lines if encountered, when deemed by Owner not to be of any further use to the project.

3.5 SELECTIVE DEMOLITION

A. The Contractor shall prevent movement or settlement of adjacent structures and shall shore up, brace, underpin and do whatever is necessary to protect adjacent structures.

B. Demolish indicated appurtenances in an orderly and careful manner so as to allow for minimal disturbance to adjacent areas.

C. Protect existing pavements, vegetation, appurtenances and structures that are not denoted on plan to be demolished.

D. Cease operations and notify Owner’s representative immediately if adjacent structures appear to be endangered. Do not resume operations until corrective measures have been taken.

E. Except where noted otherwise, immediately remove demolished material from site and dispose of legally off- site.

F. Relics, antiques and similar objects, as indicated by the Owner’s representative or as discovered or uncovered in the process of performing the Work of this Section, remain

the property of the Owner. Notify Owner's representative prior to removal and obtain acceptance regarding method of removal.

G. Remove and promptly dispose of contaminated, vermin-infested, or dangerous materials encountered.

H. Do not burn or bury materials on site.

I. Backfill areas excavated completely as a result of demolition.

J. Rough grade and compact areas affected by demolition to maintain site grades and contours.

K. Remove demolished materials from site as work progresses. Leave site in clean condition.

L. If any of the excavation is carried through error beyond the depth and dimensions indicated on the drawings or specified herein, or if the foundation soils are disturbed by de-watering or other construction operations, the Contractor shall, at their own expense, refill with approved gravel compacted to 95% of the maximum dry density at optimum moisture content or with concrete as determined by Owner.

M. When excavations have reached the prescribed depths, the Owner shall be notified and will make an inspection of the conditions and approve the placing of fill.

N. The Contractor shall obtain the location of all utilities within the scope of this work from the proper authorities so that there will be no damage done to such utilities.

O. All excavated materials that are not suitable for fill or backfill as specified herein, shall be removed and disposed of properly and legally off the property.

P. Any unsanitary condition encountered shall be corrected or entirely removed as directed.

3.6 STORAGE OF EXISTING SITE IMPROVEMENTS

A. Carefully remove, clean and deliver to an appropriate area all identified equipment to be stored.

3.7 DUST CONTROL

A. Provide all equipment, labor, materials and related work necessary for the prevention and control of dust resulting from operations in the performance of the work of this contract and in accordance with additional requirements specified herein. All costs in connection therewith shall be considered to be included in the various unit and/or lump sum prices bid for the various items as listed in the bid.

B. When, in the opinion of the Owner's representative, conditions at the site are such as to require dust control measures to supplement those required to be provided by the Contractor as described in the preceding paragraph, the Owner's representative may direct the Contractor to furnish and spread calcium chloride over certain areas at the site, at certain times and at specific rates of application. The calcium chloride shall be spread over the designated areas by approved mechanical devices at the rate for each area as directed at no additional cost to the Owner.

END OF SECTION

SECTION 02 41 16

SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Draft Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP), which is provided as an **Attachment** to this Request for Proposal.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of buildings and above-grade structures.
2. Disconnecting, capping or sealing, and abandoning in place and removing site utilities.
3. Offsite disposal of demolition materials.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PRE-INSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at 4 Wright Street, New Bedford, MA.

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.

3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for Dust Control.
6. Review procedures for protection of adjacent properties.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor.

B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property relative to dust, noise and asbestos. Indicate proposed locations and construction of barriers, as needed.

C. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Shutoff and capping of utility services.

D. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Submit before the Work begins.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Contractor Qualifications: Provide documentation relative to all required certifications and licenses.

1.9 FIELD CONDITIONS

A. Building to be demolished will be vacated and the use discontinued before start of the Work.

B. Buildings immediately adjacent to demolition area on abutting properties will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

1. Provide not less than 72 hour’s notice of activities that will affect operations of adjacent occupied buildings or public ways.
2. Maintain access to existing walkways, driveways, and other facilities used by occupants of adjacent buildings.

a. Do not close or obstruct walkways, driveways or public roads, or other facilities without written permission from authorities having jurisdiction.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: Present near building foundation at 18 Wright Street. Examine Draft RAM/SIP to become aware of locations where hazardous materials are present.

1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere on the Contract Documents. Immediately notify the Owner's Representative and Owner if hazardous materials are encountered.

E. On-site storage or sale of removed items or materials is not permitted.

1.10 COORDINATION

A. Arrange demolition schedule so as not to interfere with the public way and adjacent landowners.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 DEMOLITION CONTRACTOR

A. Demolition Contractor:

1. Include qualifications package for all subcontractors to be utilized for this project.

3.2 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting the building demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are the same as those indicated on Project Record Documents.

C. Engage a competent professional to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

E. Inventory and record the condition of items to be removed and salvaged.

3.3 PREPARATION

A. Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.
2. Contractor assumes responsibility for the safe packaging and transport of salvaged materials.

3.4 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

1. Arrange to shut off utilities with utility companies.
2. If removal, relocation, or abandonment of utility services will affect other properties, coordinate the demolition activities with the appropriate utility company to ensure proper notification of potentially impacted parties.
3. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
4. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.5 PROTECTION

A. Existing Facilities: Protect adjacent walkways, driveways, and public ways during demolition operations.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to authorities having jurisdiction.
   a. Provide at least 72 hour's notice to occupants of affected buildings if shutdown of service is required during changeover.

D. Temporary Protection: Erect temporary protection, such as fencing as needed to:

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
4. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
5. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
6. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to protect adjacent buildings.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.6 DEMOLITION, GENERAL

A. General: Demolish indicated building completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain fire watch during and for at least 4 hours after flame-cutting operations.
3. Maintain adequate ventilation when using cutting torches.
4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water

when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.7 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.

D. Existing Utilities: Demolish existing utilities and below-grade utility structures as noted on the Demolition Plan.

E. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures as noted.

3.8 SITE RESTORATION

A. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.9 REPAIRS

A. Promptly repair damage to adjacent property caused by demolition operations.

3.10 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and legally dispose of demolition materials offsite.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.11 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION

SECTION 02 60 50

UNDERGROUND PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide underground piping at the locations shown on the Contract Drawings and in accordance with the applicable details also included on the Contract Drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 MATERIAL HANDLING

A. Pipe, fittings, and appurtenances shall be inspected before they are lowered into trench. Interior of pipe and joint surfaces shall be thoroughly cleaned and shall be maintained clean. Open end of pipeline shall be securely plugged whenever pipe laying is not in progress.

B. Pipe and fittings which do not fit together to form a tight joint shall be rejected. Pipe and fittings shall be selected so that there will be as small a deviation as possible at joints so that the interior presents a smooth surface.

C. Pipe cutting shall be done with sharp tools using methods approved by pipe manufacturer in such a manner that it will not crack the pipe.

D. Pipeline materials shall be carefully handled. Pipe and fittings shall be unloaded with power equipment or lowered on plank ramp to ground. Pipe and fittings shall not be dropped or dumped.

E. Pipe shall be lowered into trench using backhoe, loader or other suitable means so as not to damage pipe.

3.2 LOCATION

A. The location of the centerline of the proposed pipeline will be staked in the field before utility construction begins.

B. The Contractor shall determine the location and elevation of underground utilities before commencing construction. Exploratory excavation shall be made sufficiently ahead of construction to permit revisions as required to meet the existing conditions.

The Contractor shall take precautionary measures to protect the utility lines shown on these plans and any other lines not shown.

3.3 OBSERVATION

A. All piping shall be observed in place by the Owner's Representative prior to backfilling. Any pipe buried without approval of the Owner's Representative shall be uncovered by the Contractor for observation at no expense to the Owner.

3.4 PIPELINE SEPARATION

A. Where an existing pipe crosses a trench at an elevation which conflicts with the proposed grade for the new pipeline, either the grade for the new pipeline shall be changed or the existing pipe shall be moved, as directed. The new pipeline shall have a clearance from all existing lines of not less than 6 inches unless specified otherwise. The space between the two pipes shall be solidly filled with compacted crushed stone. During construction, temporary supports shall be provided as required to maintain existing pipelines in position. Before the trench is refilled, existing pipelines shall be permanently supported.

3.5 PIPELINE FOUNDATION

A. Trenches shall be cut to specified depth limit by machinery. In select earth material, where machine excavation is stopped the specified distance above grade and another bedding material is not specified for the pipe, bed for pipe shall be formed of that material and trench bottom trimmed by hand to grade. Stones and unsuitable material shall be removed, and low spots refilled with crushed stone, as specified in Section 02 20 00, Earthwork.

B. In rock the pipe shall be bedded in crushed stone.

C. Pipe bed shall be hand shaped so that the pipe barrel is uniformly supported along its entire length. Joint holes shall be accurately located along pipe bed. Holes shall be cut sufficiently large for making joint and no larger. In no case shall pipe be laid on blocks.

D. After pipe is laid and adjusted to its final position, bed shall be repaired where disturbed by laying operation, and joint holes filled. Repairs shall be made by ramming bedding material under bottom and haunches of pipe, so pipe is supported for its full length and is tightly held in position.

3.6 SPECIAL PIPE FOUNDATIONS

A. Where required by the Contract Documents or directed by the Owner's Representative, a cradle of crushed stone, or concrete shall be provided to form a stable, firm bed of dimensions shown for full width of trench. No material greater than 1 inch in diameter shall be used in the cradle.

B. In deep trenches, initial backfill over pipe with concrete cradle shall not exceed a depth that will put excessive stress on pipe or concrete. Remaining backfill shall be placed not less than 48 hours after pipe is laid. Initial backfill shall not be placed until concrete has reached its initial set.

END OF SECTION

SECTION 02 81 00

TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS WITHIN STRUCTURES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Contractor shall properly transport and dispose of all items, including solid hazardous and nonhazardous wastes removed from the site, to appropriate disposal facilities. Contractor shall characterize all wastes prior to offsite disposal. This includes wastes designated for disposal by the Owner's Representative as well as the wastes generated by Contractor. Contractor shall be responsible, and will be held accountable, for assuring that all sampling, analysis, transportation, and disposal requirements of the receiving facility and federal, state, and local governments are complied with and properly documented.

1.2 SUBMITTALS

A. All final versions of weight slips, material shipping records, completed bills of lading, or hazardous waste manifests for material generated at the site and transported and disposed of offsite.

1.3 PERMITS AND REGULATIONS

A. Contractor shall comply with all federal, state, and local regulations regarding transportation and disposal of hazardous and nonhazardous material. These include, but are not limited to:

1. Trucks used for transportation of hazardous material for disposal off site shall be permitted pursuant to 310 CMR 30.0000.
2. Vehicle operator possession of a commercial driver's license with hazardous materials endorsement (if applicable).
3. Registration of vehicle as a hazardous waste carrier (if applicable).
4. Utilization of shipping papers, bills of lading, and/or hazardous waste manifest (40 CFR 262.20).
5. Proper marking and placarding of vehicles.
6. Placement of emergency response procedures and emergency telephone numbers in vehicle, and operator familiarity with emergency response procedures.
7. Compliance with load height and weight regulations.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All equipment supplied shall be in good working condition. Equipment and machinery delivered to the site, including haul trucks that have visible oil or hydraulic fluid leaks, will not be allowed on site until satisfactorily repaired. Contractor is responsible for the cleanup of any oil or hydraulic fluid spills at Contractor's expense.

B. Contractor shall not allow soil/sediment to be tracked off site at any time during the Project. Contractor shall wash trucks before they leave the site. Visible soil tracks on streets will not be allowed. Contractor shall take sufficient precautions to prevent loose soils from adhering to tire treads, wheel wells, etc. Any loose soil spread shall be cleaned up.

C. Contractor shall not allow fugitive dust emissions to be generated from trucks containing soil/sediment when leaving the site or at any time offsite. Contractor shall provide covers, such as a tarpaulin or other means, for the trucks to prevent the generation of dust prior to their arrival at the ultimate reuse or disposal location.

PART 3 - EXECUTION

3.1 TRANSPORTATION

A. All waste disposal facilities used by the Contractor shall be submitted to the Owner's Representative for approval. Contractor shall not use any disposal facility that does not have the Owner's Representative's approval. Prior to shipment of wastes off the site, Contractor shall confirm with the Owner's Representative by written communication from the designated Transportation, Storage, or Disposal Facility (TSDF) that it is authorized, has the capacity, and will provide or assure that the ultimate disposal method is followed for the particular hazardous waste on the manifest. Additionally, Contractor shall confirm by written communication from the designated transporter(s) that they are authorized to deliver the manifested waste to the designated TSDF or Solid Waste Management Facility (SWMF).

B. Any transported materials must be covered to prevent the loss of material and to prevent the generation of dust.

3.2 ANTI-TRACKING PAD

A. An Anti-Tracking Pad shall be constructed by the Contractor so that soil/sediment is not tracked off site. Details of the Anti-Tracking Pad are provided on the Project Drawings. The pad shall be constructed with a layer of filter fabric per Section 02 26 00, Geosynthetics, above the existing grade and a minimum 8-inch-thick layer of 3" - 6" crushed stone. The pad shall be graded so that water is directed away from the pad and the public right-of-way.

3.3 MANIFESTING AND DOCUMENTATION

A. Contractor shall complete all required manifest forms and Bill of Lading forms for proper transportation and disposal of materials off site. Contractor shall present the documents for proper signatory by the Owner. Contractor shall promptly provide Owner's Representative copies of all final bills of lading, manifests, Certificates of Disposal, and/or papers involved in shipping of material off of the site, as well as any weight tickets or receipts for delivery of materials to the site, or delivery to a disposal facility.

END OF SECTION

SECTION 03 30 10

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for concrete cast-in-place on the site.

B. The work of includes cast-in-place concrete pavement, sidewalks, bases, foundations, bollards, curb restraints, thrust blocks, and any other uses specified in the Contract Documents.

C. Refer to Concrete Specification prepared by structural engineer for building-related concrete specifications which may differ from the requirements in this section.

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 02 20 00 – Earthwork
2. Section 10 14 10 – Site Signage
3. Section 31 14 00 – Earth Stripping
4. Section 31 20 00 – Earth Moving
5. Section 32 16 13 – Curbs
6. Section 32 39 13 – Manufactured Metal Bollards

1.3 REFERENCE STANDARDS

A. References herein are made in accordance with the following abbreviations and all work under this Section shall conform to the latest editions as applicable.

<u>American Concrete Institute (ACI)</u>

ACI 301	Specifications for Structural Concrete for Building
ACI 304R	Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Curing Concrete
ACI 316R	Recommendations for Construction of Concrete Pavements and Concrete Bases

American Society for Testing and Materials (ASTM)

ASTM 185	Welded Wire Steel Fabric for Concrete Reinforcement
ASTM 615	Deformed and Plain Billot Steel Bars for Concrete Reinforcement
ASTM C31M	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C94	Ready-Mixed Concrete
ASTM C143	Slump of Portland Cement Concrete
ASTM C150	Portland Cement
ASTM C171	Sheet Materials for Curing Concrete
ASTM C231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Air Entraining Admixtures for Concrete
ASTM C309	Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494	Chemical Admixtures for Concrete
ASTM C1107	Packaged Dry, Hydraulic Cement Grout (Nonshrink)
ASTM C1116	Standard Specifications for Fiber-Reinforced Concrete and Shortcrete
ASTM D994	Preformed Expansion Joint Filler for Concrete (Bituminous Type)

Concrete Reinforcing Steel Institute (CRSI)
Manual of Standard Practice.

Americans with Disabilities Act and State Regulations

1.4 QUALITY ASSURANCE

A. Work and materials for construction of the cement concrete walks shall conform to ACI 316R. Other cast-in-place concrete shall conform to ACI 301.

B. Work, materials, and color of the wheelchair ramp paving shall conform to applicable sections of Americans with Disabilities Act (ADA) and state standards, whichever is more stringent.

C. Dimensions, locations, and details of equipment pads, anchors, supports, and similar features shown on the drawings are approximate. Manufacturer's approved shop drawings of equipment to be supported, anchored, or contained thereby shall be consulted for exact location, size and details.

D. Paving work, base course etc., shall be done only after excavation and construction work which might injure them has been completed. Damage caused during construction shall be repaired before acceptance.

E. Existing paving areas shall, if damaged or removed during course of this project, be repaired or replaced under this section of the specification at no cost to the Owner. Workmanship and materials for such repair and replacement, except as otherwise noted, shall match as closely as possible those employed in existing work.

F. Pavement, base, or sub-base shall not be placed on a muddy or frozen sub-grade.

G. Acquire cement and aggregate from one source for Work.

H. Conform to ACI 305R when concreting during hot weather.

I. Conform to ACI 306.1 when concreting during cold weather.

J. The Owner reserves the right to retain an independent testing laboratory to perform inspection and testing of paving and associated work.

1.5 ACCESSIBILTY COMPLIANCE

A. Special attention is to be given to compliance with the (ADA) and the requirements of the Massachusetts Architectural Access Board (MAAB).

1. Slopes: the cross pitch (perpendicular to travel) for walkways shall be constructed at 1.5%. No cross pitch for pedestrian pavements (walkways, sidewalks, plazas, etc.) shall be less than 1:100 (1 vertical: 100 horizontal) or exceed 1:50 (1 vertical: 50 horizontal). The longitudinal slope (parallel to travel) for pedestrian pavements shall be constructed at 4.5%. No longitudinal slope shall exceed 1:20 (1 vertical: 20 horizontal). The slope of handicapped curb cuts (ramp surfaces, flared side, etc.) shall be constructed at 7.5%. No slope of handicapped curb cuts shall exceed 1:12 maximum (1 vertical: 12 horizontal).

2. Verify slopes with a 2-foot electronic “Smart Level”. Pedestrian pavements that do not meet these requirements shall be replaced at the Contractor’s expense.

3. A 5’-0” minimum level landing area shall be constructed at 1.0% and be provided at entrances to buildings, which are at an exterior grade continuous with the interior floor grade. No landing shall exceed 1:50 (1 vertical: 50 horizontal). Puddling of water at the entrances shall not be allowed.

B. These requirements supersede the grades shown on the plans. If these requirements cannot be met with the grades shown on the plans, notify the Owner’s representative immediately for direction.

C. The location and construction of handicapped curb cuts shall be reviewed and approved by the Municipal Engineer prior to construction.

1.6 SUBMITTALS

A. Description of methods and sequence of placement for each type of specially-finished concrete, including description of methods and sequence of placement.

B. Manufacturer's product data for the following:

1. Form release agent.
2. Concrete coloring additive.
3. Preformed joint filler.

4. Concrete reinforcement specification data from manufacturer.
5. Stamp and Imprinting tools, manufacturer's literature.

C. Submit samples of the following:

1. For cement concrete paving show expansion joints, tooling and finish. Minimum 6' x 6' sample panel.
2. Preformed joint filler.

1.7 TESTING

A. The Owner may employ an independent testing laboratory to inspect and test concrete paving and other cast-in-place concrete work.

B. When requested, Contractor shall prepare test specimens in accordance with ASTM C31M, standard cylinder size 4-inch x 8 inch.

C. Testing of materials and installed work may occur at any time during progress of the work. Rejected materials and installed work shall be removed and replaced.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Steel reinforcing bars shall conform to ASTM A615, Grade 60, deformed.

1. Bars employed as dowels shall be hot-rolled plain rounds.

B. Steel wire: ASTM A82, plain cold drawn steel.

C. Welded wire fabric reinforcement shall conform to the applicable requirements of ASTM A185. Fabric reinforcement shall be furnished in flat sheets. Fabric reinforcement in rolls will not be permitted.

D. Supports for Reinforcement: Bolsters, chairs, and other devices for spacing, supporting, and fastening reinforcing bars, and welded wire fabric in place shall be wire bar-type supports complying with CRSI specifications.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1).

2.2 PORTLAND CEMENT CONCRETE

A. Portland cement concrete shall:

1. Have a maximum water cement ratio of 0.45 conforming to ACI 316R.
2. Be air-entrained type conforming to ASTM C94. Air content by volume shall be 6 percent + 1 percent and shall be tested in accordance with ASTM C260.
3. Be placed with a slump not less than 4 inches nor greater than 6 inches, determined in accordance with ASTM C143.
4. Use cement conforming to ASTM C150, Type I or II. Only one color of cement, all of the same manufacturer, shall be used for the work. Type III cement shall be used only with the prior approval of the Owner's Representative.
5. Use fine and coarse aggregates conforming to ASTM C33.
6. Contain a water reducing agent to minimize cement and water content of the concrete mix at the specified slump. Water reducing agent shall conform to ASTM C494, Type A.
7. Contain no calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixtures other than those specified shall be used in the concrete without the specific written permission of the Owner's Representative in each case.

2.3 CONCRETE AGGREGATES

A. Provide in conformance with ASTM C33.

B. Fine aggregates in conformance with ASTM C33, part 6.

C. Coarse aggregates in conformance with ASTM C33, parts 9 thru 11 and tables 2 and 3, with the following Class designations:

1. 1S – For footings and foundations not exposed to the weather.
2. 4S – For pavements, driveways, curbs, walkways, sidewalks, and retaining walls, that are exposed to the weather.
3. 1N – For pavements, driveways, curbs, walkways, sidewalks, and retaining walls that are not exposed to the weather.

D. Exposed Aggregate for ADA curb ramps shall be selected, hard, durable, washed rounded stones free of deleterious reactivity to cement with graded sizes between ½ to ¾ inch diameter nominal sieves.

2.4 COLORED CONCRETE

A. Coloring admixtures in conformance with ASTM C 979, synthetic or natural mineral-oxide pigments or colored water reducing admixtures, temperature stable, and nonfading.

B. Color hardener and curing compound shall be manufactured and supplied by the Harrington Bomanite Corporation, or approved equivalent.

1. Color for concrete shall have visual contrast with surrounding paving.
2. Curing compound shall be liquid applied.

C. Surface sealer shall be non-yellowing type which breathes water vapor, as manufactured by ProSoCo, Sika Chemical Corporation, Dural-International Corporation, or approved equivalent.

2.5 CURING MATERIALS FOR UNCOLORED CONCRETE

A. Curing shall be accomplished by the following methods:

1. Moist curing with burlap covering.
2. Curing paper, nonstaining, fiber reinforced laminated Kraft bituminous product conforming to ASTM C171. Four mil polyethylene sheeting may be substituted for curing paper.
3. Curing compound, a resin-base, white pigmented compound conforming to ASTM C309, Type 2.

2.6 EXPANSION JOINTS

A. Expansion joint filler shall be pre-formed, nonbituminous type conforming to ASTM D1752, Type II, similar to Sealtight Cork Expansion Joint Filler, manufactured by W.R. Meadows, Inc., or approved equivalent.

1. Premolded filler shall be one piece for the full depth and width of the joint.
2. Use of multiple pieces of lesser dimensions to make up required depth and width of joint will not be permitted.
3. Except as otherwise noted on the Drawings, joint filler shall be 1/2 in. thick.

B. Smooth dowel shall be hot rolled plain steel dowel bonded at one end and operating in smooth close fitting sleeve (of same material) at the other.

C. Unless otherwise indicated on the Drawings, expansion joints shall be located 30 ft. o.c., maximum.

2.7 CONTROL JOINTS

A. Joint filler to be polyethylene foam with manufacturer's recommended sealant.

2.8 FORMS

A. Cylindrical Forms: Sonotube Fibre Forms, wax-impregnated strippable forms manufactured by Sonoco Products Company, General Products Division, ABS or PVC plastic reusable forms, or approved equivalent.

B. Forms for Exposed Finish: Plywood, metal, metal-framed plywood faced, or other acceptable panel materials. Plywood shall be APA Ref. 1 B-B (Concrete Form), Class I Exterior Grade plywood or B-B or A-C Class I high density overlay concrete

form plywood. Form work materials shall produce full-depth, smooth, continuous, straight and level exposed surfaces.

C. Forms for Unexposed Finish: Plywood, lumber or metal, with lumber dressed on at least two edges and one side.

D. Form Ties: Prefabricated, adjustable length galvanized steel snap-off ties, with brackets, cones, cornerlocks and other accessories as necessary.

E. Form Release Agent: Commercial formulation compounds that will not bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete.

F. Imprinting Tools: Mats and tools used to stamp projecting texture and patterns onto plastic concrete surfaces shall be specifically designed with rigid back supports to enable a clean, sharp, stamping image. Stamps for curb ramps shall be designed to meet ADA detectable warning requirements.

G. Joint Filler: ASTM D1752 non-bituminous rubber or cork filler.

2.9 FIBROUS REINFORCING

A. Material shall meet ASTM C1116 and shall be manufactured by NyCon Incorporated, or approved equal.

B. Mix fibrous reinforcement in accordance with manufacturer's instructions including product data and technical bulletins.

1. Add fibrous reinforcement to concrete mix at the concrete batch facility.
2. Adding and mixing fibrous reinforcement at the job site will not be allowed.

C. Provide job mix design data to show concrete mix will attain specified strength requirements.

PART 3 - EXECUTION

3.1 SUBGRADE

A. The subgrade of areas to be paved shall be graded and compacted as specified in Section 02 20 00, Earthwork; Section 02 22 20, Excavation Trenching and Backfilling for Utility Systems; and Section 31 20 00, Earth Moving, and as shown on the Contract Drawings.

B. Excavation required in pavement subgrade shall be completed before fine grading and final compaction of subgrade are performed. Where excavation must be performed in completed subgrade, subbase, base, or pavement, subsequent backfill and compaction shall be performed as required by the Owner's Representative and as specified in Section 02 20 00, Earthwork; Section 02 22 20, Excavation Trenching and Backfilling

for Utility Systems; and Section 31 20 00, Earth Moving, and as shown on the Contract Drawings.

C. Materials shall not be stored or stockpiled on subgrade.

D. Prepared subgrade will be inspected by the Owner's Representative. Subgrade shall be approved for installation of the gravel base course. Disturbance to subgrade caused by inspection procedures shall be repaired.

3.2 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

B. In locations where new concrete is to be doweled into existing work, drill holes in existing concrete, insert steel dowels, and pack solid with non-shrink grout.

C. Moisten base to minimize absorption of water from fresh concrete.

D. Cost surfaces of utility covers and frames with oil to prevent bond with concrete pavement.

E. Notify Owner's Representative a minimum of 24 hours prior to commencement of concrete placement operations.

3.3 BASE COURSE

A. Base course for concrete paving shall be pavement subbase course or gravel base materials specified in Section 02 20 00, Earthwork; Section 02 22 20, Excavation Trenching and Backfilling for Utility Systems; and Section 31 20 00, Earth Moving, as shown on the Contract Drawings.

B. Width of base course shall extend beyond edge of the proposed pavement as shown on the drawings.

C. Material shall be placed in lifts no more than 6 inches thick, compacted measure. Each lift shall be separately compacted to specified density.

1. Material shall be placed adjacent to wall, manhole, catch basin, and other structures only after they have been set to required grade.
2. Rolling shall begin at sides and progress to center of crowned areas and shall begin on low side and progress toward high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheels.
3. Surface irregularities which exceed 1/2 inch as measured by means of a 10-foot-long straightedge, shall be regraded and recompacted.

D. Base course shall be compacted at optimum moisture content to not less than 95 percent of maximum density as determined by ASTM D1557.

E. The base course shall be kept clean and uncontaminated. Less select materials shall not be permitted to become mixed with the base course material.

3.4 STEEL REINFORCEMENT

A. Before being placed in position, reinforcing steel shall be thoroughly cleaned of loose mill and rust scale, earth, ice, and other foreign material which may reduce the bond between the concrete and reinforcing. Where there is delay in placing concrete after reinforcement is in place, bars shall be reinspected and cleaned when required.

B. Any bar showing cracks after bending shall be discarded.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement.

D. Accurately position and support reinforcement and secure against displacement. Set wire ties with ends directly into concrete.

E. Unless otherwise shown on the Drawings, reinforcing shall extend within 2 inches of form work and expansion joints. Reinforcing shall continue through control joints. Adjacent sheets of fabric reinforcing shall lap 6 inches. Interrupt reinforcement at contraction expansion joints.

F. After forms have been coated with form release agent, but before concrete is placed, reinforcing steel shall be securely wired in the required position and shall be maintained in that position until concrete is placed and compacted. Chair bars and supports shall be installed in a number and arrangement approved by the Owner's Representative.

3.5 FORMS

A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, gradient, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits.

1. Provide Class A tolerances for concrete surfaces exposed to view.
2. Provide Class C tolerances for other concrete surfaces.

B. Construct forms to provide for openings, offsets, sinkages, keyways, recesses, moldings, chamfers, blocking, screeds, bulkheads, anchorages, and inserts, and other features required for the work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent cement paste from leaking.

C. Fabricate forms for easy removal without hammering, prying or damaging concrete surfaces. Kerf wood inserts for forming keyways, reglets, recesses, and other features for easy removal.

D. Chamfer exposed corners and edges, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

E. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before placing concrete. Re-tighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

F. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.6 INSTALLING EMBEDDED ITEMS

A. General: Set and build into formwork the anchorage devices and other embedded items required for work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screen strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 PREPARING FORM SURFACES

A. Coat contact surfaces of forms with an approved, nonresidual, low-VOC form-coating compound before placing reinforcement.

3.8 CONCRETE PLACING

A. equipment, methods of mixing and placing, and precautions to be observed as to weather, and condition of base shall meet the requirements of ACI 316R.

B. The Owner's Representative shall be notified of scheduled concrete placement sufficiently in advance of start of operation to allow preliminary inspection of the work, including subgrade, forms, and reinforcing steel.

C. Work shall not be performed during rainy weather or when the temperature is less than 40°F (4.4°C).

D. Adjacent work shall be protected from stain and damage. Damaged and stained areas shall be replaced or repaired to equal their original conditions at the Contractor's expense.

E. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and anchor bolts are not disturbed during concrete placement.

F. Existing concrete, earth, and other water-permeable material against which new concrete is to be placed shall be thoroughly damp when concrete is placed. There shall be no free water on surface.

G. Concrete which has set or partially set, before placing shall not be used. Retempering of concrete will not be permitted.

H. Concrete shall be thoroughly vibrated or otherwise consolidated to secure a solid and homogeneous mass, thoroughly worked around reinforcement and into corners of forms.

I. When joining fresh concrete to concrete which has attained full set, latter shall be cleaned of foreign matter, and mortar laitance shall be removed by chipping and washing. Clean, roughened base surface shall be saturated with water, but shall have no free water on surface. A coat of 1:1 cement-sand grout, approximately 1/8 inch thick, shall be well scrubbed into the thoroughly dampened concrete base. New concrete shall be placed immediately, before grout has dried or set.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature, and when test samples were taken.

3.9 FINISHING

A. Concrete surfaces shall be screened and finished true to line and grade, and free of hollows and bumps. Surface shall be dense and smooth.

1. Finished concrete surface for concrete subbases shall be wood floated to a slightly rough surface. Surface shall not deviate more than 1/4 inch in 10 feet.
2. Finished concrete surfaces shall be wood-floated and steel troweled, or broom finished, to a uniform surface. Surface shall not deviate more than 1/8 inch in 10 feet.

B. Horizontal surfaces of concrete surfaces which will be exposed shall be given a light broomed finish, with direction of grooves in concrete surface perpendicular to length of concrete band, slab, or pad. After concrete has set sufficiently to prevent coarse aggregate from being torn from surface but before it has completely set, brooms shall be drawn across the surface to produce a pattern of small parallel grooves. Broomed surface shall be uniform, with no smooth, unduly rough or porous spots, or other irregularities. Coarse aggregate shall not be dislodged by brooming operation.

C. Immediately following finishing operations, arises at edges and both sides of expansion joints shall be rounded to a 1/4 inch radius. Control joints to be tooled shall be scored into slab surface with scoring tool. Adjacent edges of control joint shall at same time be finished to a 1/4 inch radius.

D. Where finishing is performed before end of curing period, concrete shall not be permitted to dry out and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

E. Sidewalks, walkways, accessible routes, and ramps shall be constructed and finished in accordance with the Americans with Disabilities Act, and State and Local requirements.

F. Exposed –Aggregate Finish: Expose coarse aggregate in pavement surfaces as follows:

1. Immediately after float finishing, spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.
2. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon-bristle broom.
4. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.

3.10 STAMPING

A. Mat Stamping: While initially finished concrete is plastic accurately align and place stamp mats in sequence. Uniformly load mats and press into concrete to produce requirement imprint pattern and depth of imprint on concrete surface. Remove stamp mats immediately. Hand stamp edges and surfaces unable to be imprinted by stamp mats.

B. Tool Stamping: While initially finished concrete is plastic, cover surface with polyethylene film, stretch taut to remove wrinkles, lap sides and ends 3 inches (75mm), and secure to edge forms. Lightly broom surface to remove air bubbles. Accurately align and place stamp tools in sequence and tamp into concrete to produce required imprint pattern and depth of imprint on concrete surface. Remove stamp tools immediately. Hand stamp edges and surfaces unable to be imprinted by stamp tools. Unroll and remove polyethylene film immediately after tool stamping.

3.11 CURING

A. concrete shall be kept continuously damp from time of placement until end of specified curing period or cured by other methods. water shall not be added to surface during floating and troweling operations, and not earlier than 24 hours after concrete placement. Between finishing operations, surface shall be protected from rapid drying by a covering of waterproofing paper. Surface shall be damp when the covering is placed over it, and shall be kept damp by means of a fog spray of water, applied as often as necessary to prevent drying, but not sooner than 24 hours after placing concrete. None of the water so applied shall be troweled or floated into surface.

B. Concrete surfaces shall be cured by completely covering with curing paper or application of a curing compound.

1. Concrete cured using waterproof paper shall be completely covered with paper with seams lapped and sealed with tape. Concrete surface shall not be allowed to

become moistened between 24 and 36 hours after placing concrete. During curing period, surface shall be checked frequently and sprayed with water as often as necessary to prevent drying, but not earlier than 24 hours after placing concrete.

2. Concrete cured with a curing compound shall have the compound applied at a rate of 200 square feet per gallon, in two applications perpendicular to each other.
3. Curing period shall be seven days minimum.

C. Only if additional protection is absolutely required, the surface should remain uncovered after the seven-day period for at least 4 days, after which time new and unwrinkled non-staining reinforced waterproof Kraft curing paper may be used.

3.12 EXPANSION JOINTS

A. Expansion joints shall be 1/2 inch wide and located where shown on the Drawings. Expansion joints shall be troweled in the concrete to required width with preformed joint filler in place. Joint filler shall extend the full depth of the slab and full length of the expansion joint.

1. For concrete walks, pavements, and pads, depth of joint filler shall be placed to form a 1-1/4 inch deep recess for sealant and backer rod below finished concrete surface.
2. Use of multiple pieces to make up required depth and width of joint will not be permitted.

3.13 CONSTRUCTION JOINTS

A. Construction joints shall be placed whenever placing of concrete is suspended for more than 30 minutes.

1. Butt joint with dowels or thickened edge joint shall be used if construction joints occur at control joint locations.
2. Keyed joints with tie bars shall be used if the joint occurs at any other location.
3. Unless otherwise indicated on the Drawings, control joints shall be located 6 ft. o.c. maximum.

3.14 CONTROL JOINTS

A. Control joints shall be tooled into the concrete slab, with 3-inch wide border and troweled edges, in pattern as shown on the Drawings. If no pattern is shown, then pattern shall result in square shape with a maximum area of 36 square feet. Joint shall be made after concrete is finished and when the surface is stiff enough to support the weight of work men or women without damage to the slab, but before slab has achieved its final set.

B. Scoring shall cut into slab surface at least 1 inch, but in no case not less than 25 percent of slab depth.

3.15 COLD WEATHER CONCRETING

A. Materials for concrete shall be heated when concrete is mixed, placed, or cured when the mean daily temperature is below 40°F or is expected to fall to below 40°F within 72 hours. The concrete, after placing, shall be protected by covering, heat, or both.

B. Details of handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Owner's Representative. Procedures shall be in accordance with provisions of ACI 306R.

3.16 HOT WEATHER CONCRETING

A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing shall be sprinkled with cold water. Every effort shall be made to minimize delays which will result in excessive mixing of the concrete after arrival on the site.

B. During periods of excessively hot weather (95°F., or above), ingredients in the concrete shall be cooled with cold mixing water to maintain the temperature of the concrete at permissible levels in accordance with the provisions of ACI 305. Any concrete with a temperature above 95°F, when ready for placement, will be rejected.

C. Temperature records shall be maintained throughout the period of hot weather giving air temperature, general weather conditions (calm, windy, clear, cloudy, etc.) and relative humidity. Records shall include checks on temperature of concrete as delivered and after placing in forms. Data should be correlated with the progress of the work so that conditions surrounding the construction of any part of the structure.

3.17 PROTECTION OF CONCRETE SURFACES

A. Concrete surfaces shall be protected from traffic or damage until surfaces have hardened sufficiently.

3.18 DEFECTIVE CONCRETE

A. Defective concrete is that which does not conform to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by Owner's Representative.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon direction of Owner's Representative for each individual area.

END OF SECTION

SECTION 10 14 10

SITE SIGNAGE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for site signs and supports.

B. The work includes:

1. The furnishing and installation of new signs and sign supports.
2. The removal of existing signs.
3. New signs and sign supports in public roadways under the jurisdiction of the Commonwealth of Massachusetts Department of Transportation or municipality. The signs and supports shall conform to the requirements of Sections 828 and 840 of the latest edition of the Commonwealth of Massachusetts Standard Specifications for Highways and Bridges.

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 03 30 10 – Cast-in-Place Concrete

1.3 SUBMITTALS

A. Shop Drawings

1. Shop Drawings of all signs and supports. Do not order material or begin fabrication until Owner's Representative's approval has been obtained.
2. Show sizes and thicknesses of all members, types of materials, methods of construction and assembly, type of surface treatment, complete dimensions, hangers, brackets, anchorage, fasteners, relationship to surrounding work by other trades, shop finishes, sign designs, layouts, and lettering, and other pertinent details of fabrication and installation.

1.4 QUALITY ASSURANCE

A. The manufacturer shall have experience in the type of work required and a reputation for producing satisfactory work on time.

B. Deliver and store in a manner that prevents cracking, chipping, stress of the components, and damage.

1.5 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Deterioration of polymer finishes beyond normal weathering.
   b. Deterioration of embedded graphic image colors and sign lamination.
2. Warranty Period: 5 years from date of installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable requirements of the Commonwealth of Massachusetts Regulation 521 CMR, Architectural Access Board, as amended, for signs.

2.2 ALUMINUM SIGN PANELS

A. Aluminum Sign Panel shall be fabricated from flat aluminum sheeting, ASTM B209, Alloy 6061-T6 or Alloy 5052-H38, of the following thickness and mounting, unless otherwise specified:

Area of Sign (square feet)	**Mounting**	**Thickness (inches)**
≤ 10	Single Post	0.080
Between 10 and 20	Two Posts	0.080
Between 6 and 25	Single Post (Top Mounted)	0.250

B. Sign supporting hardware shall be aluminum or stainless steel.

2.3 REFLECTIVE SHEETING

A. Reflective sheeting shall meet the requirements of AASHTO M268.

1. Panel Sheeting shall be Type II (Engineering Grade).
2. Legend Sheeting shall be Type III (High Intensity).

B. Reflective sheeting shall be applied to properly treated base panels with mechanical equipment in a manner specified for the manufacture of traffic control signs by the sheeting manufacturer. Heat activated adhesive coating sheeting shall be pre-perforated.

1. No splices shall be allowed on sign panels.

C. When pressure sensitive adhesive coating reflective sheeting is used all sheeting splices and sign edges shall be sealed with materials recommended by and in a manner specified by the sheeting manufacturer.

1. Dry heat activated adhesive coated reflective sheeting when applied to aluminum shall be edge sealed as specified by the sheeting manufacturer.

D. The reflective sheeting shall be applied to properly treated base panels with mechanical equipment in a manner specified by the sheeting manufacturer.

E. The numerals shall be black, die-cut, pre-spaced, conforming to the detail on the Drawings. Numerals shall have a pre-coated, pressure-activated adhesive applied as recommended by the manufacturer of the reflective sheeting or be opaque black permanent inks applied on approved high intensity sheeting.

F. Treatment of Aluminum Sign Panels Prior to Application of Reflective Sheeting.

1. Vapor degreasing: By total immersion of the panel in a saturated vapor or trichloroethylene. Trademark printing shall be removed with lacquer thinner or controlled alkaline cleaning system.
2. Alkaline degreasing: By total immersion of the panel in a tank containing alkaline solutions, controlled and titrated to the solution manufacturer's specification.
3. Rinsing: After satisfactory degreasing, the panels shall be thoroughly washed with running water.
4. Drying: The panel shall be thoroughly dried by use of a forced hot air dryer.
5. Metal shall not be handled between cleaning and etching operation and the application of reflective sheeting, except with devices or clean canvas gloves.
6. Metal shall not come in contact with greases, oils or other contaminants prior to the application of reflective sheeting.

2.4 LEGENDS

A. <u>Permanently Applied Legends</u>

1. Permanently applied legends shall be reflective or opaque sheeting applied directly to clean, dust-free background in a manner specified by the sheeting manufacturer.
2. Heat activated adhesive-coated material shall be applied only by mechanical means.
3. Finishes shall be as recommended by and applied in the manner specified by the sheeting manufacturer.
4. Legends shall be neatly cut.

B. Silk Screen Processed

1. The legends shall be of the series and size specified in the AASHTO Manual for "Signing and Pavement Markings" (Current Edition), and the dimension and details of the letters in each series shall be as specified in the FHWA publication "Standard Alphabet for Highway Signs" (Current Edition), or as shown on the Drawings.

2.5 FASTENERS AND ANCHORS

A. The sign fabricator shall design a complete system of fastenings and anchorage devices for the various signs, as required for attachment to the various supporting structures. These may include, concealed clip systems, face screws and epoxy adhesives. Wherever reasonably possible, fastenings and anchorage devices shall be fully concealed, and shall be vandal proof. The Contractor shall provide safe and secure installations in strict conformance to the governing laws and building code.

2.6 SIGN SUPPORTS

A. Sign supports shall be breakaway type. P-5 breakaway sign posts shall conform to Massachusetts Department of Transportation details entitled "Standard Ground Mounted Supports Breakaway Design" and material specifications.

PART 3 - EXECUTION

3.1 PROTECTION AND TEMPORARY COVERS

A. Completed sign panels shall be protected and maintained in good condition, free from dirt, scratches, hand marks or other blemishes. The panels shall be transported in a manner that prevents damage.

B. Subsequent to erection, if required by the Owner's Representative, exterior signs shall be covered until the actual use is desired. Material used to temporarily cover any sign panel shall effectively conceal the message, be non-injurious to the panel, and its finish, its structural integrity, and of sufficient durability for the time period required.

3.2 INSTALLATION

A. Erection of all signs shall be performed by experienced sign erectors. Signs shall be installed true, plumb, and level, located where shown on the Drawings or as required by the Owner's Representative. No field cutting of any sign work will be allowed. Exercise extreme care in all handling and stacking of signs to avoid chipping.

B. All work shall be rigidly anchored to the supporting construction in accordance with the approved shop drawings.

3.3 CLEAN-UP

A. Surfaces of signs shall be cleaned as recommended by the sign manufacturer after installation.

B. All defective work shall be removed and replaced with work conforming to the specified requirements.

3.4 ERECTION OF POSTS

A. P-5 Breakaway posts shall be installed in conformance with details shown on the Commonwealth of Massachusetts, Department of Transportation, Standard Drawings for Signs and Supports, when located within public roadways.

B. Posts shall be supported in a concrete base as detailed in the drawings.

C. Posts, specifically indicated on the Drawings to be driven, shall be driven a minimum of 3 feet into firm, undisturbed ground.

D. The height of signs above ground surfaces shall meet Americans with Disabilities Act (ADA) requirements.

END OF SECTION

SECTION 26 56 68

EXTERIOR LIGHTING

Lighting System with LED Light Source

PART 1 – GENERAL

1.1 SUMMARY

A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.

B. The purpose of these specifications is to define the lighting system performance and design standards for New Bedford Marine Terminal using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.

C. The primary goals of this lighting project are:

1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore, light levels are guaranteed to not drop below specified target values for a period of 10 years.
2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.

1.2 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
New area:	3fc	6:1	96	20’ x 20’

B. Color: The lighting system shall have a minimum color temperature of 4500K and a CRI of 75.

C. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below.

# of Poles	Pole Designation	Pole Height
1 new	P7	100’
1 existing to be moved.	P1	100

****existing pole will need a new pre cast foundation.**

1.3 ENVIRONMENTAL LIGHT CONTROL

A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

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B. Lighting Ordinance: In accordance with New Bedford lighting ordinance, maximum initial horizontal illumination at the property line shall not exceed 0.5 footcandles.

C. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

D. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.

E. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

PART 2 – PRODUCT

2.1 LIGHTING SYSTEM CONSTRUCTION

A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.

B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

C. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assembly.

2. Non-approved pole technology:

   a. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long-term performance concerns.

3. Lighting systems shall use concrete foundations. See Section 2.4 for details.

   a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.

   b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or reinforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.

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4. Manufacturer will supply all drivers and supporting electrical equipment
   a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
   b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
7. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
   a. Integrated grounding via concrete encased electrode grounding system.
   b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
8. Enhanced corrosion protection package: Due to the potentially corrosive environment for this project, manufacturers must provide documentation that their products meet the following enhanced requirements in addition to the standard durability protection specified above:
   a) Exposed carbon steel horizontal surfaces on the crossarm assembly shall be galvanized to no less than a five (5) mil average thickness.
   b) Exposed die cast aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.
   c) Exposed extruded aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

A. Electric Power Requirements for the Lighting Equipment:
   1. Electric power: 480 Volt, 3 Phase
   2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

2.4 STRUCTURAL PARAMETERS

A. Wind Loads: Wind loads shall be based on the 2015 International Building Code. Wind loads to be calculated using ASCE 7-10, an ultimate design wind speed of 140 and exposure category C.

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B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-6).

PART 3 – EXECUTION

3.1 SOIL QUALITY CONTROL

A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of Massachusetts for soils other than specified soil conditions;
2. Additional materials required to achieve alternate foundation;
3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12 weeks from receipt of approved submittals and receipt of complete order information.

3.3 QUALITY CONTROL

A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified.

B. Light Level Accountability

1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 10 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.

C. Correcting Non-Conformance: If, in the opinion of the Owner or their appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

A. 10-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 10 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.

B. Maintenance: Owner shall monitor the performance of the lighting system and will contact manufacturer in the event of a luminaire outage or other failure. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any area is materially impacted. Manufacturer is responsible for removal and replacement of failed

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luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.1 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

A. Design Approval: The Owner / Owner's Representative will review pre-bid submittals per section 4.1.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.

B. Approved Product: Musco's Light-Structure System™ with TLC for LED™ is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.

D. Bidders are required to bid only products that have been approved by this specification or addendum by the Owner or Owner's Representative. Bids received that do not utilize an approved system/design, will be rejected.

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SECTION 31 14 00

EARTH STRIPPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide facilities, labor, materials, tools, equipment, appliances, transportation, supervision, and related work necessary to complete the work specified in this section, and as shown on the Drawings.

B. Work performed under this section of the specifications shall be subject to the General Conditions, Supplementary Conditions and Division 1 General Provisions of the Contract Documents.

C. The work of this section includes but is not necessarily limited to:

1. The removal, hauling and stockpiling of suitable excavated materials for subsequent use in the work. Stockpiling shall include protection to maintain materials in a workable condition.
2. Rehandling, hauling and placing of stockpiled materials for use in refilling, filling, backfilling, grading and such other operations.
3. Protect and preserve all existing buildings, pavements, and utilities to remain.
4. Environmental controls.
5. Obtain all required permits, licenses, and approvals of appropriate municipal and utility authorities, prior to commencing the work of this Section, and pay costs incurred therefrom.
6. Providing products in sufficient quantities to meet the project requirements.

D. Provide facilities, labor, materials, tools, equipment, appliances, and related work necessary to provide and maintain erosion control during construction operations. All erosion control measures shall be installed prior to earthwork operations and shall be maintained according to plans and other sections of the specifications.

E. Contractor shall be responsible for notifying all affected utility companies and DIGSAFE before starting work.

1.2 RELATED DOCUMENTS

A. Carefully examine all of the Contract Documents for requirements which affect the work in this section. Other specification sections which directly relate to the work of this section include, but are not limited to, the following:

1. Section 01 41 29 – EPA NPDES Construction General Permit, for construction activities

2. Section 02 11 00 – Clearing and Grubbing

3. Section 02 11 05 – Site Clearing

4. Section 02 11 10 – Excavation and Handling of Contaminated Material

5. Section 02 20 00 – Earthwork

6. Section 02 41 10 – Site Demolition

7. Section 31 20 00 – Earth Moving

8. Section 31 25 00 – Erosion and Sedimentation Control

9. Section 31 50 00 – Excavation Support and Protection

10. Section 32 92 00 – Turfs and Grasses

11. Section 32 93 00 – Plants

12. Draft Release Abatement Measure Plan (RAM)/EPA Self-Implementing Plan (SIP)
(The Draft RAM/SIP is provided as an **Attachment** to this Request for Proposal.)

13. Soil Management Plan
(The Soil Management Plan is provided as an **Attachment** to this Request for Proposal.)

1.3 LAWS AND REGULATIONS

A. Work shall be accomplished in accordance with the Draft RAM/SIP, Soil Management Plan, regulations of local, county and state agencies and national or utility company standards as they apply.

1.4 QUALITY ASSURANCE

A. The Owner may retain and pay for the services of an independent testing and inspection firm and/or a Geotechnical Consultant to perform on-site observation and testing during the various phases of the construction operations. The scope of services will be determined by the Owner and the independent testing and inspection firm and/or the Geotechnical Consultant and will be provided to the contractor. The Owner reserves the right to modify or waive the services of the independent testing and inspection firm and/or the Geotechnical Consultant. The services of a Geotechnical Consultant/Inspection and testing firm may include, but not necessarily be limited to, the following:

1. Observation during excavation and dewatering of building and controlled fill areas.
2. Laboratory testing and analysis of fill materials as specified herein and proposed by the Contractor for incorporation into the Work.
3. Observation of construction and performance of water content, gradation and compaction tests at a frequency and locations that they shall select. The results of these tests will be submitted to the Owner, Owner's Representative, and Contractor on a timely basis so that action can be taken to remedy indicated deficiencies. During the course of construction, the Geotechnical Consultant will advise the Owner in writing if, at any time, in their opinion, the Work hereunder is of unacceptable quality. Failure of the Geotechnical Consultant to give notice, shall not excuse the Contractor from latent defects discovered in their work.

B. The Contractor shall make provisions for allowing observations and testing of Contractor's Work by the independent testing and inspection firm and/or the Geotechnical Consultant.

C. The presence of the independent testing and inspection firm and/or the Geotechnical Consultant does not include supervision or direction of the actual work of the Contractor, their employees, or agents. Neither the presence of the independent testing and inspection firm and/or the Geotechnical Consultant, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in their work.

D. Costs related to retesting due to unacceptable qualities of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

E. Whenever floodplain compensation areas are designated on the plans, grading elevations are to be considered critical to the floodplain volumetric calculations and shall be constructed by the Contractor in strict conformance with the indicated grades.

1.5 SUBMITTALS

A. For use of fabrics or geogrids, submit manufacturer's literature for approval by the Owner's Representative.

1.6 COORDINATION

A. Prior to start of earthwork, the Contractor shall arrange an on-site meeting with the Owner's Representative, the independent testing firm, and the Geotechnical Consultant for the purpose of establishing the Contractor's schedule of operations and scheduling observation and testing procedures and requirements.

B. As construction proceeds, the Contractor shall be responsible for notifying the Owner's Representative prior to the start of earthwork operations requiring observation and/or testing.

1.7 SUBSURFACE SOIL DATA

A. Geotechnical data is available for this project. This data is not part of the Contract Documents but is available to bidders for informational purposes.

B. Review available logs of borings, jar soil samples, records of explorations and other pertinent data for the site. After obtaining Owner's permission, take whatever additional subsurface explorations deemed necessary at no expense to the Owner.

C. The above data are for general information and are accurate only at the particular locations and times the subsurface explorations were made. It is the Contractor's responsibility to make interpretations and to draw conclusions based on the character of materials to be encountered and the impact on their work based on the Contractor's expert knowledge of the area and of earthwork techniques.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Filter Fabric/Geotextiles

1. Geotextile Fabric shall be used to prevent soil intrusion into drains and/or assist in stabilizing soil subgrades to be laid on approved soil subgrades prior to placement of fill materials.
   a. Contractor shall use TenCate Mirafi® 140N or equivalent filter fabric (unless otherwise indicated on the Contract Drawings) in drainage recharge systems and underdrain systems between crushed stone and granular soils, leaching areas or where indicated on the Contract Drawings.
   b. Contractor shall use TenCate Mirafi® 160N or 180N or equivalent non-woven geotextile (unless otherwise indicated on the Contract Drawings) in drainage recharge systems as the separation layer between angular stone cover and fill to prevent fines intrusion.
   c. Contractor shall use ACF M200 (U.S. Equivalent U.S. 1540) or equivalent woven geotextile (unless otherwise indicated on the Contract Drawings) in drainage recharge systems as the stabilization layer for the angular stone foundation of drainage recharge and underdrain systems at each inlet row.

2.2 USE OF MATERIALS

A. Use of materials shall be as described below and as shown on the plans. Further details can be found in the project plans. Combinations or layering of materials may be necessary in certain instances such as for detention embankments, subsurface disposal areas, and riprap walls as examples.

1. Filter Fabric/Geotextiles: To be used as filter barriers between drainage recharge systems, underdrain systems, wastewater absorption systems, and between natural earth material and backfill or other materials to assist in stabilizing soil subgrades.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Cut and remove trees, remove stumps and brush. Legally dispose of off-site.

B. Dispose of wood waste per Massachusetts 310 CMR 16.05 and 310 CMR 19.120. Wood waste may be chipped and shredded on-site and reused on-site with permission of the Owner's Representative.

C. Strip all topsoil, subsoil and other unsuitables to its full depth within the Contract limits, except in the areas with contaminated soils as detailed in Section 02 11 10, Excavation and Handling of Contaminated Material, the Draft RAM/SIP, and Soil Management Plan. In building areas, limits of excavation are defined in Section 02 11 10, Excavation and Handling of Contaminated Material.

D. Under pavement areas, unsuitable materials shall be removed and disposed of by the Contractor in an approved location, or if no approved location exists on site to an approved off site location and replaced with structural fill. Treatment of existing fill and removal of topsoil, subsoil and stumps are defined in Section 02 11 10, Excavation and Handling of Contaminated Material. These materials shall be processed to remove all roots, stones larger than 3/4 inch in diameter and other deleterious materials. Stockpile as approved by the Owner's Representative. Protect the topsoil from contamination by other materials.

E. Other specification sections shall apply to clearing and grubbing under demolition and shall include air quality, erosion control and hazardous waste.

F. Remove all topsoil, subsoil, vegetative matter, and non-soil materials and, after screening out the roots, rocks greater than ¾ inch in size, and deleterious debris, separately stockpile the topsoil and subsoil materials, except in the areas with contaminated soils as detailed in Section 02 11 10, Excavation and Handling of Contaminated Material; the Draft RAM/SIP; and Soil Management Plan.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this section.

B. Draft Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP) and the Soil Management Plan (provided as **Attachments** to this Request for Proposal).

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for work zone, perimeter landscaped areas, sidewalk, and associated areas.
3. Subbase course for concrete sidewalk and former driveway area.
4. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Requirements

1. Section 02 26 00, Geosynthetics, for geosynthetic materials.
2. Section 32 92 00, Turf and Grasses, for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
3. Section 32 93 00, Plants, for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 UNIT PRICES

A. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.

1. 6” beneath pipe in trenches, and the greater of 24” wider than pipe or 48” wide.

1.4 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Owner's Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions.
2. Bulk Excavation: Excavation of more than 10 feet in width and more than 50 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Owner's Representative. Unauthorized excavation, as well as remedial work directed by the Owner's Representative, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 2 CY for bulk excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42" maximum-width, short-tip-radius rock bucket; rated at not less than 138 BHP flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom.
2. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.5 PRE-INSTALLATION CONFERENCE

A. Pre-installation Conference: Conduct pre-excavation conference at 54 Wright Street, New Bedford.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:
   a. Personnel and equipment needed to make progress and avoid delays.
   b. Coordination of Work with utility locator service.
   c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
   d. Field quality control.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles
2. Warning tapes

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches (300 by 300 mm).
2. Warning Tape: 12 inches (300 mm) long; of each color.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D2487.
2. Laboratory compaction curve according to ASTM D1557.

1.8 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.9 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify Dig Safe a minimum of 72 hours prior to the start of construction for area where Project is located before beginning earth-moving operations.

C. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified on the Drawings are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soils utilized for all phases of this project must meet the specifications noted on the Contract Drawings, Geotechnical Report, or City of New Bedford Department of Public Infrastructure (DPI) specifications.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 3 percent of optimum moisture content at time of compaction.

D. Refer to PART 2 of Section 02 20 00, Earthwork, for soil materials pertinent to this project.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile and Separation Geotextile: Geotextile fabric shall be as specified in the Geotechnical Report and/or as specified on the Contract Plans. Refer to Table 3 in PART 2.3 of Section 02 26 00, Geosynthetics, for additional information.

2.3 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils

(0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas.
3. Orange: Telephone and other communications.
4. Blue: Water systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
   a. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included on the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.
   a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
   a. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 2 inches. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As indicated on the Contract Plans.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE INSPECTION

A. Notify Owner’s Representative when excavations have reached required subgrade.

B. If Owner's Representative determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner's Representative, without additional compensation.

3.9 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Surveying locations of underground utilities for Record Documents.
2. Testing and inspecting underground utilities.
3. Removing trash and debris.
4. Removing temporary shoring, bracing, and sheeting.
5. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Roadways: Backfilling of trenches in the public way shall be completed in accordance with City of New Bedford DPI standards.

D. Backfill voids with satisfactory soil while removing shoring and bracing.

E. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit or as specified by DPI standards.

   a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

G. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.12 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.13 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 3 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified density.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment and not more than 6 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D1557.

1. Under walkways, in the heavy lift area, and within 15 feet of the heavy lift area, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil to 95 percent.
2. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil to 90 percent.
3. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.15 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

3.16 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight.

3.17 FIELD QUALITY CONTROL

A. Special Inspections: Owner and Contractor will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.

3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner and Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections. Owner's testing agency may visit the site to spot check results submitted by the Contractor's agency.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Owner's Representative; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the Contract and General Conditions and all Sections within Division 01 - General Requirements which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Section includes construction dewatering.

B. Related Work:

1. Section 01 41 29 – EPA NPDES Construction General Permit
2. Section 02 11 00 – Clearing and Grubbing
3. Section 02 11 05 – Site Clearing
4. Section 02 11 10 – Excavation and Handling of Contaminated Material
5. Section 02 20 00 – Earthwork
6. Section 31 20 00 – Earth Moving
7. Section 31 50 00 – Excavation Support and Protection

1.3 SUBMITTALS

A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.

1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
2. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.

B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer responsible for their preparation.

C. Qualification Data: For qualified Installer and Professional Engineer.

D. Record drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions performed during dewatering.

1. Note locations and capping depth of wells and well points.

E. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

F. Field Test Reports: Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.

1.4 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a qualified Professional Engineer, using performance requirements and design criteria indicated.
2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
3. Prevent surface water from entering excavations by grading, dikes, or other means.
4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
5. Remove dewatering system when no longer required for construction.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer that has specialized in design of dewatering systems and dewatering work.

B. Regulatory Requirements: Comply with governing Environmental Protection Agency notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Preinstallation Conference: Conduct conference at Project Site.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Owner's written permission.

B. Project-Site Information: A geotechnical data and calculation package is available for information only. The opinions expressed are those of Geotechnical Engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by Geotechnical Engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical data and calculation package is included elsewhere in the Project Manual.

C. Survey Work: Engage a qualified Land Surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Monitor dewatering systems continuously.

E. Promptly repair damages to adjacent facilities caused by dewatering.

F. Protect and maintain temporary erosion and sedimentation controls during dewatering operations.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of 24 inches below surface of excavation or as directed by the Geotechnical Engineer.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on a continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 FIELD QUALITY CONTROL

A. Observation Wells: Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for temporary erosion control provisions as they relate to the construction process.

B. The work includes:

1. Providing and maintaining all temporary erosion control measures shown on the Contract Drawings and required by the Owner's Representative during the life of the Contract to control soil erosion and water pollution.
2. The installation and maintenance of additional silt fence, berms, ditches, sedimentation basins, construction exits, fiber mats, catch basin filters, straw, netting, gravel, trenches, mulches, grasses, slope drains and other approved erosion control devices or methods, needed to protect any areas on or off site.

1.2 DEFINITION AND COORDINATION OF EROSION CONTROL REQUIREMENTS

A. Temporary erosion control measures are defined as those elements are necessary to be installed by the Contractor to meet Federal, State, and Local regulations for the construction program, including, but not necessarily limited to, such items as; silt fences, berms, portable sedimentation basins, straw bales, check dams, and other such items, all of which shall be removed by the Contractor after installation of permanent erosion control measures, stabilization of the site, and prior to final completion of the project.

1.3 PRIOR TO CONSTRUCTION

A. Install soil erosion and sediment control devices prior to any soil disturbance, or in proper sequence, and maintain until permanent protection/stabilization is established.

B. Prior to the start of the construction, the Contractor shall submit to the Owner's Representative: schedules for the construction of required temporary erosion and sediment control work. No work shall be started until control schedules and methods of operations have been submitted to the Owner's Representative.

1.4 CONSTRUCTION OPERATIONS

A. When in the opinion of the Owner's Representative it becomes necessary, the Owner's Representative will inform the Contractor of construction procedures and operations that jeopardize erosion and sedimentation control provisions. If these construction procedures and operations are not corrected promptly, the Owner may suspend the

performance of any or all construction until corrections have been made, and such suspension shall not be the basis of any claim by the Contractor for additional compensation from the Owner nor for an extension of time to complete the Work.

1.5 CONTRACT DRAWINGS

A. Conforming to Contract requirements, furnish and keep at the job site a set of Contract Documents, which illustrate proposed erosion control procedures.

B. Clearly, neatly and accurately note on the designated set of the Contract Drawings all changes, revisions, and additions to the work.

C. Update the designated set of the Contract Drawings promptly as work progresses.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Silt fence fabric shall be 100X, as manufactured by TenCate Mirafi®, or approved equal.

B. Filter fabric at construction entrance shall be 600X, as manufactured by TenCate Mirafi®, or approved equal.

C. Silt sacks shall be Siltsack®, as manufactured by ACF Environmental, or approved equal.

D. Mulch Sock/Compost Filter Tube (Silt Socks)

1. Type and use: as specified by the Massachusetts Erosion & Sedimentation Control Guidelines for Urban and Suburban Areas.
2. Long fibered hay, grass mowings, or straw, in dry condition and which are relatively free of weeds and foreign matter detrimental to plant life.
3. Mulch binder: asphalt emulsion mulch binder of type acceptable to the Engineer.
4. Mulch netting: plastic or nylon mesh netting with approximate openings of 1/8 inch; or other netting approved by the Engineer.
5. Color: orange or orange striped for visibility.
6. Tensile strength: minimum 202 psi per ASTM D5035 with ultra-violet exposure resistance of 100 percent at 1,000 hours per ASTM G155.
7. Stakes for installing compost filter tubes: 1-1/2 inches square hard wood stakes, trimmed to a blunt end.
8. Compost fill material for the compost filter tube: certified though the USCC's STA Program and not derived from agricultural, food, or industrial residues; bio-solids (treated sewerage sludge); yard clippings; source-separated or mixed solid waste, free from man-made foreign matter, and without objectionable odors.

E. Straw mulch: MassDOT M6.04.2, long fibered straw, 100 percent certified weed free, free from foreign matter detrimental to plant life, and in dry condition.

F. Tackifier: biodegradable and non-toxic bonding adhesive agent during hydraulic seeding or straw mulching to minimize wind and water effects.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas in which work is to be performed. Notify the Owner's Representative, in writing, all prevailing conditions that will adversely affect satisfactory execution of work.

B. Verify the locations of proposed erosion control measures.

3.2 EROSION CONTROL – STRAW BALES or SILT SOCKS

A. Straw bales shall be installed at the locations as shown on the Drawings and in general as follows:

1. Toe of slope of embankment construction to filter all runoff flowing to off-site discharges.
2. Toe of temporary earthwork stockpile slopes.
3. Other locations shown on the Contract Drawings and required by laws, regulations, and permits.

B. Tightly abut straw bales to form a continuous barrier. Secure bales in place with two stakes per bale. The bales shall be trenched 6 inches into the ground. Soil shall be constructed on the upside slope of the bales. Deteriorated, destroyed or rotted bales shall be replaced immediately. Sediment shall be removed and disposed of periodically from behind the straw bales. The accumulated sediment shall not be allowed to rise above the mid height of the bale. All sediment, straw bales and appurtenances shall be removed and disposed of at the completion of the Contract.

3.3 SILT FENCE

A. Silt fence shall be installed at locations as shown on the Contract Drawings.

B. Supporting posts shall be spaced 4 feet on center and driven at least 1 foot into the ground. Posts shall be 1-1/2 inch square or heavier wood posts, or standard steel posts.

C. Fabric shall be anchored in a 4-inch deep trench dug on the upslope side of the posts. The trench shall be at least 4 inches wide. The fabric shall be laid in the trench, backfilled and compacted.

D. Fabric rolls shall be spliced at posts. The fabric shall be overlapped 6 inches, folded over and securely fastened to posts.

E. Silt fences shall be inspected immediately after each storm event and at least daily during prolonged rainfall.

3.4 SILT SACKS

A. Silt sacks shall be placed at all catch basins, landscape drains and/or inlets to drainage structures (on-site and off-site according to the Contract Drawings).

3.5 CONSTRUCTION REQUIREMENTS – TEMPORARY SEDIMENT CONTROL

A. The Contractor shall construct all erosion and sediment control features at the earliest practical time as outlined in the accepted schedule. Temporary erosion and sediment control measures shall be used to correct conditions that develop during construction which were unforeseen, but are needed prior to installation of permanent control features, or that are needed temporarily to control erosion or sedimentation which develops during construction operations.

B. Where erosion is likely to be a problem, clearing and grubbing operations shall be scheduled and performed so that grading operations and permanent erosion and sediment control features can follow immediately thereafter, if conditions permit; otherwise, temporary control measures will be required between successive construction stages.

C. Contractor shall be responsible for controlling erosion within the project area and retaining sediment on-site away from sensitive environmental resources. Any fines, construction delays, remedial actions, or incarceration resulting from the Contractor's failure to comply with these provisions shall be the responsibility of the Contractor and not the Owner.

D. Failure by the Contractor to control erosion, pollution, and siltation shall be cause for the Owner to employ outside assistance to provide the necessary corrective measures. The cost of such assistance, including engineering costs, will be charged to the Contractor and appropriate deductions made to the Contractor's monthly progress payment request.

E. The Contractor shall remove and properly dispose of sediment from control facilities as required by the Owner's Representative. The Contractor shall modify and improve erosion and sedimentation control facilities and replace deteriorated straw bales and other devices as required by the Owner's Representative.

F. Minimum temporary and permanent erosion and sedimentation control measures are shown on the Drawings. The Contractor shall strictly adhere to the minimum provisions shown. Additionally, temporary measures shall be selected and constructed by the Contractor in consultation with the Owner's Representative to accommodate changing field conditions that develop during construction.

G. Disturbed areas where construction has permanently or temporarily ceased, the area must be stabilized within 14 days. If earth disturbing activities will resume within 14 days, temporary stabilization is not required.

H. All disturbed areas shall be re-vegetated by loaming and seeding unless otherwise noted on the approved plan.

3.6 MAINTENANCE OF EROSION CONTROL MEASURES

A. The Contractor shall check the condition of erosion and sedimentation control devices daily and maintain them in good operating condition. Straw bales shall be replaced when deteriorated.

B. The Contractor shall inspect the condition of diversion dikes and ditches, filter berms, interceptor dikes, sediment basins and other erosion and sedimentation control devices after each rainstorm and during major storm events. Repairs shall be made as necessary.

C. During construction, temporary outlets of the drainage systems shall direct the flow to temporary or permanent sedimentation basins.

D. Temporary soil erosion and sedimentation control devices shall be removed and adjacent areas outside the limits of grading restored upon completion of the work or when required by the Owner's Representative.

E. Erosion control problems created by the Contractor, and beyond the scope of work, shall be immediately corrected by the Contractor at no additional cost to the Owner.

END OF SECTION

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the Contract and General Conditions and all Sections within Division 01 - General Requirements which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified Professional Engineer, using performance requirements and design criteria indicated.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Monitor vibrations, settlements, and movements.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Section 01 41 29 – EPA NPDES Construction General Permit
2. Section 02 11 00 – Clearing and Grubbing
3. Section 02 11 05 – Site Clearing
4. Section 02 11 10 – Excavation and Handling of Contaminated Material
5. Section 02 20 00 – Earthwork
6. Section 31 20 00 – Earth Moving
7. Section 31 23 19 – Dewatering
8. Section 33 41 00 – Storm Utility Drainage Piping
9. Section 33 49 00 – Storm Utility Drainage Structures

1.3 SUBMITTALS

A. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer responsible for their preparation.

B. Qualification Data: For qualified Professional Engineer.

C. Other Informational Submittals:

1. Photographs or Videotape: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.
   a. Note locations and capping depth of wells and well points.

1.4 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project Site.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
   a. Geotechnical report.
   b. Existing utilities and subsurface conditions.
   c. Proposed excavations.
   d. Proposed equipment.
   e. Monitoring of excavation support and protection system.
   f. Working area location and stability.
   g. Coordination with waterproofing.
   h. Abandonment or removal of excavation support and protection system.

1.5 PROJECT DESCRIPTION

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Owner no fewer than 2 days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Owner's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of Geotechnical Engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by Geotechnical Engineer. The Owner will not be responsible for interpretations or conclusions drawn from the data.

1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.
2. The geotechnical report is included elsewhere in the Project Manual.

C. Survey Work: Engage a qualified Land Surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements; establish exact

elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Owner's Representative if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A36/A36M, ASTM A690/A690M, or ASTM A992/A992M.

C. Steel Sheet Piling: ASTM A328/A328M, ASTM A572/A572M, or ASTM A690/A690M; with continuous interlocks.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 4 inches.

E. Shotcrete: Comply with Division 03 Section "Shotcrete" for shotcrete materials and mixes, reinforcement, and shotcrete application.

F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.

G. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

H. Tiebacks: Steel bars, ASTM A722/A722M.

I. Tiebacks: Steel strand, ASTM A416/A416M.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

3.3 SHEET PILING

A. Retain this article if driven sheet piling is required.

B. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

A. Most tieback systems are proprietary. Insert material requirements in Part 2 if a particular tieback is required. If tiebacks are permanent, consider level of corrosion protection of tendons and anchorage connections.

B. Tiebacks: Drill, install, grout, and tension tiebacks. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.

1. Test loading shall be observed by a qualified Professional Engineer responsible for design of excavation support and protection system.
2. Maintain tiebacks in place until permanent construction is able to withstand lateral soil and hydrostatic pressures.

3.5 BRACING

A. Bracing of wales may be required for soldier piles and lagging systems and for sheet piling.

B. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.

1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
2. Fill voids immediately with approved backfill compacted to density specified in Section 31 20 00, Earth Moving.
3. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work under this section consists of furnishing hot mix asphalt (HMA) pavement (on the Drawings, this is also referred to as "bituminous concrete pavement") composed of mineral aggregate, recycled asphalt pavement (RAP), asphalt binder material and an anti-strip additive (if required), that are mixed in a central mixing plant and then placing the mix on a prepared course in accordance with these specifications and conformance to the lines, grades, thicknesses and typical cross sections as shown on the plans or as directed by the Owner.

B. The work includes:

1. Preparation for HMA paving and furnishing and installing HMA.
2. HMA overlays over existing pavement, including surface preparation, and leveling courses, tack coating and all other associated operations required.
3. Sawcutting existing pavements.

C. Acceptance of plant produced material for gradation, asphalt content, and air voids shall be determined by the owner in accordance with the requirements of Section 3.10 Acceptance Criteria.

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 02 20 00 - Earthwork
2. Section 31 20 00 – Earth Moving
3. Section 31 50 00 – Excavation Support and Protection
4. Section 32 16 13 – Curbs

1.3 REFERENCE STANDARDS

A. References herein are made in accordance with the listed specific standards of the following organization and Work under this Section shall conform to the latest edition, unless modified by these specifications.

AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials
AI	Asphalt Institute
FHWA	Federal Highway Administration

MassDOT	Massachusetts Department of Transportation, Standards Specifications for Highways and Bridges
NETTCP	New England Transportation Technician Certification Program
Quincy	**Standard Specifications of the local municipality**

1.4 WEATHER LIMITATIONS

A. Construct pavement when atmospheric temperature is above 40°F, the base is not frozen, and there is not any film (free standing) of water on the base to be paved.

B. The required temperature of the HMA mixture, within a tolerance of plus or minus 15°F, when delivered at the site, will be governed by the temperature of the base upon which the mix is placed, as follows:

Table 1

Required Temperature of HMA Mixture

Base Temperature in Degrees F	Required Material Temperature in Degrees F (for course thickness in inches)			
	1	1-1/2	2	3 and Greater
35-40	-	305	295	280
41-50	310	300	285	275
51-60	300	295	280	270
61-70	290	285	275	265
71-80	285	280	270	265
81-90	275	270	265	260
91 & over	270	265	260	255

C. Tack coat shall be applied only when the ambient temperature is above 40°F, and when the temperature has been above 35°F for 12 hours immediately prior to application. Do not apply when base is wet, contains excess moisture, is frozen or during rain.

1.5 SUBMITTALS

A. Job Mix Formula (JMF): No HMA shall be produced until a JMF has been submitted by the Contractor and reviewed by the Owner's representative. The HMA shall be designed using procedures contained in Chapter 5, MARSHALL METHOD OF MIX DESIGN, of the Asphalt Institute's (AI) Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete, and shall meet the requirements of Table 3 and Table 4.

B. JMF Submittal: The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations and shall include as a minimum:

1. Percent passing each sieve size.
2. Gradation and percent of each individual aggregate or mineral filler, including source, location, and bulk specific gravity.
3. Percent of asphalt binder.
4. Performance graded asphalt binder certified test results and Material Certificate certifying the PG grade, including source and location.
5. Number of blows of hammer compaction per side of Marshall molded specimen.
6. Mixing temperature.
7. Compaction temperature.
8. Temperature of mix when discharged from the mixer.
9. Plot of the combined gradation on the Federal Highway Administration (FHWA) 0.45 power gradation curve.
10. Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight verses asphalt content.
11. Percent natural sand.
12. Percent fractured faces.
13. Percent elongated particles.
14. Tensile Strength Ratio (TSR)
15. Antistrip agent – type, quantity, supplier and location.

C. Performance Graded Asphalt Binder Material: The certification(s) shall show the appropriate AASHTO and/or ASTM test(s) for each material, the test results, and a statement that the material meets the specification requirement.

Reference: AASHTO MP-1 and PP6

1. Flash point
2. Rotational viscosity at 135°C and 165°C
3. Specific gravity at 25°C
4. Original G*/sinδ and phase angle at test temperature
5. RTFO percent mass loss (rolling thin film oven)
6. RTFO - G*/sinδ and phase angle at test temperature
7. PAV Residue - G*(sinδ) and phase angle at test temperature
8. Creep stiffness and m-value at test temperature
9. Direct tension results (when equipment available)
10. Strain sweep in accordance with AASHTO TP-5 (optional)
11. Physical hardening after 24 hours in accordance with AASHTO TP-1 (optional)
12. Mixing and Compaction viscosity-temperature chart

D. Asphalt Anti-Stripping Additive: This specification provides for an additive to asphalt to assist in the coating of wet aggregate and to increase the resistance of the asphalt binder coating to stripping in the presence of water. The additive shall be chemically inert to asphalt (heat stable) and when blended with asphalt shall withstand storage at a temperature of 400°F for extended periods without loss of effectiveness.

E. Testing Laboratory: The laboratory used to develop the JMF shall meet the requirements of ASTM D3666. A certification signed by the manager of the laboratory stating that it meets these requirements shall be submitted with the JMF.

F. Certified Test Reports: Submit Certified Test Report(s)signed by the material producer and Contractor certifying that materials comply with, or exceed, the requirements herein. Owner reserves the right to employ an independent testing laboratory for testing materials included in the JMF, and Contractor shall, upon request of Owner, supply suitable quantities of these materials for such testing.

G. Field Samples (Pavement Coring):

1. The Owner/Owner's Representative reserves the right to make corings of the bituminous paving to verify thickness of paving layers.
2. The location and timing of the corings shall be at the discretion of the Owner's Representative and at Owner's expense.
3. The indicated depths are minimum; if a pavement core indicates deficient pavement thickness, the Owner's Representative may require additional corings (at the Contractor's expense) to establish the extent of the deficiency.
4. Methods of correcting deficient pavement thickness shall be submitted by the Contractor for the Owner's Representative's approval. Correction shall be at no expense to the Owner.
5. Contractor shall fill and seal boring holes with the appropriate bituminous material.

1.6 COORDINATION

A. The Contractor shall coordinate paving with all other work, especially underground utility construction, to prevent covering up unfinished or uninspected work and loss of time or labor by improper scheduling. Any repaving required shall be done at no cost to Owner.

1.7 PAVEMENT WITHIN PUBLIC RIGHT OF WAY

A. The construction of all pavements within public rights-of-way shall be in accordance with the rules, regulations and requirements of the Public Agency having control and ownership of such rights-of-way.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate: Aggregate shall consist of crushed stone, with or without sand or other inert finely divided mineral aggregate. The portion of the materials retained on the #4 sieve (4.75 mm) shall be known as coarse aggregate, the portion passing the #4 sieve (4.75 mm) and being retained by the #200 sieve (0.075 µm) as fine aggregate, and the portion passing the #200 sieve (0.075 µm) as mineral filler.

1. Coarse Aggregate
   a. Coarse aggregate shall consist of sound, tough, durable particles, free from adherent coatings of clay, organic matter, and other deleterious substances. It shall show no more wear than 30 percent loss when tested in accordance with AASHTO - T96, nor shall the sodium sulfate soundness loss exceed 9 percent, or the magnesium soundness loss exceed 12 percent, after 5 cycles, when tested in accordance with ASTM C88.
   b. The coarse aggregate shall not contain more than 10 percent, by weight, of flat or elongated pieces, when tested in accordance with ASTM D4791 at a ratio stated within the standard specifications, or in lieu of, 3:1. A flat particle is one having a ratio of width to thickness greater than the stated ratio; an elongated particle one having a ratio of length to width greater than the stated ratio. An aggregate particle whose maximum length is the stated ratio times its maximum thickness is considered flat and elongated.

2. Fine Aggregate
   a. Fine aggregate shall consist of clean, sound, durable, angular particles produced by crushing natural stone, or gravel that meets the requirements for wear and soundness specified for the coarse aggregate. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. The fine aggregate, including any blended material for the fine aggregate, shall have a plasticity index of not more than 6 and a liquid limit of not more than 25 when tested in accordance with AASHTO T89 and AASHTO T90.
   b. Fine aggregates shall have sand equivalent values of 40 or greater when tested in accordance with AASHTO T176. The sand equivalent value shall be determined for the combined mix aggregates, including coarse and fine aggregates and mineral filler portions.
   c. In the fine aggregate sieve analysis passing #4 (4.75mm), the amount between two successive sieves #16, #30, #50, and #100 shall not exceed 33% of the fine aggregate total.
   d. The fine aggregate, as delivered to the mixer, shall meet the following gradation requirement:

Table 2

Sieve	Percent Passing	
	Minimum	**Maximum**
3/8 inch	95	100
No. 8	70	95
No. 50	20	40
No. 200	2	16

3. Mineral Filler: If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of AASHTO M17.

B. Recycled Asphalt Pavement: The use of a maximum of 10 % recycled asphalt pavement (RAP) will be allowed in the HMA surface courses. All other HMA mixtures may contain a maximum of 25% RAP by mass of the entire mixture.

1. The RAP, incorporated into the HMA mixtures, shall be maintained as a separate captive stockpile and shall not be added to without prior approval. RAP shall consist of asphalt pavement recovered by cold milling or other removal techniques. The RAP shall be crushed so that 100 percent passes the 3/4-inch sieve, or a smaller size depending on the mixture being produced. The Contractor shall assure that the RAP is free from contaminating substances such as joint seal compound.
2. The coarse aggregate in the RAP shall be crushed stone and the top-size shall not exceed the maximum aggregate size established by the JMF. The final HMA mixture containing RAP shall conform to all the specification requirements contained herein.
3. For mixtures containing 15% or less RAP, the asphalt binder shall be a PG 64-28. For mixtures containing greater than 15% and up to 25% RAP, the asphalt binder grade shall be a PG 58-34.
4. For design purposes, the specific gravity of the combined aggregate blend with RAP used in a HMA mixture shall be determined in accordance with the "Method of Test for Bulk Specific Gravity of Aggregate Blends with Recycled Asphalt Pavement," which is provided as **Attachment 1** to this Specification.

C. Asphalt Binder Material: The types, grades, controlling specifications, and maximum mixing temperatures for the asphalt binder materials shall conform to MassDOT (SIC 19.0) for asphalt binder course superpave as well as the following:

THE PGAB GRADE SELECTED FOR THIS CONTRACT IS PG 64-28 and PG 58-34 as applicable. If traffic speed and/or level warrant, the PGAB may be adjusted by the Owner for the Design Traffic conditions in accordance with the table below:

SUPERPAVE PGAB Adjustment for Design Traffic Conditions

Traffic Loading	Adjustment to PGAB Grade
Standing (<20 km/h)	Increase high temperature grade by 2 grades (12° C). Use low temperature grade as determined by LTTP BIND software.
Slow Transient (20 to 70 km/h)	Increase high temperature grade by 1 grade (6° C). Use low temperature grade as determined by LTTP BIND software.

Traffic Level (ESALs)	Adjustment to PGAB Grade
1×10^7 to 3×10^7	Consideration should be given to increasing high temperature grade by 1 grade (6° C). Use low temperature grad as determined by LTPP BIND software
$>3 \times 10^7$	Increase high temperature grade by 1 grade (6° C). Use low temperature grade as determined by LTTP BIND software.

The blending at the HMA plants of PG binder from different suppliers is strictly prohibited. Contractors may switch to another approved source of PG binder, upon written notification to the Owner, and by certifying that the tank to be utilized has been drained to an un-pumpable condition. The tank shall not retain more than 0.5% in volume capacity of previous residue source. Contractors who blend PG binders will be reclassified as a supplier and required to certify the binder in accordance with AASHTO MP1 and AASHTO PP-26. Also, if any modifications, blending, or addition of additives occur, the Contractor shall re-certify the material in accordance with AASHTO MP1 and AASHTO PP-26.

D. Tack Coat: Emulsified asphalt; AASHTO M140/ASTM D997 or AASHTO M 208/ ASTM D2397, RS-1 or CRS-1.

E. Mineral Filler: Rock or slag dust, Portland cement, or other inert material complying with AASHTO M 17/ASTM D242.

F. Anti-stripping additive: Shall be incorporated and thoroughly dispersed in the asphalt binder material in an amount equal to the percent by weight established by the JMF. This percent is based on the efficiency of the additive as determined by laboratory tests. The treated composite mixture shall have a minimum tensile strength ratio (TSR) of not less than 75, when tested in accordance with AASHTO T283 with the freeze/thaw cycle. The specimens for the AASHTO procedure shall be 4" (100mm) in diameter, compacted with the Marshall hammer or the Superpave gyratory compactor to the desired air void level of 7.0 $\pm$ 1.0%. If the TSR ratio is less than 75, the aggregates shall be treated with an approved antistrip in sufficient quantity to produce acceptable results. The HMA materials and asphalt binder material that require

antistrip additives (either liquid or mineral) shall continue to meet all requirements specified herein for binder and HMA. The anti-strip agent shall be included in the bid price.

G. Hot Mix Asphalt: Plant mix may be composed of a homogeneous mixture of aggregate, filler if required, asphalt binder, and/or additives, combined to meet the composition limits by weight and other characteristics as specified. The several aggregate fractions shall be sized, uniformly graded and combined in such proportions that the resulting mixture meets the grading requirements of the following specifications:

Table 3

Sieve Analysis of Mix Percent by Weight Passing

Sieve	Intermediate Course	Top Course
2 inch		
1 inch		
3/4 inch	100	
5/8 inch		
1/2 inch	65-80	100
3/8 inch		80-100
No. 4	48-65	50-76
No. 8	37-51	37-54
No. 16		26-40
No. 30	17-30	17-29
No. 50	10-22	10-21
No. 100		5-16
No. 200	0-6	2-7
PGAB (%)	5.0-6.0	5.5-7.0
Temp. Mix (°F)	265-325	265-325
Stability, lbs. (min.)	1200	1200
Flow, hundredths of an inch	8-16	8-16
Percent Air Voids	3.0-6.0	3.0-5.0

1. The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 3 when tested in accordance with AASHTO Standards T27 and T11.
2. The gradations in Table 3 represent the limits, which shall determine the suitability of aggregate for use from the sources of supply. The aggregate, as selected (and used in the JMF) and blended, shall have a gradation within the limits designated in Table 3 and shall not vary from the low limit on one sieve to

the high limit on the adjacent sieve, or vice versa, but shall be well graded from coarse to fine.

3. Deviations from the final approved mix design for gradation of aggregates shall be within the tolerances for individual measurements as specified in these requirements. The job mix formula tolerances will apply if they fall outside the grading band in Table 3. All mixture furnished for the work shall conform to the job mix formula within the tolerance ranges as specified.
4. The asphalt binder content (PGAB percentage) shall meet the minimum requirements stated in Table 3 for each mixture type. The asphalt binder content of the mixture shall be calculated on the percentage basis by weight of the total mix.
5. The maximum size aggregate used shall not be more than one-half of the thickness of the compacted course being constructed on a prepared surface or that which can be placed to achieve specification requirements. The maximum size is defined as one sieve size larger than the nominal maximum size. The nominal maximum size is defined as one sieve size larger than the first sieve to cumulatively retain more than 10 percent.

H. Additional Criteria

1. In addition to the above Marshall requirements, the mixtures shall also conform to the following:

Table 4

Minimum Percent Voids in Mineral Aggregate

U.S.A. Standard Sieve Designation (inches)	Nominal Maximum Particle Size (inches)	Nominal Maximum Particle Size (mm)	Minimum Voids in Mineral Aggregate (percent)
1/2	0.500	12.5	16
3/4	0.750	19.0	15
1	1.000	25.0	14

2. Voids in mineral aggregate (VMA), for each plant sample, shall be computed in accordance with the procedures contained in Chapter 5, MARSHALL METHOD OF MIX DESIGN, of the Asphalt Institute's Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete.
3. Each mixture shall be evaluated for stripping by performing indirect tensile tests on compacted mixtures. If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by AASHTO T283 with freeze/thaw cycle, is less than 75, the aggregates shall be rejected or the asphalt treated with an approved anti-stripping agent. The amount of anti-stripping agent added to the asphalt shall be sufficient to produce a TSR of not less than 75. If an antistrip agent is required, it will be provided by the Contractor at no additional cost.
4. In addition to the above requirements, proposed HMA shall be in conformance with MassDOT standards.

2.2 HMA FOR SIDEWALKS AND DRIVEWAYS

A. HMA for sidewalks and driveways shall conform to the requirements for dense mix, the maximum allowable percentage of wear, as determined by the L.A. Abrasion Test (AASHTO-T96), shall be 35%.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall install all pavements in the location and to the grades shown on the Drawings or approved by the Owner. The type and thickness of pavement courses shall be as shown on the Drawings.

B. Equipment: Maintain equipment in satisfactory operating condition and correct breakdowns in a manner that will not delay or be detrimental to progress of paving operations.

C. Submit proposed mix design of each class of mix for review prior to beginning of work.

D. Obtain materials from same source throughout project.

3.2 PREPARATION

A. Proof roll prepared base material surface to identify areas requiring removal and recompaction and to provide a uniform degree of compaction over the entire pavement area.

B. Verify that compacted base is dry and ready to support paving and imposed loads.

C. Verify gradients and elevations of base are correct.

D. Do not begin paving work until deficient base material areas have been corrected and are ready to receive paving. paving shall not be applied until the Owner inspects and approves the finished base.

E. Check all frames, covers, grates, water valve boxes and other miscellaneous castings that are located in the proposed pavement areas to ensure that all have been correctly positioned and set to the proper slope and elevation. All covers and grates shall be set flush with the required finished surface. No depressions or mounds will be permitted in the pavement to accommodate inaccuracies in the setting of castings.

F. All vertical surfaces of structures and existing concrete surfaces in contact with new HMA pavement shall be painted with a uniform coating of an approved tack coat material. Extreme care shall be exercised in the application of this material to prevent splattering or staining of surfaces that will be exposed after the paving is completed.

Surfaces that are stained as a result of the Contractor's operation shall be repaired or replaced at no additional cost to the Owner.

G. All existing paved surfaces to be overlaid shall be thoroughly cleaned by a self-propelled sweeper. Areas inaccessible by power sweeper shall be broom swept until the pavement surface is clean.

3.3 APPLICATION

A. Tack Coat

1. Apply tack coat to contact surfaces of curbs, gutters and edges of abutting existing pavement cutbacks.
2. Apply tack coat to existing pavement surfaces to receive HMA overlay at a rate of 0.03 to 0.06 gallons per square yard of residual asphalt on the surface.
3. When the intermediate (binder) course pavement is exposed to construction and or local traffic for more than 30 days or when the surface becomes contaminated with silt, a tack coat shall be applied prior to the surface course pavement at a rate of 0.03 to 0.06 gallons per square yard of residual asphalt on the surface.
4. Allow to dry until at proper condition to receive paving.

B. Weather Limitations: The HMA shall not be placed when weather conditions of fog or rain prevail or when the pavement surface or base shows signs of free moisture (film of water). When the surface temperature of the underlying course is less than 50°F (10°C) the Contractor shall determine the time available for compaction. The time available for compaction shall be calculated based on the time, date, air temperature, average wind speed, sky conditions, latitude, mix type, PG grade, lift thickness, mix delivery temperature, existing surface type, existing moisture content of surface, existing state of moisture in surface, and surface temperature.

The information regarding the air temperature, average wind speed, sky conditions, mix delivery temperature, and existing moisture conditions shall be evaluated by the Owner and a Contractor’s representative located at the paving operation. The estimated time available for compaction shall be provided by the Contractor to the Owner. The Owner and the Contractor shall determine if there is an adequate amount of time available to compact the mixture. Options can be explored to extend the time available for compaction. If there is an adequate amount of time available to compact the mixture, the temperature requirements may be waived by the Owner; however, all other requirements including compaction shall be met. The Contractor assumes responsibility for constructing the pavement to meet compaction and specification requirements.

The Owner will not permit work to continue when overtaken by sudden storms until the pavement surface shows no signs of free moisture. The material in transit at the time of shutdown will not be placed until the pavement surface shows no signs of free moisture, provided the mixture is within temperature limits as specified.

3.4 HOT MIX ASPHALT PAVEMENT PRODUCTION AND PLACEMENT

A. Asphalt Binder Material: The Contractor shall set aside one 1-qt samples of the asphalt binder material obtained from each truckload, shipment, or equivalent of asphalt binder material shipped to the production facility. Each sample shall be labeled with the PG grade, source and batch number, quantity, project name, plant, date, and the sampling inspector. The Contractor shall maintain documentation in the form of a Materials Certificate of each shipment, with a copy attached to each quart sample.

After receiving the quart samples, obtained by the Contractor, the Owner may test the samples for verification of the performance grade. Material shall conform to the specification requirements for the applicable performance grade as specified herein. Material not conforming to specification requirements shall be subject to corrective action, production suspension, rejection, removal, or reduced payment as determined by the Owner.

B. Job Mix Formula (JMF): No HMA shall be produced until a JMF has been submitted by the Contractor and approved by the Owner. The HMA shall be designed using procedures contained in Chapter 5, MARSHALL METHOD OF MIX DESIGN, of the Asphalt Institute's (AI) Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete, and shall meet the requirements of Table 3 and Table 4 in this specification.

All tests for initial aggregate submittals necessary to determine compliance with requirements specified herein shall be made by the Contractor.

A separate job mix formula shall be submitted for each mixture and each approved RAP stockpile (the stockpile shall be of a uniform quality throughout).

C. Sampling: The Contractor shall submit representative samples from actual sources of supply for all aggregates to be used for the production of HMA. ASTM D75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C183 shall be used in sampling mineral filler. Sampling may be observed and supervised by the Owner or their representative. No aggregate shall be used in the production mixtures without prior approval.

The approved JMF for each mixture shall be in effect until modified in writing by the Contractor. Should a change in sources of materials be made, a new JMF must be developed and approved before the new material is used. All mixture furnished for the work shall conform to the job mix formula within the tolerance ranges as specified.

D. JMF Tolerances: The job mix formula with the allowable tolerances shall govern the production limits for the aggregate gradation for each mixture. Liquid asphalt contents shall be within the limits stated in Table 5.

Table 5

Job Mix Formula Tolerances
(Based on a Single Test)

Material	Tolerance Plus or Minus
Aggregate passing No. 4 sieve or larger	6 percent
Aggregate passing No. 8 and No. 16 sieves	5 percent
Aggregate passing No. 30 sieve	4 percent
Aggregate passing No. 50 and No. 100 sieves	3 percent
Aggregate passing No. 200 sieve	2 percent
Asphalt Binder	0.4 percent
Temperature of Mix	20 degrees F (-7 C)

E. Hot Mix Asphalt Mixing Plants, Haul Vehicles, Pavers and Compactors: Shall conform to MassDOT Standard Specifications for Highways and Bridges, Section 460, unless modified herein.

F. Sampling Platform: A safe and adequate platform or catwalk with stairway and railing shall be provided to accommodate the inspector while checking temperatures and obtaining samples of the mixture from haul vehicles. The height of the platforms and raised platforms shall be adequate to accommodate safe acquisition of mix samples from the type of hauling unit(s) being utilized on the project.

G. Testing Laboratory: The Contractor or producer shall provide a fully equipped asphalt testing laboratory for control and acceptance testing functions during periods of mix production, sampling, and testing and whenever materials subject to the provisions of these specifications are being supplied or tested. The laboratory shall provide adequate equipment, space, and utilities as required for the performance of the specified tests. The laboratory and all testing equipment shall be located at the production facility. The Owner shall have priority in the use of the equipment necessary for acceptance testing. The equipment shall conform to the applicable ASTM and AASHTO specification requirements for the specific testing being performed.

Laboratory shall be in compliance with ASTM D3666 latest edition.

The laboratory shall contain all of the equipment necessary to perform testing in accordance with ASTM and AASHTO standards referenced herein and with MassDOT Standard Specifications for Roads and Bridges, latest edition, in addition to those requirements listed below:

Electronic Balance: 20,000gm capacity minimum, sensitivity 0.1gm.

Marshall equipment: Automatic HMA compactor mounted in accordance with ASTM D1559 and conforming to specifications for ASTM D1559 which consists of totally enclosed, rigidly mounted operated frame, a standard circular-foot compaction hammer assembly designed to ensure an 18 inch (457mm) drop regardless of specimen height; a one-third (1/3) horsepower motor with belt guard and controls, and automatic counter that shuts off the power after the set number of hammer drops, and a standard compaction pedestal with guide pins for centering one standard (4-inch diameter) HMA mold at a time.

The Contractor shall also provide two (2) stability compaction molds conforming to ASTM D1559 and suitable for use with the automatic HMA compactor. Note: The Soil test Model AP-800 automatic HMA compactor and AP-166 stability compaction molds have been found suitable.

Bulk Specific Gravity determination equipment (AASHTO T-166). In addition, all ancillary and miscellaneous equipment needed to perform the testing in accordance with these specifications shall be provided.

H. Temporary Storage of Hot Mix Asphalt: Use of surge bins or storage bins for temporary storage of HMA mixtures will be permitted:

1. For HMA containing more than 10% RAP, the storage period shall be established from the Rolling Thin Film Oven (RTFO) residue at 140°F (60°C), tested in accordance with AASHTO T240. Prior to production the Contractor shall recover, by AASHTO T170, a sufficient quantity of the RAP binder. The RAP binder shall be blended with the virgin binder at the JMF percentages. The laboratory RAP-virgin binder blend shall be subjected to the RTFO at 140°F (60°C) and the viscosity of the residue shall establish the maximum viscosity allowed for the binder after silo storage. The viscosity of the residue shall be determined in accordance with AASHTO T202 or AASHTO TP48.
2. If the Owner determines that there is an excessive amount of heat loss, segregation and/or oxidation of the mixture due to temporary storage, use of surge bins or storage bins will be discontinued.

I. Hand Work: Whenever possible, all pavement shall be spread by a self-propelled finishing machine. At inaccessible or irregular areas, pavement may be placed by hand methods. If hand methods are used, the hot mixture shall be spread uniformly to the required depth with hot shovels and lutes. After spreading, the hot mixture shall be carefully smoothed to remove all segregated coarse aggregate and lute marks. Lutes used for hand spreading shall be of the type designed for this use. Material loads shall not be dumped faster than they can be properly spread. Workers shall not stand on the loose mixture while spreading.

J. Paving Machine Placement: Upon arrival, the mixture shall be placed to the full width by a HMA paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling or

tearing of the HMA mat. Unless otherwise permitted, placement of the mixture shall begin along the centerline of a crowned section or on the low side of areas with a one-way slope. The top course in larger parking fields shall be placed in the direction of surface-water flow. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10 feet except where edge lanes require less width to complete the area.

1. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course.
2. The placement of the material along the longitudinal joint may be performed by setting the screed to overlay the first mat. The elevation of the screed above the surface of the first mat should be equal to the amount of roll-down expected during compaction of the new mat. The overlapped material shall be bumped by the lutes, if necessary, to optimize the density along the longitudinal joint. Under no circumstances should the overlapped material be broadcast across the mat. Excess material should be removed by hand and returned to the screed.
3. Trafficking over freshly placed surface course material shall not be permitted until the material has been compacted and allowed to cool to a temperature of 140^0F minimum.

K. Joints – Make joints between old and new pavements, and between successive days' work, to ensure continuous bond between adjoining work. Construction joints shall have the same texture, density, and smoothness as other sections of paving. Clean contact surfaces and apply tack coat.

3.5 ROLLING AND COMPACTION

A. The mixture, after being spread, shall be thoroughly compacted by rollers having a minimum weight of 240 pounds per inch of drum width as soon as it will bear the weight of the rollers without undue displacement. The number, weight, and types of rollers and sequences of rolling operations shall be such that the required compaction and surface texture are consistently attained while the mixture is in a workable condition. Rolling shall continue until the surface is of uniform texture, true to grade and cross section, and the required field compaction is obtained. The number of rollers and passes required shall be governed by the compaction results; however, at least two rollers shall be provided for each paver employed on the paving operation. Each roller shall be operated by a competent, experienced roller operator and shall be kept in as nearly continuous operation as practicable while work is underway. A plate shall be attached to each roller showing the ballasted and unballasted weight per length-width of tread.

B. Compact mixture with hot hand tampers, hand rollers, or vibratory plate compactors in areas inaccessible by self-propelled rollers.

C. Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

D. Follow breakdown rolling as soon as possible, while mixture is hot. Continue rolling until mixture has been thoroughly compacted.

E. Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained specified density.

F. Remove and replace paving areas mixed with foreign materials and defective areas and fill with fresh, hot top or intermediate course material. Compact by rolling to specified surface density and smoothness.

G. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic.

3.6 HMA SIDEWALKS

A. Forms: Where walls, curbing or other suitable permanent supports are not present, satisfactory forms shall be installed to assist in securing alignment and adequate compaction of the courses. All forms shall be removed after paving has been completed and the area backfilled and compacted.

B. Placing HMA: Unless otherwise shown on the plans, the HMA walkway surface shall be laid in two courses to a depth after compaction of 2-1/2 inches. The bottom course shall be 1-1/4 inch in thickness after compaction, and its surface after rolling shall be parallel to the proposed grade of the finished surface. The top course shall be 1-1/4 inch in thickness after compaction.

Unless otherwise directed, the walkway shall have a 1.50% slope to provide for proper drainage and shall conform to handicap accessibility requirements.

1. Spreading Mixture. The mixture shall be dumped, as needed, into a self-propelled sidewalk paver, or into wheelbarrows or an approved steel dump sheets outside the areas on which it is to be placed. It shall then be immediately distributed into place by means of shovels and lutes into a uniformly loose layer to the full width required and of such depth that, when the work is completed, it shall conform to the grade and surface contour required.
2. Rolling. The surface shall be rolled with a self-propelled tandem roller weighing not less than 1-1/2 tons and not more than 5 tons. In places not accessible to a power roller, compaction shall be obtained by means of mechanical rammers or by hand tampers weighing not less than 50 pounds and having a tamping face not exceeding 100 square inches.
3. Testing Surface. When tested with a 10-foot straightedge placed parallel to the centerline of the courses, there shall be no deviation from a true surface in excess of 1/4 of an inch.

3.7 FIELD QUALITY ASSURANCE

A. Independent Testing Laboratory, selected and paid for by the Owner, may be retained to perform construction testing of in-place HMA courses for compliance with requirements for density, thickness and surface smoothness. Top and base courses will be randomly cored by the testing laboratory technicians at a minimum rate of three cores for every course and construction phase or 40,000 square feet of paving, however, no less than three cores in light duty areas and 3 cores in heavy duty areas will be obtained.

Samples of all material including compacted specimens and certified copies of all reports and printouts shall be made available to the Owner or their representative as often as requested including:

1. Performance Graded Binders
2. Recycling agents
3. Virgin aggregates
4. Recycled pavement materials
5. Loose and compacted mixture specimens
6. Combined aggregate samples

B. Grade Control: Establish and maintain required lines and elevations.

C. Thickness: In-place compacted thickness shall not be less than the thickness specified on the Drawings. Areas of deficient paving thickness shall receive a tack coat and a minimum 1-inch compacted thickness overlay; or shall be removed and replaced to the proper thickness, at the discretion of the Owner, until specified thickness of the course is met or exceeded, at no additional cost to the Owner.

D. Surface Smoothness: Testing shall be performed on the finished surface of each course for smoothness, using a 10-foot straightedge applied parallel with, and at right angles to centerline of paved area. The results of these tests shall be made available to the Owner upon request. Surfaces will not be acceptable if they exceed the following tolerances for smoothness:

Intermediate (binder) course:	3/8 inch
Top course:	1/4 inch

E. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable paving as directed by Owner.

F. Compaction: The in-place compaction of each course shall be compacted to a density of at least 92.0 percent and no more than 97.0 percent of the theoretical density. Density shall be calculated in accordance with one of the following standards:

1. Bulk Specific Gravity and Density of Compacted Bituminous Mixture Using Paraffin – Coated Specimens: ASTM D1188.

2. Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens: ASTM D2726.
3. The theoretical maximum specific gravity for the mixture shall be measured for each sample in accordance with AASHTO T209, Type C, D, or E container.

   Areas of insufficient compaction shall be delineated, removed, and replaced in compliance with the specifications at no additional cost to the Owner.

G. Control Strip: If it is determined, during the performance of the contract, that the material does not conform to the material acceptance requirements, the Owner may order the contractor to cease all operations and construct a CONTROL STRIP consisting of a sufficient quantity of HMA according to the JMF. The contractor shall construct a test section 300 feet (90m) long by, 20 to 30 feet (6 to 9m) wide placed in two lanes, with a longitudinal cold joint, and shall be of the same depth specified for the construction of the course which it represents. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip. The equipment used in construction of the control strip shall be the same type and weight to be used on the remainder of the course represented by the control strip. A control strip may be required if a change is made in the JMF, sources of supply, or paving and rolling equipment.

1. The mixture shall be prepared, placed, and compacted in accordance with this specification. When the control strip pavement has cooled sufficiently, a total of six, 6-inch-diameter core samples of the finished pavement including 3 core samples that span the longitudinal joint shall be taken and tested for conformance to compaction requirements. The material will also be evaluated for conformance to the requirements of plant produced material.
2. If the tests by the Owner indicate that pavement does not conform to specification requirements, necessary adjustment to JMF, plant operation, placing procedures, and/or rolling procedures shall be made. A second control strip shall then be placed. If the second control strip also does not meet specification requirements, both sections shall be removed at the Contractor's expense. Additional control strips, as required, shall be constructed and evaluated for conformance to the specifications. Any additional sections that are not acceptable shall be removed at the Contractor's expense. No payment will be made for material and labor employed, either in placement or removal of the nonconforming strip.
3. In no case shall the test result of any one mat core density fall below 90% of theoretical and 88% of theoretical for joint compaction.

3.8 MATERIAL ACCEPTANCE

A. Acceptance Sampling and Testing: All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section may be performed by the Owner or their representative.

1. Plant Produced Material. Plant produced material may be tested for gradation, asphalt content, and air voids on a random basis, in accordance with ASTM D3665. Sampling shall be from material deposited into trucks at the plant or from trucks at the job site. Where more than one plant is simultaneously producing material for the job, the random sample will be obtained from one facility and considered representative of the day's production.

    a. Sampling. Each sample, obtained by the Owner or their representative and selected on a random basis, will consist of sufficient material for preparation of test specimens. One set of laboratory-compacted specimens will be prepared for each sample in accordance with AASHTO T245, at the number of blows required by Table 3. Each set of laboratory compacted specimens will consist of two test portions prepared from the same field sample.
    b. The sample of HMA may be reheated in a covered metal tin and placed in an oven to obtain the compaction temperature. The compaction temperature of the specimens will be as specified in the JMF.
    c. Testing. Sample specimens shall be tested for bulk specific gravity in accordance with AASHTO T166 or T275; whichever is applicable, for use in computing air voids.
    d. The theoretical maximum specific gravity for the mixture shall be measured for each sample in accordance with AASHTO T209, Type C, D, or E container. Samples shall be taken on a random basis, in accordance with ASTM D3665. The value used in the field placed void computations shall be the average of all maximum specific gravity measurements for each course and construction phase.
    e. Asphalt Binder Content: Extraction tests may be performed once per sample in accordance with AASHTO T164 or AASHTO T308 for determination of asphalt content. The weight of ash portion of the extraction test, as described in AASHTO T164, shall be determined as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture. If utilizing AASHTO T308 for asphalt content determination, the calibration process and calibration factor, as described in AASHTO T308, shall be determined as stated, prior to acceptance testing. A verification shall be performed as part of every twentieth test performed thereafter or when changes in the mix are apparent.

        The use of the nuclear method for determining asphalt content in accordance with AASHTO T287 is permitted, provided that it is calibrated for the specific mix being used.

    f. Gradation: Aggregate gradations shall be determined once for each sample from mechanical analysis of extracted aggregate in accordance with AASHTO T30 and AASHTO T27 (Dry Sieve). When asphalt content is determined by the nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants or from the cold feed on drum mix or continuous mix

plants, and then tested in accordance with AASHTO T27 (dry sieve) using actual batch weights to determine the combined aggregate gradation of the mixture.

2. Field Placed Material: Material placed in the field may be tested for mat and joint density, and compacted thickness on a random basis, in accordance with ASTM D3665. No surface course material shall be placed until an evaluation of the intermediate course for specification conformance is completed. The Owner, prior to placement of the surface course, may determine the quality and acceptance for the intermediate course.

    a. Mat Compaction. The lot size shall be the total quantity of each course placed per construction phase or per 200,000 square feet maximum of construction. Three, 6-inch-diameter cores of finished, compacted material shall be taken by the Owner or the Owner's representative from each course and each lot, or partial lot. Core locations will be determined by the Owner on a random basis. Cores shall not be taken closer than 1 foot (0.3 meters) from a longitudinal joint and 10 feet (3.0 meters) from a transverse joint.
    b. Joint Compaction. The lot size shall be the total length of longitudinal joints constructed by a material course placed per lot of construction. Three (3) cores of finished, compacted materials shall be taken by the Owner or the Owner's representative from each course and each lot, or partial lot. Core locations will be determined by the Owner on a random basis and be located directly over the joint, not adjacent to the joint.
    c. Sampling. Samples shall be neatly cut with a core drill. The cutting edge of the core drill bit shall be of hardened steel or other suitable material with diamond chips embedded in the metal cutting edge. The minimum diameter of the sample shall be 6 inches (152.4mm). Samples that are clearly defective, as a result of sampling, shall be discarded and another sample taken. The Owner or the Owner's representative shall furnish all tools, labor, and materials for cutting samples and filling the cored pavement. Cored holes shall be filled in a manner acceptable to the Owner and within one day after sampling.
    d. Testing. The bulk specific gravity of each cored sample will be measured by the laboratory technician in accordance with AASHTO T166 or T275, whichever is applicable. The theoretical maximum specific gravity shall be measured once for each plant sample in accordance with the plant-produced material section. The theoretical value used for the percent density of the core samples shall be the average of the maximum specific gravity measurements for the material course and construction lot. The percent density of each sample will be determined in accordance with AASHTO T269, using the bulk specific gravity of each sample and the average theoretical maximum specific gravity for the material course and construction lot.

3.9 Protection

A. Immediately after placement, protect pavement from mechanical injury for a minimum 8 hours.

3.10 ACCEPTANCE CRITERIA

A. General: Acceptance will be based on the following characteristics of the HMA and completed pavement on a material course and construction phase basis:

Hot Mix Asphalt Production

Plant air voids
Gradation
Asphalt binder content
Mixture temperature

Hot Mix Asphalt Placement

Mat density
Joint density
Thickness
Inferior material
Smoothness
Grade

1. Hot Mix Asphalt Production

a. Plant Air Voids - The average plant bulk specific gravity shall be determined per set of laboratory compacted specimens. The theoretical maximum specific gravity, for the sample, shall then be used to determine the air voids in accordance with AASTHO T269. Material shall conform to the specification requirements for air voids listed in Table 3. Material not conforming to specification requirements shall be subject to corrective action, production suspension, rejection, removal, or reduced payment.

Corrective action shall be taken by the Contractor when the calculated plant produced air voids per set of laboratory compacted specimens, fall outside the specification range by up to and including 1.5%, either on the high side or the low side. The Contractor shall be required to suspend production when the calculated air voids fall outside the specification range by more than 1.5%, either on the high side or the low side. If two consecutive calculations fall outside the specification range by up to 1.5%, either on the high side or the low side, the Contractor shall be required to suspend production. If production is suspended, the Contractor shall be required to produce material on a trial basis for testing purposes without shipment to the project. The Owner or their representative shall pay for acceptance sampling and testing for the first set of trials, necessary to determine conformance with the

specification requirements. If the first set of trials does not conform to specification requirements, the Contractor shall pay for any additional trial sampling and testing for acceptance. When trials have been approved, the plant will return to its normal operation.

b. Gradation and Asphalt Binder Content: The Contractor shall take corrective action and/or suspension of production when the individual results for asphalt content and/or gradation fall outside the following control limits:

Table 6

Control Limits for Individual Measurements

Sieve Size	Limits	
	Action	Suspension
25.4 mm	0%	0%
19.0 mm	±6%	±9%
12.5 mm	±6%	±9%
9.5 mm	±6%	±9%
4.75 mm	±6%	±9%
2.36 mm	±5%	±7.5%
1.18 mm	±5%	±7.5%
0.600 mm	±4%	±5.5
0.300 mm	±3%	±4.5
0.150 mm	±3%	±4.5
0.075 mm	±2%	±3%
Asphalt Binder Content	±0.4%	±0.70%

These limits shall be applied to the target values established in the JMF. Corrective action shall be taken by the Contractor when the calculated individual result for gradation or asphalt content falls outside the target JMF value beyond the action limit listed in Table 6. The Contractor shall take the appropriate action when results indicate the material is out of tolerance. The Contractor shall be required to suspend production when the calculated individual result for gradation falls outside the target JMF value beyond the suspension limit listed in Table 6, or when the asphalt binder content is below the minimum values stated in Table 3. The Contractor shall be required to suspend production if two points in a row fall outside the Action Limits for individual measurements. If production is suspended, the Contractor shall be required to produce material on a trial basis for testing purposes without shipment to the project. The Owner or their representative shall pay for acceptance sampling and testing for the first set of trials, necessary to determine conformance with the specification requirements. If the first set of trials does not conform to specification requirements, the Contractor shall pay

for any additional trial sampling and testing for acceptance. When trials have been approved, the plant will return to its normal operation.

c. Mixture Temperature: The temperature of the mixture shall be in accordance with the Performance Graded Asphalt Binder (PGAB) allowable mixing and compaction temperature range.
d. Failure to stop production and make adjustments when required due to an individual test not meeting the specified requirements shall subject all mix from the stop point to the point when the next individual test is back on or within the action limits, or to the point when production is actually stopped, whichever occurs first, to be considered unacceptable. This material shall be removed and replaced with materials that comply with the specifications at the Contractor's expense.

2. Hot Mix Asphalt Placement

a. Mat Density and Joint Density: Mat and Joint Density will be evaluated based on the test results obtained by the Owner. Sampling and testing shall be performed in accordance with Section 3.7 Field Quality Assurance.

The bulk specific gravity shall be determined for each compacted core specimen. The theoretical maximum specific gravity shall then be used to determine the density of the compacted specimen in accordance with AASHTO T269, using the bulk specific gravity of each sample and the average theoretical maximum specific gravity for the material course and construction lot.

$$\text{Density} = (G_{mb}/G_{mm}) \times 100$$

Where G_{mb} = bulk specific gravity of compacted specimen

G_{mm} = theoretical maximum specific gravity

HMA material shall conform to the specification requirements for density listed below. Material not conforming to specification requirements shall be subject to corrective action, production suspension, rejection, removal, or reduced payment as determined by the Owner.

Mat Density. The in-place density of each course shall be compacted to a density of at least 92.0 percent and no more than 97.0 percent of the theoretical density as determined from field or plant samples.
Joint Density. The in-place density of each course shall be compacted to a density of at least 90.0 percent and no more than 97.0 percent of the theoretical density as determined from field or plant samples.

Acceptance of field placed material for mat density and joint density will be based on the test results obtained by the Owner.

b. Thickness Determinations: The compacted thickness shall be evaluated based on the test results obtained by the Owner. Sampling and testing shall be performed in accordance with Section 3.7 Field Quality Assurance. The thickness requirements shall apply only when each pavement layer is specified to be a uniform compacted thickness of 1 inch (25mm) or greater. The compacted thickness of each layer of the hot mix asphalt or mixes will be measured to determine compliance with the acceptance tolerances in Table 7. Thickness shall be evaluated for compliance by the Owner to the requirements shown on the plans. The thickness shall be determined for each compacted core specimen in accordance with ASTM D3549.

Table 7

Thickness Acceptance Tolerances

Specified Thickness	Allowable Tolerances (T)
1 inch to 2 inches	±1/4 inch
2 inches+ to 5 inches	±3/8 inch
Over 5 inches	±1/2 inch

Material shall conform to the specification requirements for thickness listed above. Material not conforming to specification requirements shall be subject to corrective action, production suspension, rejection, removal, or reduced payment as determined by the Owner.

c. Inferior Material: The Owner may at any time, notwithstanding previous acceptance, notify the Contractor of inferior material and recommend the rejection of any batch of HMA which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or improper mix temperature. Such recommendation may be based on only visual inspection or temperature measurements. In the event of such notification, the Contractor should evaluate and dispose of any inferior material. If inferior material is not rejected by the Contractor, the Owner will take a representative sample of the rejected material in the presence of the Contractor, and if it can be demonstrated in the laboratory, that such material was erroneously incorporated into the work, payment will not be made for that material and the Contractor will remove and replace the defective material identified by the Owner.

d. Smoothness: The finished surfaces of the pavement shall be uniform in appearance, free from irregularities in contour and texture and shall present a smooth-riding surface. Smoothness evaluation applies to all HMA concrete roadways receiving 1.5 inches (38mm) or more in plan (compacted) thickness

The finished surface of the pavement shall not vary more than 1/4 inch (6.2mm) for the surface course and 3/8 inch (9.5mm) for the intermediate course. Each area shall be evaluated with a 10-foot (3.0m) straightedge.

Measurements will be made perpendicular and parallel to the paver passes at distances not to exceed 50 feet (15.2m).

When profile corrections are required, the Contractor shall use one or more of the following corrective methods:
1) Removing and replacing the entire pavement thickness;
2) Diamond grinding or micro milling;
3) Overlaying (not patching) with the specified surface course;
4) Removing the surface by milling and applying a lift(s) of the specified course(s);
5) Use of other methods that will provide the desired results;

e. Grade: The finished surface of the pavement shall not vary from the gradeline elevations and cross sections shown on the plans by more than 1/2 inch (12.70 mm). The Contractor shall remove deficient areas and replace with new material. Sufficient material shall be removed to allow at least 1.5 inches (37.5 mm) of hot mix asphalt to be placed. Skin patching for correcting low areas shall not be permitted. High points may be ground off. The Contractor shall make tests for conformity with the specified crown and grade immediately after initial compaction. Any variation shall be corrected by the removal or addition of materials and by continuous rolling.
f. Shaping Edges: While the surface is being compacted and finished, the Contractor shall carefully trim the unsupported outside edges of the pavement not receiving curbing. Edges so formed shall be beveled while still hot with the back of a lute or smoothing iron and thoroughly compacted by tampers or by other satisfactory methods.
g. The corrective method(s) chosen by the Contractor shall be performed at the Contractor's expense, including all necessary equipment and traffic control.
   1) Areas of removal and replacement shall be removed the full width of the paver pass. The removal areas shall be reconstructed with a transverse butt joint, using a transverse saw cut perpendicular to the paver pass.
   2) Replacement materials shall be placed in sufficient quantity so the finished surface will conform to grade and smoothness requirements. The corrective area shall conform to all material and compaction specification requirements.
   3) When the corrective work consists of an overlay, the overlay shall cover those paver passes sufficient to correct the defects. The area overlaid shall be placed with a transverse butt joint using a transverse saw cut and asphalt removal.
   4) All materials shall meet contract requirements. The overlay shall be placed so the finished surface will conform to grade and smoothness requirements. The overlay area shall be compacted to the specified density.

5) The Owner shall retest any sections where corrections were made to verify that the corrections produced a surface that conforms to the grade and smoothness requirements.

3.11 MEET EXISTING PAVEMENTS

A. Where new pavements will abut existing pavements, the Contractor shall sawcut the existing pavements to produce a uniform, smooth joint surface. Sawcutting of existing pavements shall be neat, straight and even lines, and done in a manner that prevents damage to the pavement to remain.

B. Full-Depth Pavement: Sawcut by approved method to the full depth of the pavement prior to placement of any new pavement. The sawcut surface shall be a neat true line with straight vertical edges free from irregularities. The sawcut surface shall be tack coated immediately prior to the installation of the new abutting HMA material to provide a bond between the old and new pavement. The new compacted pavement surface shall be finished flush with the abutting pavement.

C. HMA Overlays: The existing hot mix asphalt pavement shall be sawcut to a neat true line with straight vertical edges free of irregularities for a minimum depth of 1-1/2 inches. Prior to completing overlays, existing pavements shall be tapered by grinding. The taper, along the entire length of the joint, shall be 1-1/2 inches deep at the sawcut face and shall taper to zero inches deep toward the overlay at a distance of 2 feet from the sawcut face in driveways and at a distance of 6 feet in roadways and parking areas. The taper shall be cleaned and shall receive an asphalt emulsion tack coat immediately prior to placement of the overlay. The new compacted surface at the joint shall be flush with the abutting existing pavement.

D. Immediately prior to the placement of the HMA overlay, the sawcut edges of the existing pavement shall be tack coated to bond the new pavement to the old pavement. The new pavement surface shall be finished flush with the abutting pavement. The surface seam of the pavement joint shall be sealed with tack coat and back sanded.

END OF SECTION

Attachment 1

METHOD OF TEST FOR BULK SPECIFIC GRAVITY OF AGGREGATE BLENDS WITH RECYCLED ASPHALT PAVEMENT

1. SCOPE

A. This test method covers the procedure to determine the bulk specific gravity (Gsb) of a combined

B. This test method may involve hazardous materials, operations, and equipment. This test method does not purport to address all of the safety problems associated with the test method's use. The test method user's responsibility is to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. REFERENCED DOCUMENTS

A. AASHTO Standards

T-2 Sampling Aggregates
T-84 Specific Gravity and Absorption of Fine Aggregates
T-85 Specific Gravity and Absorption of Coarse Aggregate
T-100 Specific Gravity of Soils
T-164 Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
T170 Recovery of Asphalt From Solution by Abson Method
T-209 Maximum Specific Gravity of Bituminous Paving Mixtures
T-228 Specific Gravity of Semi-Solid Bituminous Materials (Pycnometer Method)

B. Other References

MS-2 Mix Design Methods for Asphalt Concrete by the Asphalt Institute

3. TERMINOLOGY

A. Terms and Abbreviations. Definitions for terms and abbreviations shall be in accordance with the Standard Specifications.

4. SIGNIFICANCE AND USE

A. This test method is used to determine the bulk specific gravity of a combined aggregate blend with RAP used in HMA mixture.

B. The bulk specific gravity (Gsb) of a combined aggregate blend is calculated using an estimate of the bulk specific gravity of the aggregate in the RAP and the actual bulk specific gravity of the other aggregates.

C. The bulk specific gravity of an aggregate blend is used to perform a volumetric analysis on compacted HMA in accordance with the Mix Design Methods for Asphalt Concrete by the Asphalt Institute.

5. APPARATUS

A. Apparatus shall be as stated in the referenced test methods.

6. SAMPLING

A. Sampling shall be as stated in the referenced test methods.

7. PROCEDURE

A. Identify the coarse aggregate(s), fine aggregate(s), and RAP selected for use in the mix designs.

B. Identify and record the actual percentages for each of the aggregate components used in the combined aggregate blend of the mix design.

C. Obtain a representative sample of the coarse aggregate, fine aggregate, mineral filler, and RAP in accordance with the AASHTO procedures.

D. Determine and record the bulk specific gravity of each of the coarse aggregate(s) in accordance with AASHTO T-85.

E. Determine and record the bulk specific gravity of each of the fine aggregate(s) in accordance with AASHTO T-84.

F. Determine and record the maximum specific gravity of the RAP in accordance with AASHTO T-209, Type C, D, or E container.

G. Determine and record the asphalt content of the RAP using AASHTO T164.

H. Calculate and record the effective specific gravity of the RAP aggregate in accordance with the following:

$$Gse = (100 - Pbrap)/((100/Gmmrap) - (Pbrap/Gbrap))$$

Where:

Gse = Effective specific gravity of the RAP aggregate
Pbrap = Percent binder of the RAP
Gmmrap = Maximum specific gravity of the RAP
Gbrap = Specific gravity of asphalt in the RAP (AASHTO T228)

I. Calculate and record the effective specific gravity of the combined aggregate blend as follows:

$$\text{GsbBlend} = \frac{\%CA1 + \%CA2 + \%FA1 + \%FA2 + \%BHF + \%RAP}{\frac{CA1}{Gsb} + \frac{\%CA2}{Gsb} + \frac{\%FA1}{Gsb} + \frac{\%FA2}{Gsb} + \frac{\%BHF}{Gsb} + \frac{\%RAP}{Gse}}$$

Where:

GsbBlend = Bulk specific gravity of the combined aggregate blend.
Gsb = Bulk specific gravity of each respective aggregate.
Gse = Effective specific gravity of the RAP.
%CA1 = Percent of aggregate blend that is coarse aggregate #1.
%CA2 = Percent of aggregate blend that is coarse aggregate #2.
%FA1 = Percent of aggregate blend that is fine aggregate #1.
%FA2 = Percent of aggregate blend that is fine aggregate #2.
%BHF = Percent of aggregate blend that is bag house fines.
%RAP = Percent of aggregate blend that is RAP.

8. REPORT

A. Report the Gsb of the combined aggregate blend to the nearest 0.001.

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete paving
2. Driveways
3. Roadways
4. Parking lots
5. Curbs and gutters
6. Walks

B. Related Requirements:

1. Section 02 20 00 – Earthwork
2. Section 03 30 10 – Cast in Place Concrete
3. Section 31 20 00 – Earth Moving
4. Section 31 50 00 – Excavation Support and Protection
5. Section 32 16 13 – Curbs

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:

1. Exposed Aggregate: **10-lb (4.5-kg**) Sample of each mix.

C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified installer of stamped detectable warnings, ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials
2. Steel reinforcement and reinforcement accessories
3. Fiber reinforcement
4. Admixtures
5. Curing compounds
6. Applied finish materials
7. Bonding agent or epoxy adhesive
8. Joint fillers

C. Material Test Reports: For each of the following:

1. Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
2. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than 96 inches by 96 inches.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.8 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicle and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. If steel reinforcement is required, cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms**,** steel reinforcement**,** and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from galvanized steel wire into flat sheets.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

C. Epoxy-Coated Welded-Wire Reinforcement: ASTM A884/A884M, Class A, plain steel.

D. Reinforcing Bars: ASTM A615/A615M, Grade 60; deformed.

E. Galvanized Reinforcing Bars: ASTM A767/A767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A615/A615M, Grade 60 deformed bars.

F. Epoxy-Coated Reinforcing Bars: ASTM A775/A775M or ASTM A934/A934M; with ASTM A615/A615M, Grade 60 deformed bars.

G. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, Grade 60 deformed bars; assembled with clips.

H. Plain-Steel Wire: ASTM A1064/A1064M, galvanized.

I. Deformed-Steel Wire: ASTM A1064/A1064M.

J. Epoxy-Coated-Steel Wire: ASTM A884/A884M, Class A; coated, plain.

K. Joint Dowel Bars: ASTM A615/A615M, Grade 60 plain-steel bars zinc coated (galvanized) after fabrication according to ASTM A767/A767M, Class I coating. Cut bars true to length with ends square and free of burrs.

L. Epoxy-Coated, Joint Dowel Bars: ASTM A775/A775M; with ASTM A615/A615M, Grade 60 plain-steel bars.

M. Tie Bars: ASTM A615/A615M, Grade 60; deformed.

N. Hook Bolts: ASTM A307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

O. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

P. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

Q. Zinc Repair Material: ASTM A780/A780M.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C150/C150M, Portland cement Type II.

B. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260/C260M.

D. Chemical Admixtures: Admixtures, certified by manufacturer, to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

E. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

1. Color: As selected by Architect.

F. Water: Potable and complying with ASTM C94/C94M.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry, or cotton mats.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, dissipating.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 2, Class B, dissipating.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber, ASTM D1752, cork or self-expanding cork or ASTM D8139, semirigid, closed-cell polypropylene foam in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy-Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Types I and II, if non-load bearing required; Types IV and V, for load-bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

E. Pigmented Mineral Dry-Shake Hardener: Factory-packaged, dry combination of Portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Color: As selected by Architect

F. Rock Salt: Sodium chloride crystals, kiln dried, coarse gradation with 100 percent passing 3/8-inch sieve and 85 percent retained on a No. 8 sieve.

2.7 STAMPED DETECTABLE WARNING MATERIALS

A. Detectable Warning Stamp: Semirigid polyurethane mats with formed underside capable of imprinting detectable warning pattern on plastic concrete; perforated with a vent hole at each dome.

1. Size of Stamp: One piece, matching detectable warning area shown on Drawings and Massachusetts Architectural Access Board (MAAB) and American Disabilities Act (ADA) requirements.

B. Liquid Release Agent: Manufacturer's standard, clear, evaporating formulation designed to facilitate release of stamp mats.

2.8 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content, 1-1/2-inch Nominal Maximum Aggregate Size: 5-1/2 percent plus or minus 1-1/2 percent.
2. Air Content, 1-inch Nominal Maximum Aggregate Size: 6 percent plus or minus 1-1/2 percent.
3. Air Content, 3/4-inch Nominal Maximum Aggregate Size: 6 percent plus or minus 1-1/2 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lbs./cu. yd.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

F. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum W/C Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches plus or minus 1 inch.

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete batches larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
3. Provide batch ticket for each batch discharged and used in the Work, indicating project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below sidewalks to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 31 20 00, Earth Moving.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour unless paving terminates at isolation joints.

1. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
2. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet unless otherwise indicated.

2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes.
   a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
   b. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

F. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating joint devices.

G. Screed paving surface with a straightedge and strike off.

H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

I. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

J. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.6 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.7 SPECIAL FINISHES

A. Monolithic Exposed-Aggregate Finish: Expose coarse aggregate in paving surface as follows:

1. Immediately after float finishing, spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
2. Cover paving surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
4. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

B. Seeded Exposed-Aggregate Finish: Immediately after initial floating, spread a single layer of aggregate uniformly on paving surface. Tamp aggregate into plastic concrete and float finish to entirely embed aggregate with mortar cover of 1/16 inch.

1. Spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
2. Cover paving surface with plastic sheeting, sealing laps with tape, and remove sheeting when ready to continue finishing operations.
3. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
4. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

C. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on paving surface according to manufacturer's written instructions and as follows:

1. Uniformly spread 40 lbs./100 sq. ft. (19.5 kg/10 sq. m) of dampened, slip-resistive aggregate over paving surface in two applications. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
2. Uniformly distribute approximately two-thirds of slip-resistive aggregate over paving surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with a second slip-resistive aggregate application, uniformly distributing remainder of material at right angles to first application to ensure uniform coverage and embed by power floating.
3. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
4. After curing, lightly work surface with a steel-wire brush or abrasive stone and water to expose nonslip aggregate.

D. Rock-Salt Finish: After initial brooming, uniformly spread rock salt over paving surface at the rate of 5 lbs./100 sq. ft.

1. Embed rock salt into plastic concrete with roller or magnesium float.
2. After a 7-day curing period, saturate concrete with water and broom-sweep surface to dissolve remaining rock salt, thereby leaving pits and holes.

E. Pigmented Mineral Dry-Shake Hardener Finish: After initial floating, apply dry-shake materials to paving surface according to manufacturer's written instructions and as follows:

1. Uniformly spread dry-shake hardener at a rate of 100 lbs./100 sq. ft. unless greater amount is recommended by manufacturer to match paving color required.
2. Uniformly distribute approximately two-thirds of dry-shake hardener over the concrete surface with mechanical spreader; allow hardener to absorb moisture and embed it by power floating. Follow power floating with a second application of pigmented mineral dry-shake hardener, uniformly distributing remainder of material at right angles to first application to ensure uniform color and embed hardener by final power floating.
3. After final power floating, apply a hand-troweled finish followed by a broom finish.
4. Cure concrete with curing compound recommended by dry-shake hardener manufacturer. Apply curing compound immediately after final finishing.

3.8 INSTALLATION OF DETECTABLE WARNINGS

A. Blockouts: Form blockouts in concrete for installation of detectable paving units specified in Section 321726 "Tactile Warning Surfacing."

1. Tolerance for Opening Size: Plus 1/4 inch, no minus.

B. Cast-in-Place Detectable Warning Tiles: Form blockouts in concrete for installation of tiles specified in Section 32 17 26, Tactile Warning Surfacing. Screed surface of concrete where tiles are to be installed to elevation, so that edges of installed tiles will be flush with surrounding concrete paving. Embed tiles in fresh concrete to comply with Section 32 17 26, Tactile Warning Surfacing, immediately after screeding concrete surface.

C. Stamped Detectable Warnings: Install stamped detectable warnings as part of a continuous concrete paving placement and according to stamp-mat manufacturer's written instructions.

1. Before using stamp mats, verify that the vent holes are unobstructed.
2. Apply liquid release agent to the concrete surface and the stamp mat.
3. Stamping: While initially finished concrete is plastic accurately align and place stamp mats in sequence. Uniformly load, gently vibrate, and press mats into concrete to produce imprint pattern on concrete surface. Load and tamp mats

directly perpendicular to the stamp-mat surface to prevent distortion in shape of domes. Press and tamp until mortar begins to come through all of the vent holes. Gently remove stamp mats.

4. Trimming: After 24 hours, cut off the tips of mortar formed by the vent holes.
5. Remove residual release agent according to manufacturer's written instructions, but no fewer than three days after stamping concrete. High-pressure-wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.

3.9 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lbs./sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing or moisture-retaining-cover curing as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

3.10 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-feet-long, unleveled straightedge not to exceed 1/2 inch.

4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 50 cu. yd. or fraction thereof of each concrete mixture placed each day.
   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C231/C231M; pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of five standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at 7 days and three specimens at 28 days. Hold the last cylinder for a 56-day break in the case of low breaks.
   a. A compressive-strength test shall be the average compressive strength from three specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design

compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as a sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.12 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with Portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 32 16 13

CURBS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for furnishing and installing all types of granite, concrete and bituminous concrete curbs, edging and berms.

B. The work includes:

1. Furnishing and installing curb, granite edging, curb inlets, and curb corners.
2. All associated items and operations required to complete the installations, including surface preparation, concrete support, jointing and finishing.

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 02 11 00 – Clearing and Grubbing
2. Section 02 11 05 – Site Clearing
3. Section 02 20 00 – Earthwork
4. Section 02 41 10 – Site Demolition
5. Section 03 30 10 – Cast-In-Place Concrete
6. Section 31 14 00 – Earth Stripping
7. Section 31 20 00 – Earth Moving
8. Section 32 12 16 – Asphalt Paving

1.3 REFERENCE STANDARDS

A. References herein are made in accordance with the following abbreviations and, all work under this Section shall conform to the latest editions as applicable.

B. ACI 304 – Recommended Practice for measuring, mixing, transporting and placing concrete.

C. ANSI/ASTM D1751 – Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).

D. ANSI/ASTM D1752 – Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

E. ASTM C33 – Concrete Aggregates.

F. ASTM C94 – Ready-Mixed Concrete.

G. ASTM C150 – Portland Cement.

H. ASTM C260 – Air-Entraining Admixtures for Concrete.

I. ASTM C309 – Liquid Membrane-Forming Compounds for Curbing Concrete.

J. ASTM C494 – Chemical Admixtures for Concrete.

1.4 SUBMITTALS

A. Submit Shop Drawings and Manufacturer's literature for all types of curb, edging, corners and inlets, indicating size, shape and dimensions, finish and setting method for Owner's Representative's approval.

B. Copies of tests on samples of concrete used in the manufacture of precast units showing a compressive strength of 5,000 psi prior to shipping any units.

C. As-Built Drawings

1. As-Built Drawings shall indicate the true measurements and horizontal locations of the new curb construction. As-Built Drawings shall be stamped with the seal of a Licensed Land Surveyor.
2. Submit a digital copy in a PDF and DWG format to the Owner's Representative upon completion and acceptance of work prior to obtaining substantial completion certificate.
3. Submit paper and mylar copies as required by the local municipality.

1.5 DELIVERY, STORAGE AND HANDLING

A. Granite and precast units shall be adequately protected from damage during transit to the site.

B. Curbing shall be protected against staining, chipping, and other damage. Cracked, badly chipped, or stained units will be rejected and shall not be employed in the work.

1.6 SAMPLES

A. The Contractor shall supply to the site three samples of all curb types for approval prior to ordering materials. Approved sample material may be used in the work upon approval by the Owner's Representative.

PART 2 - PRODUCTS

2.1 GRANITE CURB

A. Granite curb shall be basically light gray in color, free from seams and other structural imperfections or flaws which would impair its structural integrity, and of a smooth

splitting appearance. Natural color variation characteristic of the deposit from which the curb is obtained will be permitted.

B. Whenever curbing is sawed, all surfaces that are to be exposed shall be thoroughly cleaned and any iron rust or iron particles removed by sand blasting or other methods approved by the Owner's Representative and any saw mark in excess of 1/8 inch shall be removed.

C. Dimensions

1. The stones for the several types of granite curb shall be cut to the dimensions and curvature hereinafter needed:

Type	Min. Length	Width at Top	Depth	Minimum Width at Bottom
Highway	6 Feet	6 Inches	17 to 19 Inches	4 Inches (for 2/3 length)
Site	3 Feet	5 Inches	17 to 19 Inches	3-1/2 Inches (for 2/3 length)

Stones to be set on a radius of 100 feet or less shall be cut to the required curvature, unless otherwise approved and, except for making closures, shall be of the following minimum lengths:

Radius	Minimum Length
50 Feet to 100 Feet	6 Feet
25 Feet to less than 50 Feet	4 Feet 6 Inches
Less than 25 Feet	3 Feet

D. Finish

1. Granite curb shall have a top surface free from wind, shall be peen hammered or sawed to an approximately true plane, and shall have no projections or depressions greater than 1/8 inch. The front and back arris lines shall be pitched straight and true and there shall be no projection on the back surface for 3 inches down from the top which would exceed a batter of 3:1 (3 vertical:1 horizontal) when measures in the in-place position.

The front face shall be at right angles to the planes of the top and ends and shall be smooth quarry split, free from drill holes and with no projection of more than 1 inch and no depression of more than 1/2 inch measured from the vertical plane of the face through the arris or pitch line for a distance down from the top of 8 inches. For the remaining distance, there shall be no projection or depression greater than 1 inch measured in the same manner.

The ends of all stones shall be square with the planes of the top and face so that when the stones are placed end to end as closely as possible, no space shall show in the joint at the top and face of more than 1/2 inch for the full width of the top and for 8 inches down on the face; after which the end may break back not over 8 inches from the plane of the joint. The arris formed by the intersection of the plane of the joint with the planes of the top and exposed faces shall have no variation from the plane of the top and exposed faces greater than 1/8 inch.

2.2 GRANITE EDGING

A. Granite shall conform to ASTM C615. Stone shall be hard and durable granite of a uniformly light grayish white color free from seams that would impair the structural integrity.

B. The stones for the granite edging shall be cut to the following dimensions:

Top Width	Nominal Depth	Minimum Length
4 inches	12 inches	3 feet

C. The exposed face shall be smooth quarry split to an approximate true plane and still have no projections of more than 1-1/2 inches and no depression greater than 1 inch. The top shall be sawed and shall have no projection or depression greater than 1/4 inch. Any projection not meeting the above shall be dressed off.

D. The top and bottom lines of the face shall be pitched off to a straight line and shall not show over 1 inch between stone and straight edge when straightedge is placed along the top and bottom lines.

E. The ends shall be square to the plane of the face so when placed end to end no space more than 1-1/2 inches shall show except on a radius of 10 feet or less where the finish joint shall be no more than 3/4 inch.

F. Drill holes not more than 3-1/2 inches or 1/2 inch in depth shall be permitted.

G. The sides shall not be under the square more than 4 inches or over the square at the back more than 1 inch.

H. The arris formed by the intersection of the plane of the face with the plane of the end joint shall not vary from the plane of the face more than 1/4 inch.

2.3 PRECAST CONCRETE CURB

A. The concrete shall have a minimum compressive strength of 5,000 psi at 28 days and shall contain 5 to 7 percent entrained air. The material shall conform to Section 03 30 10, Cast-in-Place Concrete.

B. All precast curb with radius of 100 foot or less shall be formed to the radius shown on the Drawings.

C. Precast concrete curb units shall be rub finished:

1. After the concrete has properly hardened, the exposed surfaces shall be rubbed with a #16 carborundum stone or an approved abrasive to fully remove laitance and sand grain finish. No cement shall be used in the rubbing process.
2. The finish of the units shall be uniform and shall conform to those of adjacent work in their final position.

D. Precast concrete curb sections shall be furnished with sockets in each end to receive dowels to maintain the horizontal and vertical alignment of the curb. The dowel socket shall be 11/16 inch by 2-1/2 inches. 5/8-inch by 4-inch dowels shall be provided.

2.4 CAST-IN-PLACE SLIP FROM (EXTRUDED) CONCRETE CURB

A. Concrete

1. Concrete shall include approximately 75 percent State approved concrete sand and 25 percent 3/8-inch crushed stone. The concrete shall contain a minimum of 564 pounds of cement (6 sacks) per cubic yard yielding a concrete that will exceed 3,500 P.S.I. in 28 days. The concrete shall be produced according to ASTM C94 Ready Mixed Concrete or ASTM C685 Concrete Produced by Volumetric Continuous Mixing.
2. The concrete shall be of such consistency that after extrusion it will maintain the shape of the curb section without support or slumping. It shall contain the maximum amount of water that will permit this result.
3. The concrete shall contain a minimum of 1 pound of fiber reinforcement per cubic yard.

B. Grading limits shall be modified, as necessary, to produce a concrete curb that after extrusion has well defined web marks of water on the surface and is free of surface pits larger than 3/16-inch diameter.

C. A two-component epoxy or suitable cementitious adhesive designed to bond fresh cement concrete to existing bituminous pavement shall be used. Apply adhesive in accordance with manufacturer's recommendations. The adhesive shall be Surebond as manufactured by Kaufman Products, Inc. or approved equal.

D. Site Cast-in-Place Slip Form (Extruded) Concrete Curb shall be as manufactured by Concrete Crafters Inc., or approved equal.

2.5 CAST-IN-PLACE CONCRETE CURB (FORMED)

A. Concrete and reinforcement for cast-in-place concrete curbs shall be as specified in Section 03 30 10, Cast-in-Place Concrete.

2.6 BITUMINOUS CONCRETE CURB (FORMED)

A. Bituminous concrete curb shall conform to the requirements for Dense Mix as specified in Section 32 12 16, Asphalt Paving.

2.7 CEMENT MORTAR

A. Cement mortar shall be composed of one part Portland Cement and two parts of sand by volume with sufficient water to form a workable mix. Cement shall be Portland Cement Type II.

2.8 TRANSITION SECTIONS

A. Horizontal transition sections shall be provided at all locations where curb sections change (i.e., vertical to sloped). Vertical transition sections shall also be provided for precast curb sections at wheelchair ramps. Vertical transition sections for granite curb shall be made as shown on the Drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Trenching, excavation, backfilling, and compaction shall be completed in accordance with Section 31 20 00, Earth Moving, except as modified within this specification.

B. Cement mortar bedding, if required, shall be placed as shown on the Drawings and in accordance with Section 03 30 10, Cast-in-Place Concrete.

3.2 GRANITE CURB AND EDGING INSTALLATION

A. Excavation shall extend 6 inches below and behind curb, as shown on the Drawings.

1. The gravel base shall be placed in the excavated area, graded and compacted to above the proposed curb subgrade.

B. Curbing and curb corners shall be set on additional gravel spread upon the foundation. All spaces under the curb and curb corners shall be filled with gravel thoroughly compacted so that the curb and curb corners will be completely supported throughout their length. The curb shall be set at the line and grade required as shown on the plans unless otherwise directed.

C. Edging shall be set on a thoroughly compacted base so that the edging will be completely supported throughout their length. Concrete shall be placed to support the edging base as shown on the plans.

D. Curb, curb corners or edging shall be fitted together as closely as possible.

E. Immediately after the curb, curb corners, curb inlets, and edging is set, the space between it and the wall of the trench shall be filled with gravel thoroughly tamped to a depth of 6 inches, care being taken not to affect the line or grade of the curb, curb corners, curb inlets and edging. The trench shall continue to be filled with gravel and compacted in 6-inch lifts until grade is achieved. If the curb materials and trench are part of reconstruction work and existing bituminous concrete surface is to remain, then the use of concrete backfill is acceptable, to an elevation suitable to support the pavement patch or section.

F. The joints between curbstones (both front and back) or edging shall be carefully filled with cement mortar and neatly pointed on the top and front exposed portions. After pointing, the curbstones or edging shall be satisfactorily cleaned of all excess mortar that may have been forced out of the joints.

G. Transitions from normal curb settings to wheelchair ramps shall be accomplished with transition curb as shown on the drawings. Transitions shall be of the same type curb and similar to that abutting and, if on a curve, of the same radius.

H. The ends of the stone curb at driveways and intersections shall be cut at a bevel or rounded, as shown on the Drawings.

I. If curb, curb corners, curb inlets or edging of different quarries is used on the same project, curbing of each particular quarry shall be segregated and set to give uniform appearance.

J. Procedures for removal and resetting of existing granite curb, and new granite curb, in existing pavements shall include the following:

1. Prior to excavation for existing granite curb removal, the pavement surface shall be saw cut a minimum of one foot from the face of curb.
2. Existing curb shall be carefully excavated and removed in a manner that protects the curb and existing pavement to remain from damage.
3. Existing granite curb shall be cleaned by sandblasting as required to remove bituminous material, paint and concrete from exposed surfaces prior to resetting in the proposed work.
4. New granite curb shall be set to match the top of existing granite curb remaining in place at abutting sections and, if required, transitioned to the typical section shown on Drawings within the first section of curb. Cement concrete shall be placed along the front face of the curb as shown on the Drawings.

3.3 PRECAST CONCRETE CURB

A. Precast units delivered to the site shall be inspected for damage, unloaded and placed along the prepared curb trench, or other designated location, with the minimum amount of handling.

1. Materials shall be handled in a manner that prevents damage to the curb units.

2. All individual pieces of curved curbing shall be marked to correspond to the radius and location where curbing is to be set.

B. Excavation shall extend 6 inches below and behind finished curb, as shown on the Drawings.

1. The gravel base shall be placed in the excavated area, compacted and graded to the proposed curb subgrade.

C. Precast concrete curb units shall be doweled together continuously to the line and grade shown on the Drawings. Any units damaged during setting operations shall be removed and replaced.

D. After the curb is set, the trench shall be backfilled immediately with approved material. The first layer shall be 4 inches in depth and compacted. The other layers shall be not more than 6 inches in depth and compacted until the trench is filled. Care shall be taken to prevent disturbing the line or grade of the curb during this procedure.

3.4 CAST-IN-PLACE CONCRETE CURB

A. General: Concrete curb shall be cast in place to the size, shape, line and grade shown on the Drawings. The curbing shall be constructed using clean, undamaged forms and in segments separated by construction joints and expansion joints.

B. Preparation: The curb trench shall be excavated, and the gravel base placed to the dimensions shown on the Drawings. The gravel base shall be compacted and graded to the proposed curb subgrade.

C. Forms: Forms shall be metal or acceptable planed and matched lumber, straight and free from warp or other irregularities that will adversely affect the installation. Forms shall conform to the curb cross-sections shown on the drawings and shall be carefully set to line and grade, thoroughly braced and secured in place so that there will be no displacement during placing of the concrete. All forms shall be thoroughly cleaned prior to reuse.

D. Placing of Concrete: Prior to placing the concrete, the subgrade shall be moistened and the contact surfaces of the forms given a light coating of oil that will not discolor the concrete. Concrete shall be placed in the form, struck off with a template and spaded or otherwise compacted to eliminate voids and finished to a smooth even surface. The concrete may be compacted by mechanical vibrators if approved by the Owner's Representative. Placing by slip form methods shall be approved by the Owner's Representative.

E. Expansion Joints: Vertical expansion joints shall be located approximately every 75 feet and shall match the location of points of curb curvature and tangency and expansion joints in any adjacent concrete pavements and sidewalks. Expansion joints shall be constructed vertical, plumb, and at right angles to the face of the curb. They

shall be 1/2 inch in width and formed with pre-molded bituminous joint filler cut to conform to the curb cross-section.

F. Construction Joints: Vertical construction joints shall be located approximately every 15 feet equally spaced between expansion joints. The length of the curb segments may be varied slightly for closures, but in no case shall they be less than eight feet. Construction joints shall be vertical, plumb and at right angles to the face of the curb and shall be formed by approved method that will provide complete separation of the curb segments during the placing of the concrete. If curb is formed by slip form methods, the joints shall be sawed as soon as practicable after the concrete has set to prevent raveling during the sawing and before any shrinkage cracking occurs in the concrete.

G. Finishing: Forms shall be left in place for 24 hours or until the concrete has sufficiently cured to permit removal without injury to the curb. Upon removal of the forms, the exposed faces of the curb shall be immediately rubbed to a uniform surface. Rubbing shall be performed by an experienced concrete finisher. No plastering with cement mortar to fill defects will be allowed.

3.5 CAST-IN-PLACE SLIP FORM (EXTRUDED) CONCRETE CURB

A. The extruded curb shall be bonded to the existing pavement by using an adhesive. In advance of placing the curbs on the pavement the surface of the pavement shall be thoroughly cleaned, and the adhesive shall be applied. The pavement shall be cleaned, if necessary, by abrading and or high-pressure water washing so as to assure removal of all dust, loose material and/or oil.

The top of the finished curb shall be true to line. The Contractor shall carefully control the placement thickness of the top course of bituminous concrete to achieve a uniform reveal as indicated on the Drawings. The curb shall follow the contour of the pavement. The curb shall be free of humps and sags. Control joints shall be cut as soon as possible through 1/3 of the cross section of the fresh concrete. Joints shall be tooled and finished to a neat and uniform appearance. The control joints shall be installed at 9-foot intervals and more often on curves so as to minimize shrinkage cracking.

The finished curb shall be coated with a curing compound which has been designed to seal the surface and form a water proofing membrane to retard the loss of water from the fresh concrete. The manufacturer's instructions shall be followed.

3.6 BITUMINOUS CONCRETE CURB AND BERM

A. General Requirements

1. Bituminous curb shall be constructed by the use of an approved self-propelled extruding curb machine equipped with a material hopper, distributing screw and curb forming device capable of placing the bituminous mixture to the required lines, grades and proper curb cross-section. Prior to the placement of any curb,

the Contractor shall submit a detail of the cross-section of the curb mold to the Owner's Representative for approval.

B. Surface Preparation

1. Before curbing is to be placed on pavement, the pavement surface shall be thoroughly swept and cleaned by mechanical sweepers and allowed to dry. If the curb is to be placed on cement concrete pavement, the concrete shall receive a coating of tack coat material prior to placement of the curb.

C. Placing and Compaction

1. The hot bituminous mixture shall be placed in the hopper of the curb paver without segregation and extruded through the mold form to provide the proper compaction and surface texture.
2. The curb paver shall be properly supported and weighted during operation along the edge of the pavement and shall be guided along string or chalk lines to maintain the proper alignment and level of the completed curb.
3. Any portions of the completed curb, which are not satisfactorily compacted, show signs of sagging, cracking, and distortion, do not conform to the required lines, grades or cross section, and which cannot be satisfactorily repaired, shall be removed and replaced at no additional cost to the Owner.

D. Joints: Bituminous curb construction shall be a continuous operation in one direction only without joints. When placing of the curb is discontinued for a length of time that permits the mixture to cool, the curb shall be cut in a true vertical plane and the exposed end painted with tack coat material just prior to placing the fresh curb mixture against the previously constructed curb to achieve a continuous bond.

E. Curing: The newly completed curb shall be protected from traffic or other disturbance by barricades or other suitable methods until adequate stability has been obtained, but in no case less than 12 hours.

END OF SECTION

SECTION 32 17 26

TACTILE WARNING SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cast-in-place detectable warning tiles.
2. Surface-applied detectable warning tiles.
3. Detectable warning mats.
4. Cast-in-place detectable warning metal tiles.
5. Surface-applied detectable warning metal tiles.
6. Detectable warning unit pavers.

B. Related Requirements:

1. Section 32 12 16 – Asphalt Paving
2. Section 32 13 13 – Concrete Paving

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of exposed finish requiring color selection.

C. Samples for Verification: For each type of tactile warning surface, in manufacturer's standard sizes unless otherwise indicated, showing edge condition, truncated-dome pattern, texture, color, and cross section; with fasteners and anchors.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For tactile warning surfacing, to include in maintenance manuals.

1.5 QUALITY ASSURANCE

1. Subject to compliance with the Massachusetts Architectural Access Board (MAAB) requirements, as well as applicable state and local requirements.

1.6 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations for Adhesive Application:

1. Apply adhesive only when ambient temperature is above 50 deg F (10 deg C) and when temperature has not been below 35 deg F (2 deg C) for 12 hours immediately before application. Do not apply when substrate is wet or contains excess moisture.

C. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. Provide artificial shade and windbreaks, and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and higher.
   a. When ambient temperature exceeds 100 deg F (38 deg C), or when wind velocity exceeds 8 mph (13 km/h) and ambient temperature exceeds 90 deg F (32 deg C), set unit pavers within 1 minute of spreading setting-bed mortar.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of tactile warning surfaces that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Deterioration of finishes beyond normal weathering and wear.
   b. Separation or delamination of materials and components.

2. Warranty Period: To be verified with site contractor and tactile warning surfaces manufacturer.

PART 2 - PRODUCTS

2.1 TACTILE WARNING SURFACING, GENERAL

A. Accessibility Requirements: Comply with applicable provisions of the MAAB requirements, 521 CMR, as well as applicable state and local requirements for tactile warning surfaces.

1. For tactile warning surfaces composed of multiple units, provide units that when installed provide consistent side-to-side and end-to-end dome spacing that complies with requirements.

B. Source Limitations: Obtain each type of tactile warning surfacing joint material, setting material, anchor, and fastener from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

2.2 DETECTABLE WARNING TILES

A. Cast-in-Place Detectable Warning Tiles: Accessible truncated-dome detectable warning tiles with replaceable surface configured for setting flush in new concrete walkway surfaces, with slip-resistant surface treatment on domes and field of tile.

1. Material: Coordinate and verify with local municipality and 521 CMR.
2. Color: Coordinate and verify with local municipality and 521 CMR.
3. Shapes and Sizes: Coordinate and verify with local municipality and 521 CMR.
4. Dome Spacing and Configuration: Coordinate and verify with local municipality and 521 CMR.
5. Mounting: As recommended by manufacturer. Coordinate and verify with local municipality and 521 CMR.

B. Surface-Applied Detectable Warning Tiles: Accessible truncated-dome detectable warning concrete tiles configured for surface application on existing concrete walkway surfaces, with slip-resistant surface treatment on domes, field of tile, and beveled outside edges.

1. Material: Coordinate and verify with local municipality and 521 CMR.
2. Color: Coordinate and verify with local municipality and 521 CMR.
3. Shapes and Sizes: Coordinate and verify with local municipality and 521 CMR.
4. Dome Spacing and Configuration: Coordinate and verify with local municipality and 521 CMR.
5. Mounting: Adhered, and fastened, to existing concrete walkway.

2.3 DETECTABLE WARNING MATS

A. Surface-Applied Detectable Warning Mats: Accessible truncated-dome detectable warning resilient mats, UV resistant, manufactured for adhering to existing concrete walkway surfaces, with slip-resistant surface treatment on domes, field of mat, and beveled outside edges.

1. Material: Modified rubber compound, UV resistant.
2. Color: Coordinate and verify with local municipality and 521 CMR.
3. Shapes and Sizes: Coordinate and verify with local municipality and 521 CMR.
4. Dome Spacing and Configuration: Coordinate and verify with local municipality and 521 CMR.

5. Mounting: Adhered to pavement surface with adhesive and fastened with fasteners, as applicable.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of tactile warning surfaces, noncorrosive and compatible with each material joined, and complying with the following:

1. Furnish **Type 316** stainless-steel fasteners for exterior use.
2. Fastener Heads: For nonstructural connections, use flathead or oval countersunk screws and bolts with tamper-resistant heads, colored to match tile.

B. Adhesive: As recommended by manufacturer for adhering tactile warning surfacing unit to pavement.

C. Sealant: As recommended by manufacturer for sealing perimeter of tactile warning surfacing unit.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is in suitable condition to begin installation according to manufacturer's written instructions. Verify that installation of tactile warning surfacing will comply with accessibility requirements upon completion.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF TACTILE WARNING SURFACING

A. General: Prepare substrate and install tactile warning surfacing according to manufacturer's written instructions unless otherwise indicated.

B. Place tactile warning surfacing units in dimensions and orientation indicated. Comply with location requirements of AASHTO MP 12.

3.3 INSTALLATION OF DETECTABLE WARNING TILES

A. Cast-in-Place Detectable Warning Tiles:

1. Concrete Paving Installation: Comply with installation requirements in Section 32 13 13, Concrete Paving. Mix, place, and finish concrete to conditions complying with detectable warning tile manufacturer's written requirements for satisfactory embedment of tile.
2. Set each detectable warning tile accurately and firmly in place and completely seat tile back and embedments in wet concrete by tamping or vibrating. If necessary, temporarily apply weight to tiles to ensure full contact with concrete.

3. Set surface of tile flush with surrounding concrete and adjacent tiles, with variations between tiles and between concrete and tiles not exceeding plus or minus 1/8 inch (3 mm) from flush.
4. Protect exposed surfaces of installed tiles from contact with wet concrete. Complete finishing of concrete paving surrounding tiles. Remove concrete from tile surfaces.
5. Clean tiles using methods recommended in writing by manufacturer.

B. Removable Cast-in-Place Detectable Warning Tiles:

1. Concrete Paving Installation: Comply with installation requirements in Section 32 13 13, Concrete Paving. Mix, place, and finish concrete to conditions complying with detectable warning tile manufacturer's written requirements for satisfactory embedment of removable tile.
2. Set each detectable warning tile accurately and firmly in place with embedding anchors and fasteners attached, and firmly seat tile back in wet concrete by tamping or vibrating. If necessary, temporarily apply weight to tiles to ensure full contact with concrete.
3. Set surface of tile flush with surrounding concrete and adjacent tiles, with variations between tiles and between concrete and tiles not exceeding plus or minus 1/8 inch (3 mm) from flush.
4. Protect exposed surfaces of installed tiles from contact with wet concrete. Complete finishing of concrete paving surrounding tiles. Remove concrete from tile surfaces.
5. Clean tiles using methods recommended in writing by manufacturer.

C. Surface-Applied Detectable Warning Tiles:

1. Lay out detectable warning tiles as indicated and mark concrete pavement.
2. Prepare existing paving surface by grinding and cleaning as recommended by manufacturer.
3. Apply adhesive to back of tiles in amounts and pattern recommended by manufacturer and set tiles in place. Firmly seat tiles in adhesive bed, eliminating air pockets and establishing full adhesion to pavement. If necessary, temporarily apply weight to tiles to ensure full contact with concrete.
4. Install anchor devices through face of tiles and into pavement using anchors located as recommended by manufacturer. Set heads of anchors flush with top surface of mat.
5. Mask perimeter of tiles and adjacent concrete and apply sealant in continuous bead around perimeter of tile installation.
6. Remove masking, adhesive, excess sealant, and soil from exposed surfaces of detectable warning tiles and surrounding concrete pavement using cleaning agents recommended in writing by manufacturer.
7. Protect installed tiles from traffic until adhesive has set.

3.4 INSTALLATION OF DETECTABLE WARNING MATS

A. Lay out detectable warning mats as indicated and mark concrete pavement at edges of mats.

B. Prepare existing paving surface by grinding and cleaning as recommended by manufacturer.

C. Apply adhesive to back of mat in amounts and pattern recommended by manufacturer and set mat in place. Firmly seat mat in adhesive bed, eliminating air pockets and establishing full adhesion to pavement. If necessary, temporarily apply weight to mat to ensure full contact with adhesive.

D. Install anchor devices through face of mat and into pavement using anchors located as recommended by manufacturer. Set heads of anchors flush with mat surface.

E. Mask mat perimeter and adjacent concrete and apply sealant in continuous bead around perimeter of mat.

F. Remove masking, adhesive, excess sealant, and soil from exposed surfaces of detectable warning mat and surrounding concrete pavement using cleaning agents recommended in writing by manufacturer.

G. Protect installed mat from traffic until adhesive has set.

3.5 INSTALLATION OF DETECTABLE WARNING UNIT PAVERS

A. Unit Paver Installation, General:

1. Setting-Bed and Unit Paver Installation: Comply with installation requirements in Section 32 13 13, Concrete Paving.

B. Aggregate Setting-Bed Applications:

1. Place aggregate base, compact by tamping with plate vibrator, and screed to depth indicated.
2. Place leveling course and screed to a thickness of 1 to 1-1/2 inches (25 to 38 mm), taking care that moisture content remains constant, and density is loose and uniform until unit pavers are set and compacted.
3. Treat leveling course with herbicide to inhibit growth of grass and weeds.
4. Set unit pavers with a minimum joint width of 1/16 inch (1.5 mm) and a maximum of 1/8 inch (3 mm), being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines.
5. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf (16- to 22-kN) compaction force at 80 to 90 Hz.

6. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

C. Mortar Setting-Bed Applications:

1. Saturate concrete subbase with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.
2. Apply mortar-bed bond coat over surface of concrete subbase about 15 minutes before placing mortar bed. Limit area of bond coat to avoid its drying out before placing setting bed. Do not exceed 1/16-inch (1.6-mm) thickness for bond coat.
3. Apply mortar bed over bond coat; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.
4. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Before placing pavers, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.
5. Place pavers before initial set of cement occurs. Immediately before placing pavers on mortar bed, apply uniform 1/16-inch- (1.5-mm-) thick bond coat to mortar bed or to back of each paver with a flat trowel.
6. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.
7. Spaced Joint Widths: Per manufacturer tolerances.
8. Grouted Joints: Grout paver joints complying with ANSI A108.10. Grout joints as soon as possible after initial set of setting bed.
   a. Force grout into joints, taking care not to smear grout on adjoining surfaces.
   b. Tool exposed joints slightly concave when thumbprint hard.
   c. Cure grout by maintaining in a damp condition for seven days unless otherwise recommended by grout or liquid-latex manufacturer.
9. Remove excess grout from exposed paver surfaces; wash and scrub clean.
10. Protect installation from traffic until grout has set.

3.6 CLEANING AND PROTECTION

A. Remove and replace tactile warning surfacing that is broken or damaged or does not comply with requirements in this Section. Remove in complete sections from joint to joint unless otherwise approved by Architect. Replace using tactile warning surfacing installation methods acceptable to Architect.

B. Protect tactile warning surfacing from damage and maintain free of stains, discoloration, dirt, and other foreign material.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SCOPE

The work of this section includes all labor; materials, tools and equipment necessary to furnish and install chain link fencing and gates as specified herein and as shown on the Contract Drawings.

1.2 SUBMITTALS

Brochures shall be submitted in accordance with the General Conditions, as supplemented, describing all materials to be used and naming the manufacturer of such materials.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All posts, rails and couplings used in the construction of the fence shall conform to ASTM A120, Schedule 40 and shall be hot dipped galvanized steel conforming to the applicable requirements of ASTM A123 and of the nominal sizes and weights specified herein. The pipe sizes shall conform to the nominal sizes specified herein and shall be of sufficient length to extend 48 inches into concrete footings. All posts shall be equipped with tops to exclude moisture.

1. The Intermediate posts shall be 2-3/8 inches outer diameter (OD) pipe NPS2, weight 3.65 lbs. Per lineal foot.
2. All end, comer, pull and single leaf gate posts shall be 2-7/8 inches OD pipe (NPS 2-1/2), weight 5.79 lbs. per lineal foot.
3. Double leaf gateposts shall be 6-5/8 inches OD round post pipe (NPS6), weight 18.97 lbs. per lineal foot, and shall be equipped with tops designed to exclude moisture.
4. The top and the intermediate rail shall be 1.66-inch OD pipe (NPS 1-1/4), weight 2.27 lbs. per lineal foot, provided with couplings approximately every 20 feet. Couplings shall be outside sleeve type at least 7 inches long. The top rail shall pass through the line post tops and form a continuous brace from end to end of each stretch of fence. The top rail shall be securely fastened to the terminal posts by heavy pressed steel brace ands and malleable rail end connections. The line post tops, brace bands and rail end connections shall be galvanized according to ASTM A153.
5. Bracing shall be provided as specified on the Contract Drawings.
6. Gates shall have truss rods or intermediate braces. Latches shall be arranged for padlocking so that padlock will be accessible from both sides of the gate

regardless of the latching arrangement. Gate frames shall be 1.90 inches O.D. galvanized steel pipe (NPS 1-1/2) weighing 2.72 lbs. per foot. Gate fabric and shall conform to the requirements specified here in before. All gates shall be equipped with a positive type latching device with a means for padlocking. The double gate shall be equipped with a center plunger, rods, catch and semiautomatic outer catches to secure the leaves in open position. Hinges shall be of pressed steel.

7. All fittings shall be pressed steel in conformance with ASTM F226.

B. Barbed Wire

1. Barbed wire fence will be constructed of at least four wires; total height will not be less than 60” or as on adjacent fencing.
2. Barbed wire as a minimum shall be 12 ½ gage with 4-point barbs spaced not more than 6 in. apart or as on adjacent fencing.

C. Salvaged Fence

1. In locations noted on the plans, existing fencing shall be removed and salvaged.
2. The salvaged fence is to be protected from damage by the contractor and used in the locations shown on the Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of new and salvaged materials shall be made by skilled mechanics experienced in erection of this type of fence. All posts shall be set in concrete foundations to a minimum depth of 48 inches. Diameter of the foundation shall be the pipe O.D. plus 12 inches. The foundation shall be a 11-2-4 mixture of concrete and set to a depth 54 inches minimum. All foundations shall extend approximately 1 inch above grade and shall slope away from the post to grade for proper drainage. Edge of foundation shall be flush with finish grade. Foundations shall be of the shape and sizes shown on the details.

B. Line posts shall be spaced at a maximum of 10-foot intervals. Intermediate rails shall be used to brace end and gate posts to the adjacent line post, and comer posts to the two adjacent line posts. Changes in line of 30 degrees or more shall be considered comers.

C. Top rails shall form a continuous brace from end to end of each stretch of fence. Sleeve type couplings shall joint lengths of top of rail. Top rails shall be securely fastened to terminal posts by pressed steel fittings.

END OF SECTION

SECTION 323913

MANUFACTURED METAL BOLLARDS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for steel encased concrete bollards.

B. The work includes:

1. Furnishing required materials
2. Assembly and installation

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 02 20 00 – Earthwork
2. Section 03 30 10 – Cast-In-Place Concrete
3. Section 31 14 00 – Earth Stripping
4. Section 31 20 00 – Earth Moving
5. Section 32 12 16 – Asphalt Paving

1.3 SUBMITTALS

A. Submit to the Owner’s Representative for approval, two (2) complete sets of shop drawings for materials. No materials shall be fabricated or shipped prior to response by the Owner’s Representative to the shop drawing submittals.

1.4 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard warranty that metal and rubber components will be free from defects in material and workmanship for one year. Provide manufacturer's standard warranty that coatings will not peel, crack or significantly change color for two years.

PART 2 - PRODUCTS

2.1 BOLLARDS

A. Bollard pipe material shall be 6-inch diameter standard Schedule 40 steel pipe, unless otherwise indicated on the Drawings, filled and anchor encased with 3000 psi cement concrete.

B. Paint

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. Colors: As selected by Architect from the full range Benjamin Moore & Co., The Sherwin-Williams Company or approved equal.

PART 3 - EXECUTION

3.1 BOLLARDS

A. Bollards shall be installed plumb, in manually or mechanically dug holes. Bollards set in excavated holes shall be placed on a 6-inch layer of compacted gravel and then encased in a 24-inch diameter concrete encasement to the surface treatment.

B. The bollard should be filled with 3000 psi concrete and finished with a rounded concrete cap.

3.2 PAINT PREPARATION

A. Comply with manufacturer's written instruction and recommendations.

B. Clean surfaces of substances that could impair bonds of paints, including dust, dirt, oil, grease, and incompatible paints. Apply tie coat as required to produce paint systems indicated.

C. Steel: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

END OF SECTION

SECTION 32 92 00

TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

. Drawings and general provisions of the Contract, including Site Plans, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Seeding.
2. Hydroseeding.

B. Related Requirements:

1. Section 32 93 00, Plants

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of grassed areas during a calendar year. Submit before expiration of required maintenance periods.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified contractor in grass establishment.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance.

1. Spring Planting: March 1 – May 15
2. Fall Planting: September 1 – October 31

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species:

1. Quality, State Certified: State-certified seed of grass species as listed below for solar exposure.
2. Quality, Non-State Certified: Seed of grass species as listed below for solar exposure, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:
3. Sun and Partial Shade, Cool-Season Grass.

C. Seed Mixture:

1. Use MassDOT Upland Native Seed Mix 765.451 Part Shade Roadside Mix (or approved equal). Seed mixture should be similar to the following mixture:

765.451 Part Shade Roadside Mix		
Botanical Name	**Common Name**	**% Mix By Weight (PLS)**
Grass		
Elymus virginicus	Virginia Wild Rye	35.0%
Schizachyrium scoparium	Little Blue Stem	20.0%
Tridens flavus	Purpletop	10.0%
Panicum virgatum	Switch Grass	8.0%
Agrostis perennans	Upland Bentgrass	5.0%
Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	5.0%
Carex vulpinoidea	Fox Sedge	3.0%
Juncus tenuis	Path Rush	2.0%
Carex lurida	Shallow Sedge	1.5%
		89.5%
Herb/Forb		
Chamaecrista fasciculata	Partridge Pea	4.0%
Penstemon digitalis	Beard-tongue	1.0%
Zizia aurea	Golden Alexanders	0.8%
Rudbeckia hirta-VT ecotype	Black-eyed Susan-VT ecotype	0.6%
Aster divaricatus	White Wood Aster	0.5%
Solidago caesia	Woodland Goldenrod	0.4%
Pycnanthemum tenuifolium	Slender Mountain Mint	0.3%
Monarda fistulosa	Wild Bergamot	0.3%
Heliopsis helianthoides	Ox-Eye Sunflower	0.3%
Desmodium canadense	Showy Tick Trefoil	0.3%
Verbena hastata	Blue Vervain	0.3%
Eupatorium purpureum	Purple Joe Pye Weed	0.3%
Solidago bicolor	White Goldenrod	0.3%
Solidago odora	Licorice Scented Goldenrod	0.2%

Eupatorium perfoliatum	Boneset	0.2%
Aster lateriflorus	Calico Aster	0.2%
Aster novae-angliae	New England Aster	0.2%
Aquilegia canadensis	Eastern Columbine	0.2%
Lobelia cardinalis	Cardinal Flower	0.1%
		10.5%
Seeding Rate: 25.0 lbs PLS/Acre		**100.0%**

D. Straw mulch: MassDOT M6.04.2, long fibered straw, 100 percent certified weed free, free from foreign matter detrimental to plant life, and in dry condition.

E. Tackifier: biodegradable and non-toxic bonding adhesive agent during hydraulic seeding or straw mulching to minimize wind and water effects.

2.2 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to commonly accepted practice.

B. Placing Planting Soil: Refer to Landscape Plan for location of planting areas.

3.4 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds **5 mph (8 km/h).**

1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
2. Do not use wet seed or seed that is moldy or otherwise damaged.
3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Rake seed lightly into top **1/8 inch (3 mm)** of soil, roll lightly, and water with fine spray.

3.5 HYDROSEEDING

A. Hydroseeding: Mix specified seed, commercial fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber mulch per manufacturers specification tackifier.
2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500 lbs/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.
3. Upon completion of spraying of hydroseed, straw mulch should be applied over the hydroseeded areas.

3.6 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by the Owner's Representative:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent and bare spots not exceeding 5 percent.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.7 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.8 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: 60 days from date of planting completion.
   a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

END OF SECTION

SECTION 32 93 00

PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Planting soils.
3. Tree stabilization.

B. Related Sections:

1. Section 02 11 00 – Clearing and Grubbing
2. Section 02 11 05 – Site Clearing
3. Section 31 20 00 – Earth Moving
4. Section 32 92 00 – Turf and Grasses

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm

ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Finish Grade: Elevation of finished surface of planting soil.

G. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

H. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

I. Planting Area: Areas to be planted.

J. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

K. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

L. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

M. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of Owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Material Test Reports: For existing in-place surface soil and imported or manufactured topsoil.

D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

E. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.

1. Experience: Five years' experience in landscape installation in addition to requirements in Section 01 45 16.13, Contractor Quality Control.
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
3. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with United States' Department of Agriculture's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for plant growth.
   a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1,000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash

nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.

b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.

E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to

destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

G. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

1. **Notify Construction Manager and Owner no fewer than 2 days in advance of proposed interruption of each service or utility.**
2. Do not proceed with interruption of services or utilities without Owner's written permission.

C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: March 1 - May 15
2. Fall Planting: September 1 – October 31

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum

results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.8 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
   b. Structural failures including plantings falling or blowing over.
   c. Faulty performance of tree stabilization.
   d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Substantial Completion:
   a. Trees, Shrubs, Vines, and Ornamental Grasses: **12 months**.
   b. Ground Covers, Biennials, Perennials, and Other Plants: **12 months**.

3. Include the following remedial actions as a minimum:
   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: **12 months** from date of Substantial Completion.

B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin

maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: **12 months** date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or on Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on the Drawings.

E. If formal arrangements or consecutive order of plants are shown on the Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
2. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
3. Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.

G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sleeve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: **50 to 60** percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.4 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 12 percent of actual nitrogen, 0 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

E. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: 5 gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.5 PLANTING SOILS

A. Planting Soil: Existing, native surface topsoil retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

1. Supplement with planting soil when quantities are insufficient.
2. Additional Properties of Imported Topsoil: Screened and free of stones 1 inch or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes, grubs, other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled, pore-space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.

3. Mix imported topsoil with the following soil amendments and fertilizers at the following rates or as recommended by soil testing laboratory:
   a. Ratio of Loose Compost to Topsoil by Volume: 1:3.
   b. Ratio of Loose Sphagnum Peat to Topsoil by Volume: 1:3.
   c. Weight of Lime per 1000 Sq. Ft
   d. Weight of Agricultural Gypsum per 1000 Sq. Ft.
   e. Volume of Sand Plus 10 Percent per 1000 Sq. Ft.
   f. Weight of Bonemeal per 1000 Sq. Ft.
   g. Weight of Superphosphate per 1000 Sq. Ft.
   h. Weight of Commercial Fertilizer per 1000 Sq. Ft.
   i. Weight of Slow-Release Fertilizer per 1000 Sq. Ft.

2.6 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood.
2. Color: Natural.

B. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:

1. Type: Rounded riverbed gravel or smooth-faced stone.
2. Size Range: 1-1/2 inches maximum, 3/4 inch minimum.
3. Color: Uniform tan-beige color range acceptable to Architect.

2.7 PESTICIDES

A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.8 TREE STABILIZATION MATERIALS

A. Stakes and Guys:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.

2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.
3. Guys and Tie Wires: ASTM A641/A641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.
4. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
5. Guy Cables: Five-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.
6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's

acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 12 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply fertilizer directly to subgrade before loosening.
2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
   a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
   b. Mix lime with dry soil before mixing fertilizer.
3. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
   a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball

and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for balled and burlapped or container-grown stock.
2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
5. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
6. Maintain supervision of excavations during working hours.
7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
8. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Subsoil and topsoil removed from excavations may be used as planting soil.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Use planting soil for backfill.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Use planting soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Set and support bare-root stock in center of planting pit or trench with root flare 1 inch above adjacent finish grade.

1. Use planting soil for backfill. See Site Plans for planting locations.
2. Spread roots without tangling or turning toward surface and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots.
3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside soil-covered roots about 1 inch from root tips; do not place tablets in bottom of the hole or touching the roots.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

F. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 MECHANIZED TREE SPADE PLANTING

A. Trees may be planted with an approved mechanized tree spade at the designated locations. Do not use tree spade to move trees larger than the maximum size allowed for a similar field-grown, balled-and-burlapped root-ball diameter according to ANSI Z60.1, or larger than the manufacturer's maximum size recommendation for the tree spade being used, whichever is smaller.

B. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.

C. Cut exposed roots cleanly during transplanting operations.

D. Use the same tree spade to excavate the planting hole as was used to extract and transport the tree.

E. Plant trees as shown on Drawings, following procedures in "Tree, Shrub, and Vine Planting" Article.

F. Where possible, orient the tree in the same direction as in its original location.

3.7 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.8 TREE STABILIZATION

A. Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least one-third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.

2. Use two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Staking and Guying: Stake and guy trees more than 14 feet in height and more than 2-1/2 inches in caliper unless otherwise indicated. Securely attach no fewer than three guys to stakes 30 inches long, driven to grade.

1. Site-Fabricated Staking-and-Guying Method:
   a. For trees more than 6 inches in caliper, anchor guys to wood deadmen buried at least 36 inches below grade. Provide turnbuckle for each guy wire and tighten securely.
   b. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
   c. Support trees with strands of cable or multiple strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
   d. Attach flags to each guy wire, 30 inches above finish grade.
2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.9 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on plans in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with minimum 30-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or and over whole surface of planting area as indicated on plans, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.
3. Mineral Mulch in Planting Areas: Apply 3-inch average thickness of mineral mulch [extending 12 inches beyond edge of individual planting pit or and over whole surface of planting area as indicated on plans], and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.11 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.13 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.14 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 33 05 26.23

UTILITY IDENTIFICATION TRACE WIRES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section covers the furnishing, handling and installation of tracer tape, as called for on the Drawings.

1.2 SUBMITTALS

A. Six (6) sets of manufacturer's literature on the materials, colors and printing specified herein, shall be submitted to the Owner's Representative for review.

B. Tape samples shall also be submitted to the Owner's Representative for review.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Tape shall be manufactured by Reef Industries; an equivalent tape by Industrial Tape and Supply Company; or approved equal.

2.2 TAPE

A. Warning and tracer tape shall be at least 6 inches wide.

B. Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers. The metallic tracer tape shall be a minimum 5-mil thick and shall be located at a depth as indicated on the drawings.

C. Warning tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.

D. The tape shall bear the wording: "(or approved equivalent): BURIED DRAIN LINE BELOW" (with "DRAIN" replaced by "WATER", "SEWER", "ELECTRICAL", "GAS", "TELEPHONE", or "CHEMICAL" as appropriate), continuously repeated every 30 inches to identify the pipe.

E. Tape colors shall be as follows as recommended by the American Public Works Association (APWA):

Electric	Red
Gas and Oil	Yellow
Communications	Orange
Water	Blue
Sewer and Drain	Green
Chemical	Red (not APWA)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Tracer tape shall be installed above the pipe or conduit it is to identify at depths as indicated on the Drawings.

B. Follow the manufacturer's recommendations for installation.

END OF SECTION

SECTION 33 41 00

STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for furnishing and installing the site storm utility drainage piping system.

B. The work includes:

1. Site storm drainage system.
2. Site Underdrains, headwalls, flared end sections and underground stormwater detention facilities.

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 02 20 00 – Earthwork
2. Section 02 22 20 – Excavation, Trenching, and Backfilling for Utility Systems
3. Section 03 30 10 – Cast-in-Place Concrete
4. Section 31 20 00 – Earth Moving
5. Section 31 23 19 – Dewatering
6. Section 31 25 00 – Erosion and Sedimentation Controls
7. Section 31 50 00 – Excavation Support and Protection
8. Section 33 46 23 – Modular Stormwater Storage Units
9. Section 33 49 00 – Storm Utility Drainage Structures

1.3 SUBMITTALS

A. <u>Shop Drawings</u>

1. Materials list of items proposed for the work.
2. Shop drawings or descriptive literature, or both, showing dimensions, joint and other details of all materials proposed for the work. Shop drawings shall be submitted to the Owner's Representative for approval prior to ordering material.

B. <u>As-Built Drawings</u>

1. As-Built Drawings shall indicate the true measurements and location, horizontal and vertical, of all new drainage system construction. As-Built Drawings shall include a minimum of three ties showing the distance to each catch basin and manhole from fixed permanent objects. As-Built Drawings shall also contain any additional information required by the municipality. As-Built Drawings shall be stamped with the seal of a Licensed Land Surveyor.

2. Submit a digital copy in a PDF and DWG format to the Owner or the Owner's Representative upon completion and acceptance of work prior to obtaining substantial completion certificate.
3. Submit paper and mylar copies as required by the local municipality.

1.4 COORDINATION AND VERIFICATION

A. Coordinate the work with the termination of storm drain connections at buildings, connections to municipal systems, and trenching operations.

B. The contractor shall field verify and survey the size, location and elevations of all existing pipe and utility lines prior to ordering of materials for this utility system. A report of the findings of the verification survey shall be submitted to the Owner for information and comment.

1.5 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be adequately protected from damage during transit. Pipes shall not be dropped.

B. All pipe and other appurtenances shall be inspected before placement in the work and any found to be defective from any cause, including damage caused by handling, and determined by the Owner's Representative to be unrepairable, shall be replaced at no cost to the Owner.

C. Storage and handling of pipes and other system appurtenances shall be in accordance with the manufacturer's recommendations.

1.6 INSPECTION

A. The manufacturer/supplier is responsible for the provision of all test requirements specified for each type of pipe. In addition, any pipe may be inspected at the plant for compliance with these specifications by an independent testing laboratory selected and paid by the Owner. The Contractor shall require the manufacturer's cooperation in these inspections.

B. Inspection of the pipe may also be made after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the specification requirements, even though pipe samples may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the site at once.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials for storm drainage system shall be new and unused.

2.2 PIPE

A. Reinforced Concrete Pipe: Pipe shall comply with the requirements of ASTM C76. All pipe 18 inches and smaller shall be Class V. All other pipe shall be Class III unless indicated otherwise on the Drawings.

Joints for the reinforced concrete pipe shall be the tongue and groove or bell and spigot type with rubber gasket conforming to ASTM C443.

Flared end pipe sections shall be constructed in conformance with ASTM C76, Class V requirements and shall be supplied by the same manufacturer as the pipe.

B. Perforated Corrugated Plastic Pipe for Subdrain: Materials, dimensions, physical properties and fabrication of pipe or tubing, couplings and fittings shall be in conformance with AASHTO-M252.

Piping and fittings (3 to 6 inches in diameter) shall conform to ASTM F405.

Piping and fittings over 6 inches in diameter shall conform to ASTM F667.

C. Filter Fabric for Underdrains shall be Mirafi 140N.

D. Filter Fabric for Flared End Sections and Headwalls with Stone Protection shall be Mirafi 140N, or approved equivalent.

E. High Density Corrugated Polyethylene Pipe and Fittings with smooth interior shall meet the requirements of ASTM D3350. Four-inch through 10-inch diameter pipe corrugated polyethylene drainage tubing shall meet the requirements of AASHTO M252. Twelve-inch through 60-inch diameter corrugated polyethylene pipe shall meet the requirements of AASHTO M294-01, Types S. Standard 45 Degree "Y" connections shall be fabricated to sizes shown on the Drawings.

Pipe joints and fittings shall conform to the requirements of AASHTO M252 or AASHTO M294-01: Coupling bands shall conform to the manufacturer's specifications. Couplers shall cover not less than one corrugation on each section of pipe.

F. Where called for on the plans, corrugated pipe shall be slotted or perforated by the manufacturer prior to delivery to the job site.

G. Polyvinyl Chloride (PVC) Pipe: Pipe and fittings shall comply with the requirements of ASTM D3034, rated SDR 35 and ASTM D1785 for Schedule 40 and Schedule 80 pipe. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D3034 classification.

H. Ductile Iron Pipe

1. Ductile iron pipe shall be designed in accordance with ANSI A21.50/AWWA C150 and manufactured in accordance with ANSI A21.51/AWWA C151.

2. Ductile iron pipe shall be thickness Class 52, furnished in 18-foot or 20-foot nominal lengths.

PART 3 - EXECUTION

3.1 GENERAL

A. Contractor to verify the location, size invert and type of existing pipes at all points of connection prior to ordering new utility materials.

B. Verify that trench cut and excavation base is ready to receive work and that excavations, dimensions, and elevations are as indicated on Contract Drawings.

C. All pipe shall be laid accurately to the lines and grades shown on the Drawings and in conformance with the pipe manufacturer's recommendations.

D. As soon as the trench is excavated to the normal grade of the bottom of the trench, the Contractor shall immediately place the bedding material in the trench. The pipe shall be firmly bedded in the compacted bedding material accurately to the lines and grades shown on the Drawings.

E. Laying Pipe: Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a prepared trench. Pipe shall be laid with bells upgrade unless otherwise approved by the Owner's Representative.

Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash. Extreme care shall be taken to keep the bells of the pipe free from dirt and rocks so that joints may be properly lubricated and assembled. No pipe shall be trimmed or chipped to fit.

F. No length of pipe shall be laid until the proceeding lengths of pipe have been thoroughly embedded in place, to prevent movement or disturbance of the pipe alignment.

G. Notch under pipe bells and joints where required to provide for uniform bearing under entire length of pipe.

H. Excavation, backfilling, and compaction shall be as specified in Section 02 22 20, Excavation Trenching, and Backfilling for Utility Systems; Section 33 41 00, Storm Utility Drainage Piping; and Section 33 46 23, Modular Stormwater Storage Units.

I. Maintain optimum moisture content of bedding material to attain required compaction density.

J. Pipe Extension: Where an existing pipe is to be extended, the same type of pipe shall be used, unless otherwise approved by the Owner's Representative.

K. Full Lengths of Pipe: Only full lengths of pipe shall be used in the installation except that partial lengths of pipe may be used at the entrance to structures, and to accommodate the required locations of service connection fittings.

L. Pipe Entrances to Structures: All pipe entering structures shall be cut flush with the inside face of the structure, and the cut ends of the pipe surface within the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges or imperfections that will impede or affect the hydraulic characteristics of the stormwater flow. The method of cutting and finishing shall be subject to the approval of the Owner's Representative.

M. Protection During Construction: The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk.

At all times when pipe laying is not in progress, all open ends of pipes shall be closed by approved temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been dewatered and all danger of water entering the pipe eliminated.

N. Water Pipe – Drain Pipe Separation: When a drain pipe crosses above or below a water pipe, the following procedures shall be utilized:

1. Relation to Water Mains

Horizontal Separation: Whenever possible drains shall be laid at a minimum at least 5 feet, horizontally, from any existing or proposed water main. Should local conditions prevent a lateral separation of 5 feet, a drain may be laid closer than 5 feet to a water main if:

a. It is laid in a separate trench, or if;
b. It is laid in the same trench with the water mains located at one side on a bench of undistributed earth, and if;
c. In either case the elevation of the top (crown) of the drain is at least 12 inches below the bottom (invert) of the water main.

Vertical Separation: Whenever drains must cross under water mains, the drain shall be laid at such an elevation that the top of the pipe is at least 12 inches below the bottom of the water main. When the elevation of the drain cannot be varied to meet the above requirements, the water main shall be relocated to provide this separation or reconstructed with mechanical-joint pipe for a distance of 10 feet on each side of the drain. One full length of water main should be centered over the drain so that both joints will be as far from the sewer as possible.

When it is impossible to obtain horizontal and/or vertical separation as stipulated above, both the water main and drain shall be constructed of mechanical-joint cement lined ductile iron pipe or other equivalent based on water tightness and

structural soundness. Both pipes shall be pressure tested by an approved method to assure water tightness.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over-excavation with gravel borrow.

B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.3 EXCAVATION AND BACKFILLING FOR PIPES

A. The type of materials to be used in bedding and backfilling and the method of placement shall conform to the requirements of Section 02 22 20, Excavation Trenching, and Backfilling for Utility Systems; Section 33 41 00, Storm Utility Drainage Piping; Section 33 46 23, Modular Stormwater Storage Units; the details shown on the Drawings; and the following:

1. Embedment materials are those used for bedding, haunching and initial backfill around pipes as illustrated on the Drawings.
2. All embedment materials should be free from lumps of frozen soil or ice when placed. Embedment materials should be placed and compacted at optimum moisture content.

B. Trench Bedding: Material must be provided to ensure proper line and grade is maintained. Unsuitable or unstable materials shall be undercut and replaced with a suitable bedding material, placed in 6-inch lifts. Other methods of stabilization, such as geotextiles may be appropriate, and their use must be approved by Owner's Representative.

Provide a stable and uniform bedding for the pipe and any protruding features of its joints and/or fittings. The middle of the bedding equal to 1/3 of the pipe outside diameter should be loosely placed, with the remainder compacted to a minimum of 95 percent standard proctor density.

C. Haunching: Proper haunching provides a major portion of the pipe's strength and stability. Exercise care to insure placement and compaction of the embedment material in the haunches. For larger diameter pipes (>30 inches), embedment materials should be worked under the haunches by hand. Haunching materials shall be placed and compacted in 6-inch maximum lifts, compacted to 95 percent modified proctor density.

D. Initial Backfill: The initial backfill shall be from the springline to 24 inches above the pipe to provide protection for the pipe from construction operations during placement of the final backfill and protect the pipe from stones or cobbles in the final backfill. Compact initial backfill per Section 02 22 20, Excavation Trenching, and Backfilling

for Utility Systems; Section 33 41 00, Storm Utility Drainage Piping; and Section 33 46 23, Modular Stormwater Storage Units.

Flooding or jetting as a procedure for compaction are not allowed.

E. Final Backfill: The final backfill should be the same material as the proposed embankment or surface finishes. Generally, the excavated material may be used as final backfill. Placement should be as specified for the embankment. In lieu of a specification, the final backfill should be placed in 12 inch maximum lifts and compacted to a minimum 95 percent modified proctor density to prevent excessive settlement at the surface. Compaction should be performed at optimum moisture content.

F. Vehicular and Construction Loads: During construction, avoid heavy equipment loads (> 40,000 lbs. per axle over the pipe. Additional temporary cover should be placed over the pipe for heavy construction load crossings. Hydrohammers or hoe-pak compactors may not be used over the pipe until at least 48 inches of cover have been provided.

3.4 CONNECTIONS TO EXISTING FACILITIES

A. General Requirements: The contractor shall make all required connections of the proposed drainage system into existing drainage system, where and as shown on the Drawings.

B. Compliance with Requirements of Owner of Facility: Connections into existing drainage system facilities shall be performed in accordance with the requirements of the Owner of the facility. The Contractor shall comply with all such requirements, including securing of all required permits, and paying the costs thereof.

3.5 ROOF DRAIN OR SIMILAR CONNECTIONS

A. General Requirements: The Contractor shall make all required connections of the building drainage system pipes into the site drainage system at locations and at distances from the buildings as shown on the Drawings. If stubs are constructed for later connection to the building pipes, the ends shall be sealed with watertight plugs and marked with 2 x 4 risers for later location

B. Coordination with Building Contractor: The Contractor shall coordinate the work with the work of the Building Contractor to determine the exact location and elevation of the point of entry into the building.

C. Connections: Roof drain connections to the site drainage system shall be made with fittings supplied by the pipe manufacturer.

3.6 MANHOLE CONNECTIONS

A. Manhole pipe connections for precast manhole bases may be accomplished by any method described below. The Contractor shall make sure that the outside diameter of the pipe is compatible with the particular pipe connection used.

1. A tapered hole filled with non-shrink waterproof grout after the pipe is inserted. This connection method will not be allowed when connecting PVC pipe to manholes.
2. The LOCK JOINT Flexible Manhole Sleeve cast in the wall of the manhole base. The stainless-steel strap and exposed sleeve shall be protected from corrosion with a bitumastic coating.
3. PRESS WEDGE II gasket cast into the wall on the manhole base. The rubber wedge shall only be driven into the V slot from the outside of the manhole.
4. RES-SEAL, a cast iron compression ring which compresses a rubber “O” ring gasket into a tapered hole in the wall of the manhole base. Exposed metal shall be protected from corrosion with a bitumastic coating.
5. KOR-N-SEAL neoprene boot cast into the manhole wall. The stainless-steel clamp shall be protected from corrosion with a bitumastic coating.

END OF SECTION

SECTION 33 46 23

MODULAR STORMWATER STORAGE UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, technical specification, and general provisions of the Contract as modified herein apply to this section.

B. R-Tank Stormwater Storage System Installation Guide (Ferguson Waterworks, 2023) or at www.acfenvironmental.com or www.fergusongss.com

C. R-Tank Operation, Inspection & Maintenance (ACF Environmental).

1.2 DESCRIPTION OF WORK INCLUDED

A. Provide excavation and base preparation per geotechnical engineer's recommendations and/or as shown on the design drawings, to provide adequate support for project design loads and safety from excavation sidewall collapse. Excavations shall be in accordance with the Owner's and Occupational Safety and Health Administration (OSHA) requirements.

B. Provide and install R-Tank^{LD}, R-Tank^{HD}, R-Tank^{SD}, or R-Tank^{UD} system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, inlet, and outlet pipe with connections per the manufacturer's installation guidelines provided in this section.

C. Provide and construct the cover of the R-Tank system including stone backfill, structural fill cover, and pavement section as specified.

D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.

1.3 QUALITY CONTROL

A. All materials shall be manufactured in ISO certified facilities.

B. Installation Contractor shall demonstrate the following experience:

1. A minimum of three R-Tank or equivalent projects completed within 2 years.
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
3. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.

C. Installation Personnel: Performed only by skilled workers with satisfactory record of performance on bulk earthworks, pipe, chamber, or pond/landfill construction projects of comparable size and quality.

D. Contractor must have manufacturer's representative available for site review if requested by Owner.

1.4 SUBMITTALS

A. Submit proposed R-Tank layout drawings. Drawings shall include typical section details as well as the required base elevation of stone and tanks, minimum cover requirements and tank configuration.

B. Submit manufacturer's product data, including compressive strength and unit weight.

C. Submit manufacturer's installation instructions.

D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.

E. Submit material certificates for geotextile, geogrid, base course and backfill materials.

F. Submit required experience and personnel requirements as specified in Paragraph 1.3.

G. Any proposed equal alternative product substitution to this specification must be submitted for review and approved prior to bid opening. Review package should include third party reviewed performance data that meets or exceeds criteria provided in Table 1, in Paragraph 2.1.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect R-Tank and other materials from damage during delivery, and store UV sensitive materials under tarp to protect from sunlight when time from delivery to installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud, and debris.

B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.

C. Cold weather:

1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated, or muddy subgrade.

1.6 PREINSTALLATION CONFERENCE.

A. Prior to the start of the installation, a preinstallation conference shall occur with the representatives from the design team, the general contractor, the excavation contractor, the R-Tank installation contractor, and the manufacturer's representative.

1.7 PROJECT CONDITIONS

A. Coordinate installation for the R-Tank system with other on-site activities to eliminate all non-installation related construction traffic over the completed R-Tank system. No loads heavier than the design loads shall be allowed over the system, and in no case shall loads higher than a standard AASHTO HS20 (or HS25, depending on design criteria) load be allowed on the system at any time.

B. Protect adjacent work from damage during R-Tank system installation.

C. All pre-treatment systems to remove debris and heavy sediments must be in place and functional prior to operation of the R-Tank system. Additional pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.

D. Contractor is responsible for any damage to the system during construction.

PART 2 - PRODUCTS

2.1 R-TANK UNITS

A. R -Tank - Injection molded plastic tank plates assembled to form a 95% void modular structure of predesigned height (custom for each project).

B. R-Tank units shall meet the Physical & Chemical Characteristics provided in Table 1:

Table 1

Property	Description	R-Tank$^{LD.}$ Value	R-Tank$^{HD.}$ Value	R-Tank$^{SD.}$ Value	R-Tank$^{UD.}$ Value
Void Area	Volume available for water storage	95%	95%	95%	95%
Surface Void Area	Percentage of exterior available for infiltration	90%	90%	90%	90%
Vertical Compressive Strength	ASTM D2412 / ASTM F2418	30.0 psi	33.4 psi	42.9 psi	134.2 psi
Lateral Compressive Strength	ASTM D2412 / ASTM F2418	20.0 psi	22.4 psi	28.9 psi	N/A
HS-20 Minimum Cover	Cover required to support HS-20 loads	N/A	20"	18"	12" (Stone Backfill)

Property	Description	R-Tank$^{LD.}$ Value	R-Tank$^{HD.}$ Value	R-Tank$^{SD.}$ Value	R-Tank$^{UD.}$ Value
HS-25 Minimum Cover	Cover required to support HS-25 loads	N/A	24”	19”	15” (Stone Backfill)
Maximum Cover	Maximum allowable cover depth	3 feet	< 7 feet	< 10 feet	5 feet
Unit Weight	Weight of plastic per cubic foot of tank	3.29 lbs/cf	3.62 lbs/cf	3.96 lbs/cf	4.33 lbs/cf
Rib Thickness	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	N/A
Service Temperature	Safe temperature range for use	-14 – 167° F	-14 – 167° F	-14 – 167° F	-14 – 167° F

C. Supplier: Ferguson Waterworks

(T): 800-448-3636; www.acfenvironmental.com

2.2 GEOSYNTHETICS

A. Geotextile. A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.

1. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (ACF N080 or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (ACF M200 or equivalent) shall be used.

B. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (ACF BX12 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-Tank^{UD} installations and is often not required for non-traffic load applications.

2.3 BACKFILL & COVER MATERIALS

A. Bedding Materials: Stone (angular and smaller than 1.5” in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System) shall be used below the R-Tank system (3” minimum). Material must be free from lumps, debris, and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation. For infiltration applications bedding material shall be free draining.

B. Side and Top Backfill: Material must be free from lumps, debris and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.

1. Traffic Applications - Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system.
   a. For HD, and SD modules, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).
   b. For UD modules with less than 14" of top cover, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter). The use of soil backfill on the sides and top of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of 14" or more. The top backfill material (from top of module to bottom of pavement base or 12" maximum) must be consistent with side backfill.

2. Non-Traffic / Green Space Applications - For all R-Tank modules installed in green spaces and not subjected to vehicular loads, backfill materials may either follow the guidelines for Traffic Applications above, or the top backfill layer (12" minimum) may consist of AASHTO #57 stone blended with 30-40% (by volume) topsoil to aid in establishing vegetation.

C. Additional Cover Materials: Structural Fill shall consist of granular materials meeting the gradational requirements of SM, SP, SW, GM, GP, or GW as classified by the Unified Soil Classification System. Structural fill shall have a maximum of 25 percent passing the No. 200 sieve, shall have a maximum clay content of 10 percent and a maximum Plasticity Index of 4. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.

2.4 OTHER MATERIALS

A. Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

PART 3 - EXECUTION

3.1 ASSEMBLY OF R-TANK UNITS

A. Assembly of modules shall be performed in accordance with Step 2 of the R-Tank Stormwater Storage System Installation Guide.

3.2 LAYOUT AND EXCAVATION

A. Installer shall stake out, excavate, and prepare the subgrade area to the required plan grades and dimensions, ensuring that the excavation is at least 2 feet greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials.

B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.

C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, or other means until construction is complete.

D. Base of the excavation shall be uniform, level, and free of lumps or debris and soft or yielding subgrade areas. A minimum 2,000 pounds per square foot bearing capacity is required.

1. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's Representative.
2. Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.

E. Unsuitable Soils or Conditions: All questions about the base of the excavation shall be directed to the Owner's Representative, who will approve the subgrade conditions prior to placement of stone. The Owner's Representative shall determine the required bearing capacity of the R-Tank subgrade; however, in no case shall a bearing capacity of less than 2,000 pounds per square foot be provided.

1. If unsuitable soils are encountered at the subgrade, or if the subgrade is pumping or appears excessively soft, repair the area in accordance with contract documents and/or as directed by the Owner's Representative.
2. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations.
3. Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the Owner's Representative.

3.3 PREPARATION OF BASE

A. Place a thin layer (3" unless otherwise specified) of bedding material (Paragraph 2.3, A), over the subgrade to establish a level working platform for the R-Tank modules. Level to within ½" (+/- ¼") or as shown on the plans. Native subgrade soils or other materials may be used if determined to meet the requirements of Paragraph 2.3, A and are accepted by the Owner's Representative.

1. Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unyielding.

B. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents. Outline the footprint of the R-Tank system on the excavation floor using spray paint or chalk line to ensure a 2' perimeter is available around the R-Tank system for proper installation and compaction of backfill.

3.4 INSTALLATION OF THE R-TANKS

A. Where a geotextile wrap is specified on the stone base, cut strips to length, and install in excavation, removing wrinkles so material lays flat. Overlap geotextile a minimum 12” or as recommended by manufacturer. Use tape, special adhesives, sandbags, or other ballast to secure overlaps. As geotextiles can be damaged by extreme heat, smoking is not permissible on/near the geotextile, and tools using a flame to tack the overlaps, such as propane torches, are prohibited.

B. Where an impervious liner (for containment) is specified, install the liner per manufacturer’s recommendations and the contract documents. The R-Tank units shall be separated from impervious liner by a non-woven geotextile fabric installed accordance with Paragraph 3.4, A.

C. Install R-Tank modules by placing side by side, in accordance with the design drawings. No lateral connections are required. It is advisable to use a string line to form square corners and straight edges along the perimeter of the R-Tank system. The modules are to be oriented as per the design drawing with required depth as shown on plans.

1. For LD, HD, and SD installations, the large side plate of the tank should be placed on the perimeter of the system. This will typically require that the two ends of the tank area will have a row of tanks placed perpendicular to all other tanks. If this is not shown on the construction drawings, it is a simple field adjustment that will have minimal effect on the overall system footprint. Refer to the R-Tank Stormwater Storage System Installation Guide for more details.
2. For UD installations, there is no perpendicular end row required.

D. Wrap the R-Tank top and sides in specified geotextile. Cut strips of geotextile so that it will cover the sides and top, encapsulating the entire system to prevent backfill entry into the system. Overlap geotextile 12” or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious liner) during placement.

E. Identify locations of inlet, outlet, and any other penetrations of the geotextile (and optional liner). These connections should be installed flush (butted up to the R-Tank) and the geotextile fabric shall be cut to enable hydraulic continuity between the connections and the R-Tank units. These connections shall be secured using pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile, impervious liner (if specified) or pipe. Connecting pipes at 90-degree angles facilitates construction, unless otherwise specified. Ensure end of pipe is installed snug against R-Tank system.

F. Install Inspection and Maintenance Ports in locations noted on plans. At a minimum one maintenance port shall be installed within 10’ of each inlet and outlet connection, and with a maximum spacing of one maintenance port for every 2,500 square feet. Install all ports as noted in the R-Tank Stormwater Storage System Installation Guide.

G. If required, install ventilation pipes and vents as specified on drawings to provide ventilation for proper hydraulic performance. The number of pipes and vents will depend on the size of the system. Vents are often installed using a 90-degree elbow with PVC pipe into a landscaped area with 'U" bend or venting bollard to inhibit the ingress of debris. A ground level concrete or steel cover can be used.

3.5 BACKFILLING OF THE R-TANK UNITS

A. Backfill and fill with recommended materials as follows:

1. Place freely draining backfill materials (Paragraph 2.3, B) around the perimeter in lifts with a maximum thickness of 12". Each lift shall be placed around the entire perimeter such that each lift is no more than 24" higher than the side backfill along any other location on the perimeter of the R-Tank system. No fill shall be placed over top of tanks until the side backfill has been completed.
2. Each lift shall be compacted at the specified moisture content to a minimum of 95% of the Standard Proctor Density until no further densification is observed (for self-compacting stone materials). The side lifts must be compacted with walk behind compaction equipment. Even when "self-compacting" backfill materials are selected, a walk behind vibratory compactor must be used.
3. Take care to ensure that the compaction process does not allow the machinery to come into contact with the modules due to the potential for damage to the geotextile and R-Tank units.
4. No compaction equipment is permissible to operate directly on the R-Tank modules.
5. Top Backfill: Only low-pressure track vehicles shall be operated over the R-Tank system during construction. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Heavy equipment should unload in an area adjacent to the R-Tank system and the material should be moved over the system using tracked equipment with an operating weight of less than 10 tons.
   a. Typical Applications: Install a 12" (or as shown on plans) lift of freely draining material (Paragraph 2.3, B) over the R-Tank Units, maintaining 12" between equipment tracks and R-Tank System. Lightly compacted using a walk-behind trench roller. Alternately, a roller (maximum gross vehicle weight of 6 tons) may be used. Roller must remain in static mode until a minimum of 24" of cover has been placed over the modules. Sheep foot rollers should not be used.
   b. Shallow Applications (< 18" total cover): Install top backfill in accordance with plans.
6. If required, install a geogrid as shown on plans. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
7. Following placement and compaction of the initial cover, subsequent lifts of structural fill (Paragraph 2.3, C) shall be placed at the specified moisture content and compacted to a minimum of 95% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement of fill above the system, unless otherwise specified, a uniform elevation of fill shall be

maintained to within 12" across the footprint of the R-Tank system. Do not exceed maximum cover depths which are provided in Table 1 in Paragraph 2.1.

8. Place additional layers of geotextile and/or geogrid at elevations as specified in the design details. Each layer of geosynthetic reinforcement placed above the R-Tank system shall extend a minimum of 3 feet beyond the limits of the excavation wall.

B. Ensure that all unrelated construction traffic is kept away from the limits of excavation until the project is complete and final surface materials are in place. No non-installation related loading should be allowed over the R-Tank system until the final design section has been constructed (including pavement).

C. Place surfacing materials, such as groundcovers (no large trees), or paving materials over the structure with care to avoid displacement of cover fill and damage to surrounding areas.

D. Backfill depth over R-Tank system must be within the limitations provided in Table 1 in Paragraph 2.1. If the total backfill depth does not comply with this table, contact Engineer or manufacturer's representative for assistance.

3.6 MAINTENANCE REQUIREMENTS

A. A routine maintenance effort is required to ensure proper performance of the R-Tank system. The Maintenance program should be focused on pretreatment systems. Ensuring these structures are clean and functioning properly will reduce the risk of contamination of the R-Tank system and stormwater released from the site. Pre-treatment systems shall be inspected yearly, or as directed by the regulatory agency and by the manufacturer (for proprietary systems). Maintain as needed using acceptable practices or following manufacturer's guidelines (for proprietary systems).

B. All inlet pipes and Inspection and/or Maintenance Ports in the R-Tank system will need to be inspected for accumulation of sediments at least quarterly through the first year of operation and at least yearly thereafter. If sediment has accumulated to the level noted in the R-Tank Stormwater Storage System Installation Guide or beyond a level acceptable to the Owner's Representative, the R-Tank system should be flushed.

C. All inspection and maintenance activities should be performed in accordance with the R-Tank Operation, Inspection & Maintenance (ACF Environmental).

END OF SECTION

SECTION 33 49 00

STORM UTILITY DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for furnishing and installing the site storm drainage system structures.

B. The work includes:

1. Site storm drainage system manholes, catch basins, separators (water quality units), underground stormwater detention facilities, headwalls, flared end sections, and sediment control devices.

1.2 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 03 30 10 – Cast-in-Place Concrete
2. Section 31 20 00 – Earth Moving
3. Section 31 23 19 – Dewatering
4. Section 31 25 00 – Erosion and Sedimentation Controls
5. Section 31 50 00 – Excavation Support and Protection
6. Section 33 41 00 – Storm Drainage Utility Drainage Piping

1.3 SUBMITTALS

A. <u>Shop Drawings</u>

1. Materials list of items proposed for the work.
2. Shop drawings or descriptive literature, or both, showing dimensions, joint and other details of all materials proposed for the work. Shop drawings shall be submitted to the Owner's Representative for approval prior to ordering material.

B. <u>As-Built Drawings</u>

1. As-Built Drawings shall indicate the true measurements and location, horizontal and vertical, of all new storm drainage system construction. As-Built Drawings shall include a minimum of three (3) ties showing the distance to each catch basin and manhole from fixed permanent objects. As-Built Drawings shall also contain any additional information required by the municipality. As-Built Drawings shall be stamped with the seal of a Licensed Land Surveyor.

2. Submit a digital copy in a PDF and DWG format to the Owner's Representative upon completion and acceptance of work prior to obtaining substantial completion certificate.
3. Submit paper and mylar copies as required by the local municipality.

1.4 COORDINATION AND VERIFICATION

A. Coordinate the work with the termination of storm drain connections at buildings, connections to municipal systems, and trenching operations.

B. The Contractor shall field verify and survey the size, location and elevations of all existing pipe and utility lines prior to ordering of materials for this utility system. A report of the findings of the verification survey shall be submitted to the Owner's Representative for information and comment.

1.5 COORDINATION WITH THE MUNICIPALITY

A. All work shall conform to the requirements of the local municipality standard details and specifications and other regulatory authorities having jurisdiction, or this specification, whichever is more stringent. Maintain one copy of each on site.

1.6 DELIVERY, STORAGE AND HANDLING

A. All materials shall be adequately protected from damage during transit. Structures shall not be dropped.

B. All structures and other appurtenances shall be inspected before placement in the work and any found to be defective from any cause, including damage caused by handling, and determined by the Owner's Representative to be unrepairable, shall be replaced at no cost to the Owner.

C. Storage and handling of manholes, catch basins, oil-grit separators, treatment units and other system appurtenances shall be in accordance with the manufacturer's recommendations.

1.7 INSPECTION

A. The manufacturer/supplier is responsible for the provision of all test requirements specified for each type of structure. In addition, any structure may be inspected at the plant for compliance with these specifications by an independent testing laboratory selected and paid by the Owner. The Contractor shall require the manufacturer's cooperation in these inspections.

B. Inspection of the structures may also be made after delivery. The structure shall be subject to rejection at any time on account of failure to meet any of the specification requirements, even though structure samples may have been accepted as satisfactory at the place of manufacture. Structures rejected after delivery shall be marked for identification and shall be removed from the site at once.

1.8 QUALITY ASSURANCE

A. Inspection: All components shall be subject to inspection by the Owner's Representative at the place of manufacture and/or installation. All components are subject to be rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair. Final acceptance of the component is contingent upon the discretion of the Owner's Representative.

B. Warranty: The manufacturer shall guarantee the water quality unit components against all manufacturer originated defects in materials or workmanship for a period of 12 months from the date the components are delivered to the owner for installation. The manufacturer shall be notified of repair/replacement issues in writing within the referenced warranty period. The manufacturer shall, upon its determination of repair, correct or replace any manufacturer originated defects identified by written notice within the referenced warranty period. The use of water quality unit components shall be limited to the application for which it was specifically designed.

C. Manufacturers of manholes, frames and covers specified in this Section shall have a minimum 3 years documented experience.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials for storm drainage system shall be new and unused.

2.2 STORM DRAIN MANHOLES

A. Precast Units

1. Structure: 48-inch minimum inside diameter, precast concrete units (4,000 psi minimum compressive strength) with eccentric cone section tapering to 24-inch diameter and monolithic base section meeting the requirements of ASTM C478 with gaskets meetings requirements of ASTM C923. All structures shall be designed for HS-20 loading and shall be sized to accept pipe penetrations as shown on the Drawings.
2. Precast Unit Joint Seals: Butyl rubber O-ring type seals meeting the requirements of ASTM C990.
3. Openings for pipe and materials to be embedded in the walls of the manholes sections for joint seals shall be cast in the sections at the required locations during manufacture. Sections with incorrectly cast and patched pipe openings will be rejected.
4. Openings shall be cast into the manhole sections to receive entering pipes during manufacture. The openings shall be sized to provide a uniform 2 inch maximum annular space between the outside of the pipe wall and the opening in the riser. After the pipe is in position, the annular space shall be solidly filled with non-

shrink mortar. Care shall be taken to ensure that the openings are located to permit setting of the entering pipe at its correct elevation.

B. Masonry Units

1. Brick shall conform to Sewer Brick (Made from Clay or Shale), ASTM designation C32, Grade MS or Building Brick (Solid Masonry Units Made from Clay or Shale), ASTM C62, Grade SW.
2. Concrete block shall be solid block and shall conform to the Specifications for Concrete Masonry Units for Construction of Catch Basins and Manholes, ASTM designation C139.
3. Mortar shall be in conformance with ASTM C270, Type M. The mortar shall be composed of Portland cement hydrated lime, and sand, in the proportions of 1 part cement to 1/4 part hydrated limit to 3-1/2 parts sand by volume.
4. Cement shall be Type I or II Portland cement conforming to ASTM C150, Standard Specification for Portland Cement. Where masonry is exposed to salt water, Type II shall be used.
5. Hydrated lime shall be Type S conforming to ASTM D207.

1. Sand for masonry mortar shall conform to the gradation requirements of ASTM C144.

C. Steps for manholes shall be Steel Reinforced Copolymer Polypropylene plastic step with at least a 14-inch wide stepping surface conforming to ASTM C478 and A615.

D. Manhole Frame and Cover:

Unless otherwise indicated on the plans or required by the local authority having jurisdiction, drainage manhole frame and cover shall be as follows:

1. For On-Site Areas: Grey iron casting conforming to ASTM A48, heavy duty, with the word “DRAIN” embossed on cover. Letter size shall be three inches. Frame and cover shall be EJ Prescott L-7 or approved equivalent, with a minimum clear opening of 24 inches and have a minimum weight of 375 pounds. Use 3000 psi concrete to secure frame to manhole or catch basin.
2. For Off-Site/Right-of-Way Areas: Grey iron casting conforming to ASTM A48, heavy duty, with the word “DRAIN” embossed on cover. Letter size shall be three inches. Frame and cover shall be EJ Prescott L-8 or approved equivalent, with a minimum clear opening of 24 inches and have a minimum weight of 465 pounds. Use 3000 psi concrete to secure frame to manhole or catch basin.

2.3 CATCH BASINS AND DROP INLET

A. Precast catch basins and drop inlets shall be manufactured in accordance with ASTM Designation C478 (4,000 psi minimum compressive strength) to the diameters and depths shown on the Drawings. All structures shall be designed for HS-20 loading. Precast unit joints shall be sealed with butyl rubber in accordance with ASTM C990.

B. Unless using a hood, where required for oil and floating debris traps, a slot and opening shall be cast in the catch basin wall for mounting a cast iron trap over the outlet pipe.

C. When approved by the Owner's Representative, catch basins and drop inlets may be constructed with brick or concrete block walls and poured reinforced concrete bases as an alternative to precast concrete units.

D. Brick and concrete block and other materials shall conform to Paragraph 2.2, B.

2.4 CATCH BASINS FRAME AND GRATES

A. Cast iron frames and grate shall conform to ASTM A48, Class 30. When located in accessible ways, grate openings shall meet the requirements of federal, state, and local regulations adopted under the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (MAAB) requirements.

B. Unless otherwise indicated on the Drawings, catch basin frame and grate shall be as follows:

1. For On-Site Areas: Single catch basin frame and grate shall be EJ Prescott L-10 or approved equivalent with four flanges or with three flanges for use with gutter inlet or abutting vertical curb.
2. For Off-Site/Right-of-Way Areas: Single catch basin frame and grate shall be EJ Prescott L-11 (LF248) or approved equivalent with four flanges (minimum 480 pounds) or with three flanges (minimum 450 pounds) for use with gutter inlet or abutting vertical curb.
3. Frame and grate for catch basin with shallow cover shall be EJ Prescott L-11 (LF244) or approved equivalent.
4. Double catch basin grate shall be EJ Prescott L-11 (LV248-2) or approved equivalent, with four flanges or with three flanges for use with gutter inlet or abutting vertical curb.

C. Catch basin oil and floating debris trap shall be Kleanstream The Eliminator for up to 18-inch outlet pipes, or approved equivalent.

D. Openings at top of concrete structures where curb inlets are required shall be 24 inches by 27 inches.

E. Landscape (Area) drains shall be ADS manufacturer, "NYOPLAST" In-Line drain with cast ductile iron dome grate.

2.5 GRIT AND OIL SEPARATOR

A. Grit and oil separator shall be precast concrete sections of the capacity and dimensions shown on the Drawings. Grit and oil separators manufacturer and model shall be as indicated on the Drawings or approved equivalent.

B. Precast sections shall be cured by an approved ASTM method and shall not be shipped, nor subject to loading until the concrete compressive strength of 4,000 psi minimum has been achieved. Portland cement shall be Type II, ASTM C150.

C. The separator shall be designed for the following loads and possible combinations thereof:

1. H-20 loading, manhole riser with frame and cones, plus the weight of soil above.
2. Weight of precast concrete structure.
3. Initial handling and erection loadings.

D. Construction joints shall be sealed with a butyl rubber-based sealant conforming to ASTM C990.

E. Manhole riser sections, manhole steps, frames and covers shall conform to the requirements in Paragraph 2.2.

2.6 SUSPENDED SOLIDS SEPARATOR

A. Separation Unit (water quality units)

1. The separation unit shall be a manufactured stormwater treatment unit suitable for installation in a precast concrete structure. Suspended solids separators shall be made of precast concrete sections and shall be of the capacity and dimensions indicated on the Drawings.
2. The manufacturer of the water quality unit shall be one that is regularly engaged in the engineering design and production of systems deployed for the treatment of storm water runoff for at least 10 years and which have a history of successful production, acceptable to the Owner's Representative. Unless otherwise indicated on the plans, the water quality unit(s) shall be manufactured by Contech Engineered Solutions, LLC or approved equal.

B. Precast Unit

1. Precast sections shall be cured by an approved ASTM method and shall not be shipped nor subject to loading until the concrete compressive strength has attained 5,000 psi. Portland cement shall be Type II, ASTM C150.
2. Precast units shall be designed for the following loads and possible combinations thereof:
   a. H-20 loading, manhole riser with frame and cones, plus the weight of soil above and the soil loading due to the depth of the structure below finished grade.
   b. Weight of precast concrete structure.
   c. Initial handling and erection loadings.

C. Precast Unit Joints: Butyl rubber section joint conforming to ASTM C990.

D. Manhole riser sections, manhole steps, frames and covers shall be as specified in Paragraph 2.2.

2.7 STORMWATER DETENTION/INFILTRATION CHAMBERS

A. Refer to Section 33 46 23, Modular Stormwater Storage Chamber.

2.8 OUTLET CONTROL MANHOLES OR STRUCTURES AND HEADWALLS

A. Outlet structures shall be made of concrete or precast concrete and shall be of the size, capacity, and dimensions indicated on the Drawings. Precast outlet structures shall be as manufactured by Oldcastle Precast, Inc. or approved equal.

B. Precast sections shall be cured by an approved ASTM method and shall not be shipped nor subject to loading until the concrete compressive strength has attained 4,000 psi minimum and 28 days after fabrication. Portland cement shall be Type II, ASTM C150.

C. The precast unit shall be designed for the following loads and possible combinations thereof:

1. H-20 loading, manhole riser with frame and cones, plus the weight of soil above and the soil loading due to the depth of the structure below finished grade.
2. Weight of precast concrete structure.
3. Initial handling and erection loading.
4. Cast in place concrete shall be constructed in accordance with Section 03 30 00, Cast-in-Place Concrete.

D. Construction joints shall be sealed with a butyl rubber-based sealant.

E. Manhole riser sections, manhole steps, frames, and covers shall be as specified for precast concrete storm drain manholes.

F. Grates and grills for outlet structures, which are not manufactured cast iron standards, shall be hot dip galvanized iron units shop constructed to fit the dimensions indicated on the Drawing's safety bars shall be 60 Ksi reinforcing steel.

2.9 SILT SACKS/SEDIMENT CONTROL DEVICES

A. Install at locations shown on the Drawings.

B. Manufacturer: ACF Environmental, Inc. or approved equal.

C. Material to be a polypropylene geotextile fabric with strength per ASTM D4884.

PART 3 - EXECUTION

3.1 GENERAL

A. Contractor to verify the locations and types of existing pipes and structures at all points of connection prior to ordering new utility materials.

B. All structures shall be laid accurately to the locations and elevations shown on the Drawings and in conformance with the structures manufacturer's recommendations.

C. As soon as the trench is excavated to the normal grade of the bottom of the trench, the Contractor shall immediately place the bedding material in the trench. The structure shall be firmly bedded in the compacted bedding material accurately to the locations and elevations shown on the Drawings.

D. Excavation, backfilling and compaction shall be as specified in Section 02 22 20, Excavation, Trenching, and Backfilling for Utility Systems.

E. Protection During Construction: The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any structure shall be performed at the Contractor's risk.

F. At all times when structure installation is not in progress, all structure openings shall be closed by approved temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been dewatered and all danger of water entering the structure is eliminated.

G. Do not install structures where site conditions induce loads exceeding structural capacity of structures.

H. Inspect precast concrete structures immediately prior to placement in excavation to verify structures are internally clean and free from damage. Remove and replace damaged units.

3.2 MANHOLES, CATCH BASINS, AND DROP INLETS-PRECAST

A. Manholes Catch Basins and Drop Inlets shall be constructed at the locations and to the lines, grades, dimensions and design shown on Drawings or as required by the Owner's Representative.

B. Precast concrete Units shall be installed in a manner that ensures watertight construction and all leaks in precast concrete structures shall be sealed. If required, precast concrete structures shall be repaired or replaced to obtain watertight construction.

C. Stubs shall be short pieces of pipe cut from the bell ends of the pipe. Stubs shall be plugged with brick masonry unless otherwise directed by the Owner's Representative.

D. Manhole Inverts shall conform accurately to the size of the adjoining pipes.

1. Manhole inverts shall be constructed of 3,500 psi concrete as shown on the Drawings.
2. Inverts shall be laid out in smooth diameter curves of the longest possible radius to provide uniform flow channels.
3. Invert shelves shall be graded with a 1-inch drop per 1-foot length sloped from the manhole walls.

E. Manhole steps shall be accurately positioned and embedded in the concrete when the section is cast. Precast-reinforced concrete manhole sections shall be set vertical and with sections and steps in true alignment.

F. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or with mortar. The mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch, hammered into the holes until it is dense and an excess of paste appears on the surface, and finished smooth and flush with the adjoining surfaces.

G. Precast sections shall be level and plumb with approved joint seals. Water shall not be permitted to rise over newly made joints until after inspection and acceptance. All joints shall be watertight.

H. Openings which have to be cut in the sections in the field shall be carefully made to prevent damage to the riser. Damaged risers will be rejected and shall be replaced at no additional cost to the Owner.

I. Change-In-Type Structures. Where indicated on the Drawings, existing subsurface drain structures shall be converted to the new structure types in the following manner;

1. Catch Basins to Manholes
   a. Fill basin sump with 3000 psi concrete and create new inverts at the elevations and sizes indicated and in accordance with specifications and details for new drain manholes.
   b. Provide and adjust to grade new drain manhole frame and cover.
   c. Stockpile existing frame and grade per Owner directions.

2. Manholes to Catch Basins (inlets)
   a. Where sump is indicated on the Drawings, replace existing manhole structure with new precast catch basin structure.
   b. Where sump is not indicated on the Drawings, replace existing frame and cover with new frame and grate and adjust to grade per these specifications and details for new catch basins.
   c. Stockpile existing manhole frame and cover per Owner's directions.

3.3 BRICK MASONRY

A. Brick masonry structures shall be watertight. All leaks in brick masonry structures shall be sealed. All brick masonry shall be laid by skilled work men and women.

B. All beds on which masonry is to be laid shall be cleaned and wetted properly. Brick shall be wetted as required to be damp, but free of any surface water when placed in the work. Bed joints shall be formed of a thick layer of mortar which shall be smoothed or furrowed slightly. Head joints shall be formed by applying a full coat of mortar on the entire brick end, or on the entire side, and then shoving the mortar covered end or side of the brick tightly against the bricks laid previously. The practice of buttering at the corners of the brick and then throwing the mortar in the empty joints will not be permitted. Dry or butt joints will not be permitted. Joints shall be uniform in thickness and approximately 1/4 inch thick.

C. Brickwork shall be constructed accurately to the required structure dimensions and tapered at the top to the dimensions of the flanges of the cast-iron frames, as shown on the Drawings.

D. Joints on the inside face of walls shall be tooled slightly concave with an approved jointer when the mortar is thumbprint hard. The mortar shall be compressed with complete contact along the edges to seal the surface of the joints.

E. All castings to be embedded in the brickwork shall be accurately set and built-in as the work progresses.

F. Water shall not be allowed to flow against brickwork or to rise on the masonry for 60 hours after it has been laid, and any brick masonry damaged in this manner shall be replaced as directed at no additional cost to the Owner. Adequate precautions shall be taken in freezing weather to protect the masonry from damage by frost.

3.4 CONCRETE MASONRY UNITS

A. Concrete masonry units shall be soaked in water before laying. As circular concrete block walls are laid-up, the horizontal joints and keyways shall be flushed full with mortar. As rectangular blocks are laid-up, all horizontal and vertical joints shall be flushed full with mortar. Plastering of the outside of block structures will not be required. No structure shall be backfilled until all mortar has completely set.

3.5 MANHOLE STEPS

A. Steps shall be cast into the precast walls during manufacture.

B. Steps in brick masonry and concrete units shall be installed as the masonry courses are laid.

3.6 CASTINGS

A. Cast-iron frames for grates and covers shall be well bedded in cement mortar and accurately set to the proposed grades.

B. All voids between the bottom flange and the structure shall be completely filled to make a watertight fit. A ring of mortar, at least one-inch thick and pitched to shed water away from the frame shall be placed over and around the outside of the bottom flange. The mortar shall extend to the outer edge of the masonry all around its circumference and shall be finished smooth. No visible leakage will be permitted.

C. Structures within the limits of bituminous concrete pavement shall be temporarily set at the elevation of the bottom of the binder course. After the binder course has been compacted, the structures shall be set at their final grade. Backfill necessary around such structures after the binder course has been completed shall be made with 3,500 psi concrete.

3.7 GRIT AND OIL SEPARATOR, AND SUSPENDED SOLIDS SEPARATORS

A. The separators shall be installed in accordance with the manufacturer's recommendations and related sections of the Contract Documents. The manufacturer shall provide the Contractor installation instructions and offer on-site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.

B. Separator structures shall be placed on a foundation of 12-inch thick minimum of gravel material. If groundwater is encountered, the foundation base shall be 12-inch thick minimum of crushed stone. Place structures in the dry.

C. Contractor to notify Owner’s Representative immediately if groundwater is encountered above elevations shown in the Contract Documents. Contractor to provide ballast in the form of anchoring, pre-cast concrete or cast-in-place concrete.

D. Precast sections shall be assembled with butyl rubber O-ring joint seals. The structure shall be watertight after assembly.

E. The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner which leaves no sharp points or edges.

3.8 CLEANING, TESTING AND REPAIR

A. The Contractor shall clean the entire drainage system of all debris and obstructions. This shall include, removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean,

and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing drains, storm recharge chambers, storm drains and/or streams.

B. Testing and Correction of Defective Work: If a mandrel 3 feet long and 90 percent of the pipe diameter cannot be pulled through the completed pipe runs after 7 days of completed trench backfill, the pipe line shall be deemed unacceptable and the pipe lines shall be removed and replaced. The Contractor shall make the necessary repairs or replacements required to permanently provide an open and structurally sound drainage system capable of supporting the anticipated loading from all sources throughout the year.

3.9 FINAL INSPECTION

A. Upon completion of the work, and before final acceptance by the Owner's Representative, the entire drainage system shall be subjected to a final inspection in the presence of the Owner's Representative. The work shall not be considered as complete until all requirements for line, grade, cleanliness, mandrel tests and other requirements have been met.

END OF SECTION

ATTACHMENT 3: AMERICAN RESCUE PLAN ACT (ARPA) CONTRACT ADDENDUM

American Rescue Plan Act (ARPA) Contract Addendum

The contract to which this addendum is attached ("Contract") is funded with federal assistance provided to the Commonwealth of Massachusetts by the U.S. Department of Treasury ("Treasury") under the American Rescue Plan Act ("ARPA Funds"), Sections 602(b) and 603(b) of the Social Security Act, Pub. L. No. 117-2. As a result, the Contract is subject to certain provisions of the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards in 2 C.F.R. Part 200, other than such provisions as Treasury has determined or may determine are inapplicable to the ARPA Funds. In addition, pursuant to 2 C.F.R. §200.327, the Contract must include applicable provisions described in Appendix II to 2 C.F.R. Part 200, each of which is contained in this Addendum.

The following terms and conditions apply to you (the "Contractor" or "Vendor"), as a Contractor of the Massachusetts Clean Energy Technology Center, and are hereby made part of the Contract.

A. **Equal Employment Opportunity**. During the performance of this Contract, Contractor agrees as follows:

    1. Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

    2. Contractor will, in all solicitations or advertisements for employees placed by or on behalf of Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

    3. Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or

action, including an investigation conducted by the employer, or is consistent with Contractor's legal duty to furnish information.

4. Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

5. Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

6. Contractor will furnish to the Administering Agency (as specified in 41 C.F.R. §60-1.3) and the Secretary of Labor all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Administering Agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

7. In the event of Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended, in whole or in part, and Contractor may be declared ineligible for further government contracts or Federally Assisted Construction Contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965. Such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8. Contractor will include the portion of the sentence immediately preceding paragraph A.1. of this section and the provisions of paragraphs A.1. through A.7. in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor

or vendor. Contractor will take such action with respect to any subcontract or purchase order as the Administering Agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Administering Agency, Contractor may request the United States to enter into such litigation to protect the interests of the United States.

9. MassCEC agrees that it will assist and cooperate actively with the Administering Agency and the Secretary of Labor in obtaining the compliance of Contractor and any subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor; that it will furnish the Administering Agency and the Secretary of Labor such information as they may require for the supervision of such compliance; and that it will otherwise assist the Administering Agency in the discharge of the agency's primary responsibility for securing compliance.

10. MassCEC further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and Federally Assisted Construction Contracts pursuant to the Executive Order and that it will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon Contractor and any subcontractors by the Administering Agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the MassCEC agrees that if it fails or refuses to comply with these undertakings, the Administering Agency may take any or all of the following actions: cancel, terminate, or suspend, in whole or in part, this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

B. Copeland "Anti-Kickback" Act. Contractor and any subcontractors performing work under the contract shall comply with 18 U.S.C. §874. The MassCEC shall report all suspected or reported violations to Treasury.

C. Suspension and Debarment.

1. This Contract is a covered transaction for purposes of 2 CFR §180.210 and 31 CFR §19.2103000. Therefore, this Contract is a lower-tier covered transaction for purposes of 2 C.F.R. Part 180 and 31 C.F.R. Part 19 if (1) the amount of this Contract is greater than or equal to $25,000 (2 C.F.R. § 180.220(b)(1); 31 C.F.R. § 19.220(b)(1)); (2) the Contract requires the consent of an official of the Department of the Treasury (2 C.F.R. § 180.220(b)(2); 31 C.F.R. § 19.220(b)(2)); or (3) this Contract is for federally required audit services (2 C.F.R. § 180.220(b)(3); 31 C.F.R. § 19.220(b)(3)).

2. As such, the Contractor is required to verify that Contractor's principals (defined at 2 CFR § 180.995) or its affiliates (defined at 2 CFR § 180.905) of both Contractor and Contractor's principals are not excluded (defined at 2 CFR § 180.935) and are not disqualified (defined at 2 CFR § 180.935). If any of the foregoing persons are excluded or disqualified and the Secretary of the Treasury has not granted an exception pursuant to 31 C.F.R. §19.120(a) (a) this Contract shall be void; (b) MassCEC shall not make any payments of federal financial assistance to Contractor; and (c) MassCEC shall have no obligations to Contractor under this Contract.

3. The Contractor must comply with 2 CFR pt. 180, subpart C and 31 CFR pt. 19, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into. This certification is a material representation of fact relied upon by MassCEC and all liability arising from an erroneous representation shall be borne solely by the Contractor.

4. If it is later determined that the Contractor did not comply with 2 CFR pt. 180, subpart C and 31 CFR pt. 19, in addition to remedies available to MassCEC, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

D. Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352, as amended.

1. Contractor certifies that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. §1352. Contractor shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier, up to the recipient who in turn will forward the certification(s) to the awarding agency. This certification is a material representation of fact upon which MassCEC has relied when entering into this contract, and all liability arising from an erroneous representation shall be borne solely by Contractor.

2. ***Contractors must sign the certification on the last page of this addendum and shall cause any subcontractors with a subcontract (at any tier) exceeding $100,000 to file with the tier above it the same certification.**

E. Access to Records.

1. Contractor agrees to provide MassCEC, the U.S. Department of Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, investigations and transcriptions. The Contractor agrees to permit any of the foregoing parties to reproduce by any means or to copy excerpts and transcriptions as reasonably needed, and agrees to cooperate with all such requests. No language in this contract is intended to prohibit audits or internal reviews by the Treasury Department or the Comptroller General of the United States.

2. Contractor agrees to retain all records covered by this section through December 31, 2031, or such longer period as is necessary for the resolution of any litigation, claim, negotiation, audit or other inquiry involving the contract.

F. Rights to Inventions Made Under a Contract or Agreement.

1. The Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use for "Government purposes," any subject data or copyright described below. "Government purposes" means use only for the direct purposes of the Government. Without the copyright owner's consent, the Government may not extend its federal license to any other party.

   (a) Any subject data developed under the contract, whether or not a copyright has been obtained, and

   (b) Any rights of copyright purchased by Contractor using federal assistance funded in whole or in part by the Department of the Treasury.

2. Unless Treasury determines otherwise, a Contractor performing experimental, developmental, or research work required as part of this contract agrees to permit Treasury to make available to the public either (a) Treasury's license in the copyright to any subject data developed in the course of the Contract or (b) a copy of the subject data first produced under the contract for which a copyright has not been obtained. If the experimental, developmental, or research work which is the subject of this contract is not completed for any reason whatsoever, all data developed under the contract shall

become subject data as defined herein and shall be delivered as the Government may direct.

3. Unless prohibited by North Carolina law, upon request by the Government, Contractor agrees to indemnify, save, and hold harmless the Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by Contractor of proprietary rights, copyrights, or right of privacy arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under the contract. Contractor shall be required to indemnify the Government for any such liability arising out of the wrongful act of any employee, official, or agent of the Contractor.

4. Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

5. Data developed by Contractor and financed entirely without using federal assistance provided by the Government that has been incorporated into work required by the underlying contract is exempt from the requirements herein, provided that Contractor identifies that data in writing at the time of delivery of the contract work. Contractor agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with federal assistance.

6. For the purposes of this section "subject data" means "recorded information, whether or not copyrighted, . . . that is delivered or specified to be delivered as required by the contract." Examples of "subject data" include, but are not limited to, "computer software, standards, specifications, engineering drawings and associated lists, process sheets, manuals, technical reports, catalog item identifications, and related information, but do not include financial reports, cost analyses or other similar information used for performance or administration of the contract."

G. Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327 through 333) (applies only to purchases over $100,000, when laborers or mechanics are used.) Where applicable, all contracts in excess of $100,000 that involve the employment of mechanics or laborers shall include a provision for compliance with 40 U.S.C. §3702 and §3704 of the Contract Work Hours and Safety Standards Act, as supplemented by Department of Labor regulations (29 CFR part 5). Under §3702 of the Act, each Contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard workweek of 40 hours. Work in excess of the standard workweek is permissible provided that the worker is compensated at a rate of not less than 1 1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek. The requirements of 40 U.S.C. §3704 are applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of

supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

H. Clean Air Act & Federal Water Pollution Control Act (applies to purchases of more than $150,000).

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

2. The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §1251 et seq.

3. The Contractor agrees to report each violation of the Clean Air Act and the Water Pollution Control Act to MassCEC of Gastonia and understands and agrees that MassCEC will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

4. Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance.

I. Prohibition on Contracting for Covered Telecommunications Equipment or Services.

1. Definitions. Unless otherwise defined in this contract, capitalized terms used in this section shall have the meanings ascribed thereto in this section.

   (a) "Backhaul" means intermediate links between the core network, or backbone network, and the small subnetworks at the edge of the network (e.g., connecting cell phones/towers to the core telephone network). Backhaul can be wireless (e.g., microwave) or wired (e.g., fiber optic, coaxial cable, Ethernet).

   (b) "Covered Foreign Country" means the People's Republic of China.

   (c) "Covered Telecommunications Equipment or Services" means (i) telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities); (ii) for the purpose of public safety, security of Government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities); (iii) telecommunications or video surveillance services provided by such entities or using such equipment;

or (iv) telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a Covered Foreign Country.

(d) "Critical Technology" means (i) defense articles or defense services included on the United States Munitions List set forth in the International Traffic in Arms Regulations under subchapter M of chapter I of title 22, Code of Federal Regulations; (ii) items included on the Commerce Control List set forth in Supplement No. 1 to part 774 of the Export Administration Regulations under subchapter C of chapter VII of title 15, Code of Federal Regulations and controlled (a) pursuant to multilateral regimes, including for reasons relating to national security, chemical and biological weapons proliferation, nuclear nonproliferation, or missile technology, or (b) for reasons relating to regional stability or surreptitious listening; (iii) specially designed and prepared nuclear equipment, parts and components, materials, software, and technology covered by part 810 of title 10, Code of Federal Regulations (relating to assistance to foreign atomic energy activities); (iv) nuclear facilities, equipment, and material covered by part 110 of title 10, Code of Federal Regulations (relating to export and import of nuclear equipment and material); (v) select agents and toxins covered by part 331 of title 7, Code of Federal Regulations; part 121 of title 9 of such Code; or part 73 of title 42 of such Code; or (vi) emerging and foundational technologies controlled pursuant to §1758 of the Export Control Reform Act of 2018 (50 U.S.C. §4817).

(e) "Interconnection Arrangements" means arrangements governing the physical connection of two or more networks to allow the use of another's network to hand off traffic where it is ultimately delivered (e.g., connection of a customer of telephone provider A to a customer of telephone company B) or sharing data and other information resources.

(f) "Roaming" means cellular communications services (e.g., voice, video, data) received from a visited network when unable to connect to the facilities of the home network either because signal coverage is too weak or because traffic is too high.

(g) "Substantial or Essential Component" means any component necessary for the proper function or performance of a piece of equipment, system, or service.

(h) "Telecommunications Equipment or Services" means telecommunications or video surveillance equipment or services, such as, but not limited to, mobile phones, land lines, internet, video surveillance, and cloud services.

2. Prohibitions.

(a) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after August 13, 2020, from obtaining or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

(b) Unless an exception in applies, Contractor and any subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds (including, without limitation, Fiscal Recovery Funds) received from a federal government to:

i. Procure or obtain any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology of any system;

ii. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology of any system;

iii. Enter into, extend, or renew contracts with entities that use Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology as part of any system; or

iv. Provide, as part of its performance of this contract, any subcontract; any other contractual instrument; or any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology as part of any system.

3. Exceptions.

(a). This clause does not prohibit Contractor or subcontractors from providing:

i. A service that connects to the facilities of a third party, such as Backhaul, Roaming, or Interconnection Agreements, or

ii. Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(b). By necessary implication and regulation, the prohibitions also do not apply to:

i. Covered telecommunications equipment that:

(a) Is not used as a Substantial or Essential Component of any system and

(b) Is not used as Critical Technology of any system.

ii. Other telecommunications equipment or services that are not considered Covered Telecommunications Equipment or Services.

4. Reporting Requirement.

(a). In the event Contractor identifies, during contract performance, covered Telecommunications Equipment or Services used as a Substantial or Essential Component of any system or as Critical Technology as part of any system, or if Contractor is notified of such by a subcontractor at any tier or by any other source, Contractor shall report the information in paragraph 4(b) of this section to MassCEC, unless procedures for reporting the information are established elsewhere in this contract.

(b). Contractor shall report the following information to MassCEC pursuant to paragraph 4(a) of this section:

i. Within one business day from the date of such identification or notification: contract number; order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

ii. Within ten business days of submitting the information in paragraph 4(b)(i) of this section, any further available information about mitigation actions undertaken or recommended. In addition, Contractor shall describe (1) the efforts it undertook to prevent use or submission of Covered Telecommunications Equipment or Services and (2) any additional efforts that will be incorporated to prevent future use or submission of Covered Telecommunications Equipment or Services.

5. SubContractor. Contractor shall cause to be inserted into all subcontracts and other contractual instruments relating to the performance of this contract the substance of this Section I, including this paragraph 5.

J. Domestic preference for certain procurements using federal funds. Contractor should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other

manufactured products). The requirements of this section must be included in all sub-awards including all contracts and purchase orders for work or products under this award. For purposes of this section:

1. "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

2. "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

K. Procurement of Recovered Materials.

1. This section shall apply if (1) this contract involves the purchase of an item designated by the Environmental Protection Agency ("EPA") in 40 C.F.R. Part 247 that exceeds $10,000 or (2) the total value of such designated items acquired during MassCEC's preceding fiscal year exceeded $10,000.

2. In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:

    a. Competitively within a timeframe providing for compliance with the contract performance schedule;

    b. Meet contract performance requirements; or

    c. Be acquired at a reasonable price.

3. Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines website. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

L. Minority and Women Business Enterprises. Contractor hereby agrees to comply with the following when applicable: The requirements of Executive Orders 11625 and 12432 (concerning Minority Business Enterprise), and 12138 (concerning Women's Business Enterprise), ***when applicable.*** Accordingly, the Contractor hereby agrees to take affirmative steps to assure that women and minority businesses are utilized when possible as sources

of supplies, equipment, construction and services. Affirmative steps shall include the following:

1. Including qualified women's business enterprises and small and minority businesses on solicitation lists;

2. Assuring that women's enterprises and small and minority businesses are solicited whenever they are potential sources;

3. When economically feasible, dividing total requirements into smaller tasks or quantities so as to permit maximum participation by small and minority business, and women's business enterprises;

4. Where the requirement permits, establishing delivery schedules which will encourage participation by women's business enterprises and small and minority business; and

5. Using the services and assistance of the Small Business Administration, and the U.S. Office of Minority Business Development Agency of the Department of Commerce; and the North Carolina Office for Historically Underutilized Businesses.

For the purposes of these requirements, a Minority Business Enterprise (MBE) is defined as an enterprise that is at least 51 percent owned and controlled in its daily operation by members of the following groups: Black, Hispanic, Asian or Pacific Islander, American Indian, or Alaskan Natives. A Women Business Enterprise (WBE) is defined as an enterprise that is at least 51 percent owned and controlled in its daily operation by women. Additionally, an MBE or WBE qualifies if it is currently certified as a North Carolina "historically underutilized business" under N.C.G.S. §143-128.4(a) and qualifies as a "small business" if it is independently owned and operated and is qualified under the Small Business Administration criteria and size standards at 13 C.F.R. Part 21.

M. Assurances of Compliance with Title VI of the Civil Rights Act of 1964. Contractor and any subcontractor, or the successor, transferee, or assignee of Contractor or any subcontractor, shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. §§ 2000d *et seq*.), as implemented by the Department of the Treasury's Title VI regulations, 31 C.F.R. Part 22, which are herein incorporated by reference and made a part of this contract. Title VI also provides protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S.C. §§ 2000d *et seq*., as implemented by Treasury's Title VI regulations, 31 C.F.R. Part 22, and herein incorporated by reference and made a part of this contract.

N. Conflicts of Interest; Gifts and Favors.

1. Contractor certifies to MassCEC that as of the date hereof, to the best of its knowledge after reasonable inquiry, no employee, officer, elected official, or agent of MassCEC involved in the selection, award, or administration of this contract (each a "Covered Individual"); no member of a Covered Individual's immediate family; no partner of a Covered Individual; and no organization (including Contractor) which employs or is about to employ a Covered Individual has a financial or other interest in, or has received a tangible personal benefit from, Contractor. Should Contractor obtain knowledge of any such interest or any tangible personal benefit described in the preceding sentence after the date hereof, Contractor shall promptly disclose the same to MassCEC in writing.

2. Contractor certifies to MassCEC that it has not provided, nor offered to provide, any gratuities, favors, or anything of value to an officer, employee, elected official or agent of MassCEC. Should Contractor obtain knowledge of the provision, or offer of any provision, of any gratuity, favor, or anything of value to an officer, employee, elected official or agent described in the preceding sentence after the date hereof, Contractor shall promptly disclose the same to MassCEC in writing.

CONTRACTOR:

The undersigned, as Contractor's duly authorized representative, hereby certifies under the pains and penalties of perjury that Contractor is in compliance with all certifications required in this Addendum.

By: _____

Name: _____

Title: _____

Acknowledged by MassCEC:

By: _____

Name: _____

Title: _____

- This form is required only for purchases of more than $100,000 –

31 CFR Part 21 – New Restrictions on Lobbying –
CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of their knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers (including subcontracts, sub grants, and contracts under grants, loans, and cooperative agreements) and that all Contractors shall certify and disclose accordingly.

4. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Ch. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____
Signature of Contractor's authorized official

Date: _____

_____
(Print name and title of person signing above)

ATTACHMENT 4: PREVAILING WAGE RATES

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: Massachusetts Clean Energy Center

Contract Number: MACEC-FY25-02 **City/Town:** NEW BEDFORD

Description of Work: Site demolition work including concrete building foundations, utilities and structures, pavements, utility disconnections, grading, and utilities.

Job Location: 4 Wright St

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F "rental of equipment" contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Issue Date: 05/14/2025 **Wage Request Number:** 20250513-071

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.95	$15.57	$20.17	$0.00	$75.69
	06/01/2025	$40.95	$15.57	$20.17	$0.00	$76.69
	12/01/2025	$40.95	$15.57	$21.78	$0.00	$78.30
	01/01/2026	$40.95	$16.17	$21.78	$0.00	$78.90
	06/01/2026	$41.95	$16.17	$21.78	$0.00	$79.90
	12/01/2026	$41.95	$16.17	$23.52	$0.00	$81.64
	01/01/2027	$41.95	$16.77	$23.52	$0.00	$82.24
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.02	$15.57	$20.17	$0.00	$75.76
	06/01/2025	$41.02	$15.57	$20.17	$0.00	$76.76
	12/01/2025	$41.02	$15.57	$21.78	$0.00	$78.37
	01/01/2026	$41.02	$16.17	$21.78	$0.00	$78.97
	06/01/2026	$42.02	$16.17	$21.78	$0.00	$79.97
	12/01/2026	$42.02	$16.17	$23.52	$0.00	$81.71
	01/01/2027	$42.02	$16.77	$23.52	$0.00	$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.14	$15.57	$20.17	$0.00	$75.88
	06/01/2025	$41.14	$15.57	$20.17	$0.00	$76.88
	12/01/2025	$41.14	$15.57	$21.78	$0.00	$78.49
	01/01/2026	$41.14	$16.17	$21.78	$0.00	$79.09
	06/01/2026	$42.14	$16.17	$21.78	$0.00	$80.09
	12/01/2026	$42.14	$16.17	$23.52	$0.00	$81.83
	01/01/2027	$42.14	$16.77	$23.52	$0.00	$82.43
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	12/01/2024	$42.80	$14.50	$11.05	$0.00	$68.35
	06/01/2025	$43.80	$14.50	$11.05	$0.00	$69.35
	12/01/2025	$44.80	$14.50	$11.05	$0.00	$70.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2024	$48.12	$7.07	$20.60	$0.00	$75.79

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$31.28	$7.07	$13.22	$0.00	$51.57
2	65	$31.28	$7.07	$13.22	$0.00	$51.57
3	70	$33.68	$7.07	$14.23	$0.00	$54.98
4	75	$36.09	$7.07	$15.24	$0.00	$58.40
5	80	$38.50	$7.07	$16.25	$0.00	$61.82
6	85	$40.90	$7.07	$17.28	$0.00	$65.25
7	90	$43.31	$7.07	$18.28	$0.00	$68.66
8	95	$45.71	$7.07	$19.32	$0.00	$72.10

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	02/01/2025	$65.80	$11.49	$23.59	$0.00	$100.88
	08/01/2025	$67.95	$11.49	$23.59	$0.00	$103.03
	02/01/2026	$69.30	$11.49	$23.59	$0.00	$104.38
	08/01/2026	$71.50	$11.49	$23.59	$0.00	$106.58
	02/01/2027	$72.90	$11.49	$23.59	$0.00	$107.98

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 New Bedford*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.90	$11.49	$23.59	$0.00	$67.98
2	60	$39.48	$11.49	$23.59	$0.00	$74.56
3	70	$46.06	$11.49	$23.59	$0.00	$81.14
4	80	$52.64	$11.49	$23.59	$0.00	$87.72
5	90	$59.22	$11.49	$23.59	$0.00	$94.30

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$33.98	$11.49	$23.59	$0.00	$69.06
2	60	$40.77	$11.49	$23.59	$0.00	$75.85
3	70	$47.57	$11.49	$23.59	$0.00	$82.65
4	80	$54.36	$11.49	$23.59	$0.00	$89.44
5	90	$61.16	$11.49	$23.59	$0.00	$96.24

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$47.35	$9.90	$19.05	$0.00	$76.30
	06/01/2025	$48.85	$9.90	$19.05	$0.00	$77.80
	12/01/2025	$50.35	$9.90	$19.05	$0.00	$79.30
	06/01/2026	$51.90	$9.90	$19.05	$0.00	$80.85
	12/01/2026	$53.40	$9.90	$19.05	$0.00	$82.35
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.20	$9.90	$19.05	$0.00	$75.15
	06/01/2025	$47.70	$9.90	$19.05	$0.00	$76.65
	12/01/2025	$49.20	$9.90	$19.05	$0.00	$78.15
	06/01/2026	$50.75	$9.90	$19.05	$0.00	$79.70
	12/01/2026	$52.25	$9.90	$19.05	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.53	$9.90	$19.05	$0.00	$75.48
	06/01/2025	$48.03	$9.90	$19.05	$0.00	$76.98
	12/01/2025	$49.53	$9.90	$19.05	$0.00	$78.48
	06/01/2026	$51.08	$9.90	$19.05	$0.00	$80.03
	12/01/2026	$52.58	$9.90	$19.05	$0.00	$81.53
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2025	$49.62	$9.83	$19.97	$0.00	$79.42
	09/01/2025	$50.87	$9.83	$19.97	$0.00	$80.67
	03/01/2026	$52.12	$9.83	$19.97	$0.00	$81.92
	09/01/2026	$53.37	$9.83	$19.97	$0.00	$83.17
	03/01/2027	$54.62	$9.83	$19.97	$0.00	$84.42

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.33	$9.83	$1.73	$0.00	$33.89
2	45	$22.33	$9.83	$1.73	$0.00	$33.89
3	55	$27.29	$9.83	$3.40	$0.00	$40.52
4	55	$27.29	$9.83	$3.40	$0.00	$40.52
5	70	$34.73	$9.83	$16.51	$0.00	$61.07
6	70	$34.73	$9.83	$16.51	$0.00	$61.07
7	80	$39.70	$9.83	$18.24	$0.00	$67.77
8	80	$39.70	$9.83	$18.24	$0.00	$67.77

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.89	$9.83	$1.73	$0.00	$34.45
2	45	$22.89	$9.83	$1.73	$0.00	$34.45
3	55	$27.98	$9.83	$3.40	$0.00	$41.21
4	55	$27.98	$9.83	$3.40	$0.00	$41.21
5	70	$35.61	$9.83	$16.51	$0.00	$61.95
6	70	$35.61	$9.83	$16.51	$0.00	$61.95
7	80	$40.70	$9.83	$18.24	$0.00	$68.77
8	80	$40.70	$9.83	$18.24	$0.00	$68.77

Notes:

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS-ZONE 3 (Wood Frame)*	10/01/2024	$26.65	$7.02	$4.80	$0.00	$38.47
	10/01/2025	$27.75	$7.02	$4.80	$0.00	$39.57
	10/01/2026	$28.85	$7.02	$4.80	$0.00	$40.67

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
All Aspects of New Wood Frame Work						

Apprentice - *CARPENTER (Wood Frame) - Zone 3*

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$15.99	$7.02	$0.00	$0.00	$23.01
2	60	$15.99	$7.02	$0.00	$0.00	$23.01
3	65	$17.32	$7.02	$1.00	$0.00	$25.34
4	70	$18.66	$7.02	$1.00	$0.00	$26.68
5	75	$19.99	$7.02	$4.80	$0.00	$31.81
6	80	$21.32	$7.02	$4.80	$0.00	$33.14
7	85	$22.65	$7.02	$4.80	$0.00	$34.47
8	90	$23.99	$7.02	$4.80	$0.00	$35.81

Effective Date - 10/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.65	$7.02	$0.00	$0.00	$23.67
2	60	$16.65	$7.02	$0.00	$0.00	$23.67
3	65	$18.04	$7.02	$1.00	$0.00	$26.06
4	70	$19.43	$7.02	$1.00	$0.00	$27.45
5	75	$20.81	$7.02	$4.80	$0.00	$32.63
6	80	$22.20	$7.02	$4.80	$0.00	$34.02
7	85	$23.59	$7.02	$4.80	$0.00	$35.41
8	90	$24.98	$7.02	$4.80	$0.00	$36.80

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	07/01/2024	$49.19	$13.35	$24.21	$1.80	$88.55

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (New Bedford)*

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.60	$13.35	$16.43	$0.00	$54.38
2	60	$29.51	$13.35	$19.21	$1.80	$63.87
3	65	$31.97	$13.35	$20.21	$1.80	$67.33
4	70	$34.43	$13.35	$21.21	$1.80	$70.79
5	75	$36.89	$13.35	$22.21	$1.80	$74.25
6	80	$39.35	$13.35	$23.21	$1.80	$77.71
7	90	$44.27	$13.35	$24.21	$1.80	$83.63

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$58.18	$15.55	$16.50	$0.00	$90.23
	06/01/2025	$59.51	$15.55	$16.50	$0.00	$91.56
	12/01/2025	$60.98	$15.55	$16.50	$0.00	$93.03
	06/01/2026	$62.31	$15.55	$16.50	$0.00	$94.36
	12/01/2026	$63.79	$15.55	$16.50	$0.00	$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.23	$9.95	$0.00	$0.00	$39.18
2	55	$32.15	$9.95	$6.66	$0.00	$48.76
3	60	$35.08	$9.95	$7.26	$0.00	$52.29
4	65	$38.00	$9.95	$7.87	$0.00	$55.82
5	70	$40.92	$9.95	$20.32	$0.00	$71.19
6	75	$43.85	$9.95	$20.93	$0.00	$74.73
7	80	$46.77	$9.95	$21.53	$0.00	$78.25
8	90	$52.61	$9.95	$22.74	$0.00	$85.30

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	12/02/2024	$46.25	$9.90	$18.90	$0.00	$75.05
	06/02/2025	$47.75	$9.90	$18.90	$0.00	$76.55
	12/01/2025	$49.25	$9.90	$18.90	$0.00	$78.05
	06/01/2026	$50.80	$9.90	$18.90	$0.00	$79.60
	12/07/2026	$52.30	$9.90	$18.90	$0.00	$81.10
	06/07/2027	$53.90	$9.90	$18.90	$0.00	$82.70
	12/06/2027	$55.50	$9.90	$18.90	$0.00	$84.30
	06/05/2028	$57.18	$9.90	$18.90	$0.00	$85.98
	12/04/2028	$58.85	$9.90	$18.90	$0.00	$87.65

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	12/02/2024	$47.25	$9.90	$18.90	$0.00	$76.05
	06/02/2025	$48.75	$9.90	$18.90	$0.00	$77.55
	12/01/2025	$50.25	$9.90	$18.90	$0.00	$79.05
	06/01/2026	$51.80	$9.90	$18.90	$0.00	$80.60
	12/07/2026	$53.30	$9.90	$18.90	$0.00	$82.10
	06/07/2027	$54.90	$9.90	$18.90	$0.00	$83.70
	12/06/2027	$56.50	$9.90	$18.90	$0.00	$85.30
	06/05/2028	$58.18	$9.90	$18.90	$0.00	$86.98
	12/04/2028	$59.85	$9.90	$18.90	$0.00	$88.65

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.90	$18.90	$0.00	$75.80
	06/02/2025	$48.50	$9.90	$18.90	$0.00	$77.30
	12/01/2025	$50.00	$9.90	$18.90	$0.00	$78.80
	06/01/2026	$51.55	$9.90	$18.90	$0.00	$80.35
	12/07/2026	$53.05	$9.90	$18.90	$0.00	$81.85
	06/07/2027	$54.65	$9.90	$18.90	$0.00	$83.45
	12/06/2027	$56.25	$9.90	$18.90	$0.00	$85.05
	06/05/2028	$57.93	$9.90	$18.90	$0.00	$86.73
	12/04/2028	$59.60	$9.90	$18.90	$0.00	$88.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	12/02/2024	$47.25	$9.90	$18.90	$0.00	$76.05
	06/02/2025	$48.75	$9.90	$18.90	$0.00	$77.55
	12/01/2025	$50.25	$9.90	$18.90	$0.00	$79.05
	06/01/2026	$51.80	$9.90	$18.90	$0.00	$80.60
	12/07/2026	$53.30	$9.90	$18.90	$0.00	$82.10
	06/07/2027	$54.90	$9.90	$18.90	$0.00	$83.70
	12/06/2027	$56.50	$9.90	$18.90	$0.00	$85.30
	06/05/2028	$58.18	$9.90	$18.90	$0.00	$86.98
	12/04/2028	$59.85	$9.90	$18.90	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.90	$18.90	$0.00	$75.80
	06/02/2025	$48.50	$9.90	$18.90	$0.00	$77.30
	12/01/2025	$50.00	$9.90	$18.90	$0.00	$78.80
	06/01/2026	$51.55	$9.90	$18.90	$0.00	$80.35
	12/07/2026	$53.05	$9.90	$18.90	$0.00	$81.85
	06/07/2027	$54.65	$9.90	$18.90	$0.00	$83.45
	12/06/2027	$56.25	$9.90	$18.90	$0.00	$85.05
	06/05/2028	$57.93	$9.90	$18.90	$0.00	$86.73
	12/04/2028	$59.60	$9.90	$18.90	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	12/02/2024	$46.25	$9.90	$18.90	$0.00	$75.05
	06/02/2025	$47.75	$9.90	$18.90	$0.00	$76.55
	12/01/2025	$49.25	$9.90	$18.90	$0.00	$78.05
	06/01/2026	$50.80	$9.90	$18.90	$0.00	$79.60
	12/07/2026	$52.30	$9.90	$18.90	$0.00	$81.10
	06/07/2027	$53.90	$9.90	$18.90	$0.00	$82.70
	12/06/2027	$55.50	$9.90	$18.90	$0.00	$84.30
	06/05/2028	$57.18	$9.90	$18.90	$0.00	$85.98
	12/04/2028	$58.85	$9.90	$18.90	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$78.11	$10.08	$24.29	$0.00	$112.48
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A $69.83, 3A $91.79,4A $102.14 Total Rate						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A $54.20, 3A $73.93,4A $82.05 Total Rate						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$83.69	$10.08	$24.29	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.01	$12.00	$0.60	$0.00	$32.61
2	45	$22.51	$12.00	$0.68	$0.00	$35.19
3	50	$25.01	$12.00	$0.75	$0.00	$37.76
4	55	$27.51	$12.00	$8.59	$0.00	$48.10
5	60	$30.01	$12.00	$9.15	$0.00	$51.16
6	65	$32.51	$12.00	$9.74	$0.00	$54.25
7	70	$35.01	$12.00	$10.30	$0.00	$57.31
8	75	$37.52	$12.00	$10.89	$0.00	$60.41

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.90	$12.25	$0.63	$0.00	$33.78
2	45	$23.51	$12.25	$0.71	$0.00	$36.47
3	50	$26.13	$12.25	$0.78	$0.00	$39.16
4	55	$28.74	$12.25	$9.11	$0.00	$50.10
5	60	$31.35	$12.25	$9.71	$0.00	$53.31
6	65	$33.96	$12.25	$10.32	$0.00	$56.53
7	70	$36.58	$12.25	$10.91	$0.00	$59.74
8	75	$39.19	$12.25	$11.52	$0.00	$62.96

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.81	$16.03	$0.00	$0.00	$48.84
2	55	$36.09	$16.03	$20.21	$0.00	$72.33
3	65	$42.65	$16.03	$20.21	$0.00	$78.89
4	70	$45.93	$16.03	$20.21	$0.00	$82.17
5	80	$52.50	$16.03	$20.21	$0.00	$88.74

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2025	$53.22	$15.30	$16.40	$0.00	$84.92
	11/01/2025	$54.51	$15.30	$16.40	$0.00	$86.21
	05/01/2026	$55.95	$15.30	$16.40	$0.00	$87.65
	11/01/2026	$57.24	$15.30	$16.40	$0.00	$88.94
	05/01/2027	$58.67	$15.30	$16.40	$0.00	$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2025	$54.82	$15.30	$16.40	$0.00	$86.52
	11/01/2025	$56.12	$15.30	$16.40	$0.00	$87.82
	05/01/2026	$57.57	$15.30	$16.40	$0.00	$89.27
	11/01/2026	$58.87	$15.30	$16.40	$0.00	$90.57
	05/01/2027	$60.32	$15.30	$16.40	$0.00	$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2025	$26.22	$15.30	$16.40	$0.00	$57.92
	11/01/2025	$26.98	$15.30	$16.40	$0.00	$58.68
	05/01/2026	$27.83	$15.30	$16.40	$0.00	$59.53
	11/01/2026	$28.59	$15.30	$16.40	$0.00	$60.29
	05/01/2027	$29.44	$15.30	$16.40	$0.00	$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$45.96	$15.55	$16.50	$0.00	$78.01
	06/01/2025	$47.02	$15.55	$16.50	$0.00	$79.07
	12/01/2025	$48.19	$15.55	$16.50	$0.00	$80.24
	06/01/2026	$49.25	$15.55	$16.50	$0.00	$81.30
	12/01/2026	$50.43	$15.55	$16.50	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$27.01	$9.90	$18.46	$0.00	$55.37
	06/01/2025	$28.09	$9.90	$18.46	$0.00	$56.45
	12/01/2025	$28.09	$9.90	$18.46	$0.00	$56.45
	06/01/2026	$29.21	$9.90	$18.46	$0.00	$57.57
	12/01/2026	$29.21	$9.90	$18.46	$0.00	$57.57
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2025	$57.73	$8.83	$20.27	$0.00	$86.83
	09/01/2025	$59.23	$8.83	$20.27	$0.00	$88.33
	03/01/2026	$60.73	$8.83	$20.27	$0.00	$89.83
	09/01/2026	$62.23	$8.83	$20.27	$0.00	$91.33
	03/01/2027	$63.73	$8.83	$20.27	$0.00	$92.83

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$25.98	$8.83	$1.76	$0.00	$36.57
2	45	$25.98	$8.83	$1.76	$0.00	$36.57
3	55	$31.75	$8.83	$3.52	$0.00	$44.10
4	55	$31.75	$8.83	$3.52	$0.00	$44.10
5	70	$40.41	$8.83	$16.75	$0.00	$65.99
6	70	$40.41	$8.83	$16.75	$0.00	$65.99
7	80	$46.18	$8.83	$18.51	$0.00	$73.52
8	80	$46.18	$8.83	$18.51	$0.00	$73.52

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$26.65	$8.83	$1.76	$0.00	$37.24
2	45	$26.65	$8.83	$1.76	$0.00	$37.24
3	55	$32.58	$8.83	$3.52	$0.00	$44.93
4	55	$32.58	$8.83	$3.52	$0.00	$44.93
5	70	$41.46	$8.83	$16.75	$0.00	$67.04
6	70	$41.46	$8.83	$16.75	$0.00	$67.04
7	80	$47.38	$8.83	$18.51	$0.00	$74.72
8	80	$47.38	$8.83	$18.51	$0.00	$74.72

Notes: Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.59	$10.80	$1.80	$0.00	$32.19
2	56	$22.04	$10.80	$1.80	$0.00	$34.64
3	63	$24.49	$10.80	$2.45	$0.00	$37.74
4	69	$26.94	$10.80	$2.45	$0.00	$40.19
5	75	$29.39	$10.80	$3.15	$0.00	$43.34
6	81	$31.83	$10.80	$3.15	$0.00	$45.78
7	88	$34.28	$10.80	$10.45	$0.00	$55.53
8	94	$36.73	$10.80	$10.45	$0.00	$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$31.37	$0.00	$0.00	$0.00	$31.37
2	60	$34.22	$15.55	$16.50	$0.00	$66.27
3	65	$37.07	$15.55	$16.50	$0.00	$69.12
4	70	$39.92	$15.55	$16.50	$0.00	$71.97
5	75	$42.77	$15.55	$16.50	$0.00	$74.82
6	80	$45.62	$15.55	$16.50	$0.00	$77.67
7	85	$48.48	$15.55	$16.50	$0.00	$80.53
8	90	$51.33	$15.55	$16.50	$0.00	$83.38

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$32.08	$0.00	$0.00	$0.00	$32.08
2	60	$35.00	$15.55	$16.50	$0.00	$67.05
3	65	$37.91	$15.55	$16.50	$0.00	$69.96
4	70	$40.83	$15.55	$16.50	$0.00	$72.88
5	75	$43.75	$15.55	$16.50	$0.00	$75.80
6	80	$46.66	$15.55	$16.50	$0.00	$78.71
7	85	$49.58	$15.55	$16.50	$0.00	$81.63
8	90	$52.50	$15.55	$16.50	$0.00	$84.55

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - B*	04/01/2025	$43.83	$14.59	$19.04	$2.24	$79.70
	10/01/2025	$45.08	$14.59	$19.04	$2.24	$80.95
	04/01/2026	$46.58	$14.59	$19.04	$2.24	$82.45
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - B*	04/01/2025	$43.83	$30.43	$19.04	$2.24	$95.54
	10/01/2025	$45.08	$30.43	$19.04	$2.24	$96.79
	04/01/2026	$46.58	$30.43	$19.04	$2.24	$98.29
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	09/01/2024	$51.23	$14.75	$19.61	$0.00	$85.59
	09/01/2025	$54.31	$14.75	$19.61	$0.00	$88.67
	09/01/2026	$57.38	$14.75	$19.61	$0.00	$91.74

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Southern MA*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.62	$14.75	$14.32	$0.00	$54.69
2	60	$30.74	$14.75	$15.37	$0.00	$60.86
3	70	$35.86	$14.75	$16.43	$0.00	$67.04
4	80	$40.98	$14.75	$17.49	$0.00	$73.22

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.16	$14.75	$14.32	$0.00	$56.23
2	60	$32.59	$14.75	$15.37	$0.00	$62.71
3	70	$38.02	$14.75	$16.43	$0.00	$69.20
4	80	$43.45	$14.75	$17.49	$0.00	$75.69

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	$29.72	$7.70	$17.10	$0.00	$54.52
2	75	$31.85	$7.70	$17.10	$0.00	$56.65
3	80	$33.97	$7.70	$17.10	$0.00	$58.77
4	85	$36.09	$7.70	$17.10	$0.00	$60.89
5	90	$38.21	$7.70	$17.10	$0.00	$63.01
6	95	$40.34	$7.70	$17.10	$0.00	$65.14

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.37	$9.90	$18.36	$0.00	$51.63
2	70	$27.27	$9.90	$18.36	$0.00	$55.53
3	80	$31.16	$9.90	$18.36	$0.00	$59.42
4	90	$35.06	$9.90	$18.36	$0.00	$63.32

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.20	$9.90	$18.36	$0.00	$52.46
2	70	$28.24	$9.90	$18.36	$0.00	$56.50
3	80	$32.27	$9.90	$18.36	$0.00	$60.53
4	90	$36.31	$9.90	$18.36	$0.00	$64.57

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$38.95	$9.90	$18.46	$0.00	$67.31
	06/01/2025	$40.34	$9.90	$18.46	$0.00	$68.70
	12/01/2025	$41.72	$9.90	$18.46	$0.00	$70.08
	06/01/2026	$43.16	$9.90	$18.46	$0.00	$71.52
	12/01/2026	$44.60	$9.90	$18.46	$0.00	$72.96

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.37	$9.90	$18.46	$0.00	$51.73
2	70	$27.27	$9.90	$18.46	$0.00	$55.63
3	80	$31.16	$9.90	$18.46	$0.00	$59.52
4	90	$35.06	$9.90	$18.46	$0.00	$63.42

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.20	$9.90	$18.46	$0.00	$52.56
2	70	$28.24	$9.90	$18.46	$0.00	$56.60
3	80	$32.27	$9.90	$18.46	$0.00	$60.63
4	90	$36.31	$9.90	$18.46	$0.00	$64.67

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	12/02/2024	$39.04	$9.90	$18.42	$0.00	$67.36
	06/02/2025	$40.43	$9.90	$18.42	$0.00	$68.75
	12/01/2025	$41.81	$9.90	$18.42	$0.00	$70.13
	06/01/2026	$43.25	$9.90	$18.42	$0.00	$71.57
	12/07/2026	$44.69	$9.90	$18.42	$0.00	$73.01
	06/07/2027	$46.14	$9.90	$18.42	$0.00	$74.46
	12/06/2027	$47.59	$9.90	$18.42	$0.00	$75.91
	06/05/2028	$49.09	$9.90	$18.42	$0.00	$77.41
	12/04/2028	$50.59	$9.90	$18.42	$0.00	$78.91
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$50.36	$11.49	$21.62	$0.00	$83.47
	08/01/2025	$52.08	$11.49	$21.62	$0.00	$85.19
	02/01/2026	$53.16	$11.49	$21.62	$0.00	$86.27
	08/01/2026	$54.92	$11.49	$21.62	$0.00	$88.03
	02/01/2027	$56.04	$11.49	$21.62	$0.00	$89.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE & TILE FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.18	$11.49	$21.62	$0.00	$58.29
2	60	$30.22	$11.49	$21.62	$0.00	$63.33
3	70	$35.25	$11.49	$21.62	$0.00	$68.36
4	80	$40.29	$11.49	$21.62	$0.00	$73.40
5	90	$45.32	$11.49	$21.62	$0.00	$78.43

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.04	$11.49	$21.62	$0.00	$59.15
2	60	$31.25	$11.49	$21.62	$0.00	$64.36
3	70	$36.46	$11.49	$21.62	$0.00	$69.57
4	80	$41.66	$11.49	$21.62	$0.00	$74.77
5	90	$46.87	$11.49	$21.62	$0.00	$79.98

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$65.82	$11.49	$23.56	$0.00	$100.87
	08/01/2025	$67.97	$11.49	$23.56	$0.00	$103.02
	02/01/2026	$69.32	$11.49	$23.56	$0.00	$104.37
	08/01/2026	$71.52	$11.49	$23.56	$0.00	$106.57
	02/01/2027	$72.92	$11.49	$23.56	$0.00	$107.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.91	$11.49	$23.56	$0.00	$67.96
2	60	$39.49	$11.49	$23.56	$0.00	$74.54
3	70	$46.07	$11.49	$23.56	$0.00	$81.12
4	80	$52.66	$11.49	$23.56	$0.00	$87.71
5	90	$59.24	$11.49	$23.56	$0.00	$94.29

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$33.99	$11.49	$23.56	$0.00	$69.04
2	60	$40.78	$11.49	$23.56	$0.00	$75.83
3	70	$47.58	$11.49	$23.56	$0.00	$82.63
4	80	$54.38	$11.49	$23.56	$0.00	$89.43
5	90	$61.17	$11.49	$23.56	$0.00	$96.22

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	01/06/2025	$45.09	$10.08	$21.47	$0.00	$76.64
	01/05/2026	$47.42	$10.08	$21.47	$0.00	$78.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 01/06/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$24.80	$10.08	$5.50	$0.00	$40.38
2	65	$29.31	$10.08	$6.50	$0.00	$45.89
3	75	$33.82	$10.08	$18.97	$0.00	$62.87
4	85	$38.33	$10.08	$19.97	$0.00	$68.38

Effective Date - 01/05/2026

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$26.08	$10.08	$5.50	$0.00	$41.66
2	65	$30.82	$10.08	$6.50	$0.00	$47.40
3	75	$35.57	$10.08	$18.97	$0.00	$64.62
4	85	$40.31	$10.08	$19.97	$0.00	$70.36

Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension,
but do receive annuity. (Step 1 $5.72, Step 2 $6.66)
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	06/01/2025	$25.97	$15.30	$16.40	$0.00	$57.67
	12/01/2025	$26.63	$15.30	$16.40	$0.00	$58.33
	06/01/2026	$27.22	$15.30	$16.40	$0.00	$58.92
	12/01/2026	$27.89	$15.30	$16.40	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$31.08	$15.30	$16.40	$0.00	$62.78
	06/01/2025	$31.80	$15.30	$16.40	$0.00	$63.50
	12/01/2025	$32.60	$15.30	$16.40	$0.00	$64.30
	06/01/2026	$33.32	$15.30	$16.40	$0.00	$65.02
	12/01/2026	$34.12	$15.30	$16.40	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.23	$9.95	$0.00	$0.00	$39.18
2	55	$32.15	$9.95	$6.66	$0.00	$48.76
3	60	$35.08	$9.95	$7.26	$0.00	$52.29
4	65	$38.00	$9.95	$7.87	$0.00	$55.82
5	70	$40.92	$9.95	$20.32	$0.00	$71.19
6	75	$43.85	$9.95	$20.93	$0.00	$74.73
7	80	$46.77	$9.95	$21.53	$0.00	$78.25
8	90	$52.61	$9.95	$22.74	$0.00	$85.30

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$49.36	$9.95	$23.95	$0.00	$83.26

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.68	$9.95	$0.00	$0.00	$34.63
2	55	$27.15	$9.95	$6.66	$0.00	$43.76
3	60	$29.62	$9.95	$7.26	$0.00	$46.83
4	65	$32.08	$9.95	$7.87	$0.00	$49.90
5	70	$34.55	$9.95	$20.32	$0.00	$64.82
6	75	$37.02	$9.95	$20.93	$0.00	$67.90
7	80	$39.49	$9.95	$21.53	$0.00	$70.97
8	90	$44.42	$9.95	$22.74	$0.00	$77.11

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.42	$9.95	$23.95	$0.00	$81.32

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.71	$9.95	$0.00	$0.00	$33.66
2	55	$26.08	$9.95	$6.66	$0.00	$42.69
3	60	$28.45	$9.95	$7.26	$0.00	$45.66
4	65	$30.82	$9.95	$7.87	$0.00	$48.64
5	70	$33.19	$9.95	$20.32	$0.00	$63.46
6	75	$35.57	$9.95	$20.93	$0.00	$66.45
7	80	$37.94	$9.95	$21.53	$0.00	$69.42
8	90	$42.68	$9.95	$22.74	$0.00	$75.37

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.96	$9.95	$23.95	$0.00	$81.86

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.98	$9.95	$0.00	$0.00	$33.93
2	55	$26.38	$9.95	$6.66	$0.00	$42.99
3	60	$28.78	$9.95	$7.26	$0.00	$45.99
4	65	$31.17	$9.95	$7.87	$0.00	$48.99
5	70	$33.57	$9.95	$20.32	$0.00	$63.84
6	75	$35.97	$9.95	$20.93	$0.00	$66.85
7	80	$38.37	$9.95	$21.53	$0.00	$69.85
8	90	$43.16	$9.95	$22.74	$0.00	$75.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$46.02	$9.95	$23.95	$0.00	$79.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.01	$9.95	$0.00	$0.00	$32.96
2	55	$25.31	$9.95	$6.66	$0.00	$41.92
3	60	$27.61	$9.95	$7.26	$0.00	$44.82
4	65	$29.91	$9.95	$7.87	$0.00	$47.73
5	70	$32.21	$9.95	$20.32	$0.00	$62.48
6	75	$34.52	$9.95	$20.93	$0.00	$65.40
7	80	$36.82	$9.95	$21.53	$0.00	$68.30
8	90	$41.42	$9.95	$22.74	$0.00	$74.11

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$38.95	$9.90	$18.46	$0.00	$67.31
	06/01/2025	$40.34	$9.90	$18.46	$0.00	$68.70
	12/01/2025	$41.72	$9.90	$18.46	$0.00	$70.08
	06/01/2026	$43.16	$9.90	$18.46	$0.00	$71.52
	12/01/2026	$44.60	$9.90	$18.46	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.78	$15.57	$20.17	$0.00	$75.52
	06/01/2025	$40.78	$15.57	$20.17	$0.00	$76.52
	12/01/2025	$40.78	$15.57	$21.78	$0.00	$78.13
	01/01/2026	$40.78	$16.17	$21.78	$0.00	$78.73
	06/01/2026	$41.78	$16.17	$21.78	$0.00	$79.73
	12/01/2026	$41.78	$16.17	$23.52	$0.00	$81.47
	01/01/2027	$41.78	$16.77	$23.52	$0.00	$82.07
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 2*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$23.39	$10.08	$2.53	$0.00	$36.00
2	55	$28.58	$10.08	$5.07	$0.00	$43.73
3	70	$36.38	$10.08	$19.22	$0.00	$65.68
4	80	$41.58	$10.08	$21.76	$0.00	$73.42

Notes:

% Indentured BEFORE 8/1/2020, 50/60/70/75/80/80/90/90

Step 1 $60.36/2 $65.75/3 $70.75/4 $73.35/5&6 $75.95/7&8 81.14

Apprentice to Journeyworker Ratio:1:5

PIPELAYER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/26/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.00	$10.15	$2.50	$0.00	$33.65
2	50	$26.25	$10.15	$2.50	$0.00	$38.90
3	60	$31.49	$10.15	$8.90	$0.00	$50.54
4	70	$36.74	$10.15	$14.24	$0.00	$61.13
5	80	$41.99	$10.15	$17.80	$0.00	$69.94

Effective Date - 08/25/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$22.10	$10.15	$2.50	$0.00	$34.75
2	50	$27.62	$10.15	$2.50	$0.00	$40.27
3	60	$33.14	$10.15	$8.90	$0.00	$52.19
4	70	$38.67	$10.15	$14.24	$0.00	$63.06
5	80	$44.19	$10.15	$17.80	$0.00	$72.14

Notes:

Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$17.54	$0.00	$67.14
	06/01/2025	$41.09	$9.90	$17.54	$0.00	$68.53
	12/01/2025	$42.47	$9.90	$17.54	$0.00	$69.91
	06/01/2026	$43.91	$9.90	$17.54	$0.00	$71.35
	12/01/2026	$45.35	$9.90	$17.54	$0.00	$72.79
	06/01/2027	$46.80	$9.90	$17.54	$0.00	$74.24
	12/01/2027	$48.25	$9.90	$17.54	$0.00	$75.69
	06/01/2028	$49.75	$9.90	$17.54	$0.00	$77.19
	12/01/2028	$51.25	$9.90	$17.54	$0.00	$78.69
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER *LABORERS - ZONE 2*	12/01/2024	$39.95	$9.90	$18.36	$0.00	$68.21
	06/01/2025	$41.34	$9.90	$18.36	$0.00	$69.60
	12/01/2025	$42.72	$9.90	$18.36	$0.00	$70.98
	06/01/2026	$44.16	$9.90	$18.36	$0.00	$72.42
	12/01/2026	$45.60	$9.90	$18.36	$0.00	$73.86
	06/01/2027	$47.05	$9.90	$18.36	$0.00	$75.31
	12/01/2027	$48.50	$9.90	$18.36	$0.00	$76.76
	06/01/2028	$50.00	$9.90	$18.36	$0.00	$78.26
	12/01/2028	$51.50	$9.90	$18.36	$0.00	$79.76
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.95	$9.65	$18.46	$0.00	$68.06
	06/01/2025	$41.34	$9.65	$18.46	$0.00	$69.45
	12/01/2025	$42.72	$9.65	$18.46	$0.00	$70.83
	06/01/2026	$44.16	$9.65	$18.46	$0.00	$72.27
	12/01/2026	$45.60	$9.65	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 170 - Dauphinais (Bellingham)*	01/01/2025	$27.60	$11.26	$6.15	$0.00	$45.01
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	02/01/2025	$52.03	$13.28	$21.70	$0.00	$87.01
	08/01/2025	$53.53	$13.28	$21.70	$0.00	$88.51
	02/01/2026	$54.78	$13.28	$21.70	$0.00	$89.76

Apprentice - *ROOFER - Local 33*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.02	$13.28	$15.55	$0.00	$54.85
2	60	$31.22	$13.28	$21.70	$0.00	$66.20
3	65	$33.82	$13.28	$21.70	$0.00	$68.80
4	75	$39.02	$13.28	$21.70	$0.00	$74.00
5	85	$44.23	$13.28	$21.70	$0.00	$79.21

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.77	$13.28	$15.55	$0.00	$55.60
2	60	$32.12	$13.28	$21.70	$0.00	$67.10
3	65	$34.79	$13.28	$21.70	$0.00	$69.77
4	75	$40.15	$13.28	$21.70	$0.00	$75.13
5	85	$45.50	$13.28	$21.70	$0.00	$80.48

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive $1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	02/01/2025	$52.28	$13.28	$21.70	$0.00	$87.26
	08/01/2025	$53.78	$13.28	$21.70	$0.00	$88.76
	02/01/2026	$55.03	$13.28	$21.70	$0.00	$90.01
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - B*	04/01/2025	$43.83	$14.59	$19.04	$2.24	$79.70
	10/01/2025	$45.08	$14.59	$19.04	$2.24	$80.95
	04/01/2026	$46.58	$14.59	$19.04	$2.24	$82.45

Apprentice - *SHEET METAL WORKER - Local 17-B*

Effective Date - 04/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.53	$14.59	$4.18	$1.09	$37.39
2	45	$19.72	$14.59	$4.71	$1.17	$40.19
3	50	$21.92	$14.59	$11.84	$1.45	$49.80
4	55	$24.11	$14.59	$11.84	$1.52	$52.06
5	60	$26.30	$14.59	$15.53	$1.64	$58.06
6	65	$28.49	$14.59	$15.84	$1.71	$60.63
7	70	$30.68	$14.59	$16.15	$1.78	$63.20
8	75	$32.87	$14.59	$16.45	$1.86	$65.77
9	80	$35.06	$14.59	$16.76	$1.93	$68.34
10	85	$37.26	$14.59	$17.07	$2.00	$70.92

Effective Date - 10/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$18.03	$14.59	$4.18	$1.09	$37.89
2	45	$20.29	$14.59	$4.71	$1.17	$40.76
3	50	$22.54	$14.59	$11.84	$1.45	$50.42
4	55	$24.79	$14.59	$11.84	$1.52	$52.74
5	60	$27.05	$14.59	$15.53	$1.64	$58.81
6	65	$29.30	$14.59	$15.84	$1.71	$61.44
7	70	$31.56	$14.59	$16.15	$1.78	$64.08
8	75	$33.81	$14.59	$16.45	$1.86	$66.71
9	80	$36.06	$14.59	$16.76	$1.93	$69.34
10	85	$38.32	$14.59	$17.07	$2.00	$71.98

Notes:

Apprentice to Journeyworker Ratio:1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.53	$15.57	$20.17	$0.00	$76.27
	06/01/2025	$41.53	$15.57	$20.17	$0.00	$77.27
	12/01/2025	$41.53	$15.57	$21.78	$0.00	$78.88
	01/01/2026	$41.53	$16.17	$21.78	$0.00	$79.48
	06/01/2026	$42.53	$16.17	$21.78	$0.00	$80.48
	12/01/2026	$42.53	$16.17	$23.52	$0.00	$82.22
	01/01/2027	$42.53	$16.77	$23.52	$0.00	$82.82
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	03/01/2025	$64.93	$11.51	$23.80	$0.00	$100.24

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$22.73	$11.51	$13.07	$0.00	$47.31
2	40	$25.97	$11.51	$13.90	$0.00	$51.38
3	45	$29.22	$11.51	$14.72	$0.00	$55.45
4	50	$32.47	$11.51	$15.55	$0.00	$59.53
5	55	$35.71	$11.51	$16.38	$0.00	$63.60
6	60	$38.96	$11.51	$17.20	$0.00	$67.67
7	65	$42.20	$11.51	$18.03	$0.00	$71.74
8	70	$45.45	$11.51	$18.85	$0.00	$75.81
9	75	$48.70	$11.51	$19.68	$0.00	$79.89
10	80	$51.94	$11.51	$20.50	$0.00	$83.95

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$40.69	$11.75	$14.53	$0.00	$66.97
	09/01/2025	$42.52	$12.00	$15.30	$0.00	$69.82
	09/01/2026	$44.41	$12.25	$16.09	$0.00	$72.75
	09/01/2027	$46.51	$12.50	$16.93	$0.00	$75.94

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$64.74	$11.49	$23.59	$0.00	$99.82
	08/01/2025	$66.89	$11.49	$23.59	$0.00	$101.97
	02/01/2026	$68.24	$11.49	$23.59	$0.00	$103.32
	08/01/2026	$70.44	$11.49	$23.59	$0.00	$105.52
	02/01/2027	$71.84	$11.49	$23.59	$0.00	$106.92

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.37	$11.49	$23.59	$0.00	$67.45
2	60	$38.84	$11.49	$23.59	$0.00	$73.92
3	70	$45.32	$11.49	$23.59	$0.00	$80.40
4	80	$51.79	$11.49	$23.59	$0.00	$86.87
5	90	$58.27	$11.49	$23.59	$0.00	$93.35

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$33.45	$11.49	$23.59	$0.00	$68.53
2	60	$40.13	$11.49	$23.59	$0.00	$75.21
3	70	$46.82	$11.49	$23.59	$0.00	$81.90
4	80	$53.51	$11.49	$23.59	$0.00	$88.59
5	90	$60.20	$11.49	$23.59	$0.00	$95.28

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$50.20	$9.90	$19.05	$0.00	$79.15
	06/01/2025	$51.70	$9.90	$19.05	$0.00	$80.65
	12/01/2025	$53.20	$9.90	$19.05	$0.00	$82.15
	06/01/2026	$54.75	$9.90	$19.05	$0.00	$83.70
	12/01/2026	$56.25	$9.90	$19.05	$0.00	$85.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.32	$9.90	$19.05	$0.00	$75.27
	06/01/2025	$47.82	$9.90	$19.05	$0.00	$76.77
	12/01/2025	$49.32	$9.90	$19.05	$0.00	$78.27
	06/01/2026	$50.87	$9.90	$19.05	$0.00	$79.82
	12/01/2026	$52.37	$9.90	$19.05	$0.00	$81.32
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.20	$9.90	$19.05	$0.00	$75.15
	06/01/2025	$47.70	$9.90	$19.05	$0.00	$76.65
	12/01/2025	$49.20	$9.90	$19.05	$0.00	$78.15
	06/01/2026	$50.75	$9.90	$19.05	$0.00	$79.70
	12/01/2026	$52.25	$9.90	$19.05	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.82	$15.57	$20.17	$0.00	$76.56
	06/01/2025	$41.82	$15.57	$20.17	$0.00	$77.56
	12/01/2025	$41.82	$15.57	$21.78	$0.00	$79.17
	01/01/2026	$41.82	$16.17	$21.78	$0.00	$79.77
	06/01/2026	$42.82	$16.17	$21.78	$0.00	$80.77
	12/01/2026	$42.82	$16.17	$23.52	$0.00	$82.51
	01/01/2027	$42.82	$16.77	$23.52	$0.00	$83.11
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	12/01/2024	$58.43	$9.90	$19.50	$0.00	$87.83
	06/01/2025	$59.93	$9.90	$19.50	$0.00	$89.33
	12/01/2025	$61.43	$9.90	$19.50	$0.00	$90.83
	06/01/2026	$62.98	$9.90	$19.50	$0.00	$92.38
	12/01/2026	$64.48	$9.90	$19.50	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	12/01/2024	$60.43	$9.90	$19.50	$0.00	$89.83
	06/01/2025	$61.93	$9.90	$19.50	$0.00	$91.33
	12/01/2025	$63.43	$9.90	$19.50	$0.00	$92.83
	06/01/2026	$64.98	$9.90	$19.50	$0.00	$94.38
	12/01/2026	$66.48	$9.90	$19.50	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	12/01/2024	$50.50	$9.90	$19.50	$0.00	$79.90
	06/01/2025	$52.00	$9.90	$19.50	$0.00	$81.40
	12/01/2025	$53.50	$9.90	$19.50	$0.00	$82.90
	06/01/2026	$55.05	$9.90	$19.50	$0.00	$84.45
	12/01/2026	$56.55	$9.90	$19.50	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	12/01/2024	$52.50	$9.90	$19.50	$0.00	$81.90
	06/01/2025	$54.00	$9.90	$19.50	$0.00	$83.40
	12/01/2025	$55.50	$9.90	$19.50	$0.00	$84.90
	06/01/2026	$57.05	$9.90	$19.50	$0.00	$86.45
	12/01/2026	$58.55	$9.90	$19.50	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
For apprentice rates see "Apprentice- LINEMAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$42.03	$9.25	$14.35	$0.00	$65.63
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$37.09	$9.25	$10.87	$0.00	$57.21
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	$22.25	$9.25	$1.82	$0.00	$33.32
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$49.45	$9.25	$17.48	$0.00	$76.18

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$29.67	$9.25	$3.39	$0.00	$42.31
2	65	$32.14	$9.25	$3.46	$0.00	$44.85
3	70	$34.62	$9.25	$3.54	$0.00	$47.41
4	75	$37.09	$9.25	$5.11	$0.00	$51.45
5	80	$39.56	$9.25	$5.19	$0.00	$54.00
6	85	$42.03	$9.25	$5.26	$0.00	$56.54
7	90	$44.51	$9.25	$7.34	$0.00	$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Additional Apprentice Information:

All apprentices must be registered with the Division of Apprenticeship Training (DAS) in accordance with M.G.L. c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L. c. 149, §§ 26-27D. Apprentice ratios are established by DAS pursuant to M.G.L. c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements (CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate. Parties having questions regarding what ratio to use should contact DAS.

ATTACHMENT 5: CONTRACT DRAWINGS

IFB DRAWING SET

NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT
(54 & 18 WRIGHT STREET PARCELS)

NEW BEDFORD, MA
MAY 2025

THE FOLLOWING CURRENT EDITION STANDARD SPECIFICATIONS SHALL APPLY TO CONSTRUCTION ON THIS PROJECT: CITY OF NEW BEDFORD - DEPARTMENT OF PUBLIC INFRASTRUCTURE CONSTRUCTION STANDARDS AND SPECIFICATIONS (GOVERNING) AND MASSDOT STANDARD SPECIFICATIONS INCLUDING CONSTRUCTION & MATERIALS MANUALS (SECONDARY WHERE APPLICABLE).

OWNER/APPLICANT

MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
63 FRANKLIN STREET
3RD FLOOR
BOSTON, MA 02110

PROGRAM MANAGER & MARINE STRUCTURAL ENGINEERING

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
15 CREEK ROAD
MARION, MA 02738
PH: (508) 748-0937
FX: (800) 668-3220

DOUGLAS ERNST
MASSCEC PROGRAM MANAGER
PH: (515) 251-2585
CELL: (515) 491-8852

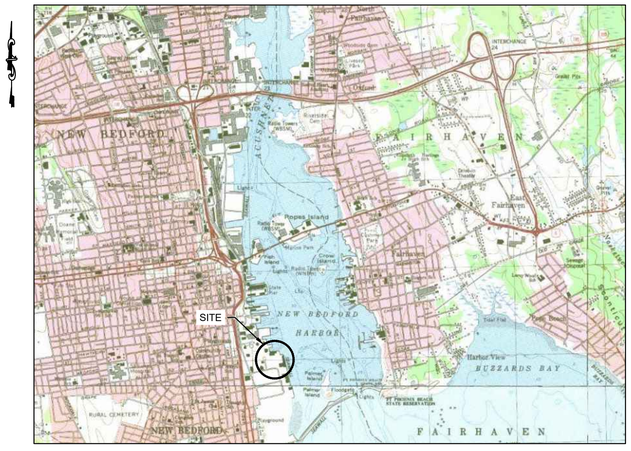
ENVIRONMENTAL, GEOTECHNICAL, AND CIVIL ENGINEERING

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
31 BELLOWS ROAD
RAYNHAM, MASSACHUSETTS 02767
PH: (774) 501-2176
PH: (866) 312-2024
FX: (774) 501-2669

TERMINAL ELECTRICAL ENGINEERING

LKB INC, A VERTEX COMPANY
ONE AERIAL WAY
SYOSSET, NY 11791
PH: (516) 938-0600

VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

811 Know what's below. Call 811 before you dig.

PROFESSIONAL SEAL

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

C - CIVIL

SHEET TITLE:
COVER SHEET

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.01

SHEET NUMBER
G-001

Monday, May 5, 2025 3:44:49 PM
DWG Filename: 24m070.01 masscec_front end.dwg Layout: g-001
DWG Folder Location: pw:\\foth-pw.bentley.com:foth-pw-01\Documents\Clients\MA Clean Energy\0024M070.01\CAD\Drawings\

SHEET NUMBER	DRAWING NUMBER	SHEET TITLE	OWNER	DATE ISSUED	DATE REVISED
		GENERAL DRAWINGS (G-SERIES)	**FOTH**		
1	G-001	COVER SHEET	FOTH	5/07/2025	
2	G-002	DRAWING INDEX	FOTH	5/07/2025	
3	G-003	LEGEND & ABBREVIATIONS	FOTH	5/07/2025	
4	G-004	KEY MAP	FOTH	5/07/2025	
		CIVIL DRAWINGS (C-SERIES)	**CEC**		
5	C-001	GENERAL NOTES	CEC	5/07/2025	
6	C-100	OVERALL EXISTING CONDITIONS	CEC	5/07/2025	
7	C-101	18 & 54 WRIGHT STREET EXISTING CONDITIONS	CEC	5/07/2025	
8	C-110	18 & 54 WRIGHT STREET DEMOLITION AND EROSION CONTROLS	CEC	5/07/2025	
9	C-200	OVERALL LAYOUT PLAN	CEC	5/07/2025	
10	C-201	18 & 54 WRIGHT STREET LAYOUT PLAN	CEC	5/07/2025	
11	C-301	18 & 54 WRIGHT STREET GRADING AND DRAINAGE PLAN	CEC	5/07/2025	
12	C-401	18 & 54 WRIGHT STREET CONTOUR PLAN	CEC	5/07/2025	
13	C-501	18 & 54 WRIGHT STREET UTILITIES PLAN	CEC	5/07/2025	
14	C-600	SECTIONS SHEET 1	CEC	5/07/2025	
15	C-601	SECTIONS SHEET 2	CEC	5/07/2025	
16	C-800	DETAILS SHEET 1	CEC	5/07/2025	
17	C-801	DETAILS SHEET 2	CEC	5/07/2025	
18	C-802	DETAILS SHEET 3	CEC	5/07/2025	
19	CF-1	OVERALL SITE CUT/FILL EXHIBIT	CEC	5/07/2025	
20	CF-2	UNSUITABLE MATERIAL CUT/FILL EXHIBIT	CEC	5/07/2025	

Foth

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
△			
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△			

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/25
DESIGNED	ITB	05/07/25
CHECKED	DSK	05/07/25

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:

DRAWING INDEX

ISSUANCE:

IFB DRAWING SET

PROJECT NO: 0024M070.01

SHEET NUMBER

G-002

Tuesday, May 6, 2025 11:54:13 AM
DWG Filename: 24m070.01 masscec_front end.dwg Layout: g-002
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.01\CAD\DRAWINGS\

GENERAL SYMBOLS

EXISTING	PROPOSED	
		CONTOURS (MAJOR)
		CONTOURS (MINOR)
		CONDUIT
E	E	ELECTRIC
GAS	GAS	GAS
SS	SS	STORM SEWER (DRAINAGE)
SAN	SAN	SANITARY SEWER
W	W	WATER (POTABLE / IRRIGATION)
OHE	OHE	OVERHEAD UTILITY
FO	FO	FIBER OPTICS
COMM	COMM	COMMUNICATIONS
CA	CA	COMPRESSED AIR
		LIMIT OF GRADING (DAYLIGHT)
		EROSION CONTROL
		FENCE
		GUARDRAIL
		ANNUAL HIGH TIDE LINE (AHTL)
		MEAN HIGH WATER (MHW)
		MEAN LOW WATER (MLW)
		PROPERTY LINE
		RESOURCE AREA
		TREELINE
		WATER SUPPLY
		TREE CONIFEROUS
		TREE DECIDUOUS
		SHRUB
		CONTROL POINT
		BENCHMARK
		SECTION CORNER
		SOIL BORING
		CLEANOUT
		VALVE
		WATER VALVE
		GAS WELL
		ABANDONED MONITORING WELL
		MONITORING WELL
		MONITORING WELL NEST
D	D	DRAIN MANHOLE
E	E	ELECTRIC MANHOLE
M	M	MISC MANHOLE
S	S	SEWER MANHOLE
W	W	WATER MANHOLE
C	C	COMMUNICATIONS MANHOLE
GG	GG	GAS GATE
WG	WG	WATER GATE
		HYDRANT
		UTILITY POLE
HH	HH	HANDHOLE
		LIGHT POLE
TC	TC	TRASH CAN
MP	MP	METAL POST
PM	PM	PARKING METER
		PILE (TIMBER OR STEEL)
		SHEET PILE
		TRAFFIC SIGN
		DRAINAGE ARROW
		W BEAM
		HANDICAP SYMBOL
		CATCH BASIN
		WETLAND SYMBOL

NOTE: NOT ALL LEGEND ENTRIES SHOWN ABOVE ARE UTILIZED IN THE PLAN SET.

CONVENTIONAL SIGNS

A / 9	CROSS SECTION SITE PLAN CALLOUT
A / 9 SECTION / DETAIL TITLE SCALE: 1" = 10'	SECTION / DETAIL LABEL
MATCH LINE	MATCHLINE
	SLOPE LABEL
	STONE WALL
	WATER LEVEL
N	NORTH ARROW
EBB FLOOD	TIDAL FLOW DIRECTION

HATCHING

EXISTING	PROPOSED	
		CONCRETE
		GRAVEL
		SAND
		FILL/GROUND SURFACE
		RIP RAP
		STAGING AREA
		WETLAND
		DEMOLITION
		SITE RESTORATION

TREE SYMBOLS & ABBREVIATIONS

ASPEN	ASPEN
ARBOR	ARBORVITAE
BOAK	BLACK OAK
CHERRY	CHERRY
DOG	DOGWOOD
INK	INKBERRY BUSH
JMAPLE	JAPANESE MAPLE
RBIRCH	RIVER BIRCH
RM	RED MAPLE
SHRUB	SHRUB
SMAPLE	SILVER MAPLE
TUPELO	TUPELO
WOAK	WHITE OAK
WP	WHITE PINE

ABBREVIATIONS

ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
A.C.	ASPHALT CONCRETE
AHT	ANNUAL HIGH TIDE
ALT	ANNUAL LOW TIDE
BB	BORING
BIT	BITUMINOUS
BD	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCB	CAPE COD BERM
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CI	CAST IRON
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO	CLEANOUT
CONC	CONCRETE
CONT	CONTINUED
CONST	CONSTRUCTION
CP	CONTROL POINT
CY	CUBIC YARD
D	DIAMETER
Ø	DIAMETER
DI	DUCTILE IRON
DWY	DRIVEWAY
EB	EASTBOUND
ELEV	ELEVATION
EL.	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
EX	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN	FOUNDATION
FES	FLARED END SECTION
FT	FOOT
GALV	GALVANIZED
GAR	GARAGE
GCL	GEOSYNTHETIC CLAY LINER
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
GW	GAS WELL
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
ID	INSIDE DIAMETER
IN	INCH
INV	INVERT
JCT	JUNCTION
KSI	KIPS PER SQUARE INCH
L	LENGTH
LLDPE	LINEAR LOW DENSITY POLYETHYLENE
LB	LEACHING BASIN
LHW	LEACHATE HEAD WELL

ABBREVIATIONS (CONT)

LP	LIGHT POLE
LT	LEFT
LWD	LOW WATER DATUM
LYS	LYSIMETER
MAX	MAXIMUM
MB	MAIL BOX
MH	MANHOLE
MHW	MEAN HIGH WATER
MHHW	MEAN HIGHER HIGH WATER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLW	MEAN LOW WATER
MLLW	MEAN LOWER LOW WATER
MW	MONITORING WELL
NB	NORTHBOUND
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT-TO-SCALE
OD	OUTSIDE DIAMETER
OHWM	ORDINARY HIGH WATER MARK
PERM	PERMANENT
±	PLUS OR MINUS
PC	POINT OF CURVATURE
PGL	PROFILE GRADE LINE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PSI	POUNDS PER SQUARE INCH
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	PRIVATE WELL
PWW	PAVED WATER WAY
R	RADIUS
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET	WALL RETAINING WALL
ROW	RIGHT-OF-WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	SOUTHBOUND
SDR	STANDARD DIMENSION RATIO
SF	SQUARE FOOT
SGC	SLOPED GRANITE CURB
SHLD	SHOULDER
SMH	SEWER MANHOLE
SS	STAINLESS STEEL
SSR	SIDE SLOPE RISER
ST	STREET
STA	STATION
STN	STONE
SW	SIDEWALK
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VGC	VERTICAL GRANITE CURB
VIF	VERIFY IN FIELD
WCR	WHEELCHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

SURVEY REFERENCES

1. THE VERTICAL DATUM IS THE MEAN LOWER LOW WATER DATUM (-1.92 NORTH AMERICAN VERTICAL DATUM OF 1988 ELEVATIONS BASED ON GEOID18).

MLLW	NAVD 88	
1.92	0.00	NAVD88
0.14	-1.78	MLW
0.00	-1.92	MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

Foth

PROJECT: PHASE 3 TERMINAL EXPANSION SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/25
DESIGNED	ITB	05/07/25
CHECKED	DSK	05/07/25

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:

LEGEND & ABBREVIATIONS

ISSUANCE:

IFB DRAWING SET

PROJECT NO: 0024M070.01

SHEET NUMBER

G-003

Monday, May 5, 2025 3:45:00 PM
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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.01\CAD\DRAWINGS\

Foth

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
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DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/25
DESIGNED	ITB	05/07/25
CHECKED	DSK	05/07/25

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED
PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:

KEY MAP

ISSUANCE:

IFB DRAWING SET

PROJECT NO: 0024M070.01

SHEET NUMBER

G-004

Monday, May 5, 2025 4:03:06 PM
DWG Filename: 24m070.01 masscec_front end.dwg Layout: g-004
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.01\CAD\DRAWINGS\

GENERAL NOTES

1. EXISTING CONDITIONS AS DEPICTED ON THESE PLANS ARE GENERAL AND ILLUSTRATIVE IN NATURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE SITE AND BE FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING ON THIS PROJECT. IF CONDITIONS ENCOUNTERED DURING EXAMINATION ARE SIGNIFICANTLY DIFFERENT FROM THOSE SHOWN, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

2. EXISTING CONDITIONS INFORMATION IS COMPILED FROM AN ON THE GROUND SURVEY PERFORMED BY CIVIL AND ENVIRONMENTAL CONSULTANTS, INC. AND CHA CONSULTING, INC. EXISTING CONDITIONS INFORMATION IS DEPICTED ON AN EXISTING CONDITIONS PLAN ENTITLED "OVERALL EXISTING CONDITIONS PLAN" DATED JANUARY 31, 2025.

3. THE SUBJECT PROPERTY IS LOCATED IN SPECIAL FLOOD HAZARD AREAS WITHOUT BASE FLOOD ELEVATION (BFE); AND "OTHER FLOOD AREAS" FLOOD "ZONE X" (AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD BASED ON THE FLOOD INSURANCE RATE MAP, MAP NO. 25005C0481G, WITH A MAP REVISED DATE OF JULY 16, 2014.

4. THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES (INCLUDING THOSE LABELED PER RECORD DATA) PRIOR TO THE BEGINNING OF CONSTRUCTION OR EARTH MOVING OPERATIONS. INFORM ENGINEER OF ANY CONFLICTS DETRIMENTAL TO THE DESIGN INTENT.

5. THE CONTRACTOR SHALL CALL DIGSAFE AT 1-800-322-4844 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER AND ENGINEER PRIOR TO EXCAVATION.

6. THE CONTRACTOR AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS, TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.

7. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND OWNER'S REPRESENTATIVE FOR ANY AND ALL INJURIES AND/OR DAMAGES TO PERSONNEL, EQUIPMENT AND/OR EXISTING FACILITIES OCCURRING IN THE COURSE OF THE DEMOLITION AND CONSTRUCTION DESCRIBED IN THE PLANS AND SPECIFICATIONS.

8. CONTRACTOR SHALL OBTAIN A PERMIT FOR ALL CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH LOCAL, STATE, & FEDERAL REGULATIONS.

9. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES, OBTAIN ALL APPLICABLE PERMITS, AND PAY ALL REQUIRED FEES PRIOR TO BEGINNING WORK.

10. ANY WORK PERFORMED IN RIGHT OF WAYS SHALL BE IN ACCORDANCE WITH THE APPLICABLE LOCAL OR STATE REQUIREMENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE NECESSARY PERMITS FOR THE WORK, SCHEDULE NECESSARY INSPECTIONS, AND PROVIDE THE NECESSARY TRAFFIC CONTROL MEASURES AND DEVICES, ETC., FOR WORK PERFORMED IN THE RIGHT OF WAYS.

11. THE CONTRACTOR IS TO PERFORM ALL INSPECTIONS AS REQUIRED BY THE UNITED STATES EPA FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND FURNISH OWNERS REPRESENTATIVE WITH WRITTEN REPORTS.

12. CONTRACTOR SHALL IMPLEMENT ALL SOIL AND EROSION CONTROL PRACTICES IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN, STORM WATER POLLUTION PREVENTION PLAN AND STATE AND LOCAL REGULATIONS.

13. ALL GROUND SURFACE AREAS THAT HAVE BEEN EXPOSED OR LEFT BARE AS A RESULT OF CONSTRUCTION AND ARE TO FINAL GRADE AND ARE TO REMAIN SO, SHALL BE SEEDED AND MULCHED AS SOON AS PRACTICAL IN ACCORDANCE WITH SPECIFICATIONS. IF NO SPECIFICATIONS ARE SUPPLIED, USE STATE OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

14. ITEM NUMBERS REFER TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND ALL CONSTRUCTION WORK SHALL BE DONE ACCORDING TO SAID SPECIFICATIONS AND IN ACCORDANCE WITH APPLICABLE STANDARDS OF THE CITY OF NEW BEDFORD. WHEN IN CONFLICT, THE CITY OF NEW BEDFORD REQUIREMENTS SHALL PREVAIL.

15. ALL WORK PERFORMED BY THE CONTRACTOR SHALL CONFORM TO THE LATEST REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT.

16. THE CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION. IT IS NOT THE ENGINEER'S INTENT THAT ANY SINGLE PLAN SHEET IN THIS SET OF DOCUMENTS FULLY DEPICTS ALL WORK ASSOCIATED WITH THE PROJECT.

17. BEFORE INSTALLATION OF STORM OR SANITARY SEWER, OR OTHER UTILITY, THE CONTRACTOR SHALL VERIFY ALL CROSSINGS, BY EXCAVATION WHERE NECESSARY, AND INFORM THE OWNER AND THE ENGINEER OF ANY CONFLICTS. THE ENGINEER WILL BE HELD HARMLESS IN THE EVENT HE IS NOT NOTIFIED OF DESIGN CONFLICTS PRIOR TO CONSTRUCTION.

18. ADJUST/RECONSTRUCT ALL EXISTING CASTINGS, CLEANOUTS, ETC. WITHIN PROJECT AREA TO GRADE AS REQUIRED.

19. CONTRACTOR TO REMOVE & REPLACE PAVEMENT AS SPECIFIED.

20. SITE SIGNAGE AND STRIPING SHALL BE IN ACCORDANCE WITH THE MASSACHUSETTS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

DEMOLITION NOTES

1. ALL EXISTING ABOVE AND BELOW GROUND STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE REMOVED UNLESS NOTED OTHERWISE WITHIN THIS CONSTRUCTION SET AND/OR PROJECT SPECIFICATIONS. THIS INCLUDES FOUNDATION SLABS, WALLS AND FOOTINGS. CAVITIES LEFT BY STRUCTURE REMOVAL SHALL BE BACKFILLED WITH SATISFACTORY MATERIALS AND COMPACTED TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATION.

2. NO TREES SHALL BE REMOVED, NOR VEGETATION DISTURBED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.

3. TREE PROTECTION FENCING SHALL BE IN ACCORDANCE WITH THE DETAILED DRAWINGS. DO NOT OPERATE OR STORE EQUIPMENT, NOR HANDLE OR STORE MATERIALS WITHIN THE DRIP LINES OF THE TREES SHOWN TO REMAIN.

4. PROTECTION OF EXISTING TREES AND VEGETATION: PROTECT EXISTING TREES AND OTHER VEGETATION INDICATED TO REMAIN IN PLACE AGAINST UNNECESSARY CUTTING, BREAKING OR SKINNING OF ROOTS, SKINNING OR BRUISING OF BARK, SMOTHERING OF TREES BY STOCKPILING CONSTRUCTION MATERIALS OR EXCAVATED MATERIALS WITHIN DRIP LINE, EXCESS FOOT OR VEHICULAR TRAFFIC, OR PARKING OF VEHICLES WITHIN DRIP LINE. PROVIDE TEMPORARY GUARDS TO PROTECT TREES AND VEGETATION TO BE LEFT STANDING.

5. ALL DEMOLITION WASTE AND CONSTRUCTION DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE IN A STATE APPROVED WASTE SITE AND IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. REPAIR DAMAGE ACCORDING TO THE APPROPRIATE UTILITY COMPANY STANDARDS AND AT THE CONTRACTOR'S EXPENSE.

6. ALL UTILITY DISCONNECTION, REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY / AGENCY OR THE CITY OF NEW BEDFORD.

7. THE BURNING OF CLEARED MATERIAL AND DEBRIS SHALL NOT BE ALLOWED UNLESS CONTRACTOR OBTAINS PRIOR WRITTEN AUTHORIZATION FROM THE LOCAL AUTHORITIES.

8. EROSION & SEDIMENT CONTROL MEASURES AROUND AREAS OF DEMOLITION SHALL BE PROPERLY INSTALLED AND FUNCTION PROPERLY PRIOR TO INITIATION OF DEMOLITION ACTIVITIES.

9. IF ASBESTOS OR HAZARDOUS MATERIALS ARE FOUND ON SITE, SUCH MATERIALS SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIALS CONTRACTOR. CONTRACTOR SHALL NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED.

10. CONTRACTOR SHALL ADHERE TO ALL LOCAL, STATE, FEDERAL AND OSHA REGULATIONS DURING ALL DEMOLITION ACTIVITIES.

11. CONTRACTOR SHALL PROTECT ALL CORNER PINS, MONUMENTS, PROPERTY CORNERS AND BENCHMARKS DURING DEMOLITION ACTIVITIES. IF DISTURBED, CONTRACTOR SHALL HAVE DISTURBED ITEMS RESET BY A LICENSED SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.

12. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES TO REMAIN. ANY ITEMS TO REMAIN THAT HAVE BEEN DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.

13. CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND AS REQUIRED BY LOCAL AGENCIES WHEN WORKING IN AND/OR ALONG STREETS, ROADS, HIGHWAYS, ETC.. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL AND COORDINATE WITH LOCAL AND/OR STATE AGENCIES REGARDING THE NEED, EXTENT AND LIMITATIONS ASSOCIATED WITH INSTALLING AND MAINTAINING TRAFFIC CONTROL MEASURES.

14. THE CONTRACTOR SHALL PROVIDE NEAT, STRAIGHT, FULL DEPTH, SAW CUTS OF EXISTING PAVEMENT WHERE INDICATED ALONG LIMITS OF PAVEMENT DEMOLITION.

15. ALL UTILITY AND STRUCTURE REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED AND PROPERLY DOCUMENTED BY A CERTIFIED PROFESSIONAL, WHEN APPLICABLE, WITH THE APPROPRIATE UTILITY COMPANY, MUNICIPALITY AND/OR AGENCY. DEMOLITION OF REGULATED ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO; WELLS, ASBESTOS, UNDER GROUND STORAGE TANKS, SEPTIC TANKS AND ELECTRIC TRANSFORMERS. DEMOLITION CONTRACTOR SHALL REFER TO ANY ENVIRONMENTAL STUDIES FOR DEMOLITION RECOMMENDATIONS AND GUIDANCE. AVAILABLE ENVIRONMENTAL STUDIES MAY INCLUDE, BUT ARE NOT LIMITED TO PHASE I ESA, PHASE II, WETLAND AND STREAM DELINEATION AND ASBESTOS SURVEY. ALL APPLICABLE ENVIRONMENTAL STUDIES SHALL BE MADE AVAILABLE UPON REQUEST.

16. ALL PAVEMENT, BASE COURSES, SIDEWALKS, CURBS, BUILDINGS, FOUNDATIONS, ETC., WITHIN THE AREA TO BE DEMOLISHED SHALL BE REMOVED TO FULL DEPTH. EXISTING BASE COURSE MATERIALS MAY BE WORKED INTO THE NEW PAVEMENT OR BUILDING SUBGRADE IF THE GRADATION, CONSISTENCY, COMPACTION, SUBGRADE CONDITION, ETC., ARE IN ACCORDANCE WITH THE SPECIFICATIONS AND RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION REPORT. BASE COURSE MATERIALS SHALL NOT BE WORKED INTO THE SUBGRADE AREAS TO RECEIVE LANDSCAPING.

17. THE CONTRACTOR SHALL USE SUITABLE METHODS TO CONTROL DUST AND DIRT CAUSED BY THE DEMOLITION ACTIVITIES.

LAYOUT NOTES

1. THE CONTRACTOR SHALL CHECK EXISTING GRADES, DIMENSIONS, AND INVERTS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SHALL TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. THE CONTRACTOR SHALL RELOCATE EXISTING UTILITIES AS INDICATED OR AS NECESSARY FOR CONSTRUCTION.

3. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY. THE CONTRACTOR SHALL INSTALL ALL UTILITIES, INCLUDING IRRIGATION SLEEVING, PRIOR TO THE INSTALLATION OF PAVED SURFACES.

4. THE CONTRACTOR SHALL PROTECT ALL TREES TO REMAIN.

5. ALL DAMAGE TO EXISTING PAVEMENT TO REMAIN WHICH RESULTS FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED WITH EQUIVALENT MATERIALS AT THE CONTRACTOR'S EXPENSE.

6. SITE DIMENSIONS SHOWN ARE TO THE FACE OF CURB, EDGE OF PAVEMENT, OR DENSE GRADED GRAVEL UNLESS OTHERWISE NOTED.

7. COORDINATES ARE FOR BUILDING COLUMNS, EXTERIOR BUILDING WALLS, CENTER OF DRIVEWAYS, CENTER OF SANITARY SEWER MANHOLES, AND CENTER OF STRUCTURES PLACED SIX INCHES INSIDE FACE OF CURB FOR DRAIN INLETS, UNLESS OTHERWISE NOTED.

8. CONTRACTOR SHALL MAINTAIN ONE SET OF AS-BUILT / RECORD DRAWINGS ON-SITE DURING CONSTRUCTION FOR DISTRIBUTION TO THE OWNER AND/OR OWNER'S REPRESENTATIVE UPON COMPLETION.

9. REFER TO THE ARCHITECTURAL, PLUMBING & ELECTRICAL DRAWINGS FOR EXACT DIMENSIONS AND LOCATIONS OF UTILITY SERVICE ENTRY LOCATIONS AND PRECISE BUILDING DIMENSIONS.

10. THIS SITE LAYOUT IS SPECIFIC TO THE APPROVALS NECESSARY FOR THE CONSTRUCTION IN ACCORDANCE WITH THE CITY OF NEW BEDFORD. NO CHANGES TO THE SITE LAYOUT ARE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. CHANGES MADE TO THE SITE LAYOUT WITHOUT APPROVAL IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. CHANGES INCLUDE BUT ARE NOT LIMITED TO, INCREASED IMPERVIOUS PAVEMENT, ADDITION / DELETION OF PARKING SPACES, MOVEMENT OF CURB LINES, CHANGES TO DRAINAGE STRUCTURES AND PATTERNS, CHANGES TO LANDSCAPING, ETC.

GRADING NOTES

1. ALL PROPOSED GRADES SHOWN ARE FINAL GRADES, TOP OF GROUND LEVEL, TOP OF PAVEMENT, OR GRATE ELEVATION AT THE DRAWDOWN POINT UNLESS NOTED OTHERWISE.

2. REFER TO AND FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT.

3. ALL FILL UNDER PAVEMENT OR DENSE GRADED GRAVEL (HEAVY LIFT) SHALL BE COMPACTED TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

4. ALL ELEVATIONS SHOWN ARE FINISHED GRADE ELEVATIONS.

5. CONTRACTOR SHALL STRICTLY ADHERE TO THE EROSION & SEDIMENT CONTROL PLAN PREPARED FOR THIS PROJECT.

6. EARTHWORK SHALL INCLUDE CLEARING AND GRUBBING, STRIPPING AND STOCKPILING TOPSOIL, MASS GRADING, EXCAVATION, FILLING, UNDER CUT AND REPLACEMENT, IF REQUIRED, AND COMPACTION.

7. CONTRACTOR TO REFILL UNDERCUT AREAS WITH SUITABLE MATERIAL AND COMPACT AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

8. CONTRACTOR TO PLACE TOPSOIL OVER THE SUBGRADE OF UNPAVED, DISTURBED AREAS TO A DEPTH INDICATED ON THE LANDSCAPE PLANS (6" MINIMUM).

9. ALL SLOPES IN NON-PAVED AREAS SHALL BE 3:1 (HORIZONTAL:VERTICAL) MAXIMUM UNLESS NOTED OTHERWISE.

10. ALL AREAS NOT PAVED OR DENSE GRADED GRAVEL SHALL BE STABILIZED IN ACCORDANCE WITH THE EROSION & SEDIMENT CONTROL PLAN, UNLESS NOTED OTHERWISE.

11. COMPACTED FILLS ARE TO BE MADE TO A MINIMUM OF THREE FEET ABOVE THE CROWN OF ANY PROPOSED SEWER PRIOR TO CUTTING OF TRENCHES FOR PLACEMENT OF SAID SEWERS. ALL FILLS SHALL BE CONTROLLED, COMPACTED, AND INSPECTED BY AN APPROVED TESTING LABORATORY OR AN INSPECTOR FROM THE APPROPRIATE GOVERNMENTAL AGENCY.

12. ALL EXCESS SOIL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE. EXCESS SOIL MATERIALS SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.

13. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING THE SITE EARTHWORK BY IMPORTING OR EXPORTING AS NECESSARY TO ACHIEVE DESIGN GRADES AND SPECIFICATIONS.

STORM DRAINAGE NOTES

1. DISTANCES SHOWN ON PIPING ARE HORIZONTAL DISTANCES FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE, UNLESS NOTED OTHERWISE.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION, TESTING AND FINAL ACCEPTANCE OF ALL NEW STORMWATER MANAGEMENT FACILITIES. CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE REGULATING AGENCIES CONCERNING INSTALLATION, INSPECTION AND APPROVAL OF THE STORM DRAINAGE SYSTEM CONSTRUCTION.

3. ALL STORMWATER MANAGEMENT FACILITIES, INCLUDING COLLECTION AND CONVEYANCE STRUCTURES, SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS.

4. ALL PROPOSED STORM SEWERS, SURFACE OR OTHER DRAINAGE FACILITIES WITHIN THE PROPERTY ARE TO BE PRIVATE AND MAINTAINED BY THE OWNER.

5. THE CONTRACTOR IS TO CONSTRUCT CURBS, CATCH BASINS, DOWNSPOUTS, PIPING AND CONNECTION ETC. AS REQUIRED TO CONVEY THE ROOF AND PAVED SURFACE DRAINAGE TO THE INFILTRATION CHAMBERS.

6. ALL CATCH BASINS AND MANHOLES WITH A DEPTH GREATER THAN 4' SHALL BE PROVIDED WITH STEPS. STEPS SHALL MEET THE REQUIREMENTS OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

7. STORM SEWER PIPE LABELED "ST" SHALL BE ONE OF THE FOLLOWING: PVC SDR-35, OR HIGH DENSITY POLYETHYLENE. HIGH DENSITY POLYETHYLENE (HDPE) SHALL NOT BE PERMITTED WITHIN THE CITY RIGHT OF WAY. ANY USE OF HDPE WITHIN PRIVATE PROPERTY MUST CHANGE IN MATERIAL PRIOR TO ENTERING CITY LAYOUT. STORM SEWER PIPE LABELED "RCP" SHALL BE REINFORCED CONCRETE PIPE. ALL STORM SEWER PIPE IS TO BE INSTALLED PER MASSDOT SPECIFICATIONS OR CITY OF NEW BEDFORD SPECIFICATIONS.

8. STORM SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL-AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

UTILITY NOTES

1. ALL PROPOSED UTILITY LINES AND EXTENSIONS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE PRIVATE UTILITY COMPANY SPECIFICATIONS. CONTRACTOR SHALL COORDINATE UTILITY DISCONNECTIONS WITH THE APPROPRIATE AGENCY.

2. THE CONTRACTOR IS PARTICULARLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON IS BASED ON TOPOGRAPHIC SURVEYS AND RECORD DRAWINGS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE FOR INSTRUCTIONS. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO RELOCATE EXISTING UTILITIES CONFLICTING WITH IMPROVEMENTS SHOWN HEREON IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.

3. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

4. MAINTAIN MINIMUM 10-FOOT HORIZONTAL AND 18-INCH MINIMUM VERTICAL SEPARATION BETWEEN SANITARY SEWER, STORM SEWER AND WATER SUPPLY LINE, UNLESS NOTED OTHERWISE.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES, GAS LINES, AND UNDERGROUND ELECTRIC DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO PAVEMENT AND DENSE GRADED AGGREGATE CONSTRUCTION.

6. ALL TRENCH SPOILS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE. TRENCH SPOILS SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.

7. SANITARY SEWER SHALL BE PVC-SDR 35 PER ASTM D-3034 OR APPROVED EQUAL (CONFORMING TO CITY OF NEW BEDFORD WATER & SEWER DEPARTMENT RULES AND REGULATIONS) INSTALLED AT A MINIMUM SLOPE OF ONE PERCENT (1.00%) UNLESS NOTED OTHERWISE. SANITARY SEWER SERVICE SHALL BE INSTALLED AT A MINIMUM DEPTH OF FOUR FEET (4') UNLESS NOTED OTHERWISE. A MINIMUM OF 18" CLEARANCE SHALL BE MAINTAINED AT ALL WATER LINE & SANITARY SEWER CROSSINGS. SANITARY SEWER SERVICE JOINTS SHALL CONFORM TO ASTM D-3212.

8. SANITARY SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL-AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

9. DISTANCES SHOWN FOR BOTH SANITARY AND STORM SEWER PIPES ARE MEASURED FROM CENTER OF STRUCTURE, CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD CUT LENGTH. COORDINATES FOR STORM & SANITARY STRUCTURES ARE SHOWN TO THE CENTER STRUCTURE UNLESS NOTED OTHERWISE.

10. ROOF DRAINS, FOUNDATION DRAINS AND ALL OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEMS ARE PROHIBITED.

11. CONTRACTOR SHALL ADJUST ALL EXISTING UTILITY SURFACE FEATURES INCLUDING BUT NOT LIMITED TO CASTINGS, VALVE BOXES, PEDESTALS, CLEANOUTS, ETC. TO MATCH PROPOSED FINISHED GRADES, UNLESS NOTED OTHERWISE.

12. THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS OF ALL IMPROVEMENTS. DRAWINGS SHALL INCLUDE AT LEAST TWO DIMENSIONS TO EACH VALVE AND MANHOLE FROM KNOWN SITE FEATURES. DRAWINGS SHALL INCLUDE HORIZONTAL AND VERTICAL INFORMATION ON ALL NEW UTILITIES AS WELL AS EXISTING UTILITIES ENCOUNTERED.

13. ALL WATERLINE CROSSINGS SHALL MAINTAIN A VERTICAL SEPARATION OF 18" MINIMUM. SANITARY SEWER SHALL BE LOCATED 18" BELOW WATERMAIN AT ALL CROSSINGS. WATERMAIN SHALL BE LOCATED A MINIMUM OF 10' HORIZONTALLY FROM ANY SANITARY SEWER OR STORM SEWER. ALL MEASUREMENTS SHALL BE TAKEN FROM OUTSIDE OF SEWER PIPE TO THE OUTSIDE OF WATERMAIN PIPE. ONE FULL LENGTH OF WATERMAIN PIPE SHALL BE LOCATED AT ALL CROSSINGS TO ENABLE BOTH JOINTS TO BE LOCATED AS FAR FROM SEWER AS POSSIBLE.

14. ALL WATER SERVICE PIPE SIZES 3" THRU 12" SHALL BE DUCTILE IRON PIPE CLASS 52 PIPE PER LOCAL JURISDICTION, FROM WATERMAIN THRU METER SETTING(S) INCLUDING THE METER BYPASS.

15. ALL WATER SERVICE PIPE, 2" AND SMALLER, SHALL BE K SOFT COPPER FROM WATERMAIN THRU CURB STOP, OR APPROVED EQUAL.

16. WATERLINE IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL-AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

ABBREVIATIONS

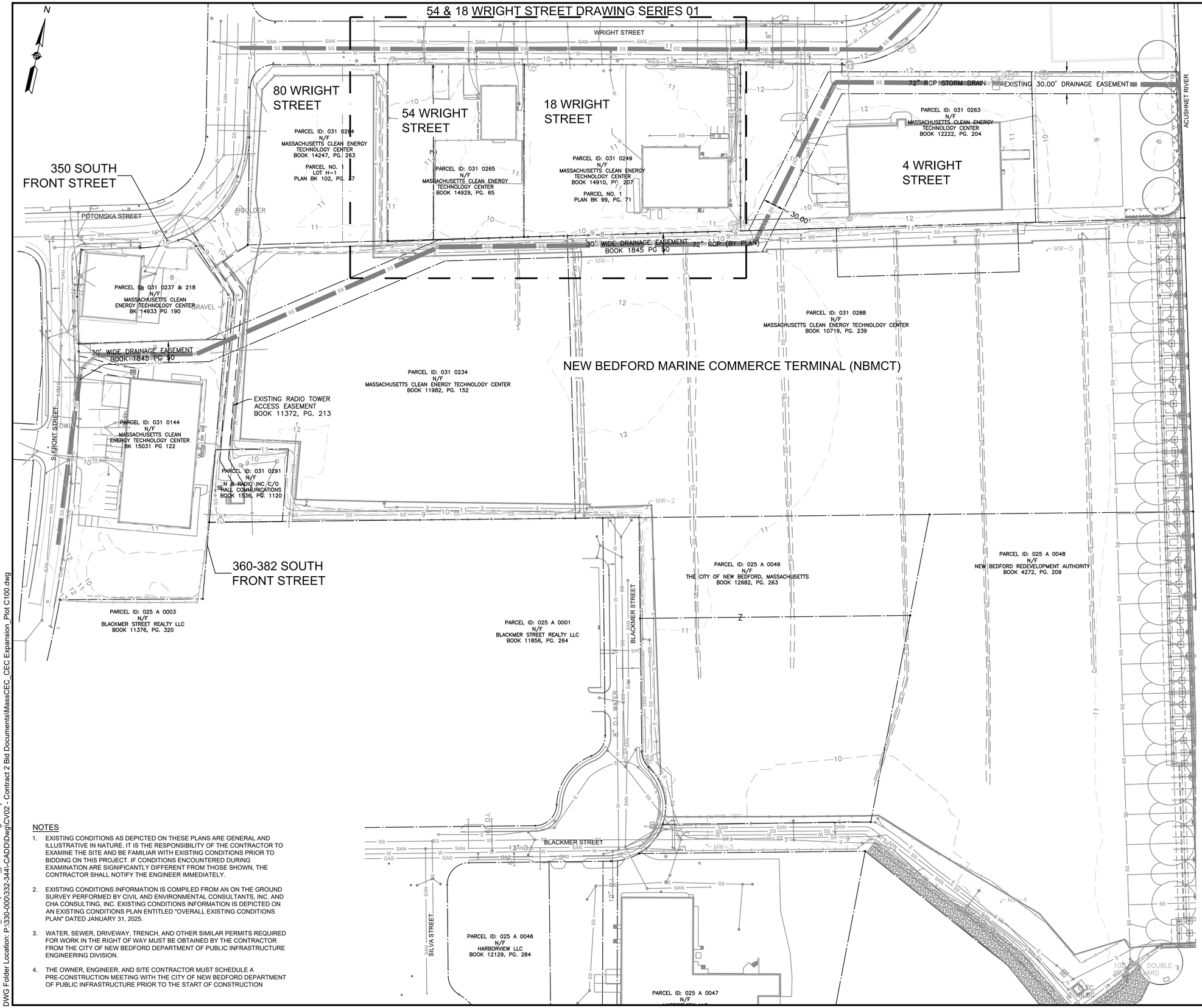
ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
A.C.	ASPHALT CONCRETE
AHT	ANNUAL HIGH TIDE
ALT	ANNUAL LOW TIDE
BB	BORING
BIT	BITUMINOUS
BD	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCB	CAPE COD BERM
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CI	CAST IRON
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO	CLEANOUT
CONC	CONCRETE
CONT	CONTINUED
CONST	CONSTRUCTION
CP	CONTROL POINT
CY	CUBIC YARD
D	DIAMETER
Ø	DIAMETER
DI	DUCTILE IRON
DWY	DRIVEWAY
EB	EASTBOUND
ELEV	ELEVATION
EL.	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
EX	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN	FOUNDATION
FES	FLARED END SECTION
FT	FOOT
GALV	GALVANIZED
GAR	GARAGE
GCL	GEOSYNTHETIC CLAY LINER
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
GW	GAS WELL
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
ID	INSIDE DIAMETER
IN	INCH
INV	INVERT
JCT	JUNCTION
KSI	KIPS PER SQUARE INCH
L	LENGTH
LLDPE	LINEAR LOW DENSITY POLYETHYLENE
LB	LEACHING BASIN
LHW	LEACHATE HEAD WELL

ABBREVIATIONS (CONT)

LP	LIGHT POLE
LT	LEFT
LWD	LOW WATER DATUM
LYS	LYSIMETER
MAX	MAXIMUM
MB	MAIL BOX
MH	MANHOLE
MHW	MEAN HIGH WATER
MHHW	MEAN HIGHER HIGH WATER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLW	MEAN LOW WATER
MLLW	MEAN LOWER LOW WATER
MW	MONITORING WELL
NB	NORTHBOUND
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT-TO-SCALE
OD	OUTSIDE DIAMETER
OHWM	ORDINARY HIGH WATER MARK
PERM	PERMANENT
±	PLUS OR MINUS
PC	POINT OF CURVATURE
PGL	PROFILE GRADE LINE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PSI	POUNDS PER SQUARE INCH
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	PRIVATE WELL
PWW	PAVED WATER WAY
R	RADIUS
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET	WALL RETAINING WALL
ROW	RIGHT-OF-WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	SOUTHBOUND
SDR	STANDARD DIMENSION RATIO
SF	SQUARE FOOT
SGC	SLOPED GRANITE CURB
SHLD	SHOULDER
SMH	SEWER MANHOLE
SS	STAINLESS STEEL
SSR	SIDE SLOPE RISER
ST	STREET
STA	STATION
STN	STONE
SW	SIDEWALK
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VGC	VERTICAL GRANITE CURB
VIF	VERIFY IN FIELD
WCR	WHEELCHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

SUGGESTED GENERAL CONSTRUCTION SEQUENCE

(ACTUAL ORDER OF CONSTRUCTION OPER



NOTES

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4. THE OWNER, ENGINEER, AND SITE CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY OF NEW BEDFORD DEPARTMENT OF PUBLIC INFRASTRUCTURE PRIOR TO THE START OF CONSTRUCTION

REFERENCES

1. THE VERTICAL DATUM IS THE MEAN LOWER LOW WATER DATUM (-1.92 NORTH AMERICAN VERTICAL DATUM OF 1988 ELEVATIONS BASED ON GEOID18).

MLLW	NAVD88	
1.92	0.00	NAVD 88
0.14	-1.78	MLW
0.00	-1.92	MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 1, 2025

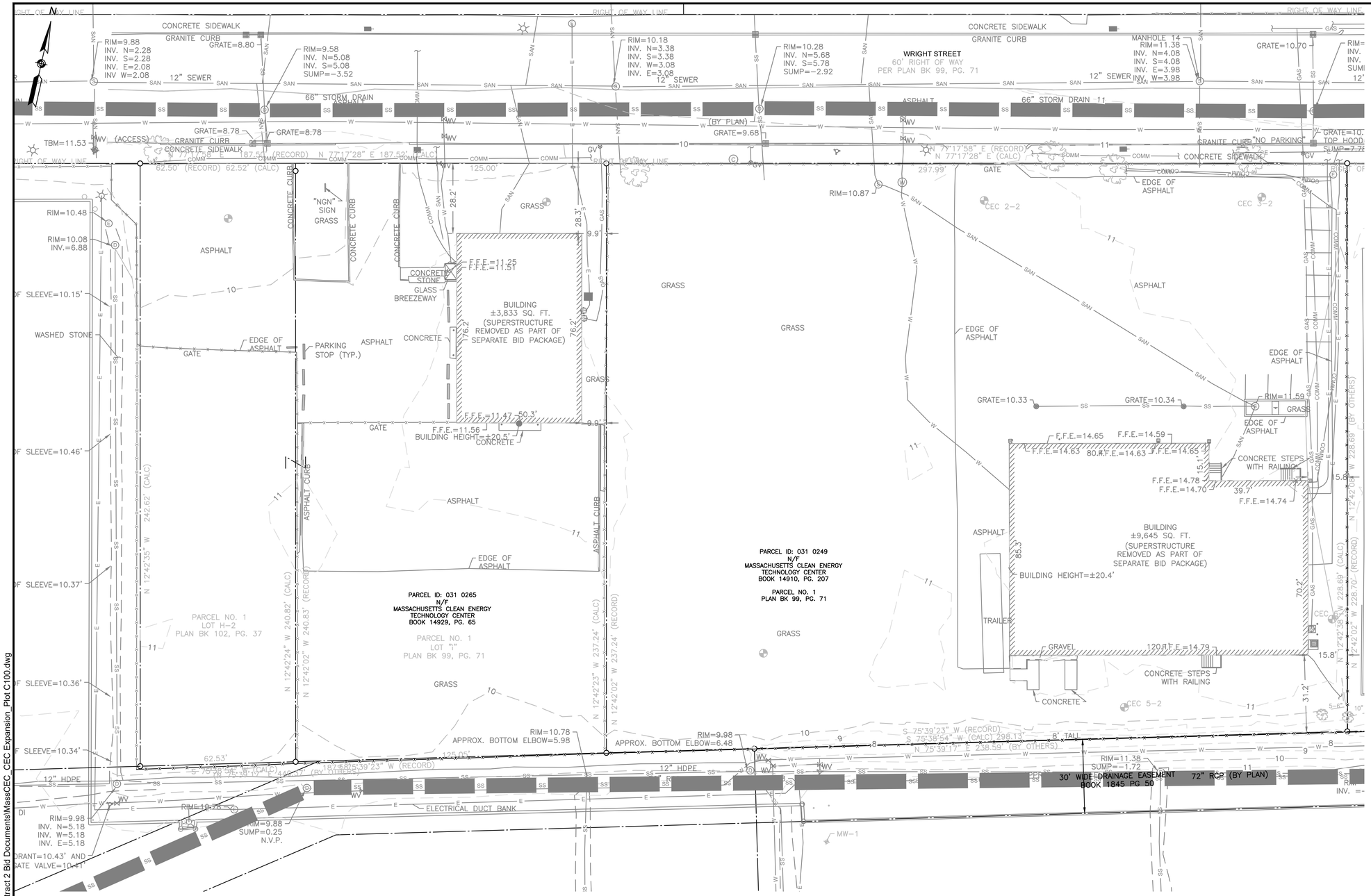
SHEET TITLE:
OVERALL EXISTING CONDITIONS

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-100

Monday, May 5, 2025 2:13:56 PM
DWG Filename: masscec_cec expansion_plot c100.dwg Layout: c-100
DWG Folder Location: P:\330-000\332-344-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C100.dwg



NOTES

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REFERENCES

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MLLW	NAVD88
1.92	0.00 NAVD 88
0.14	-1.78 MLW
0.00	-1.92 MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

Civil & Environmental Consultants, Inc.
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www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

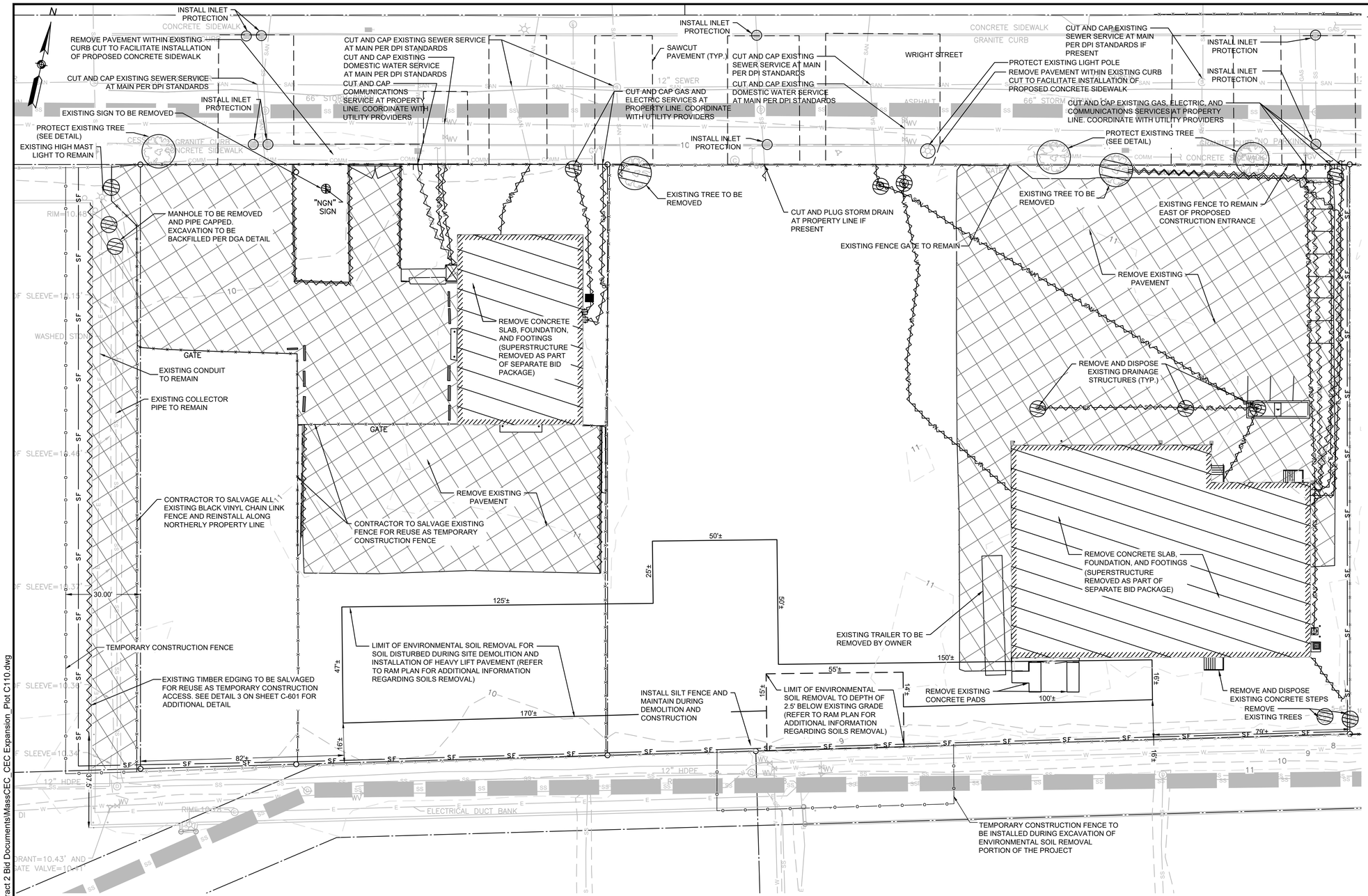
SHEET TITLE:
18 & 54 WRIGHT STREET EXISTING CONDITIONS

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-101

Monday, May 5, 2025 2:13:58 PM
DWG Filename: masscec_cec expansion_plot c100.dwg Layout: c-101
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C100.dwg



LEGEND

- STRUCTURE TO BE REMOVED
- PAVEMENT TO BE REMOVED
- LINEAR OBJECT TO BE REMOVED
- OBJECT TO BE REMOVED
- SF — PROPOSED SILT FENCE
- PROPOSED INLET PROTECTION
- PROPOSED CONSTRUCTION EXIT
- TEMPORARY CONSTRUCTION FENCE

NOTES

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4. THE OWNER, ENGINEER, AND SITE CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY OF NEW BEDFORD DEPARTMENT OF PUBLIC INFRASTRUCTURE PRIOR TO THE START OF CONSTRUCTION
5. ANY DISTURBANCE BY THE CONTRACTOR TO THE SITE OR EXISTING UTILITIES NOT SHOWN ON THESE PLANS OUTSIDE OF THE LIMIT OF WORK IS TO BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO OWNER.

FENCING NOTES

1. EXISTING BLACK VINYL CHAIN LINK FENCE ALONG 80 & 54 WRIGHT STREET PROPERTY LINE IS TO BE SALVAGED FOR REUSE ALONG NORTHERLY PROPERTY LINE.
2. EXISTING 8' HIGH CHAIN LINK FENCING NOT USED ALONG NORTHERLY PROPERTY LINE IS TO BE SALVAGED FOR REUSE AS TEMPORARY CONSTRUCTION FENCING.
3. ALL REMAINING EXISTING FENCING SHALL BE SALVAGED AND STOCKPILED AND SHALL REMAIN PROPERTY OF THE OWNER.

REFERENCES

1. THE VERTICAL DATUM IS THE MEAN LOWER LOW WATER DATUM (-1.92 NORTH AMERICAN VERTICAL DATUM OF 1988 ELEVATIONS BASED ON GEOID18).

MLLW	NAVD88
1.92	0.00 NAVD 88
0.14	-1.78 MLW
0.00	-1.92 MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

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www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

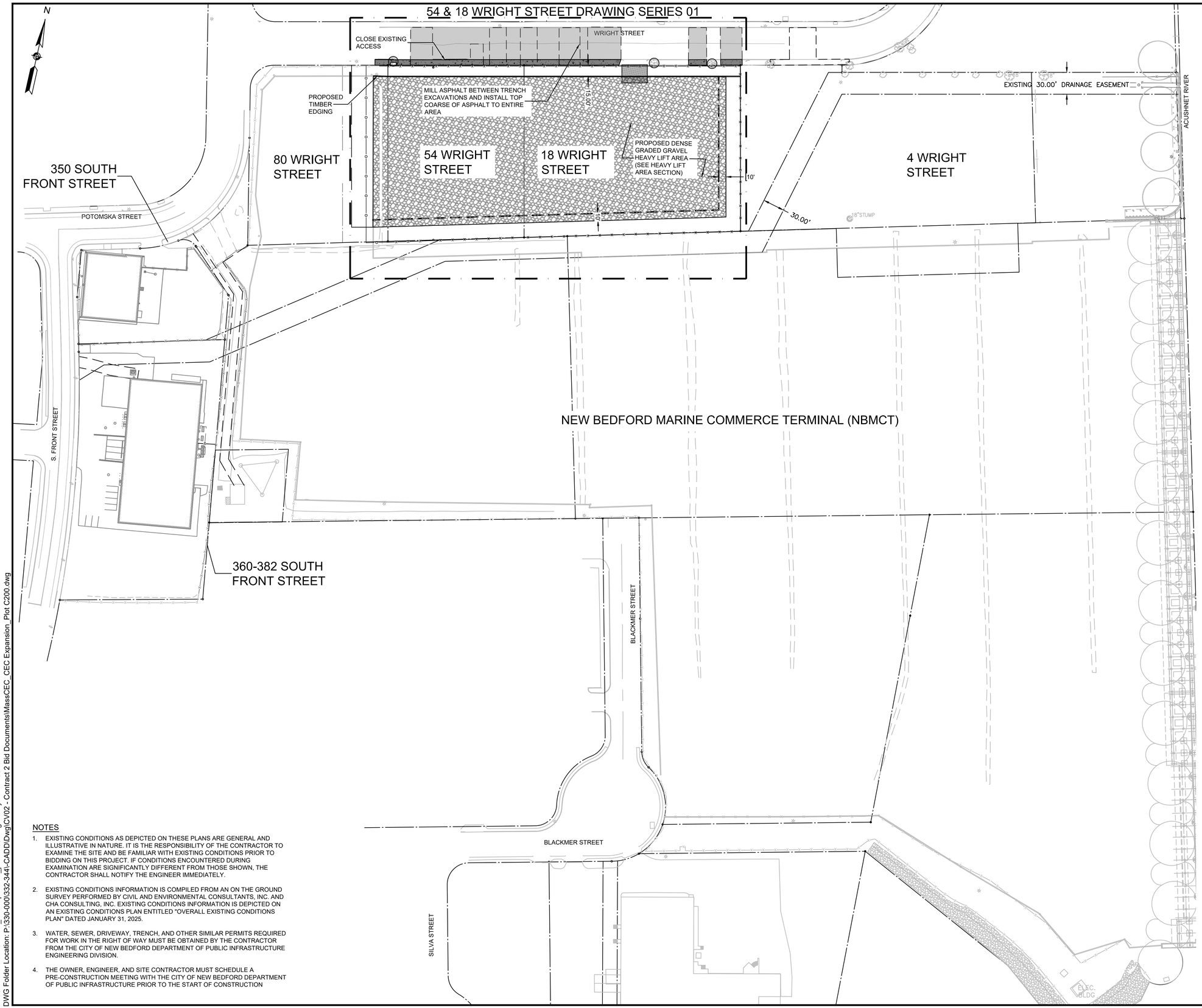
SHEET TITLE:
18 & 54 WRIGHT STREET DEMOLITION AND EROSION CONTROLS

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-110

Monday, May 5, 2025 2:16:27 PM
DWG Filename: masscec_cec expansion_plot c110.dwg Layout: c-111
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C110.dwg



LEGEND

- PROPOSED CONCRETE SIDEWALK
- PROPOSED HEAVY LIFT AREA
- PROPOSED CURB
- PROPOSED FENCE
- PROPOSED HEAVY LIFT BOUNDARY
- PROPOSED PAVEMENT
- TEMPORARY CONSTRUCTION FENCE

NOTES

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GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

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PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

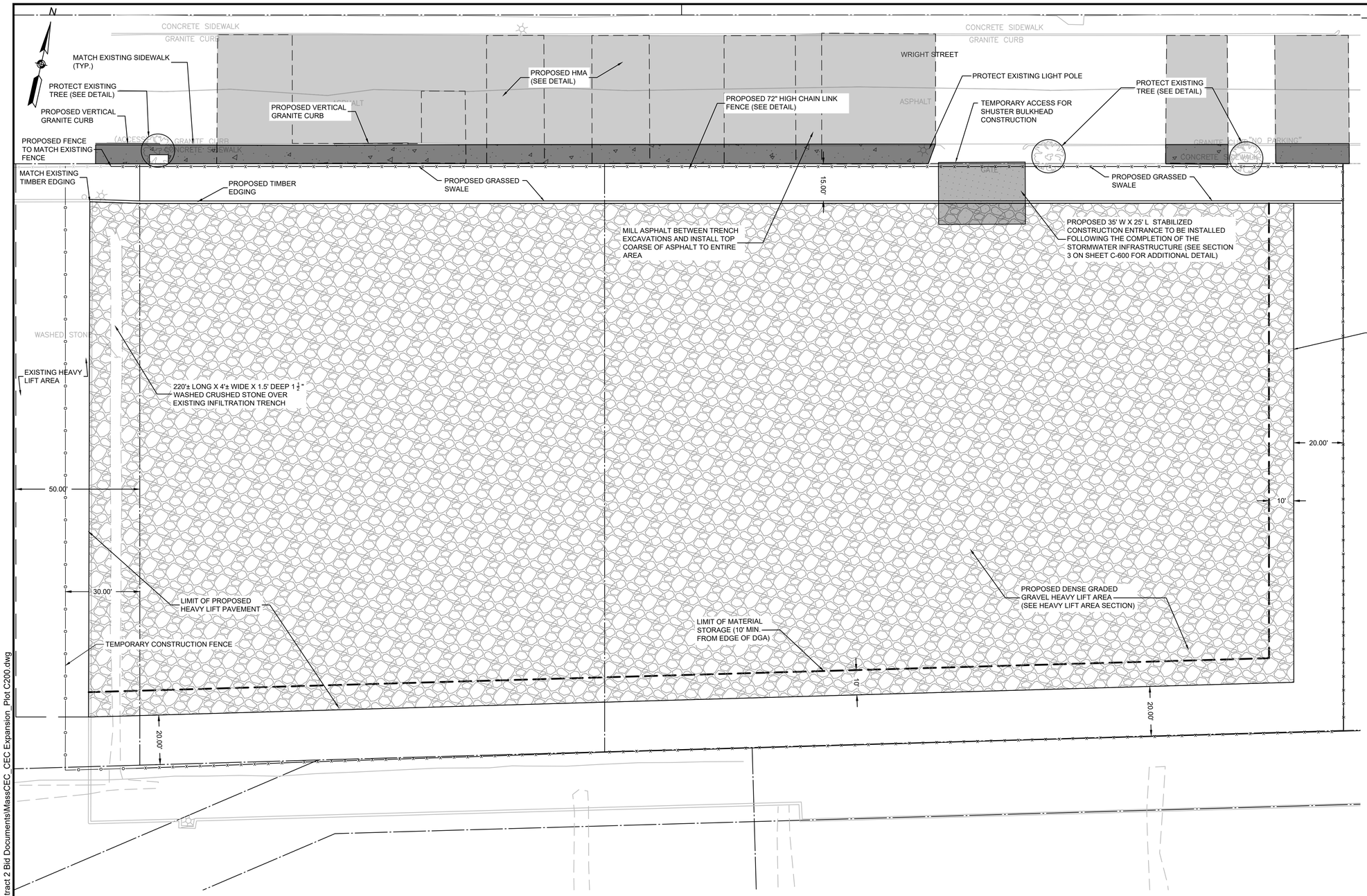
SHEET TITLE:
OVERALL LAYOUT PLAN

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-200

Monday, May 5, 2025 2:16:54 PM
DWG Filename: masscec_cec expansion_plot c200.dwg Layout: c-200
DWG Folder Location: P:\330-000\332-441-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C200.dwg



LEGEND

- PROPOSED PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- PROPOSED HEAVY LIFT AREA
- PROPOSED CURB
- PROPOSED FENCE
- PROPOSED HEAVY LIFT BOUNDARY
- TEMPORARY CONSTRUCTION FENCE

NOTES

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MLLW	NAVD88
1.92	0.00 NAVD 88
0.14	-1.78 MLW
0.00	-1.92 MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

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Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

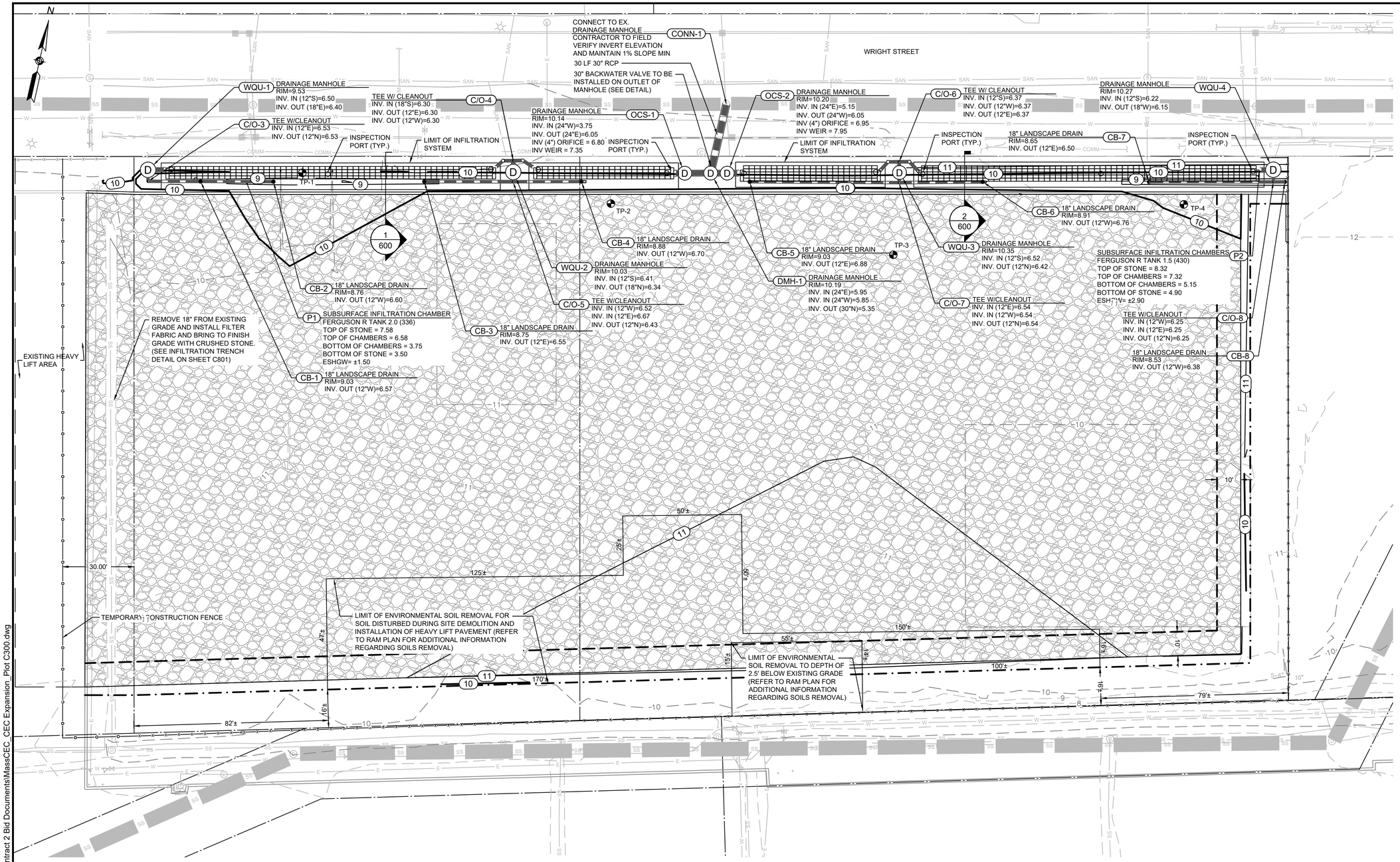
SHEET TITLE:
18 & 54 WRIGHT STREET LAYOUT PLAN

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-201

Monday, May 5, 2025 2:17:01 PM
DWG Filename: masscec_cec expansion_plot c200.dwg Layout: c-201
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C200.dwg



NOTES

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5. CONTRACTOR IS TO INSTALL CATCH BASIN SILT SACKS IN LANDSCAPE DRAIN INLETS UPON COMPLETION OF INSTALLATION.

LEGEND

10	EXISTING CONTOURS (MAJOR)
11	EXISTING CONTOURS (MINOR)
10	PROPOSED CONTOURS (MAJOR)
11	PROPOSED CONTOURS (MINOR)
	TEMPORARY CONSTRUCTION FENCE
1 1	SECTIONS (SHEET C-600)
	PROPOSED STORM DRAIN PIPE
	PROPOSED ROOF LEADER
	PROPOSED LANDSCAPE INLET
D	PROPOSED DRAIN STRUCTURE
	PROPOSED SUBSURFACE CHAMBER
WQU-1	PROPOSED STRUCTURE LABEL

REFERENCES

1. THE VERTICAL DATUM IS THE MEAN LOWER LOW WATER DATUM (-1.92 NORTH AMERICAN VERTICAL DATUM OF 1988 ELEVATIONS BASED ON GEOID18).

MLLW	NAVD88
1.92	0.00 NAVD 88
0.14	-1.78 MLW
0.00	-1.92 MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

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PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
1	---	---	---
2	---	---	---
3	---	---	---
4	---	---	---
5	---	---	---

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

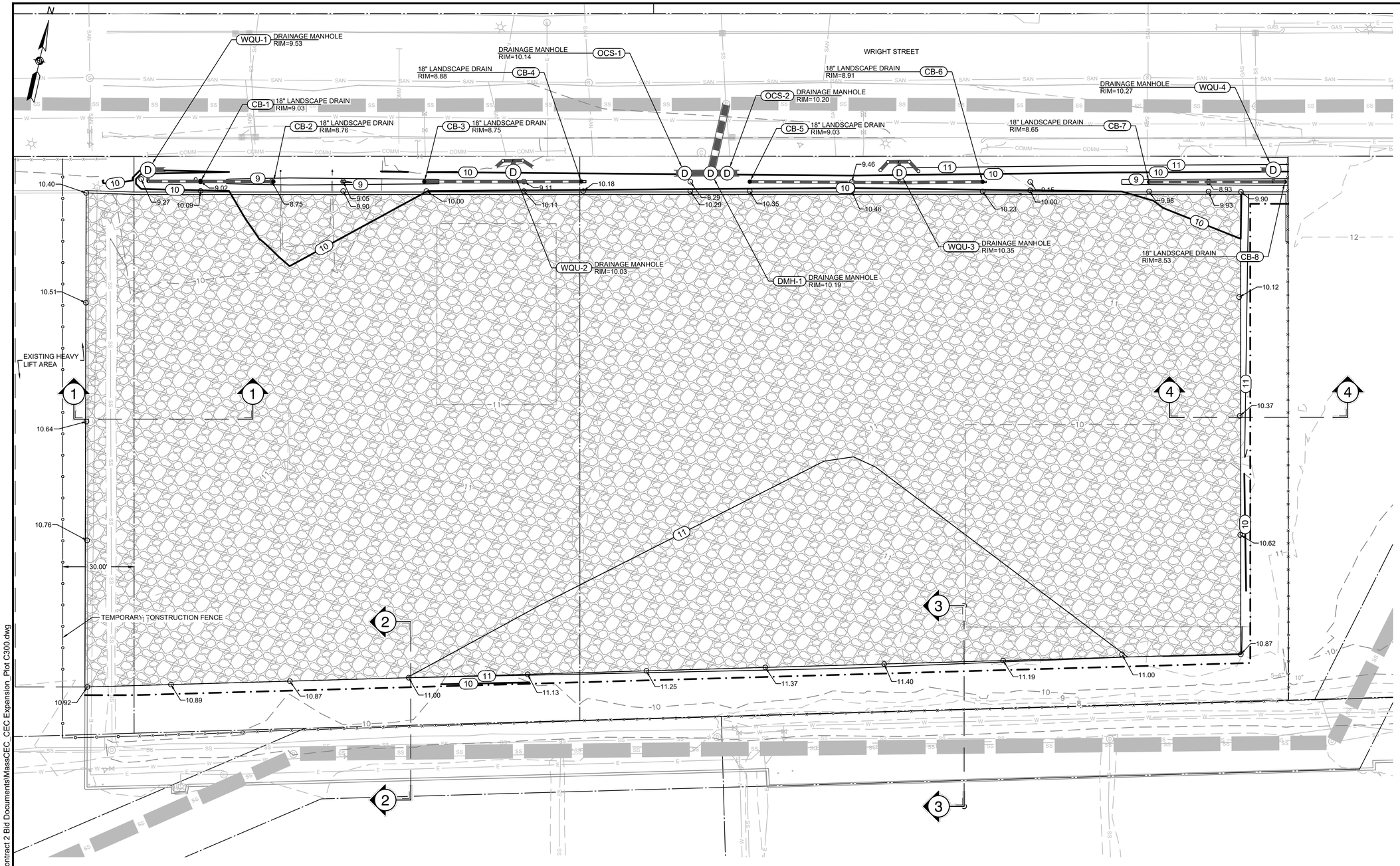
SHEET TITLE:
18 & 54 WRIGHT STREET GRADING AND DRAINAGE PLAN

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-301

Monday, May 5, 2025 2:17:52 PM
DWG Filename: masscec_cec expansion_plot c300.dwg Layout: c-301
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C300.dwg



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5. CONTRACTOR IS TO INSTALL CATCH BASIN SILT SACKS IN LANDSCAPE DRAIN INLETS UPON COMPLETION OF INSTALLATION.

LEGEND

- 10 — EXISTING CONTOURS (MAJOR)
- 11 — EXISTING CONTOURS (MINOR)
- 10 — PROPOSED CONTOURS (MAJOR)
- 11 — PROPOSED CONTOURS (MINOR)
- 1 1 — SECTIONS (SHEET C-600)
- PROPOSED STORM DRAIN PIPE
- D — PROPOSED DRAIN STRUCTURE

GRADING NOTE:

1. REFER TO SHEET C-301 FOR ADDITIONAL GRADING AND DRAINAGE DETAIL

REFERENCES

1. THE VERTICAL DATUM IS THE MEAN LOWER LOW WATER DATUM (-1.92 NORTH AMERICAN VERTICAL DATUM OF 1988 ELEVATIONS BASED ON GEOID18).

MLLW	NAVD88
1.92	0.00 NAVD 88
0.14	-1.78 MLW
0.00	-1.92 MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

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PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
1	---	---	---
2	---	---	---
3	---	---	---
4	---	---	---
5	---	---	---

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

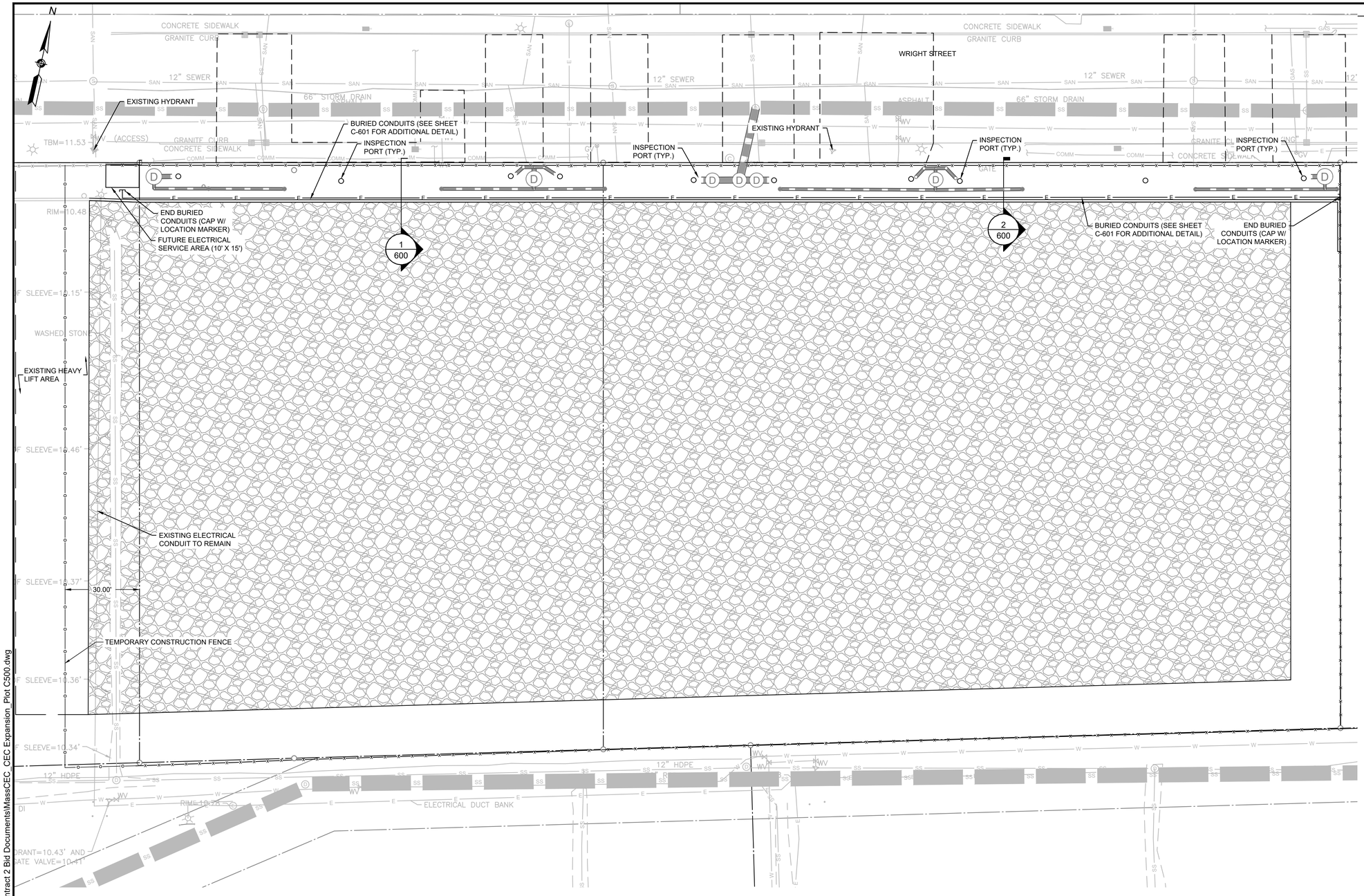
SHEET TITLE:
18 & 54 WRIGHT STREET CONTOUR PLAN

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-401

Monday, May 5, 2025 2:18:05 PM
DWG Filename: masscec_cec expansion_plot c300.dwg Layout: c-401
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C300.dwg



LEGEND

E	PROPOSED UNDERGROUND ELECTRIC
W	PROPOSED WATER LINE
SAN	PROPOSED SANITARY SEWER LINE
	CLEANOUT
S	SEWER MANHOLE
	VALVE
	WATER VALVE
W	WATER MANHOLE
WG	WATER GATE
	HYDRANT
	HIGH MAST LIGHT POLE
E	ELECTRIC MANHOLE
	ELECTRIC CONTROL BOX
ET	ELECTRIC TRANSFORMER
	ELECTRIC METER
AC	AC UNIT
VLT	VAULT
	GAS METER
GG	GAS GATE
C	COMMUNICATIONS MANHOLE
	UTILITY POLE
	PROPOSED STORM DRAIN PIPE
	PROPOSED ROOF LEADER
	PROPOSED CATCH BASIN
	PROPOSED LANDSCAPE INLET
D	PROPOSED DRAIN STRUCTURE
	PROPOSED CURB INLET
	TEMPORARY CONSTRUCTION FENCE

NOTES

1. EXISTING CONDITIONS AS DEPICTED ON THESE PLANS ARE GENERAL AND ILLUSTRATIVE IN NATURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE SITE AND BE FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING ON THIS PROJECT. IF CONDITIONS ENCOUNTERED DURING EXAMINATION ARE SIGNIFICANTLY DIFFERENT FROM THOSE SHOWN, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
2. EXISTING CONDITIONS INFORMATION IS COMPILED FROM AN ON THE GROUND SURVEY PERFORMED BY CIVIL AND ENVIRONMENTAL CONSULTANTS, INC. AND CHA CONSULTING, INC. EXISTING CONDITIONS INFORMATION IS DEPICTED ON AN EXISTING CONDITIONS PLAN ENTITLED "OVERALL EXISTING CONDITIONS PLAN" DATED JANUARY 31, 2025.
3. WATER, SEWER, DRIVEWAY, TRENCH, AND OTHER SIMILAR PERMITS REQUIRED FOR WORK IN THE RIGHT OF WAY MUST BE OBTAINED BY THE CONTRACTOR FROM THE CITY OF NEW BEDFORD DEPARTMENT OF PUBLIC INFRASTRUCTURE ENGINEERING DIVISION.
4. THE OWNER, ENGINEER, AND SITE CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY OF NEW BEDFORD DEPARTMENT OF PUBLIC INFRASTRUCTURE PRIOR TO THE START OF CONSTRUCTION

REFERENCES

1. THE VERTICAL DATUM IS THE MEAN LOWER LOW WATER DATUM (-1.92 NORTH AMERICAN VERTICAL DATUM OF 1988 ELEVATIONS BASED ON GEOID18).

MLLW	NAVD88
1.92	0.00 NAVD 88
0.14	-1.78 MLW
0.00	-1.92 MLLW

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:
18 & 54 WRIGHT STREET UTILTIES PLAN

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-501

Monday, May 5, 2025 2:18:44 PM
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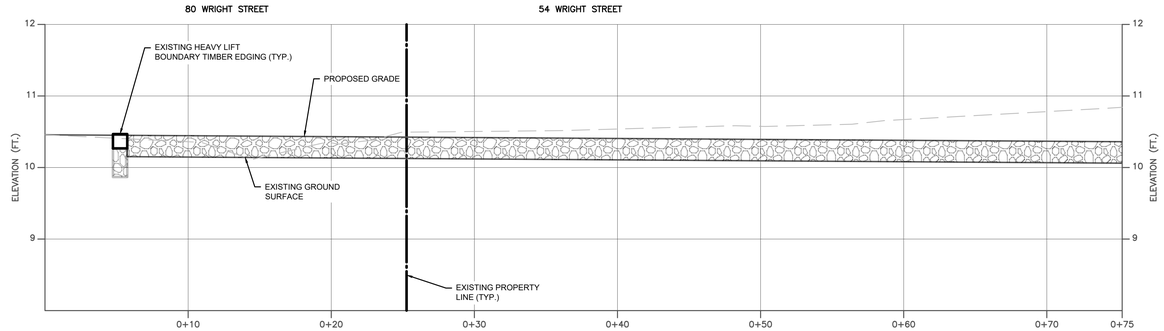
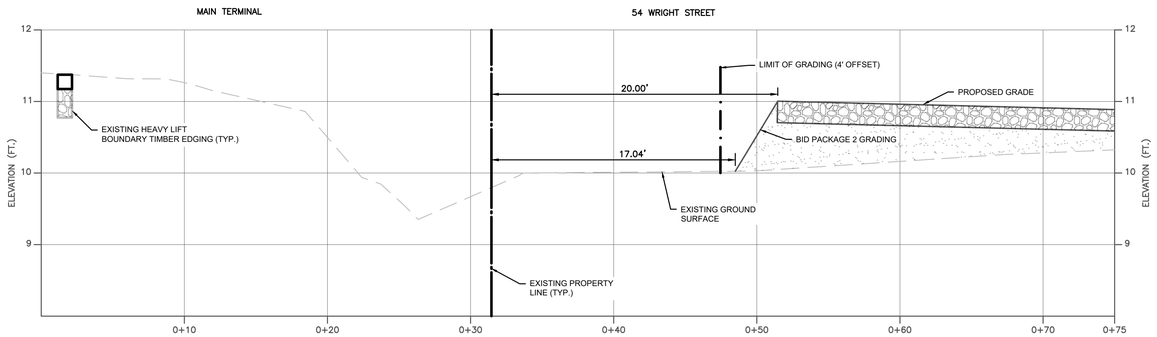


SECTION 1 PROFILE
SCALE H:1"=20'; V:1"=4'



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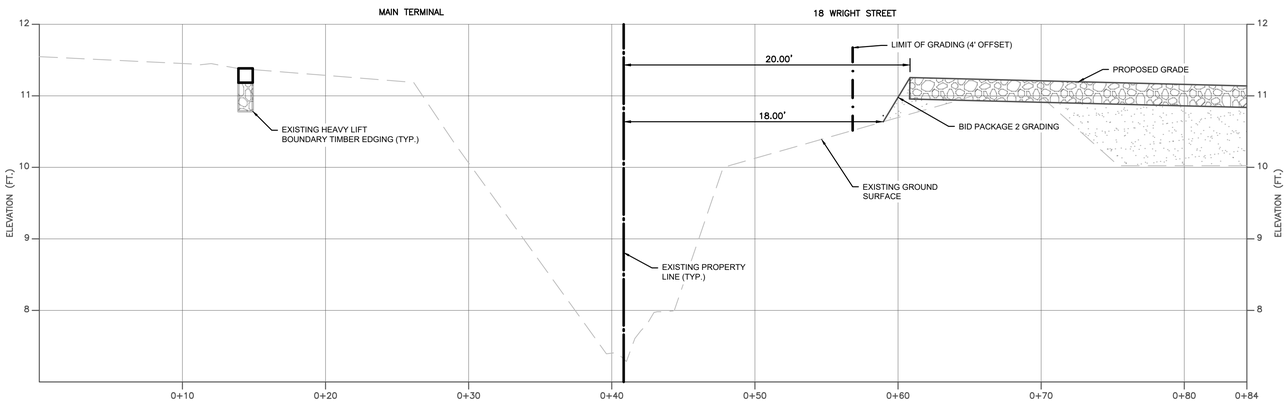

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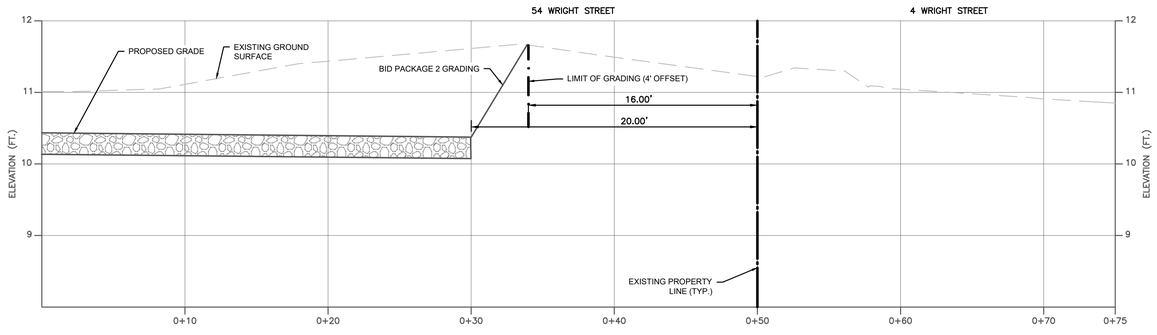

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REFERENCES

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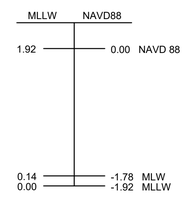

OFFSETS TAKEN FROM USACE GUIDANCE IN QUALITY CONTROL

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31 Bellows Road · Raynham, MA 02767
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www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
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△	---	---	---
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DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:
SECTIONS SHEET 1

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-600

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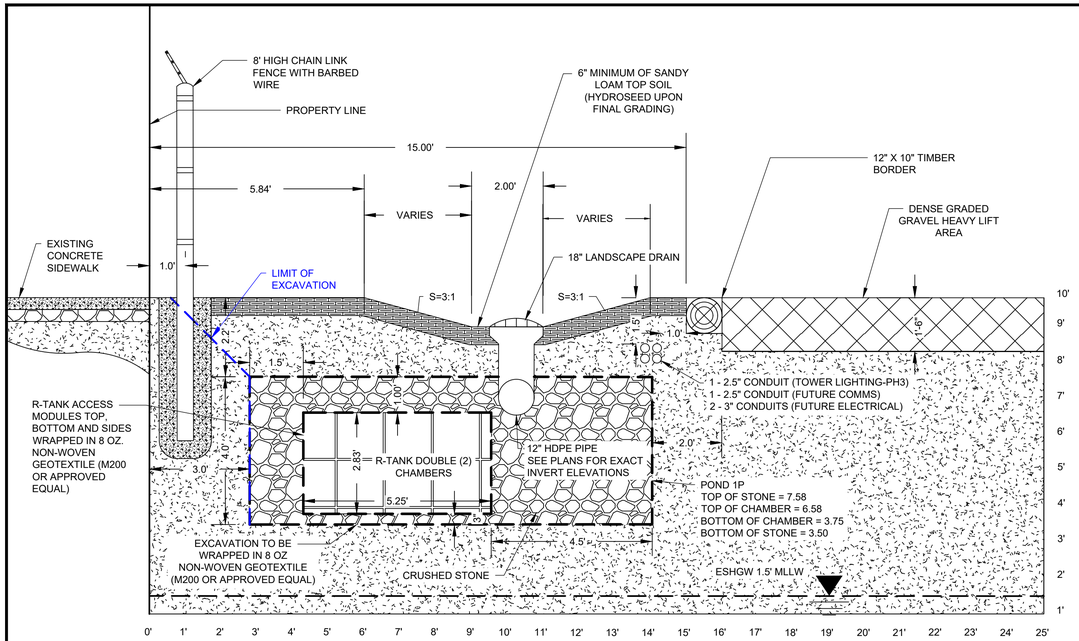
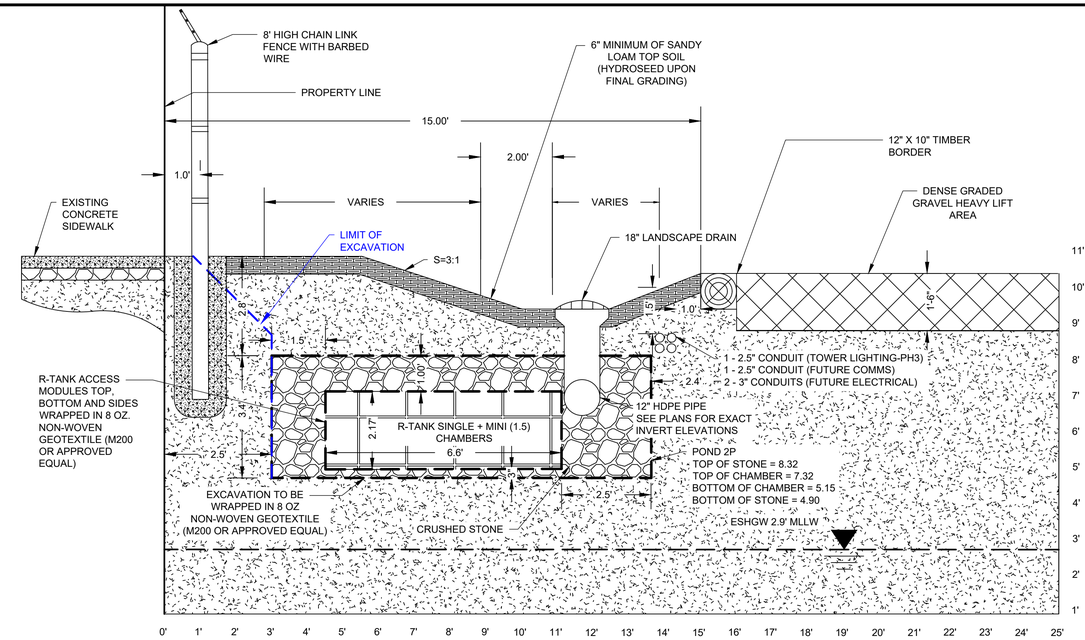
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C300.dwg



1 / 600 STORMWATER CHAMBERS 1P
SCALE: NTS



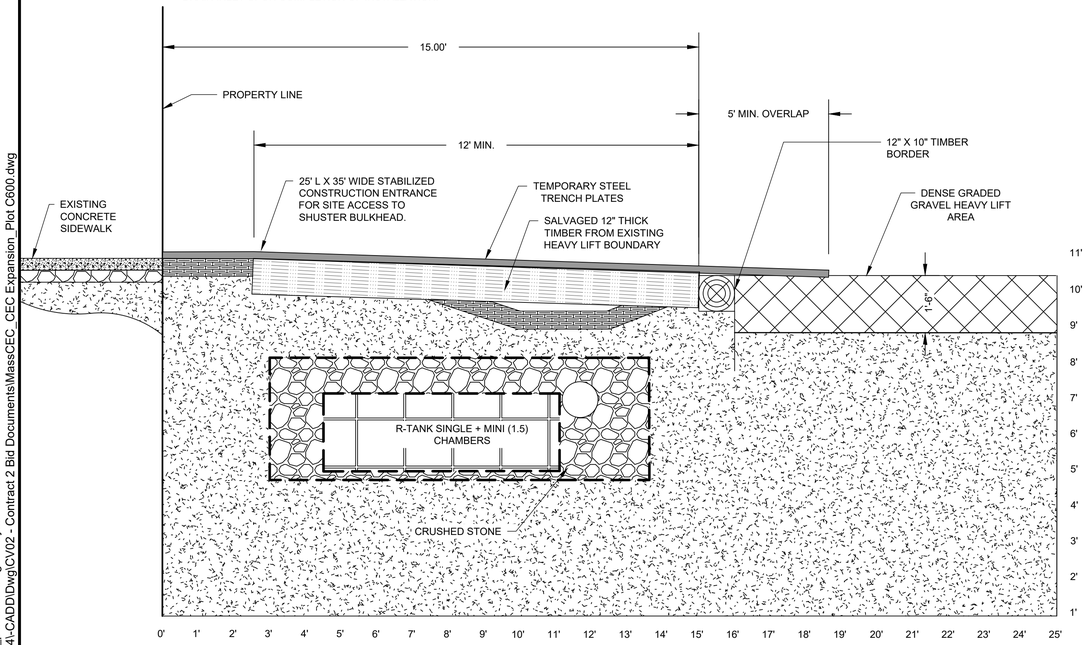
2 / 600 STORMWATER CHAMBERS 2P
SCALE: NTS

NOTES

1. REFER TO SHEET C-802 FOR ADDITIONAL NOTES AND DETAILS PERTAINING TO THE R-TANK CHAMBERS.
2. CONTRACTOR IS TO INSTALL CATCH BASIN SILT SACKS IN THE LANDSCAPE DRAIN INLET UPON COMPLETION OF INSTALLATION.

NOTES

1. REFER TO SHEET C-802 FOR ADDITIONAL NOTES AND DETAILS PERTAINING TO THE R-TANK CHAMBERS.
2. CONTRACTOR IS TO INSTALL CATCH BASIN SILT SACKS IN THE LANDSCAPE DRAIN INLET UPON COMPLETION OF INSTALLATION.



3 / 600 TEMPORARY CONSTRUCTION ACCESS
SCALE: NTS

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PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
1	---	---	---
2	---	---	---
3	---	---	---
4	---	---	---
5	---	---	---

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:
SECTIONS SHEET 2

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-601

Monday, May 5, 2025 2:19:31 PM
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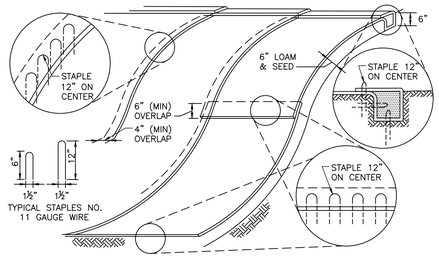
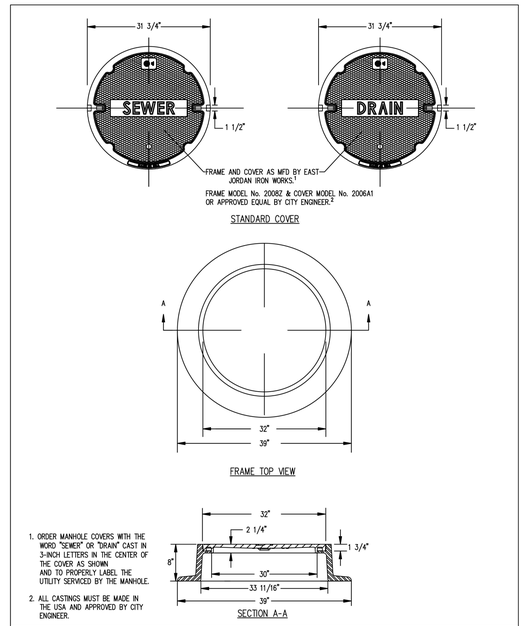


NOTES:

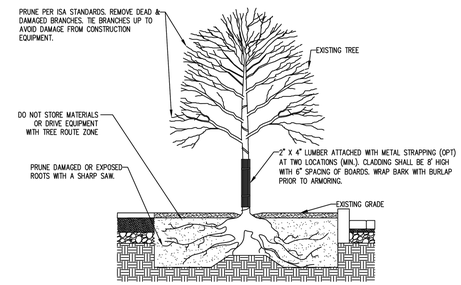
1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A SIX (6) INCH DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROXIMATELY FOUR (4) INCH OVERLAP WHERE TWO (2) OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH SIX (6) INCH MINIMUM OVERLAP AND STAPLE BOTH TOGETHER.
5. MORE FASTENERS MAY BE REQUIRED DUE TO BLANKET COMPOSITION, SOIL TYPE, SURFACE UNIFORMITY AND SLOPE STEEPNESS. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
6. TO BE PLACED ON SLOPES 3:1 OR GREATER, AS SHOWN ON PLANS.
7. STRAW MATS TO BE INSTALLED ON GRASSED SWALES UPON COMPLETION OF INSTALLATION OF TOP SOIL, FINAL GRADING OF TOP SOIL AND APPLICATION OF HYDROSEEDING.

1 / C800 EROSION CONTROL BLANKET ON SLOPE
SCALE: N.T.S



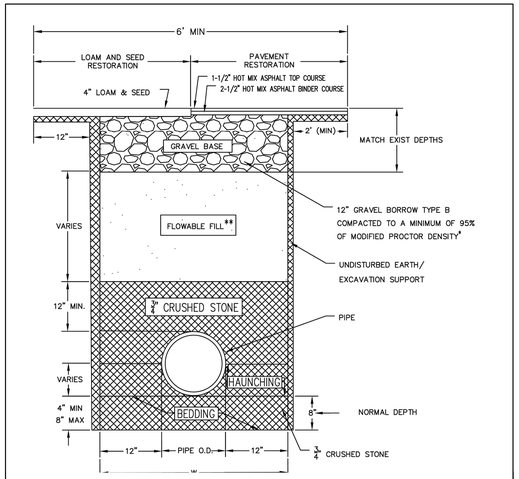
1. ORDER MANHOLE COVERS WITH THE WORD "SEWER" OR "DRAIN" CAST IN 3-INCH LETTERS IN THE CENTER OF THE COVER AS SHOWN AND TO PROPERLY LABEL THE UTILITY SERVICED BY THE MANHOLE.
2. ALL CASTINGS MUST BE MADE IN THE USA AND APPROVED BY CITY ENGINEER.

MANHOLE FRAME AND COVER
NTS
20



NOTES:
NO STORAGE OF EQUIPMENT OR STOCKPILING OF MATERIALS WITHIN DRIPLINE.

TREE PROTECTION
NTS
68



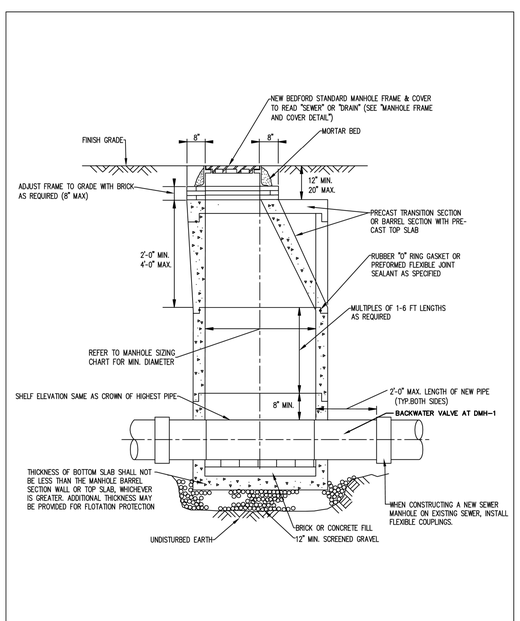
NOTES:

1. CONTRACTOR MUST MATCH INTO EXISTING PAVEMENT DEPTH IF MORE THAN 4" TOTAL.
2. WHEN IN ROCK, 8" CLEARANCE SHALL BE PROVIDED.

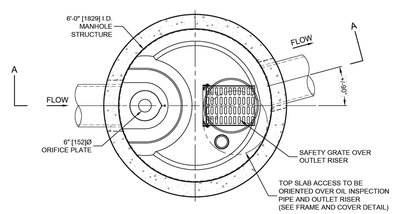
*SEE SPECIFICATIONS IN SECTION III
**SEE SPECIFICATIONS IN SECTION II–B

Depth from Ground Surface to Pipe Invert (D)	Excavation Width (W) [Nominal Pipe Diameter]		
	[0 to 6in]	[6in to 24in]	[Over 24in]
0 to 6ft	2ft	4ft	D + 3ft
6ft to 12ft	4ft	5ft	D + 3ft
12ft to 20ft	7ft	7ft	D + 5ft
20ft to 24ft	8ft	8ft	D + 5ft

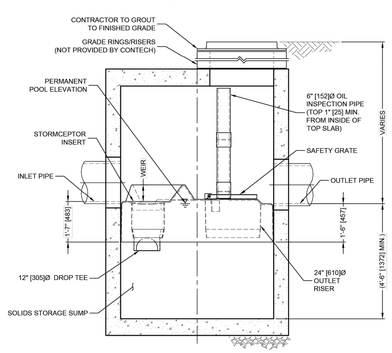
TYPICAL TRENCH DETAIL
NTS
4A



PRECAST MANHOLE WITH PRECAST BASE
NTS
22



PLAN VIEW
TOP SLAB NOT SHOWN

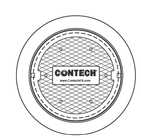


SECTION A-A

Stormceptor®
FOR PATENT INFORMATION, GO TO www.contech-cpi.com/IP

STORMCEPTOR DESIGN NOTES

THE STANDARD STC900 CONFIGURATION IS SHOWN.



FRAME AND COVER
(MAY VARY)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs [L/s])			
PEAK FLOW RATE (cfs [L/s])			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES / SPECIAL REQUIREMENTS:			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. STORMCEPTOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STORMCEPTOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2" [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. STORMCEPTOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMCEPTOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

STC900
STORMCEPTOR
STANDARD DETAIL

I:\COMMON\CAD\TREATMENT\23 STORMCEPTOR\40 STANDARD DRAWINGS\IN PROCESS\STC900.DTL DWG 2/10/2019 3:47 PM

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
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PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION
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DATE OF PREPARATION

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CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:
DETAILS SHEET 1

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-800

Monday, May 5, 2025 2:19:58 PM
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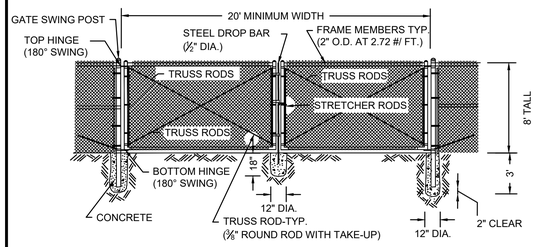
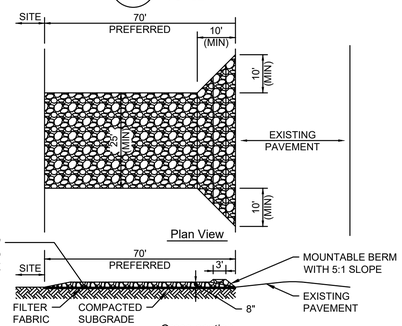
DWG Folder Location: P:\330-000\332-341-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C800.dwg



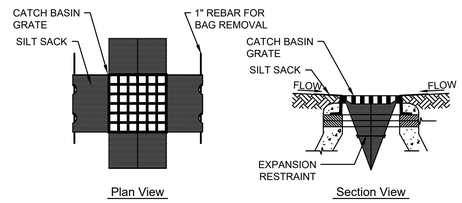
1 / C801 DOUBLE SWING GATE
SCALE: N.T.S



NOTES:

1. ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF WATER, RUNOFF AND/OR SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED PRIOR TO FINAL FINISHED MATERIALS BEING INSTALLED.

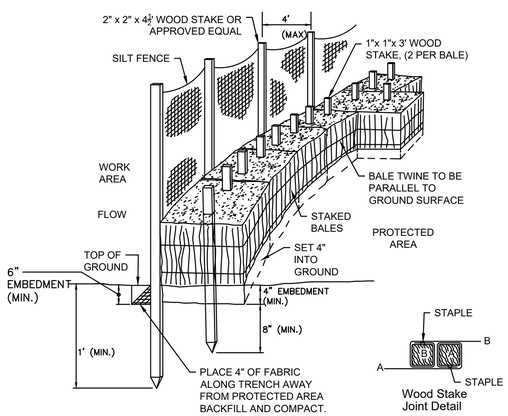
4 / C801 STABILIZED CONSTRUCTION EXIT
SCALE: N.T.S



CONSTRUCTION NOTES

1. INSTALL SILT SACKS IN ALL CATCH BASINS AND LANDSCAPE DRAIN INLETS WHERE INDICATED ON THE SITE PLANS BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER THE BINDER COURSE IS PLACED AND EROSION CONTROL BARRIERS HAVE BEEN REMOVED.
2. GRATE TO BE PLACED OVER SILT SACK.
3. SILT SACKS SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS. CLEANING OR REPLACEMENT SHALL BE PERFORMED AS NEEDED. MAINTAIN SILT SACKS UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED.

2 / C801 SILT SACK INLET PROTECTION
SCALE: N.T.S

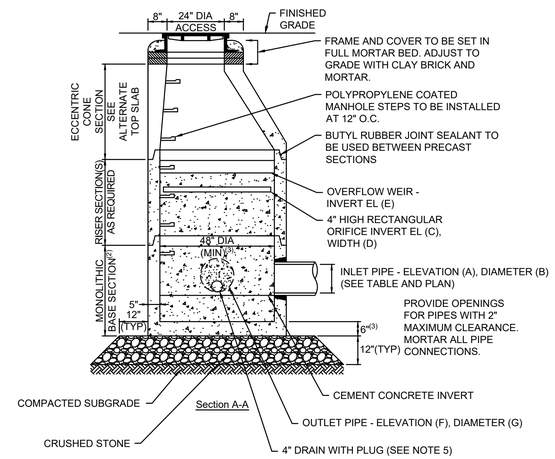


NOTES

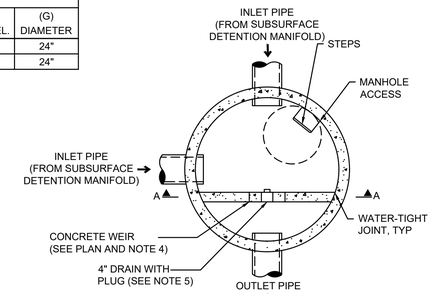
1. PLACE ONE STRAW BALE PERPENDICULAR ALONG STRAW BALE BARRIER (100' O.C.)

5 / C801 SILT FENCE/STRAW BALE BARRIER
SCALE: N.T.S

OUTLET CONTROL STRUCTURE	INLET PIPE		4" HIGH RECTANGULAR ORIFICE		OVERFLOW WEIR	OUTLET PIPE	
	(A) INVERT EL.	(B) DIAMETER	(C) INVERT EL.	(D) WIDTH	(E) INVERT EL.	(F) INVERT EL.	(G) DIAMETER
OCS 1	3.75	24"	6.80	40"	7.35	6.05	24"
OCS 2	5.15	24"	6.95	40"	7.95	6.05	24"

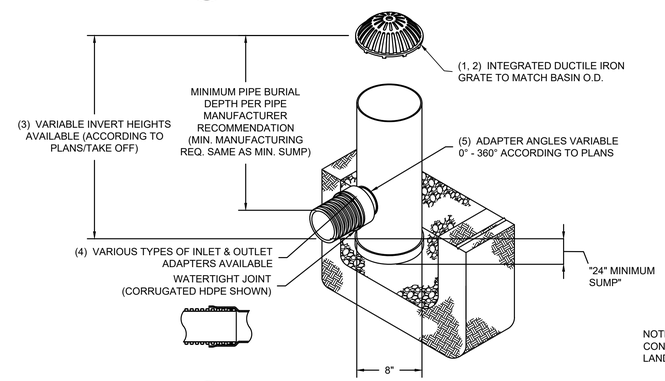


3 / 801 OUTLET CONTROL STRUCTURE DETAIL
SCALE: NTS



NOTES

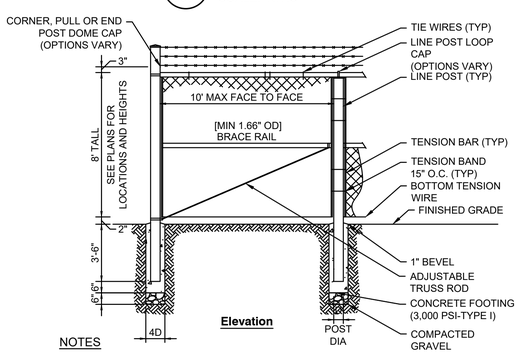
1. STRUCTURE TO BE PRECAST CONCRETE, MINIMUM 4,000 PSI. ALL SECTIONS TO BE DESIGNED TO MEET OR EXCEED HS-20 LOADING.
2. BASE TO BE SINGLE POUR MONOLITHIC SECTION.
3. 60" (5'-0") INSIDE DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET. 6" MINIMUM WALL THICKNESS AND 7" MINIMUM BASE THICKNESS FOR 5'-0" DIAMETER PRECAST MANHOLE.
4. SEE PLANS FOR WEIR ELEVATIONS AND CONFIGURATIONS.
5. PLUG SHALL CONSIST OF A 4" PVC PIPE WITH A THREADED PLUG.



1. 8" - 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536GRADE 70-50-05.
2. 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 36").
5. ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6. 8" - 30" DOME GRATES HAVE NO LOAD RATING.
7. THE BACKFILL MATERIAL SHALL BE CRUSHED STONE OR OTHER GRANULAR MATERIAL MEETING THE REQUIREMENTS OF CLASS I, CLASS II, OR CLASS III MATERIAL AS DEFINED IN ASTM D2321. BEDDING & BACKFILL FOR SURFACE DRAINAGE INLETS SHALL BE PLACED & COMPACTED UNIFORMLY IN ACCORDANCE WITH ASTM D2321.

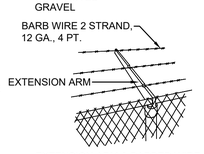
NOTE:
CONTRACTOR IS TO INSTALL CATCH BASIN SILT SACK IN LANDSCAPE DRAIN INLETS UPON COMPLETION OF INSTALLATION.

6 / C801 NYLOPLAST LANDSCAPE DRAIN BASIN WITH DOME GRATE
SCALE: NTS



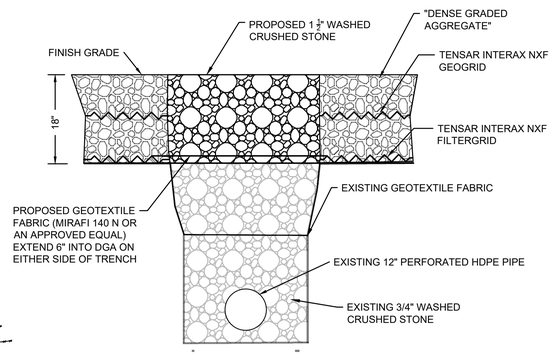
NOTES

1. FENCE TO BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND THE CHAIN LINK FENCE MANUFACTURERS INSTITUTE PRODUCT MANUAL.
2. POSTS SHALL MAINTAIN A MINIMUM DEPTH OF 3'-6" IN GROUND AND SHALL NOT BE RACKED TO ACCOMMODATE CHANGES IN GRADE.
3. LINE OF FENCE, TOP AND BOTTOM, SHALL BE INSTALLED STRAIGHT AND TRUE. POSTS SHALL BE INSTALLED PARALLEL AND PLUMB. RAILS SHALL BE INSTALLED PARALLEL TO GROUND SURFACE AND EACH OTHER.

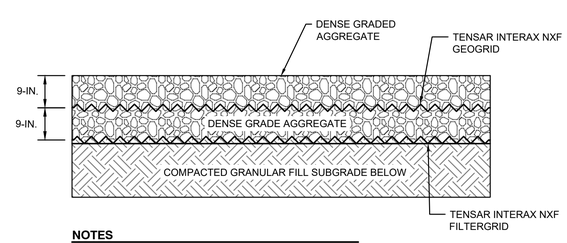


EXTENSION ARM & BARBED WIRE

7 / C801 PERIMETER FENCE
SCALE: N.T.S



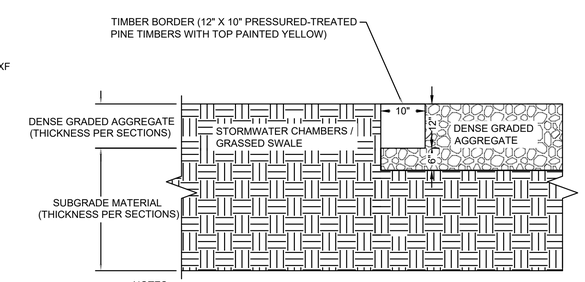
8 / C801 RECONSTRUCTED INFILTRATION TRENCH DETAIL
SCALE: NTS



NOTES

1. PRIOR TO GEOGRID PLACEMENT, ALL SURFICIAL ASPHALT AND TOPSOIL SHALL BE REMOVED DOWN TO GRANULAR SUBGRADE SOILS. THE SUBGRADE SHALL BE SCARIFIED IN PLACE AND PROOFROLLED USING HEAVY PNEUMATIC TIRED EQUIPMENT EXERTING A MINIMUM 10-TON AXLE LOAD TO VISUALLY EVALUATE FOR AREAS OF INSTABILITY. AREAS THAT ARE ASSESSED TO BE WEAK OR UNSTABLE DURING PROOFROLLING SHALL BE EXCAVATED DOWN TO FIRM GRANULAR SOIL AND THE RESULTING EXCAVATION SHOULD BE BACKFILLED WITH COMPACTED LIFTS OF GRANULAR FILL. THE GRANULAR FILL SHALL BE PLACED IN MAXIMUM 12-INCH THICK LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY, AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR), AND TO VISUAL NON-MOVEMENT.
2. DENSE GRADE AGGREGATE SHALL MEET GRADATION REQUIREMENTS FOR PROCESSED GRAVEL FOR SUBBASE AS SPECIFIED IN TABLE M1.03.1-1 OF MASSACHUSETTS DOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, 2024 EDITION. SELECT GRAVEL FILL SHALL BE PLACED IN MAXIMUM 12-INCH THICK LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR), AND TO VISUAL NON-MOVEMENT.
3. FOLLOW ALL MANUFACTURER'S INSTRUCTIONS WHEN INSTALLING GEOGRID. MINIMUM OVERLAP OF 2 FEET REQUIRED AT ROLL ENDS.
4. IN THE EVENT OF FUTURE EXCAVATIONS THAT REQUIRE REPAIR OF GEOGRID, THE DAMAGED GEOGRID SHALL BE REMOVED AND REPLACED WITH NEW GEOGRID. THE NEW GEOGRID SHOULD COVER THE DAMAGED AREA AND EXTEND THREE FEET BEYOND IT IN ALL DIRECTIONS.

9 / 801 HEAVY LIFT SECTION DETAIL
SCALE: NTS



NOTES:
1. REFER TO PLANS FOR LOCATION OF TIMBER BORDER.
2. REINSTALL TIMBER BORDER AS NEEDED TO ACCOMMODATE GRADING.

10 / C802 HEAVY LIFT BOUNDARY TIMBER EDGING DETAIL
SCALE: NOT TO SCALE

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
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www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT
EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:
DETAILS SHEET 2

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-801

Monday, May 5, 2025 2:20:00 PM
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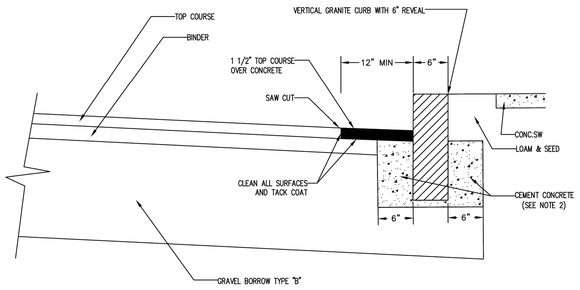
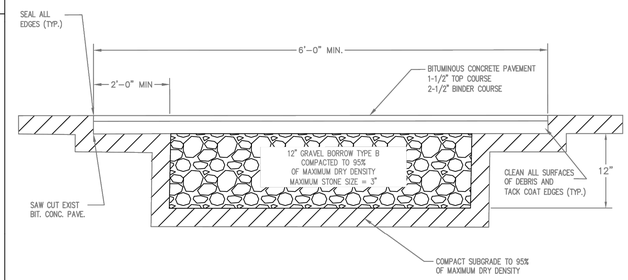
DWG Folder Location: P:\330-000\332-344\-CADD\Dwg\CV02 - Contract 2 Bid Documents\MassCEC_CEC Expansion_Plot C800.dwg

6 — METHOD OF SETTING VERTICAL CURB



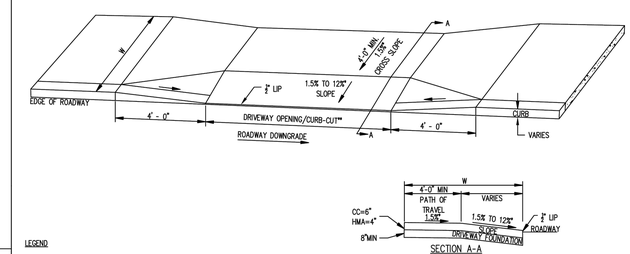
NOTES:
1. SAW CUT NEAT LINE 12" FROM CURB LINE AND REMOVE BINDER, BASE COURSE GRAVEL AND REPLACE WITH CONCRETE
2. ALL CEMENT CONCRETE TO MEET OR EXCEED SPECIFICATIONS OF THIS MANUAL.

5 — HMA PAVEMENT RESTORATION



NOTE:
MUST MATCH INTO EXISTING PAVEMENT IF LARGER THAN 4" MIN.

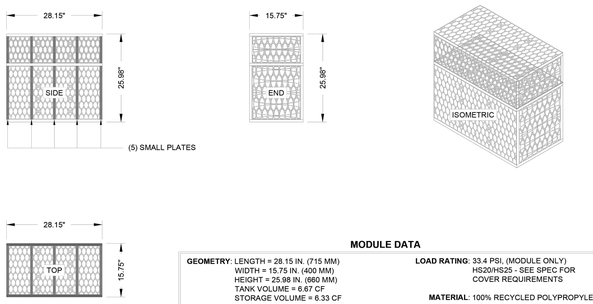
8A — SIDEWALK THROUGH DRIVEWAYS



SECTION A-A

LEGEND
CC =CEMENT CONCRETE
HMA =HOT MIX ASPHALT
* =TOLERANCE FOR CONSTRUCTION ±0.5%
** =16' MAX. FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS REQUIRE TRAFFIC COMMISSION APPROVAL.

NOTE:
1. FOR COMMERCIAL DRIVEWAYS INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS).



MODULE DATA

GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 25.98 IN. (660 MM)
TANK VOLUME = 6.67 CF
STORAGE VOLUME = 6.33 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING: 33.4 PSI, (MODULE ONLY)
HS20/HS25 - SEE SPEC FOR COVER REQUIREMENTS

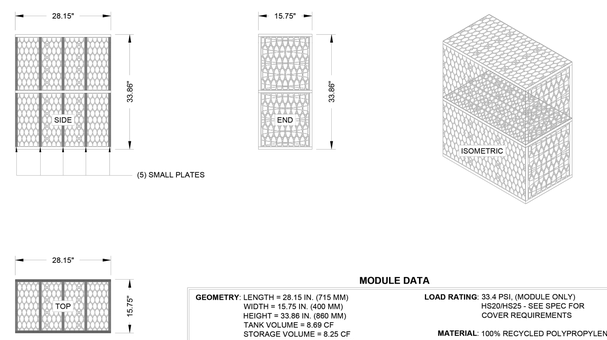
MATERIAL: 100% RECYCLED POLYPROPYLENE

SMALL PLATES REQUIRED: 5/SEGMENT, 10/MODULE

FERGUSON WATERWORKS
FOR ADDITIONAL INFORMATION PLEASE CONTACT:
FERGUSON WATERWORKS, 1-800-448-3636, www.ferguson.com

NOT TO SCALE — 05/16/2022

R-TANK^{HD} SINGLE+MINI MODULE



MODULE DATA

GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 33.86 IN. (860 MM)
TANK VOLUME = 8.69 CF
STORAGE VOLUME = 8.25 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING: 33.4 PSI, (MODULE ONLY)
HS20/HS25 - SEE SPEC FOR COVER REQUIREMENTS

MATERIAL: 100% RECYCLED POLYPROPYLENE

SMALL PLATES REQUIRED: 5/SEGMENT, 10/MODULE

FERGUSON WATERWORKS
FOR ADDITIONAL INFORMATION PLEASE CONTACT:
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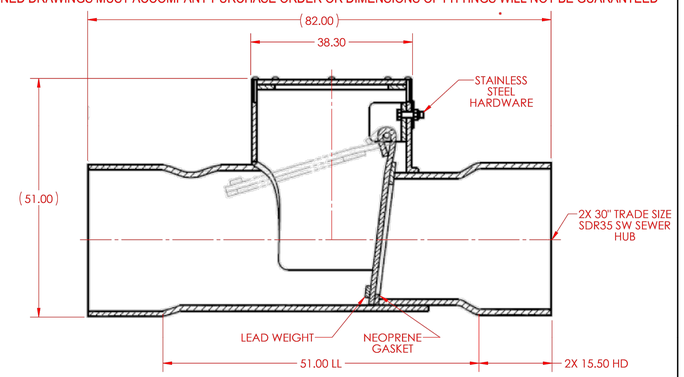
NOT TO SCALE — 05/16/2022

R-TANK^{HD} DOUBLE MODULE

SIGNED DRAWINGS MUST ACCOMPANY PURCHASE ORDER OR DIMENSIONS OF FITTINGS WILL NOT BE GUARANTEED



DISCLAIMER - PLEASE READ

--DIMENSIONS AND APPEARANCE ARE APPROXIMATE AND SUBJECT TO CHANGE WITHOUT NOTICE DUE TO DESIGN OR PRODUCTION MODIFICATIONS
--ANGLE TOLERANCE IS +/- 2 DEGREES.
--ALL OTHER DIMENSIONS ARE TO TOLERANCES OF +/- 1"
--ALL FITTINGS ARE SUBJECT TO NAPCO "STANDARD TERMS AND CONDITIONS"

REF.
79ABWV30
79ABWV--SPEC

NAPCO PIPE & FITTINGS
56400 Mound Road
Shelby Township, MI 48316
U.S.A.
Phone (800) 232-5690 | Fax (586) 781-0888
CSShelby@napcopipe.com | www.napcopipe.com

PRINTED COPIES ARE FOR REFERENCE ONLY
DATE: 5/13/2021 DRAWN BY: GEB
DATE: 5/13/2021 CHECKED BY: RSS

30" IN-LINE BACKWATER VALVE
PVC SDR35 SW SEWER
30"x 30" HxH

P0130.L

PLASTIC TRENDS FITTINGS — CUSTOMER

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PROJECT:
PHASE 3 TERMINAL EXPANSION
SITE 1 - TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP
COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:
DETAILS SHEET 3

ISSUANCE:
IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER
C-802

Monday, May 5, 2025 2:20:06 PM
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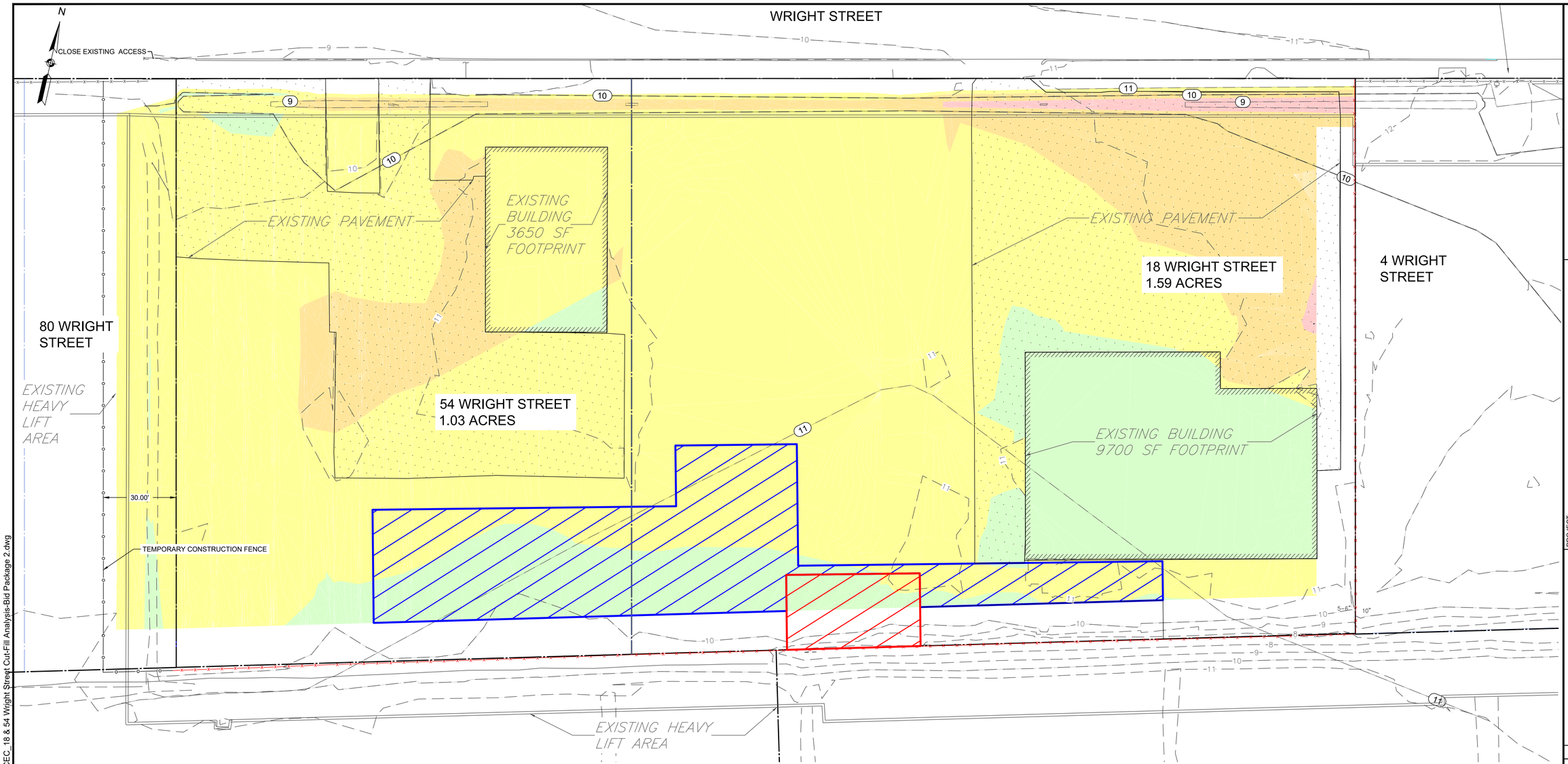

	EXPORT CUT CATEGORIES	AREA (SF)	DEPTH (FT)	VOLUME (CY)	
SOIL REMOVAL (ESTIMATED)	PCBS > 25 PPM	1,700	2.5	157	CUT
	PCBS > 1PPM < 25 PPM	11,000	VARIES	500	CUT
	TOPSOIL REMOVAL	50,300	0.5	940	CUT
	PROPOSED DRAINAGE SYSTEM	4,435	3	500	CUT
	PROPOSED HEAVY LIFT DGA SURFACE	97,300	1.50	2,950	CUT
			TOTAL:	5,100	CUT

* EXCLUDES ASPHALT PAVEMENT REMOVAL (670 CY) AND FOUNDATION/SLAB REMOVAL (500 CY)

LEGEND

- CUT DEPTH OF 1.5' - 2.5'
- CUT DEPTH OF 0.5' - 1.5'
- CUT DEPTH OF 0.5' - FILL DEPTH OF 0.5'
- FILL DEPTH OF 0.5' - 1.5'
- FILL DEPTH OF 1.5' - 2.5'
- FILL DEPTH OF 2.5' - 3.5'
- FILL DEPTH OF 3.5' - 4.5'
- ENVIRONMENTAL SOIL REMOVAL (PCBS > 25 PPM)
- ENVIRONMENTAL SOIL REMOVAL (PCBS > 1 PPM < 25 PPM)
- EXISTING PAVEMENT TO BE REMOVED
- EXISTING STRUCTURE TO BE REMOVED
- (10) PROPOSED CONTOUR
- 10 EXISTING CONTOUR

CALCULATION ASSUMPTIONS

1. EARTHWORK VOLUMES ARE DIRECT COMPARISON OF FINISHED SURFACE GRADE AND EXISTING SURFACE GRADE LESS AGGREGATE VOLUMES (CONTRACTOR SHALL ACCOUNT FOR COMPACTION, MOISTURE/DENSITY, AND SHRINKAGE FACTORS BASED ON SELECTION OF BORROW MATERIAL).
2. ALL EXCAVATION AND AGGREGATE MATERIAL VOLUMES ARE ESTIMATED, CONTRACTOR TO VERIFY AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PROJECT: PHASE 3 TERMINAL EXPANSION TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49369
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:

OVERALL SITE CUT/FILL EXHIBIT

ISSUANCE:

IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER

CF-1

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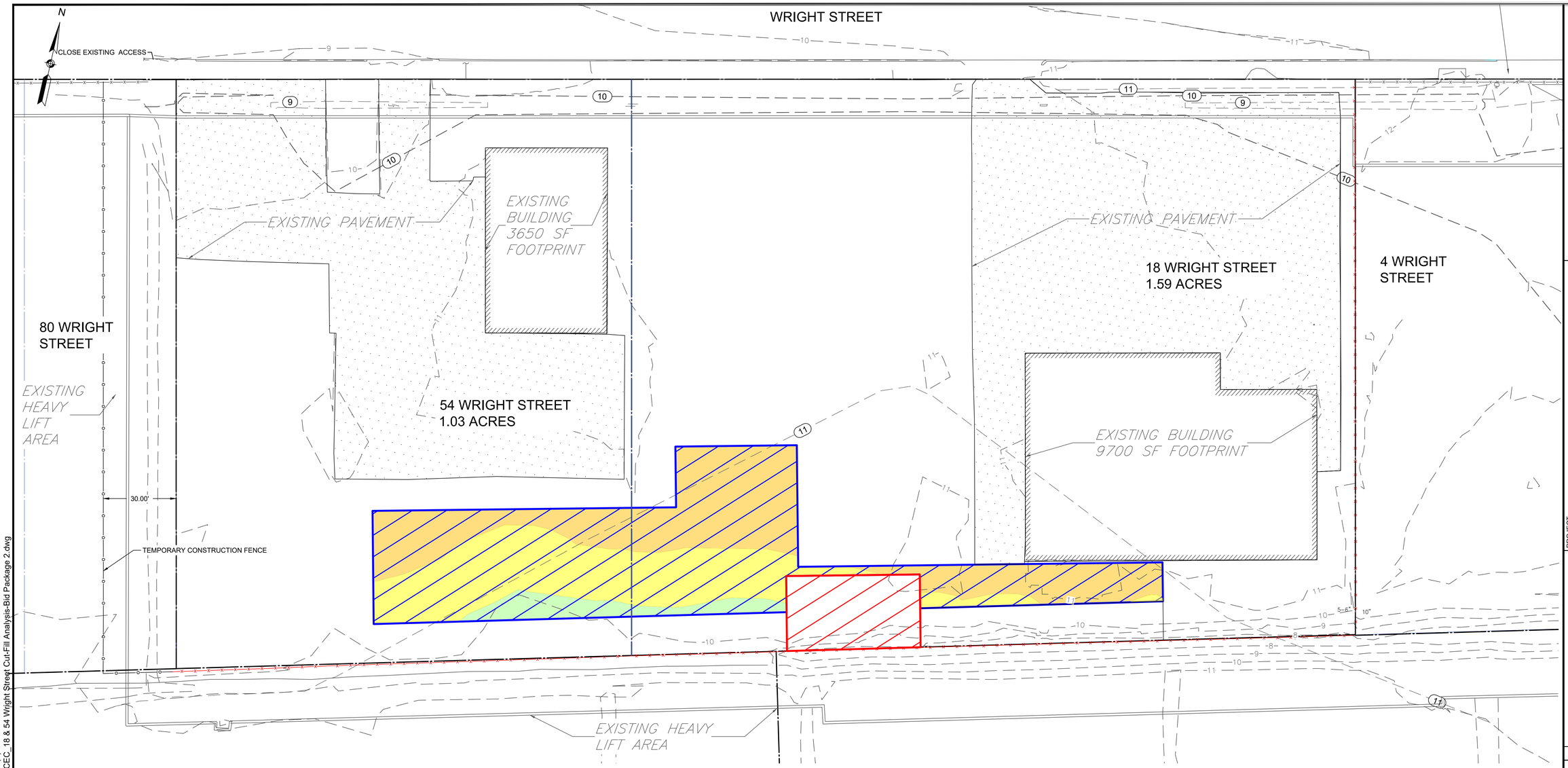

LEGEND

- CUT DEPTH OF 1.0' - 1.5'
- CUT DEPTH OF 0.5' - 1.0'
- CUT DEPTH OF 0.0' - 0.5'

CALCULATION ASSUMPTIONS

1. EARTHWORK VOLUMES ARE DIRECT COMPARISON OF FINISHED SURFACE GRADE AND EXISTING SURFACE GRADE LESS AGGREGATE VOLUMES (CONTRACTOR SHALL ACCOUNT FOR COMPACTION, MOISTURE/DENSITY, AND SHRINKAGE FACTORS BASED ON SELECTION OF BORROW MATERIAL).
2. ALL EXCAVATION AND AGGREGATE MATERIAL VOLUMES ARE ESTIMATED, CONTRACTOR TO VERIFY AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

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Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PROJECT: PHASE 3 TERMINAL EXPANSION TERMINAL HEAVY-LIFT EXPANSION PROJECT

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

NO	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	ITB	05/07/2025
DESIGNED	ITB	05/07/2025
CHECKED	DSK	05/07/2025

PE STAMP

COMMONWEALTH OF MASSACHUSETTS
DAVID S. KELLEY
CIVIL
NO. 49969
REGISTERED PROFESSIONAL ENGINEER
May 7, 2025

SHEET TITLE:

UNSUITABLE MATERIAL CUT/FILL EXHIBIT

ISSUANCE:

IFB DRAWING SET

PROJECT NO: 0024M070.04

SHEET NUMBER

CF-2

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ATTACHMENT 6: SOIL MANAGEMENT PLAN
(CIVIL & ENVIRONMENTAL CONSULTANTS, INC., MARCH 2025)

SOIL MANAGEMENT PLAN

NEW BEDFORD MARINE COMMERCE TERMINAL
MASSACHUSETTS CLEAN ENERGY CENTER
4 WRIGHT STREET
NEW BEDFORD, MASSACHUSETTS

Prepared for:

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CEC Project 332-344

MARCH 2025

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TABLE OF CONTENTS

1.0 INTRODUCTION.....1
1.1 PURPOSE.....1
1.2 ROLES AND RESPONSIBILITIES.....1

2.0 SITE AND SURROUNDING AREA DESCRIPTION.....3
2.1 SITE HISTORY.....5
2.2 RELEASE HISTORY.....6
2.3 SUBSURFACE CONDITIONS.....10
2.4 TYPE OF HAZARD ANTICIPATED.....11

3.0 SOIL MANAGEMENT.....12
3.1 OVERVIEW.....12
3.2 EXCAVATED MATERIAL CATEGORIES.....13
3.3 TEMPORARY STOCKPILING OF SOIL.....13
3.4 FIELD SCREENING.....14
3.5 SOIL CHARACTERIZATION.....15

4.0 DUST, ODOR, VAPOR CONTROLS.....16

5.0 DECONTAMINATION.....17

FIGURES

Figure 1 – Site Locus Map
Figure 2 – NBMCT Parcel Overview Map
Figure 3 – NBMCT Terminal Expansion 'Site' Boundary Map

EXHIBITS

EXHIBIT A – Adequately Regulated Determination
EXHIBIT B – Figures and Tables by CEC and Others
EXHIBIT C – Activity and Use Limitations
EXHIBIT D – Boring Logs and Test Pits

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1.0 INTRODUCTION

Civil & Environmental Consultants, Inc. (CEC) has prepared this Soil Management Plan (SMP) to address earthwork activities related to the redevelopment of the properties associated with the New Bedford Marine Commerce Terminal (NBMCT) in New Bedford, Massachusetts (the Property). A Locus Map and a Site Overview map, and AUL Overview map are provided as Figures 1 through 3, respectively. This Soil Management Plan was prepared on behalf of the Massachusetts Clean Energy Technology Center of Boston, Massachusetts (MassCEC) and is intended to broadly apply to construction activities that are conducted by or on behalf of MassCEC on the Property.

1.1 PURPOSE

The purpose of this SMP is to present the planned procedures for the handling, managing, and relocation of soil during earthwork activities associated with the construction project. The specific objectives of the SMP are to:

- Describe general Site-wide excavation/earthwork activities and activities where the excavation extends into potentially OHM-impacted soils and/or fill material;
- Describe the on-Site re-use of soil/fill during the earthwork;
- Describe general site controls and soil erosion mitigation procedures.
- Describe the segregation of soil and stockpiling procedures;
- Describe the procedures for off-Site transport and disposal, reuse, or recycling of soils; and
- Describe the controls for dust, odor, and vapor mitigation and monitoring.

This SMP is applicable to two distinct types of soil; 1) General fill (dense grade aggregate, granular fill, etc..) that has been imported onto the Disposal Site(s) are part of the protective cap and/or as an improved surface and 2) Urban fill and native soils which may include ash, peat, sand, debris and may contain contaminants such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), or metals.

1.2 ROLES AND RESPONSIBILITIES

MassCEC is responsible for implementation of projects at the Property conducted under this SMP. the earthwork will be performed by a qualified contractor (the Contractor) and environmental services will be provided by a Licensed Site Professional (LSP). The following identifies the typical roles and responsibilities of each organization involved in the proposed earthwork. However, some responsibilities may vary based upon the specific project:

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- The Contractor will typically perform all earthwork activities, including excavation; soil management; off-Site transportation and appropriate disposal, re-use, or recycling of any materials not to be re-used on-Site; and, import/placement of fill/backfill required to achieve necessary grades for the project.

- The Contractor will typically be prepared and responsible for enacting mitigating measures of dust, odor, and vapor suppression as appropriate and in accordance with section 4.0 of this SMP.

- The LSP will prepare a Health and Safety Plan (HASP) for its employees, as required by 310 CMR 40.0871(e). The Contractor is typically responsible for their own employee's health and safety and for conformance with Occupational Health and Safety Administration (OSHA) standards and regulations.

- The LSP's firm will typically provide environmental consulting services including LSP services, as necessary, related to the earthwork activities.

- MassCEC or the Contractor will inform the LSP of any new (currently undetected), or significantly different circumstances relating to soil conditions and/or potential contamination discovered during the performance of the work.

With the existence of known reportable conditions within Disposal Site Boundaries and as defined in the Massachusetts Contingency Plan, 310 CMR 40.0000 (the MCP), handling of the soils located on the Property requires best management practices (BMPs) to ensure that a condition of significant risk is not created as a result of the earthwork activities. Reportable conditions existing on the Property include OHM-impacted materials at the expansion parcels and OHM-impacted materials underlying the existing imported protective cap within the NBMCT.

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2.0 SITE AND SURROUNDING AREA DESCRIPTION

The NBMCT is situated within an industrial area along the coast of New Bedford, Massachusetts. The NBMCT is comprised of a 30-acre facility between JFK Memorial Highway and the New Bedford Harbor and ~8 acres of recently acquired commercial property that is proposed to be a redeveloped as part of an expanded facility (expansion Sites); The 30-acre facility is predominately structurally undeveloped but includes an approximately 27,500 square foot single story building on 4 Wright Street. The existing main terminal portion of the NBMCT is subject to multiple Activity and Use Limitations (AULs. The Property includes the following sites with the associated Release Tracking Numbers (RTNs) listed if applicable:

Shuster Property (former RIST, LLC)
Address: Front Street
Parcel ID/Lot Size: 31- 288 / ~7.74 acres
Current Owner: MassCEC
RTN: 4-23736
Compliance Status/Date: Tier1D / 12/27/2012

Shuster "Jog"
Address: South of Wright Street
Parcel ID/Lot Size: 31- 289 / ~0.39 acres
Current Owner: MassCEC
It is unclear if this is part of any mapped Disposal Site, but CEC understands it will be covered by a pending Permanent Solution Statement (PSS) and AUL.

New Bedford Radio, Inc., (Hall Comm)
Address: South Front Street Lot 1 & 2
Parcel ID / Lot Size: 31-234 (~4.17 acres) / 31- 291 (~0.23 acres)
Current Owners: MassCEC / NB Radio, Inc.
RTN: 4-25350
Compliance Status/Date: Tier1D / 10/08/2015

(Former) DMF Parcel 1
Address: North of 16 Blackmer Street
Parcel ID/Lot Size: 25A-53 / ~1.2 acres
Current Owner: City of New Bedford
RTN: 4-24296
Compliance Status/Date: Tier1D / 12/03/2013

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DMF Parcel 2
Address: 16 Blackmer Street
Parcel ID/Lot Size: 25A-49 / ~2.2 acres
Current Owner: City of New Bedford
RTN: 4-15490
Compliance Status/Date: RAO (i.e. a Permanent Solution was achieved) / 3/27/2009

New Bedford Redevelopment Authority
Address: Southeast Blackmer Street
Parcel ID/Lot Size: 25A- 48 / ~9.23 acres
Current Owner: City of New Bedford
It is unclear if this is part of any mapped Disposal Site, but CEC understands it will be covered by a pending Permanent Solution Statement (PSS) and AUL.

Former Dartmouth Finishing Site
Address: 45 Cove Street
Parcel ID/Lot Size: 21- 45 / ~4.3 acres
Current Owner: City of New Bedford
RTN: 4-23616
Compliance Status/Date: Tier Classified / 10/03/2012

Expansion Site 1
Addresses: 54 Wright Street & 18 Wright Street
Parcel ID/Lot Size: 31-265 & 31-249 / ~2.1 acres
Current Owner: MassCEC
RTN 4-50261
Compliance Status/Date: 120-day notification / 5/24/2024 & 1/17/2025

Expansion Site 2
Addresses: 350 South Front Street /0 SS MacArthur Boulevard & 360-382 South Front Street
Parcel ID/Lot Size: 31-218 & 31-237 & 31-144 / ~2.15 acres
Current Owner: MassCEC
RTN 4-50261
Compliance Status/Date: 120-day notification / 5/24/2024 & 1/17/2025

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Expansion Site 3
Addresses: 4 Wright Street /portion of R ES South Front Street
Parcel ID/Lot Size: 31- 263 & 31-288 / ~2.2 acres
Current Owner: MassCEC
RTN 4-50261
Compliance Status/Date: 120-day notification / 5/24/2024 & 1/17/2025

The Property structures include the following:

Property	Approximate Building Size (square feet)	Structure
4 Wright Street	27,500	Single-story concrete building
18 Wright Street	10,000	Single-story metal building
54 Wright Street	3,750	Commercial warehouse
350 South Front Street & 0 SS Macarthur Boulevard	6,400	Single-story metal building
360-382 South Front Street	21,500	Single-story metal building

Currently, greater than 21-acres of the NBMCT have been engineered and constructed to accommodate a heavy-lift capacity and consists of a surficial dense grade aggregate pavement. Adjacent properties primarily include seafood and seafood related commercial properties. Additionally, there are abutting commercial retailers to the 45 Cove Street property.

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2.1 SITE HISTORY

Historically, situated within the footprint of Shuster and DMF parcels was the former Potomska Mills complex which operated from the late 1800s until it was demolished in 1936. Since the early 1940s, these parcels have been vacant of industrial activities and remain structurally undeveloped lots.

The Former Dartmouth Finishing Site was the location of a fabric finishing and dyeing business that discontinued operations after its bankruptcy in 1994. Prior to the Dartmouth Finishing companies' occupancy included The Hathaway Manufacturing Company (textiles) in the 1950s; and Dartmouth Mills (textiles) in the early 1900s. The property was structurally improved upon with a 120,000 square foot single-story building that was demolished between 1999 and 2001. Also on the property were two underground storage tanks (USTs). The USTs are associated with an RTN (4-23616) and were removed in 2004 as part of remedial actions.

54 Wright Street (Site 1) was historically occupied by a boat builder and for the storage of fisherman's lockers between 1888 and 1950. The current building at the property was erected around 1978 for use as a shop for auto repairs and marine electronics.

18 Wright Street (Site 1) was undeveloped prior to 1950, then historically used for the storage of fisherman's lockers as of 1950. The current building at the property was erected around 1984 for use as a fish processing plant.

350 South Front Street (Site 2) was historically occupied by Potomska Mill beginning in 1888 through 1936 when it was demolished. A building was originally erected at the property around 1950 for use as a fish processing facility, followed by the re-development of the property in 1996 with the existing building for use by fish processing companies.

360-382 South Front Street (Site 2) was historically occupied by Potomska Mill beginning in 1888 through 1936 when it was demolished. The property remained undeveloped until approximately 2000 when the current building was erected for use as a fish processing facility.

Sites 1 through 3 and the surrounding area was located near or in the Acushnet River until it was filled in the 1960s and 1970s. The United States Environmental Protection Agency (USEPA) has been and continues to assess and remediate the Acushnet Estuary Superfund Site which encompasses the river and estuaries is impacted with PCBs and metals. The source of the fill material used to create the land at the Subject Property and surrounding area is unknown, nor if the sediment in the river was removed prior to emplacing the fill material.

2.2 RELEASE HISTORY

Shuster Property (former RIST, LLC)
RTN: 4-23736

In August 2011, a subsurface and groundwater investigation was conducted that included soil borings and monitoring well installation, test pit excavation, and soil and groundwater sampling. Contaminants were detected in soils above reportable concentrations (RCS-2) identified in the MCP (310 CMR 40.1600) that included:

- PCBs;
- total lead;
- total petroleum hydrocarbons (TPH);
- extractable petroleum hydrocarbons (EPH) fractions;
- polycyclic aromatic hydrocarbons (PAH); and
- volatile petroleum hydrocarbon (VPH) fractions and several target volatile organic compounds (VOC).

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Naphthalene was also detected in groundwater above the applicable MassDEP reportable concentration (RCGW-2).

An initial RAM Plan was submitted to MassDEP on July 3, 2013 that outlined RAM activities associated with the improvements to the main terminal on this parcel. Construction activities occurring under the RAM Plan included soils management and excavation. Excavated OHM-impacted soils were removed to off-site facilities if PCB concentrations were greater than 50 parts per million (ppm) and/or if EPH/TPH concentrations were greater than 10,000 ppm. A protective cap of clean dense grade aggregate was installed to a depth of three feet as an acceptable alternative to an asphalt cap. As discussed above, the status of this Disposal Site is currently on record with MassDEP as a Tier 1D, but it is CEC's understanding that the Disposal Site is considered adequately regulated (Exhibit A).

New Bedford Radio, Inc., (Hall Comm)
RTN: 4-25350

Extensive surficial soil sampling was completed on this parcel and involved over 1,000 surficial soil samples. Additionally, in January 2014 eight test pits were excavated and six soil borings were advanced. Test pits were advanced to a depth of 6 feet below grade surface (bgs) and soil borings were advanced to 11 feet bgs.

A release was reported to MassDEP on October 1, 2014, due to exceedances of MCP RCS-2 values for the following contaminants:

- PCB;
- lead;
- naphthalene; and
- cadmium.

A RAM Plan was filed on October 20, 2014, related to the New Bedford Marine Commerce Terminal (NBMCT) construction activities that required soils management within the Disposal Site for off-site disposal and onsite reuse. PCB-impacted soils with concentrations greater than 50 ppm were sent to off-site facilities for disposal. A protective cap of clean dense grade aggregate was installed to a depth of three feet as an acceptable alternative to an asphalt cap

A RAM Status Report was filed with MassDEP on May 17, 2016, and an AUL was filed for this Disposal Site on September 16, 2019. The AUL applies to both "Lot 1" and "Lot 2" of Map 31 parcels 234 and 291. The AUL conditions for each of these parcels vary. As discussed above, the status of this Disposal Site is currently on record with MassDEP as a Tier 1D, but it is CEC's understanding that the Disposal Site is considered adequately regulated (Exhibit A).

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DMF Parcel 1
RTN: 4-24296

A release was reported to MassDEP in November 2012 after Phase I investigations performed for the NBMCT identified PCB concentrations in soils greater than applicable RCS-2 standard.

The initial RAM Plan submitted to MassDEP on July 3, 2013, outlined RAM activities for the Shuster Property and three abutting RTNs, including DMF Parcels 1 and 2 and the Former Dartmouth Finishing Site. Construction activities occurring under the RAM plan included soils management and soils excavation. Excavated OHM-impacted soils were removed to offsite facilities if PCB concentrations were greater than 50 ppm and/or if EPH/TPH concentrations were greater than 10,000 ppm. A protective cap of clean dense grade aggregate was installed to a depth of three feet as an acceptable alternative to an asphalt cap. As discussed above, the status of this Disposal Site is currently on record with MassDEP as a Tier 1D, but it is CEC's understanding that the Disposal Site is considered adequately regulated (Exhibit A).

DMF Parcel 2
RTN: 4-15490

Phase I investigations in January 2000, were limited in scope to the perceived high-risk areas and the Disposal Site assessment included several test pits, discrete soil sampling locations, and installation and sampling of one groundwater monitoring well. There were observed exceedances within soils of MCP RCS-1/RCS-2 criteria for PAHs and lead.

Phase II investigations in May 2006 were performed to verify and delineate the presence of contaminants in soil and groundwater identified in the Phase I investigations. Soil samples were assessed from three borings and six test pits. Borings were advanced to a depth of 2.5 feet bgs and the test pits were sampled in intervals at 0-3 feet bgs and 3–6 feet bgs. Consistent with the results of the Phase I investigations, exceedances of the MCP RCS-1/RCS-2 criteria for PAHs and lead were observed in soil samples collected across the Disposal Site as part of the Phase II investigation.

In 2009, a Method 3 Risk Characterization was completed and a Class A-3 Response Action Outcome (RAO) Statement was submitted. The RAO concluded that an asphalt cap and an AUL would be necessary to ensure soil exposure pathways remained incomplete. The AUL was filed February 3, 2010.

RAM activities performed in 2013 included the removal of OHM-impacted soils and the installation of an acceptable protective cap in areas where the existing asphalt cap would be replaced. Three feet of dense grade aggregate was installed as an acceptable and protective

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alternative to the asphalt cap. A SMP was prepared as part of the prior RAM plan. This current SMP is intended as an alternative SMP that can be utilized on any portion of the Property.

A Permanent Solution has been achieved for this Disposal Site.

Former Dartmouth Finishing Site
RTN: 4-23616

A subsurface investigation in August 2004 included the removal of two 10,000-gallon Underground Storage Tanks (USTs) and approximately 80 cubic yards of petroleum-impacted soil. Petroleum odors and staining were reportedly confined to the northeast portion of each tank footprint.

In October 2011, Phase II investigations identified contaminant concentrations both in soil and groundwater that were greater than the applicable RCS-1/RCGW-2 concentrations. Contaminant concentrations that exceeded the RCS-1 standard included:

- EPH fractions;
- VPH fractions;
- PAHs;
- barium, cadmium, total chromium, and lead.

Dissolved silver was also detected in four monitoring wells greater than the RCGW-2 standard.

A Tier Classification was submitted on October 3, 2012 which classified the site as Tier II.

The initial RAM Plan submitted to MassDEP on July 3, 2013 outlined RAM activities for the Shuster Property and three abutting RTNs including the Former Dartmouth Finishing Site. Construction activities occurring under the RAM Plan included soils management and soils excavation. Excavated OHM-impacted soils were removed (76 tons) to offsite facilities if PCB concentrations were greater than 50 ppm and/or if EPH/TPH concentrations were greater than 10,000 ppm. A protective cap of clean dense grade aggregate (approximately one foot thick) and imported dredge materials (approximately two feet thick) were installed to a depth of three feet as an acceptable alternative to an asphalt cap.

A RAM Completion Report was filed in November of 2015 and an AUL was recorded on April 14, 2016 for this Disposal Site.

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Expansion Sites 1, 2, & 3
RTN: 4-50261

Beginning in November 2023, an initial subsurface investigation was conducted at these Sites after the completion of multiple ASTM Phase I Environmental Site Assessments (ESAs). The subsurface investigation included soil borings across all the Sites with hundreds of samples submitted for various parameters. A release was reported to MassDEP in May 2024 and again in January 2025 for contaminants that were detected in soils above reportable concentrations (RCS-1 and/or RCS-2 depending upon location) identified in the MCP (310 CMR 40.1600) which included:

- PCBs;
- total lead;
- semi-volatile organic compounds (SVOCs);
- volatile petroleum hydrocarbon (VPH) fractions; and
- extractable petroleum hydrocarbons (EPH) fractions.

Additionally, concentrations of PCBs were detected on the Property triggering the Toxic Substances Control Act (TSCA), the regulations for which are listed in Title 40 of the Code of Federal Regulations (CFR) Part 761 (40 CFR Part 761).

An initial RAM plan will be submitted in early 2025, concurrent with this SMP, and will outline RAM activities associated with the expansion of the main terminal at these Sites. The construction will occur in phases between 2025 and 2027, beginning with Site 1. Construction activities occurring under this RAM Plan will include site preparation and demolition, fencing installation, water and electric utility installation, drainage utility installation, installation of foundations for lighting, and any associated excavation of subgrade soils within the Property. Excavated OHM-impacted soils will be removed to off-site facilities if PCB concentrations are greater than 25 milligrams per kilogram (mg/kg). As part of the NBMCT Terminal Expansion, a heavy lift "cap" or surface, similar to the current engineered barrier, is proposed for portions of the Property. The proposed "cap" will consist of two layers of geogrid and select gravel fill, totaling a thickness of approximately 18".

2.3 SUBSURFACE CONDITIONS

Based on historical subsurface investigations, generally the top 6 feet of subsurface (prior to capping) consisted of fine to medium sandy fill. Ash, brick, and other debris defined by the MassDEP as "urban fill" have been observed throughout the existing NBMCT at different intervals in both test pits and borings (Exhibit D). A layer of organic soils or peat, likely the native ground surface, has been observed at approximately 3-4 feet bgs, underlying imported fill materials. Post-excavation activities across the existing NBMCT have involved importing dense grade aggregate

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and granular fill materials to create a protective cap that limits exposure to potentially OHM-impacted soils and provides an engineered surface for heavy lifting. The thickness of the cap is approximately three-feet across much of the NBMCT. The average groundwater elevation throughout the NBMCT is approximately 5-6 feet bgs, with groundwater elevations ranging from 7-8 feet bgs to as shallow as 3.5 feet bgs.

At the expansion Sites, and based on subsurface investigations completed at these Sites, the top 6 feet of subsurface soils consisted of fine to medium sandy fill. Ash, brick, and other debris defined by the MassDEP as "urban fill" have been observed throughout the parcels at different intervals in the soil borings. A layer of organic soils or peat, likely the native ground surface, has been observed at approximately 8-12 feet bgs, underlying the fill materials, primarily at Site 1. Groundwater was not investigated at this property; however, groundwater elevations are estimated to be similar to the existing NBMCT, ranging from 7-8 feet bgs to as shallow as 3.5 feet bgs.

2.4 TYPE OF HAZARD ANTICIPATED

Site workers could potentially be exposed to soils contaminated with volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), lead, and other metals. The primary hazard will be exposure to soil via inhalation, direct/dermal contact, or incidental ingestion of dust generated during soil management activities.

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3.0 SOIL MANAGEMENT

3.1 OVERVIEW

Impacted soil and fill materials are present at the Property within the boundaries of various Disposal Sites (see Exhibit B). Individuals engaged in activities at the Property may be exposed to contaminants through incidental ingestion, dermal contact, or inhalation of soil particles if proper precautions are not taken. Due to the potential to encounter waste materials, CEC recommends the appropriate level of training per OSHA and industry standards.

Regardless of the soil type, the following procedures will be performed when soils are disturbed to minimize or eliminate the potential of exposure.

- During soil disturbance activity, dust suppression (i.e. watering, etc.) techniques must be employed as necessary.

- In the event that an unexpected observation or situation arises during work (i.e. encounter buried drums, metals/construction debris, contaminated soil, etc.), earthwork activities will immediately stop. Workers will not attempt to handle the situation themselves but will contact the appropriate supervisor/personnel for further direction.

- Soil that is exposed or excavated is anticipated to be re-used within the Disposal Site Boundary of origin.

- If soil is encountered that is not structurally suitable for reuse on the Property, it should be characterized through sampling and laboratory analysis to determine the appropriate management of the soil. Soil should not transfer between Disposal Site Boundaries or removed from the Property unless, based on additional characterization, an LSP deems it suitable for a specific on-site reuse or off-Site reuse, recycling or disposal at an appropriately permitted location.

- Significant volumes of groundwater are not expected to enter excavations and/or require management. The management of groundwater is outside of the scope of this document. If dewatering is required, a groundwater management plan should be developed.

- All regrading at the property shall be reviewed to ensure that it maintains the adequate thickness of the protective cap.

- All work shall conform with the attached AUL(s) (Exhibit C).

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3.2 EXCAVATED MATERIAL CATEGORIES

CEC has developed the following categories to distinguish the soils to be managed under this SMP.

Category A (General fill suitable for reuse): The soil/fill material that is located on the Property that is assumed to be *suitable* for reuse on the Property as part of the construction project. An example of this type of material would be dense grade aggregate originating from a depth of less than 3 feet below grade.

Category B (General fill not suitable for reuse): The soil/fill material that is located on the Property outside of a Disposal Site Boundary and that is assumed *unsuitable* for reuse on the Property as part of the construction project. This is typically soil that is unsuitable for reuse from a geotechnical perspective, but this soil may also contain contaminants and should be assumed to contain contaminants until laboratory testing proves otherwise. An example of this type of material would be organic soils from portion of 80 Wright Street outside of any Disposal Site area.

Category C: OHM-impacted soil that is located within a Disposal Site Boundary on the Property that has been analyzed and determined to be *unsuitable* for reuse on the Property as part of the construction project. This soil may be unsuitable for reuse either due to geotechnical characteristics or concentrations of OHM-related contaminants. This soil will require management under a RAM Plan.

3.3 TEMPORARY STOCKPILING OF SOIL

The Contractor should perform the excavation and soil management activities in a manner that minimizes the need to stockpile excavated soil on the Property, to the extent feasible.

In general, Category B and C excavated materials stockpiles should not exceed 500 cubic yards, shall be located at least 100 feet from any wetlands or other tributaries, and shall be surrounded by appropriate siltation controls to prevent potential run-off. Larger stockpiles may be approved after consultation with the LSP-of-record. The stockpile shall not be placed on or directly upgradient of any drainage catch-basins, manholes, drainage swales, or other potential discharge pathways. The siltation control measures shall be secured at all times and shall be adequately monitored until the soil is removed from the Site and transported to at an approved facility. Category B and C soil shall be stockpiled on a minimum of two (2) layers of 6-mil polyethylene sheeting and covered with a minimum of one (1) layer of 6-mil polyethylene sheeting at the end of the workday. No regulated soils will be stockpiled on-Site for greater than 120 days without prior approval from the LSP-of -Record.

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The following are the stockpiling procedures for each soil Category:

- Category A: This category broadly includes previously imported fill materials comprising the installed protective cap. This material should not be removed from the Property without consultation with an LSP. Stockpiles of this material may exceed 500 cubic yards and no polyethene sheeting is required to encapsulate the stockpile.

- Category B: This soil is not regulated under the MCP so long as it remains on-site but is intended for potential off-site disposal/reuse due to some other factor. This soil requires proper management to ensure that a reportable condition, as defined in the MCP, is not created. This soil may include urban fill, ash, peat, and sand. Any of this soil that is stockpiled shall be covered with 6-mil poly at the end of each day and remain covered until it has been properly characterized for disposal parameters. This material should not be removed from the Property without consultation with an LSP.

- Category C: This soil is regulated under the MCP and requires proper management. This is the soil that originates within a Disposal Site boundary and may be subject an AUL. This soil may not be reused at another Disposal Site on the Property without characterization and not within three feet of a final grade. Any of this soil that is stockpiled shall be covered with 6-mil poly at the end of each day and remain covered until it has been properly characterized for disposal parameters. This material should not be removed from the Property or reused without consultation with an LSP.

3.4 Field Screening

Soil being excavated from within a Disposal Site Boundary on the Property should be screened utilizing a photoionization detector (PID) for total organic vapors (TOVs). The PID should be calibrated to an isobutylene standard, and the frequency of screening should be no less than 1 sample for every 50 cubic yards of soil. Soil exhibiting PID readings of greater than or equal to 5 parts per million by volume (ppmv), and/or exhibiting visual or olfactory signs of contamination (staining/odors), should be segregated and should not be reused on the Property.

Soils will also be visually screened for other evidence of contamination (staining, sheens, free product).

In the event that excavated or sampled material has visible stains or unnatural odor, or if potentially contaminated and/or hazardous material is encountered, work will be stopped until the LSP and/or LSP representative has been notified.

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3.5 SOIL CHARACTERIZATION

Should it be determined that any soils from the Property (regardless of disposal category) are to be removed from the Property, the soil must be characterized for disposal by collecting representative soil samples. The soil will be sampled and analyzed under the direction of the LSP. The sampling procedures and analytical parameters will be based upon the requirements of the facility to which it will be transported to for reuse, recycling, treatment and/or disposed. The number of samples and analyses will depend on the facility. The soil samples will be placed in the appropriate glassware with preservative (if applicable) and then submitted to a laboratory, on ice and under a chain of custody for analyses. The selected facility shall be contacted prior to characterizing the soil to ensure the adequate number of samples are collected and the appropriate analyses are performed.

Soil characterization samples may be collected and screened from excavated stockpiles or in-situ. Sample depth intervals and location(s) will be included in the field notes. A minimum of five representative grab samples may be composited for appropriate analyses. However, volatile organic compounds (VOCs) will be grab samples and taken from biased-high soils exhibited from field screening results using a PID. Stockpile characterization samples will be typically collected for at least every 500 cubic yards of excavated materials designated for off-site disposal or Category B soil designated for reuse. However, the sampling frequency may be adjusted by the LSP, based upon professional judgement, regulatory guidance, and the requirements of the disposal facility.

Soil characterization methodology will require the samples will be a minimum 5-point composite and the top 12-inches of the sampling location will be removed prior to sampling. Waste characterization samples may be analyzed for total petroleum hydrocarbons (TPH), VOCs, semi-volatile VOCs (SVOCs), polycyclic aromatic hydrocarbons (PAHs), conductivity, flashpoint, pH, reactive sulfide, reactive cyanide, polychlorinated biphenyls (PCBs), and/or Resource Conservation and Recovery Act (RCRA) 8 metals with/without toxicity characteristic leaching procedure (TCLP) analysis to accommodate analytical disposal criteria of the utilized offsite facilities.

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4.0 DUST, ODOR, VAPOR CONTROLS

Significant odors, vapors, and/or dust are not anticipated. The Contractor will be responsible for evaluating conditions at the Property during soil management activity. The LSP may not be continuously present during soil management, but the LSP and/or his designee will conduct periodic inspections throughout the duration of the work.

During the construction activities, evaluation will be performed to identify conditions where dust becomes visible at the perimeter of the area of work. Throughout the duration of the work, dust control shall be performed as necessary to ensure that no visible or nuisance dust is allowed to migrate from the work area, areas of exposed soils, and/or stockpiles. Dust monitoring will consist of visual monitoring on an on-going basis. If dust is generated by the excavation activities and dust control is warranted, it will consist of spraying water, wetting the soils and/or the excavator bucket, or other feasible means. Spraying shall not introduce excessive moisture to the soils or produce runoff. Water supplied will be free of any contaminants. For excavation of soils with known concentrations of PCBs, the LSP should be consulted to determine if quantitative dust monitoring is required.

If these mitigating actions are inadequate to control airborne particulates, alternative control measure will be evaluated by the LSP and/or LSP's representative for implementation across the Property.

DRAFT

5.0 DECONTAMINATION

Prior to exiting the Property, vehicles and equipment will be brushed of visible soils and tires will be adequately cleaned to prevent tracking materials offsite, where appropriate.

Additional decontamination efforts at the Property may be deemed necessary by the LSP and/or LSP representative if OHM-impacted soils are exposed during excavation activities. Decontamination procedures will vary based upon the location and nature of the activity and must comply with state and federal regulations.

DRAFT

FIGURES

DRAFT

Civil & Environmental Consultants, Inc.

31 Bellows Road
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Ph: 774.501.2176

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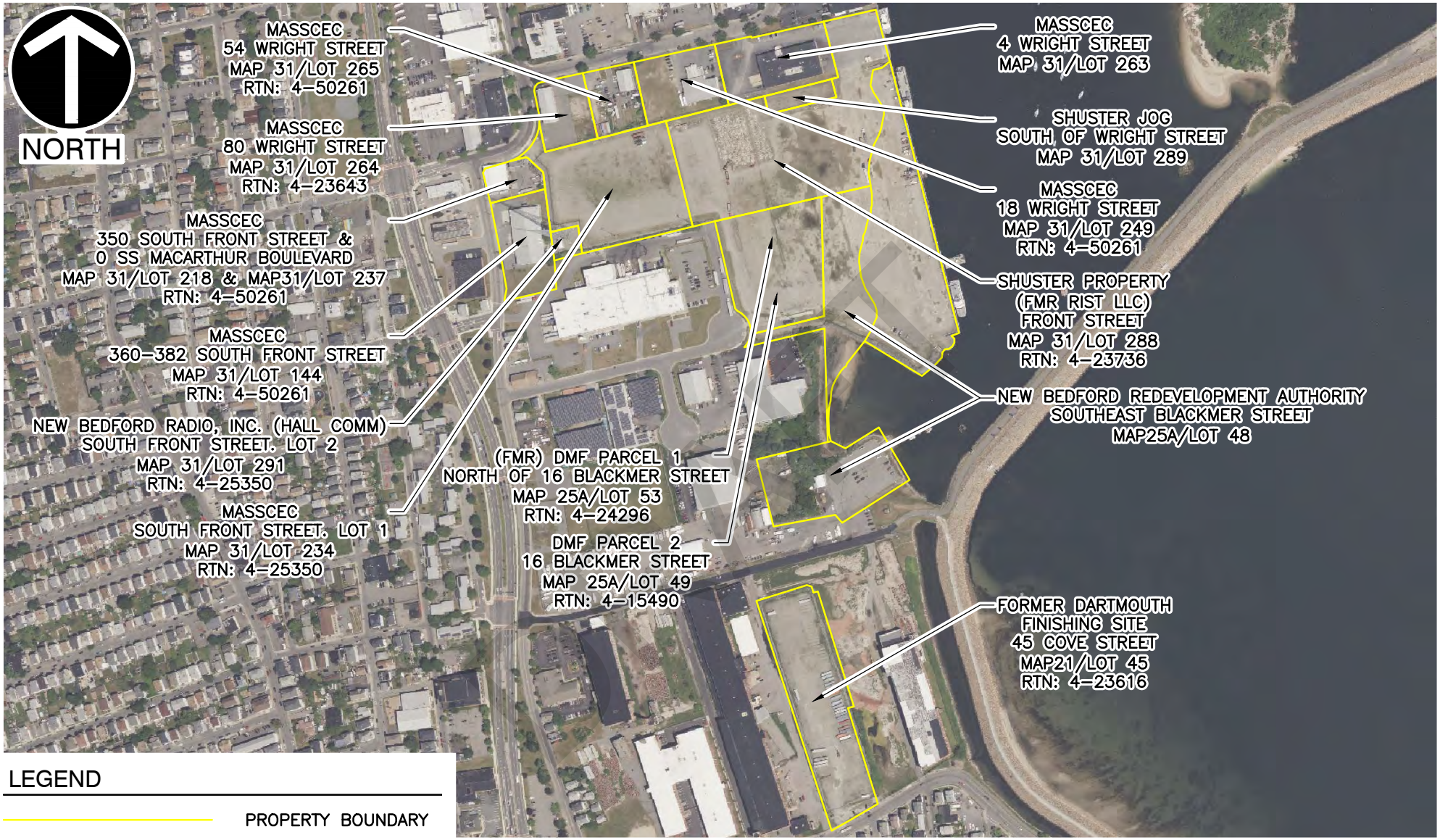
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE LOCUS MAP

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	FIGURE NO.:	1
DATE:	MARCH 2025	DWG SCALE:	1"=4,000'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Site Locus.dwg{FIGURE 1} LS:(3/6/2025 - abucco) - LP: 3/19/2025 4:06 PM



LEGEND

PROPERTY BOUNDARY

SCALE IN FEET

0 500 1,000

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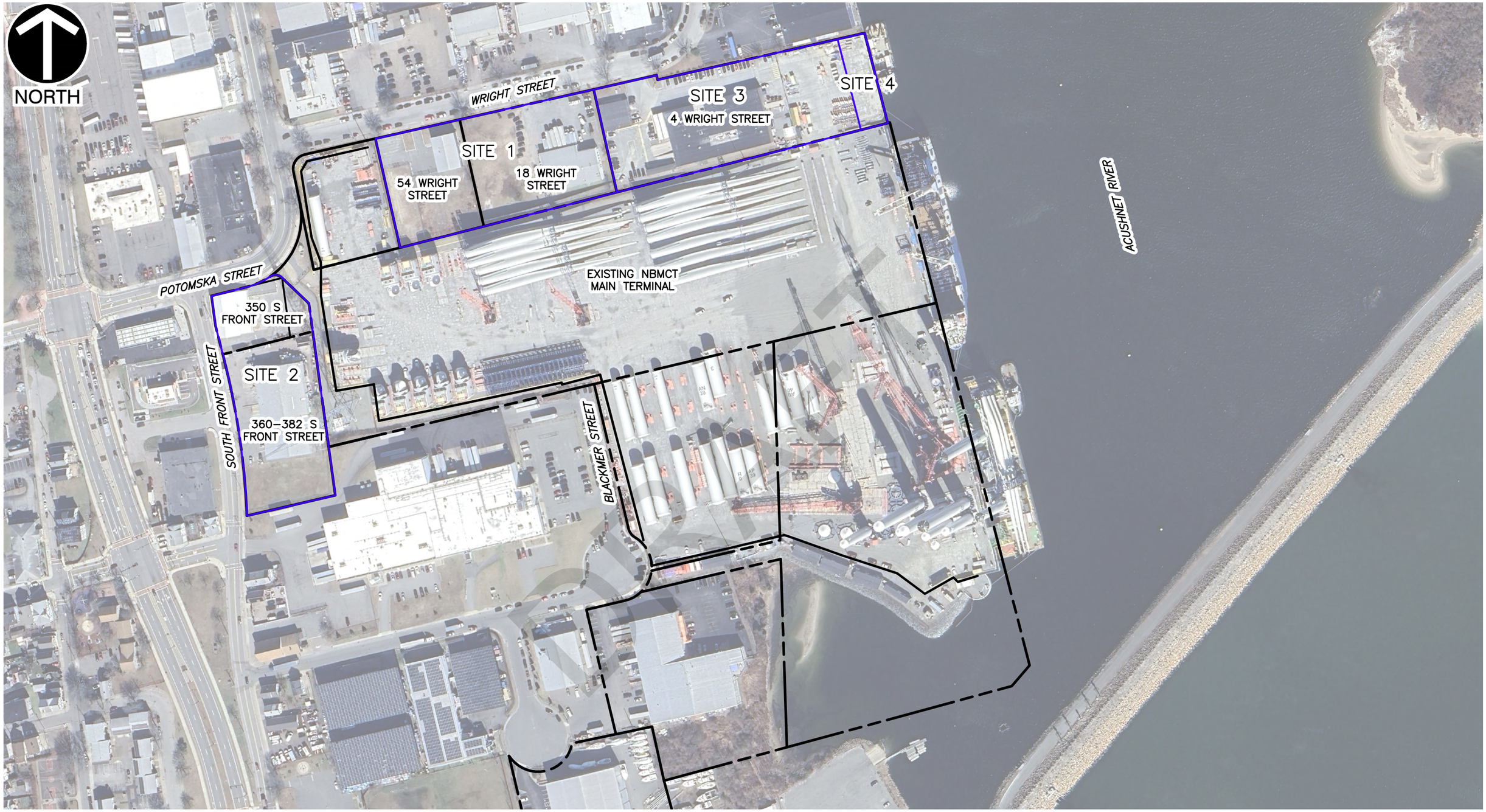
NBMCT PARCEL OVERVIEW MAP

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	FIGURE NO.:	2
DATE:	MARCH 2025	DWG SCALE:	1"=500'	PROJECT NO:	332-344		



LEGEND

PROPOSED EXPANSION AREA

PROPERTY LINE

SCALE IN FEET

0 200 400

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NEW BEDFORD, MASSACHUSETTS

NBMCT TERMINAL EXPANSION
"SITE" BOUNDARY MAP

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	FIGURE NO.:
DATE:	MARCH 2025	DWG SCALE:	1"=200'	PROJECT NO:	332-344	3

P:\330-000\332-344\-CADD\Dwg\EN04 – Soil Remediation\332344-EN04-NBMCT Terminal Expansion Site Boundaries.dwg{FIGURE 3} LS:(3/12/2025 – abucco) – LP: 3/19/2025 4:09 PM

EXHIBIT A
ADEQUATELY REGULATED DETERMINATION

DRAFT

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK
Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

July 1, 2013

Bill White
Director, Offshore Wind Sector Development
Massachusetts Clean Energy Center
55 Summer Street, 9th Floor
Boston, MA 02110

Re: Adequately Regulated Determination for New Bedford Marine Commerce Terminal

Dear Mr. White:

I write in response to your June 24, 2013 letter requesting that the Massachusetts Department of Environmental Protection (MassDEP) determine that certain aspects of the New Bedford Marine Commerce Terminal project, also called the South Terminal project (the Project), be deemed "adequately regulated" under the provisions set forth in 310 CMR 40.0110 of the Massachusetts Contingency Plan (MCP).

310 CMR 40.0111 states, in pertinent part:

> The Department shall deem response actions at a disposal site subject to CERCLA adequately regulated for purposes of compliance with [the MCP], provided:
> (a) the Department concurs with the ROD and/or other EPA decisions for remedial actions at such site in accordance with 40 CFR 300.515(e); or,
> (b) if the Department requests that EPA change or expand the EPA-selected remedial action, EPA agrees to integrate the Department's proposed changes or expansions into the planned CERCLA remedial action in accordance with 40 CFR 300.515(f) [the State Enhanced Remedy provisions]….

Upon request by MassDEP, in its November 16, 2012 "Final Determination for the South Terminal Project" (Final Determination), EPA expanded the State Enhanced Remedy (SER), which is incorporated into the 1998 Record of Decision for the Upper and Lower Harbor at the New Bedford Harbor Superfund Site ("1998 ROD") so that it includes the South Terminal Project. MassDEP concurred with the 1998 ROD, as amended, and with the Final Determination.

DRAFT

Therefore, MassDEP determines that the Project is "adequately regulated" pursuant to 310 CMR 40.0111(a) and (b).

Also noted in your June 24, 2013 letter is EPA's requirement that remediation of the upland portion of the Project be conducted in accordance with M.G.L. Chapter 21E and the MCP. MassDEP acknowledges that certain investigation, remediation, and public involvement activities, apart from MCP requirements, are also specified in the Final Determination. Therefore, in the case of the upland portion of the Project, the "adequately regulated" status will eliminate the need to comply with MCP requirements that are duplicative of work already being required by EPA. However, MassDEP believes that the following activities are necessary to meet the requirements of Chapter 21E and the MCP for the upland portion of the Project, and that these activities would not be duplicative of other requirements contained in EPA's Final Determination:

- Use of the Bill of Lading Process (when Hazardous Waste Manifests are not required) in accordance with 310 CMR 40.0034;
- Reporting of any new or additional release conditions to MassDEP under the guidelines and timetables under Subpart C of the MCP;
- Meeting the Response Action Performance Standard as outlined within 310 CMR 40.0191;
- Utilizing MCP cleanup standards and/or risk-based cleanup standards generated via a Method 3 risk assessment to determine compliance with MCP performance standards under Subpart I of the MCP;
- Submittal of Release Abatement Measure (RAM) Plan, status reports and completion report pursuant to 310 CMR 40.0440;
- Preparation of a risk assessment for the Site(s) under Subpart I of the MCP;
- Preparation of Activity and Use Limitations under Subpart J of the MCP; and
- Preparation of Class A or Class B Response Action Outcomes for outstanding Release Tracking Numbers (RTNs) under Subpart J of the MCP.

Please let me know if you have any questions about this. You may reach me at (617) 556-1121 or Benjamin.Ericson@state.ma.us.

Sincerely,

Benjamin J. Ericson
Assistant Commissioner for Waste Site Cleanup

Cc: Phil Weinberg, Regional Director of MassDEP SERO
Millie Garcia-Serrano, Deputy Regional Director, MassDEP SERO
Paul Craffey, BWSC, State Enhanced Remedy Oversight Coordinator

DRAFT

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info@masscec.com · www.masscec.com

June 24, 2013

Mr. Benjamin J. Ericson
Assistant Commissioner for Waste Site Cleanup
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Adequately Regulated Determination

Dear Assistant Commissioner Ericson,

I write this letter on behalf of the Massachusetts Clean Energy Center ("CEC"), the project proponent for the development of the New Bedford Marine Commerce Terminal ("Terminal"), requesting that the Massachusetts Department of Environmental Protection ("DEP") issue a determination that certain aspects of the environmental investigation, remediation, and public involvement activities associated with the Terminal project be deemed adequately regulated under the Adequately Regulated provisions set forth in the Massachusetts Contingency Plan ("MCP") at 310 CMR 40.0110. As you know, the Terminal project is being constructed under the direction of the USEPA, by virtue of the State Enhanced Remedy provision of the New Bedford Harbor Superfund Site Record of Decision, and the Final Determination for the South Terminal Project, dated November 16, 2012.[1] While crafting the Final Determination, EPA:

- reviewed historic data associated with previous uses of some of the properties involved in the project;
- reviewed historic environmental investigations conducted to date on some of the properties involved in the project;
- directed the Commonwealth to conduct environmental investigations on certain properties associated with the project;
- requested proposals for environmental remediation on certain properties associated with the project, and reviewed and accepted those proposals;
- requested commitments from the Commonwealth with regard to future maintenance of existing asphalt surfaces on certain properties associated with the project; and

DRAFT

[1] The Final Determination can be found on the Executive Office of Energy and Environmental Affairs website at http://www.mass.gov/eea/ocean-coastal-management/serth/.

- required the commitment of the Commonwealth to conduct a public involvement process to ensure communication with the public regarding EPA's decisions and actions, as well as the progress of work in association with the project.

According to the Adequately Regulated provisions set forth at 310 CMR 40.0110, DEP shall deem response actions at a disposal site subject to CERCLA adequately regulated for purposes of compliance with 310 CMR 40.0000, if DEP concurs with the ROD and/or other EPA decisions for remedial actions at such site in accordance with 40 CFR 300.515(e). CEC maintains that DEP's issuance of its Applicable or Relevant and Appropriate Requirements ("ARAR) in connection with the Terminal project constitutes the requisite concurrence of the Final Determination issued by EPA on November 12, 2012, so as to constitute "other EPA decision[] for remedial action" under 310 CMR 40.0111(1)(a).

Notwithstanding the foregoing, CEC recognizes that EPA has indicated that sampling and remediation are to take place as part of the 21E/MCP process. CEC also concedes that the Final Determination does not clearly identify a cleanup standard for the work proposed for the Terminal; and that, DEP's ARAR that it submitted in relation to the Final Determination contemplated that CEC would undertake a detailed site assessment and implement an appropriate response action under the MCP.

However, it is equally important to note that EPA has directly regulated environmental investigation and proposed remediation for this project to date. EPA has also taken an active role in regulating the investigation and proposed remediation for the project, and that some aspects of the 21E/MCP process have already been reviewed and regulated by EPA. More importantly, various elements of CEC's appropriate response actions are already contemplated in the Final Determination. In light of these considerations, CEC requests that MassDEP specifically deem the following actions taken to date (or specifically approved by EPA to date) as Adequately Regulated:

- Onsite investigation conducted to date (unless previously conducted under the MCP by others);

- Onsite investigations as outlined within the Commonwealth's Sampling and Analysis Plan submitted to EPA, dated March 21, 2013 (or the final revision of such plan);

- Remediation as currently outlined within the Commonwealth's January 18, 2012 submission to USEPA and approved by EPA within its Final Determination for the South Terminal Project, dated November 16, 2012 (which has been publicly available since July of 2012 on the EEA website);

- Mitigation measures as currently outlined within the USEPA Final Determination for the South Terminal Project, dated November 16, 2012;

- Intensive public engagement, including 9 public meetings and numerous meeting with local environmental groups, in association with the project; and

- Timetables for document submission MCP compliance.

DRAFT

Implementation of ARARs associated with 21E/MCP compliance would involve:

- Use of the Bill of Lading Process (when Hazardous Waste Manifests are not required) in accordance with 310 CMR 40.0034;
- Reporting of any new or additional release conditions to MassDEP under the guidelines and timetables under Subpart C of the MCP;
- Meeting the Response Action Performance Standard as outlined within 310 CMR 40.0191;
- Utilizing MCP cleanup standards and/or risk-based cleanup standards generated via a Method 3 risk assessment to determine compliance with MCP performance standards under Subpart I of the MCP;
- Submittal of Release Abatement Measure (RAM) Plan, status updates and completion report pursuant to 310 CMR 40.0440;
- Preparation of a risk assessment for the Site(s) under Subpart I of the MCP;
- Preparation of Activity and Use Limitations under Subpart J of the MCP; and
- Preparation of Class A or Class B Response Action Outcomes for outstanding RTNs under Subpart J of the MCP.

Finally, CEC commits to completing and submitting the associated paperwork for the above-referenced activities within 120 days of the completion of the construction of the Terminal.

MassCEC sincerely appreciates your consideration of this very important matter. If you have any questions, please do not hesitate to contact me at 617-315-9330.

Sincerely,

Bill White

Bill White
Director, Offshore Wind Sector Development

DRAFT

EXHIBIT B
FIGURES AND TABLES BY CEC AND OTHERS

DRAFT

MassDEP - Bureau of Waste Site Cleanup

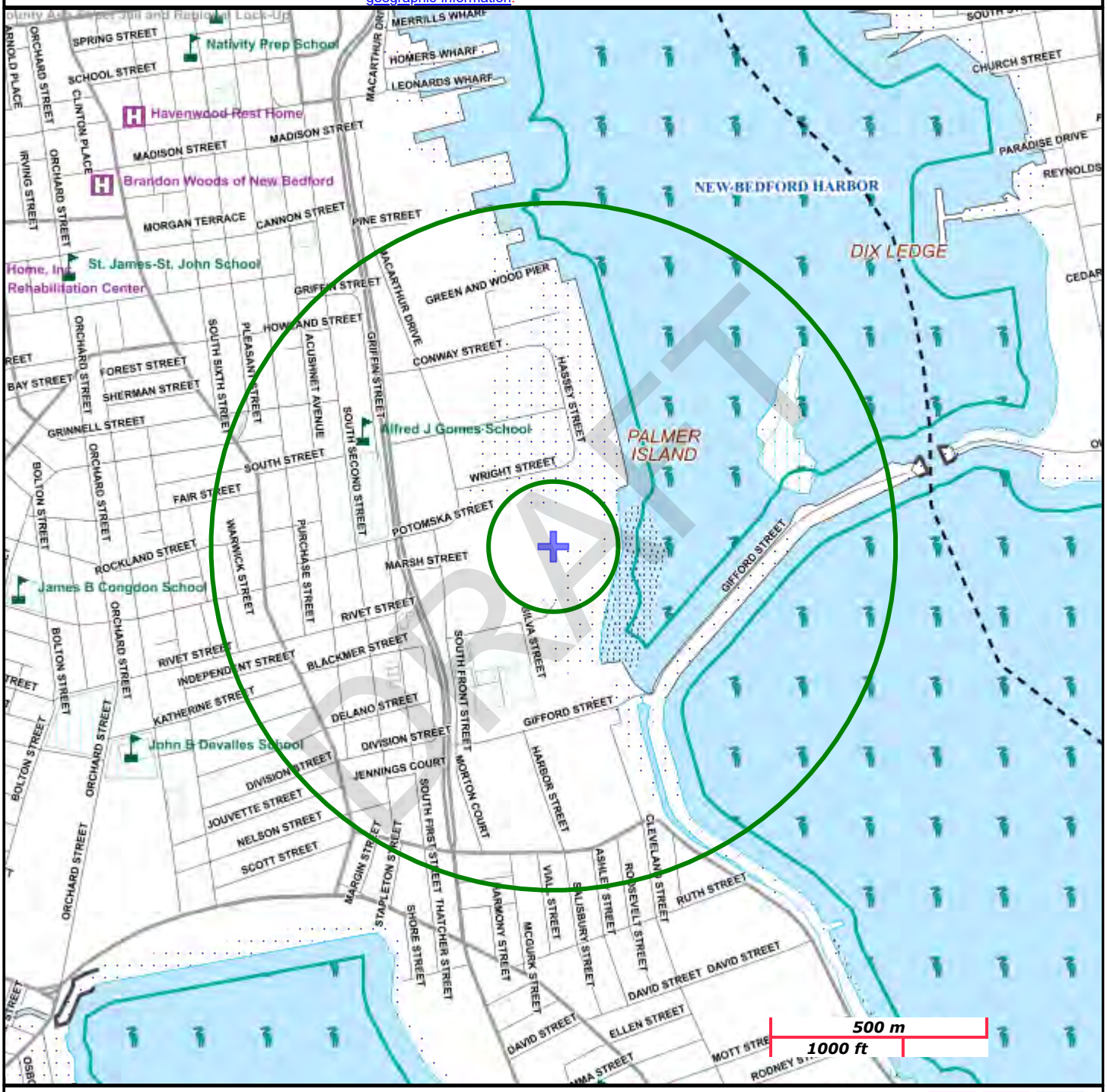
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
NBMCT
80 WRIGHT STREET NEW BEDFORD, MA

NAD83 UTM Meters:
4609654mN , 340334mE (Zone: 19)
September 28, 2022

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

NHESP Pri-Hab of Rare Species; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

EXHIBIT B
FIGURES BY CEC

DRAFT

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31 Bellows Road
Raynham, MA 02767

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www.cecinc.com

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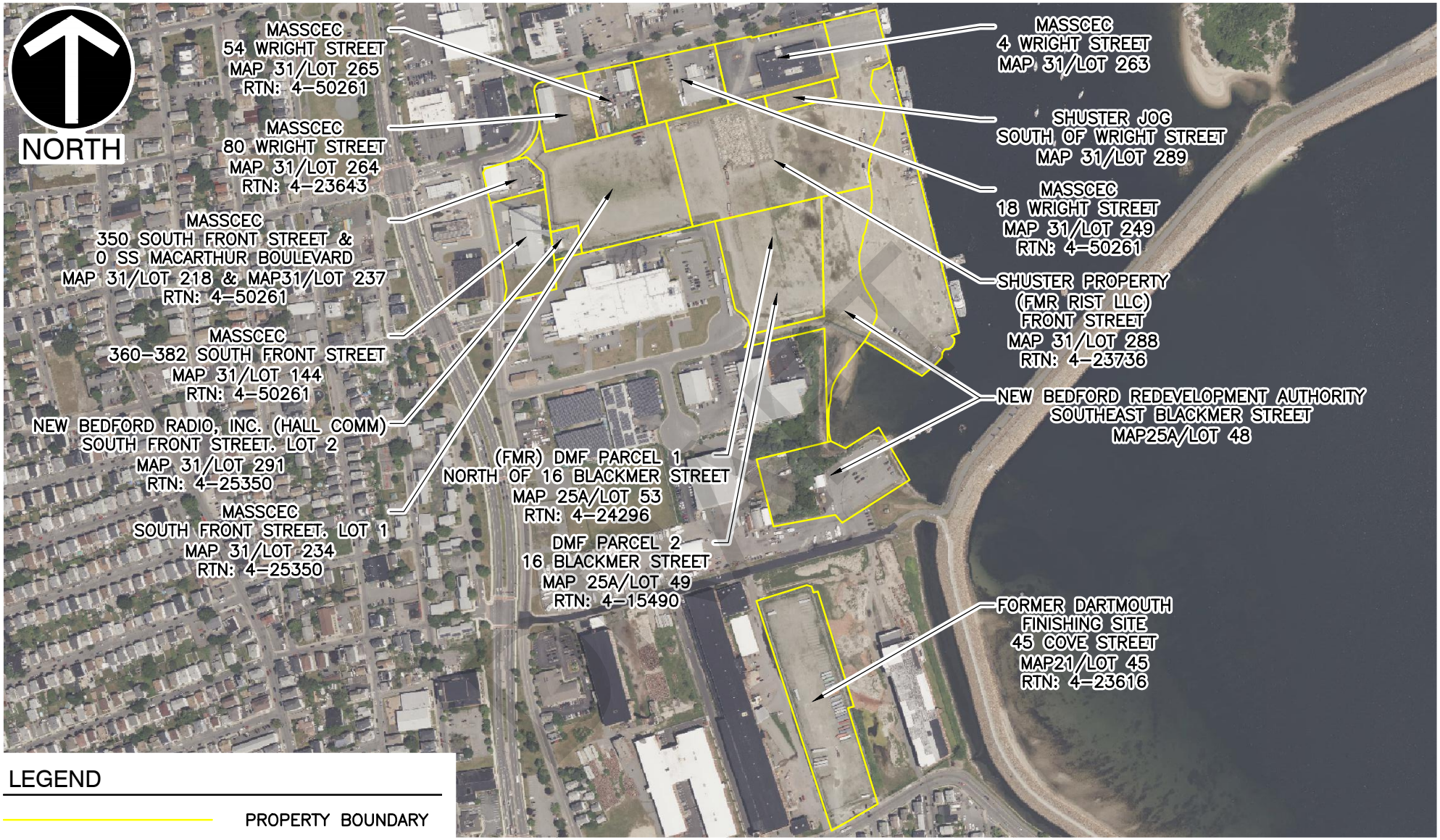
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE LOCUS MAP

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	FIGURE NO.:	1
DATE:	MARCH 2025	DWG SCALE:	1"=4,000'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Site Locus.dwg{FIGURE 1} LS:(3/6/2025 - abucco) - LP: 3/19/2025 4:06 PM



LEGEND

PROPERTY BOUNDARY

SCALE IN FEET

0 500 1,000

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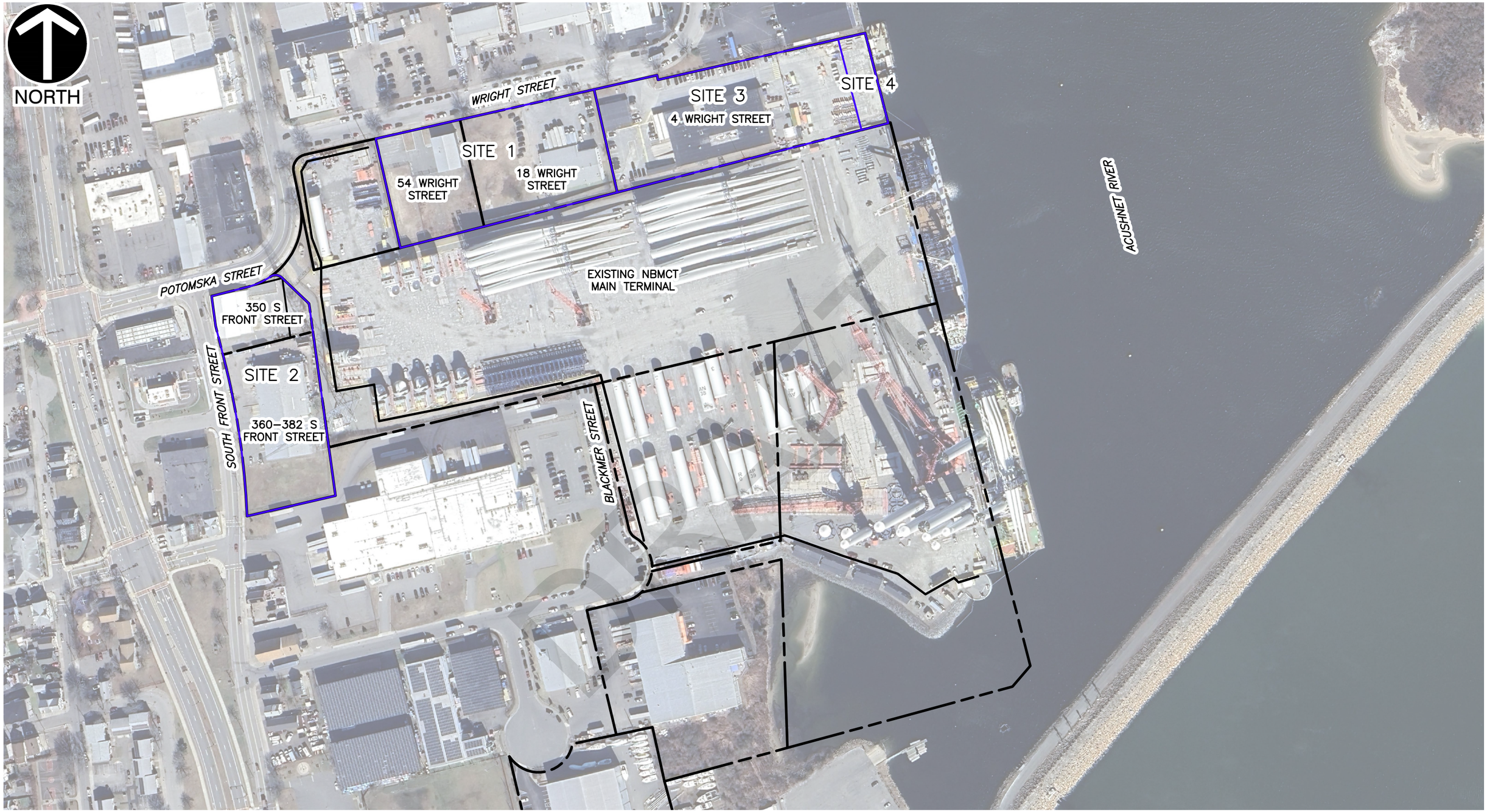
NEW BEDFORD, MASSACHUSETTS

NBMCT PARCEL OVERVIEW MAP

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	FIGURE NO.:	2
DATE:	MARCH 2025	DWG SCALE:	1"=500'	PROJECT NO:	332-344		



LEGEND

PROPOSED EXPANSION AREA

PROPERTY LINE

SCALE IN FEET

0 200 400

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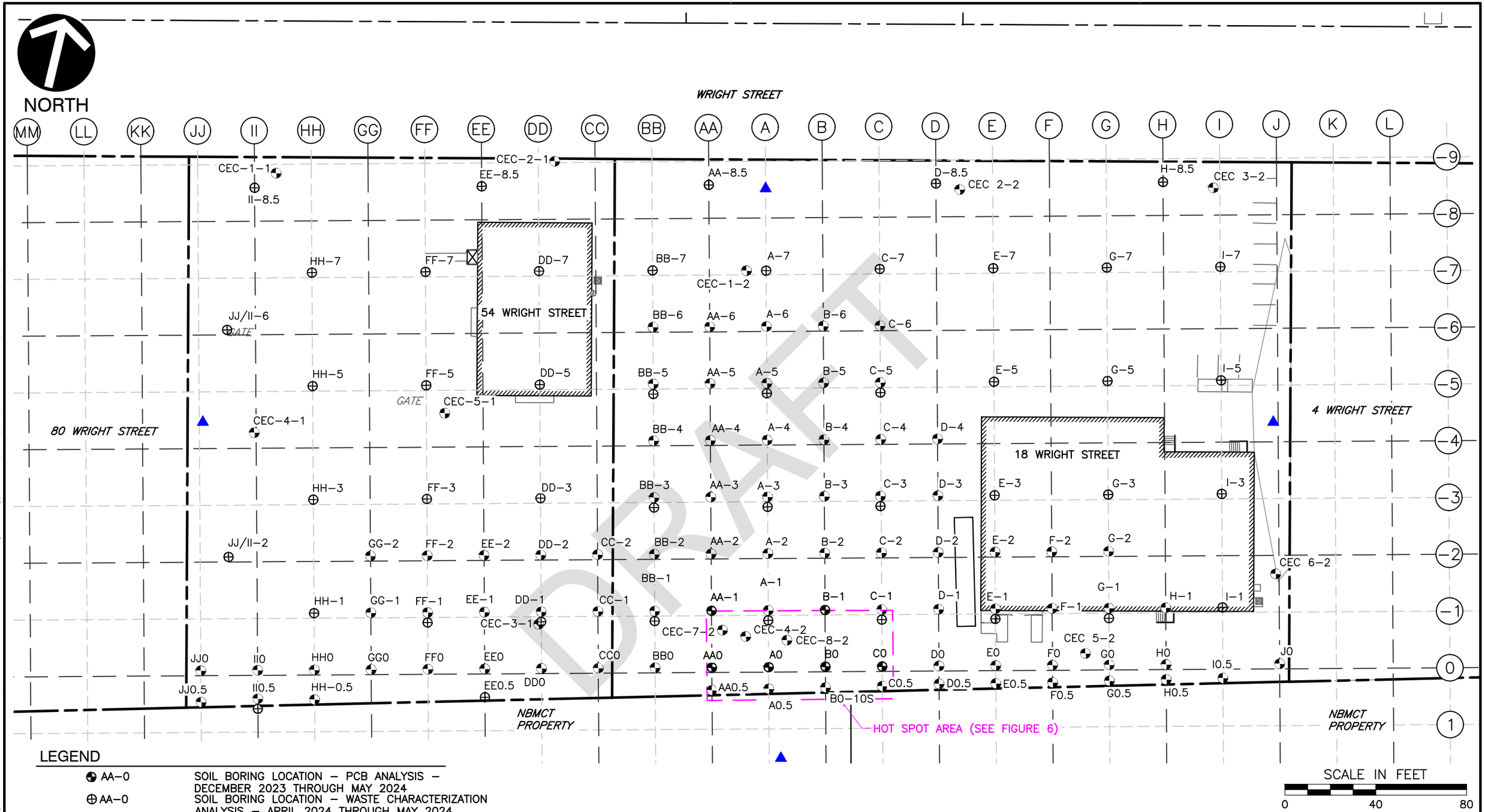
NEW BEDFORD, MASSACHUSETTS

NBMCT TERMINAL EXPANSION
"SITE" BOUNDARY MAP

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	FIGURE NO.:
DATE:	MARCH 2025	DWG SCALE:	1"=200'	PROJECT NO:	332-344	3

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-NBMCT Terminal Expansion Site Boundaries.dwg{FIGURE 3} LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:09 PM



LEGEND

AA-0	SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024
AA-0	SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024
CEC-0-0	SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024
	EXISTING PROPERTY LINE
▲	PROPOSED AIR/DUST MONITORING LOCATION
	50'x50' GRID SPACING
	25'x25' GRID SPACING

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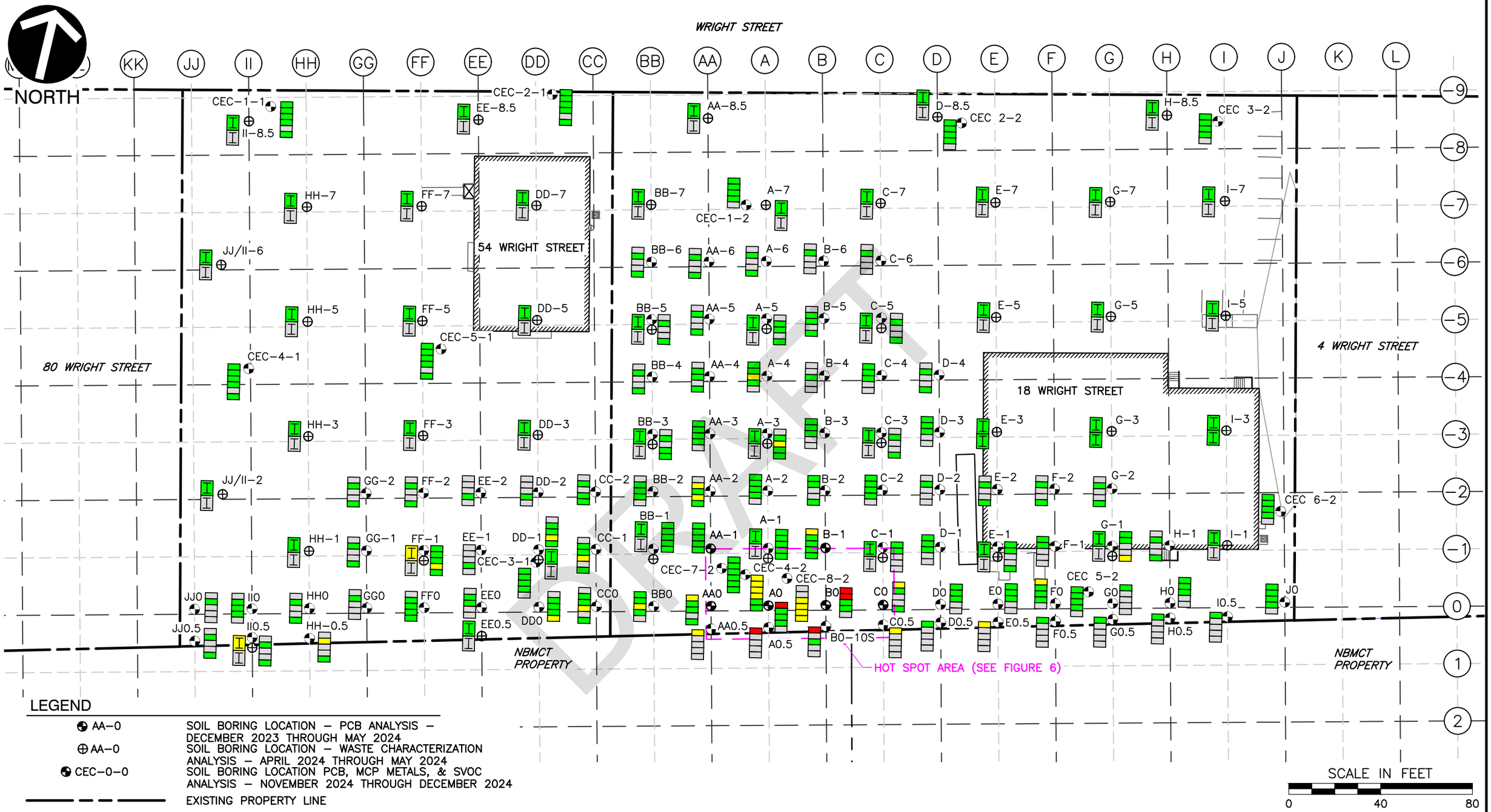
SITE 1 BORING LOCATION PLAN AND SAMPLING GRID

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:	4
DATE:	MARCH 2025	DWG SCALE:	1"=40'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg{FIGURE 4} LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:18 PM



LEGEND

AA-0	SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024
AA-0	SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024
CEC-0-0	SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024
	EXISTING PROPERTY LINE
	50'x50' GRID SPACING
	25'x25' GRID SPACING

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0-1	PCB RESULT <1MG/KG
1-2	PCB RESULT 1 ≤ 25MG/KG
2-3	PCB RESULT >25MG/KG
3-4	NO SAMPLE ANALYZED
4-5	
5-10	

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0-5	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE
5-10	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE

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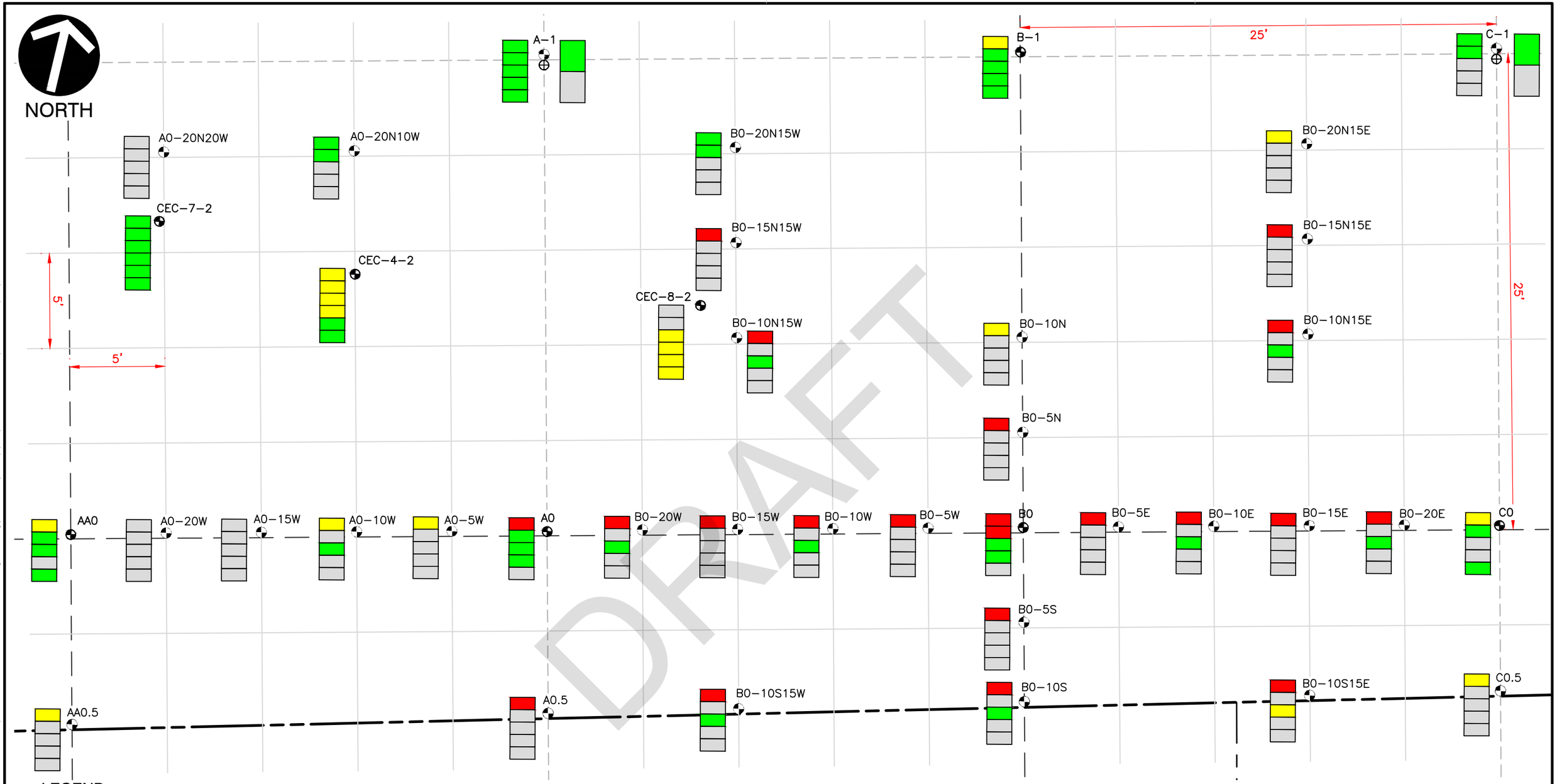
NEW BEDFORD, MASSACHUSETTS

SITE 1 SOIL RESULTS - PCBS

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:
DATE:	MARCH 2025	DWG SCALE:	1"=40'	PROJECT NO:	332-344	5

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg(FIGURE 5) LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:18 PM



LEGEND

AA-0	SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024
AA-0	SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024
CEC-0-0	SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024
	EXISTING PROPERTY LINE
	50'x50' GRID SPACING
	25'x25' GRID SPACING
	5'x5' GRID SPACING

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0-1	PCB RESULT <1MG/KG
1-2	PCB RESULT 1 ≤ 25MG/KG
2-3	PCB RESULT >25MG/KG
3-4	NO SAMPLE ANALYZED
4-5	
5-10	

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0-5	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE
5-10	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE

SCALE IN FEET

0 5 10

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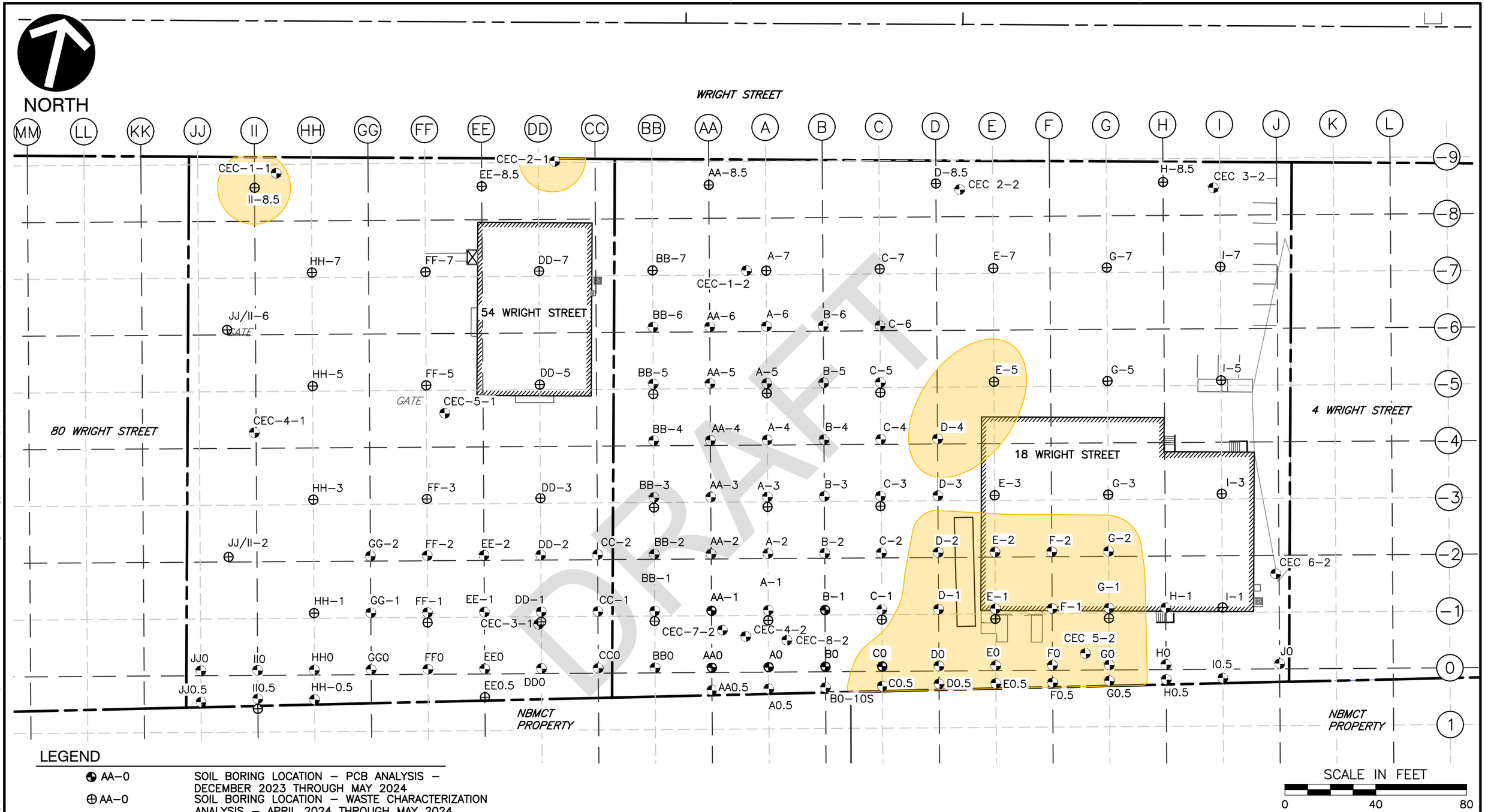
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE 1 HOT SPOT SOIL RESULTS - PCBS

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:	6
DATE:	MARCH 2025	DWG SCALE:	1"=5'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg{FIGURE 6} LS:(3/12/2025 - abucco) - LP: 3/19/2025 5:04 PM



LEGEND

AA-0	SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024
AA-0	SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024
CEC-0-0	SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024
	EXISTING PROPERTY LINE
	50'x50' GRID SPACING
	25'x25' GRID SPACING
	APPROXIMATE AREA OF LEAD CONCENTRATIONS >200 MG/KG

Civil & Environmental Consultants, Inc.
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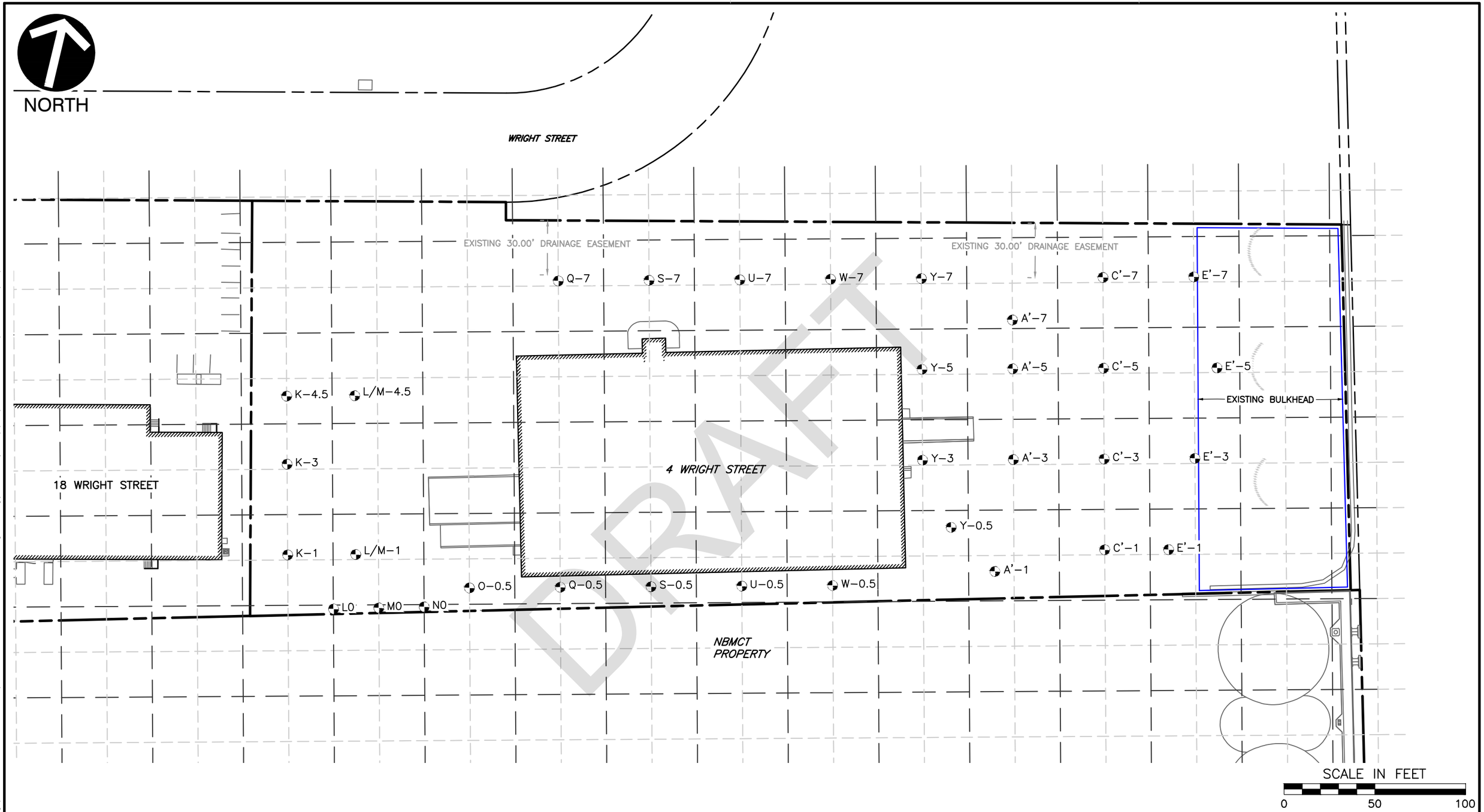
NEW BEDFORD, MASSACHUSETTS

SITE 1 SOIL RESULTS - LEAD

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:	7
DATE:	MARCH 2025	DWG SCALE:	1"=40'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\ENO4 - Soil Remediation\332344-ENO4-Soil Remediation Figures.dwg{FIGURE 7} LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:21 PM



LEGEND

AA-0	SOIL BORING LOCATION – PCB ANALYSIS – JULY 2024
— — — —	50'x50' GRID SPACING
- - - - -	25'x25' GRID SPACING

CEC
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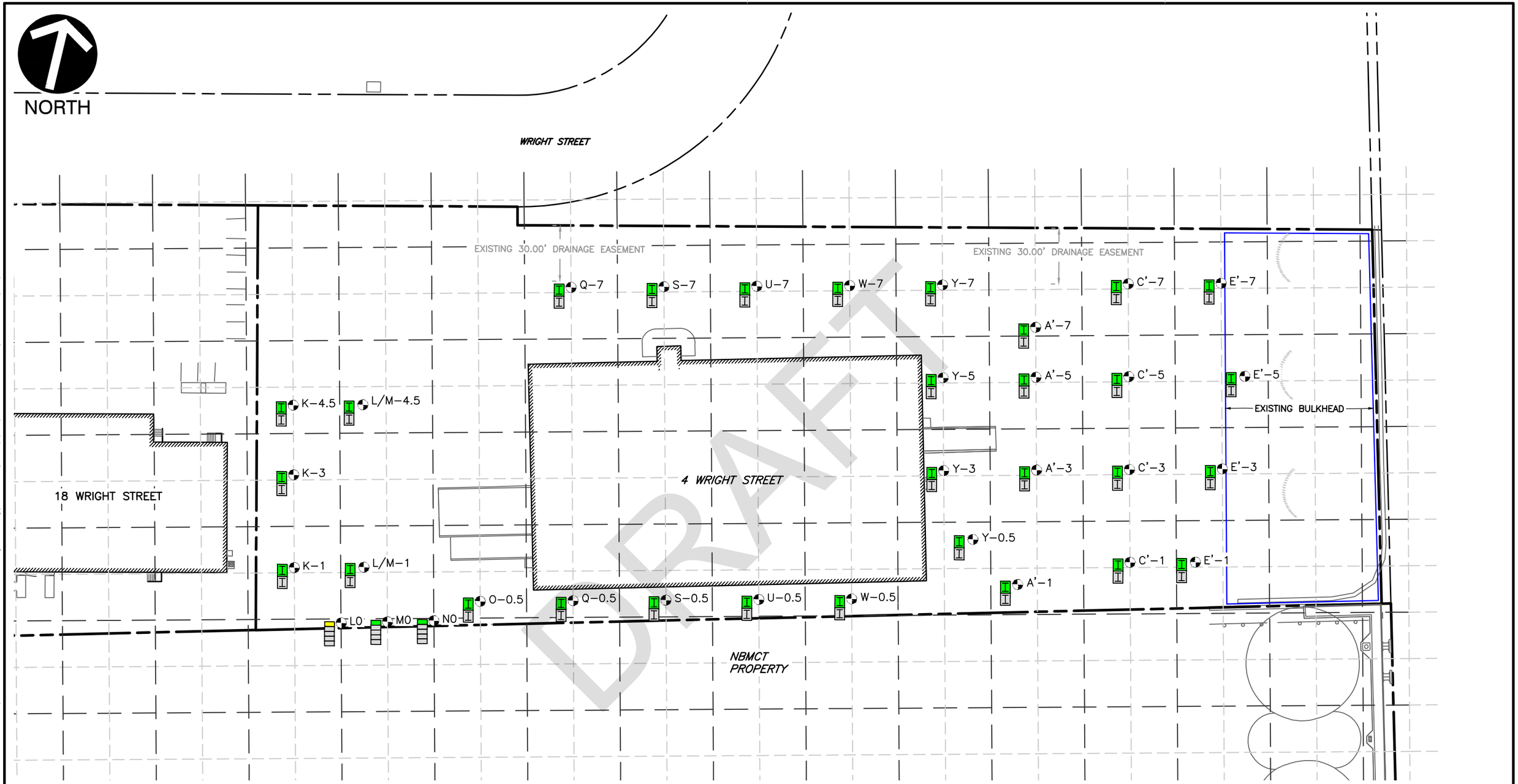
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE 3 BORING LOCATION PLAN AND SAMPLING GRID

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:
DATE:	MARCH 2025	DWG SCALE:	1"=50'	PROJECT NO:	332-344	8

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg{FIGURE 8} LS:(3/19/2025 - abucco) - LP: 3/25/2025 1:13 PM



LEGEND

AA-0	SOIL BORING LOCATION – PCB ANALYSIS – JULY 2024
— — — — —	50'x50' GRID SPACING
- - - - - -	25'x25' GRID SPACING

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0–1	PCB RESULT <1MG/KG
1–2	PCB RESULT 1 ≤ 25MG/KG
2–3	PCB RESULT >25MG/KG
3–4	NO SAMPLE ANALYZED
4–5	
5–10	

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0–5	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE
5–10	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE

SCALE IN FEET

0 50 100

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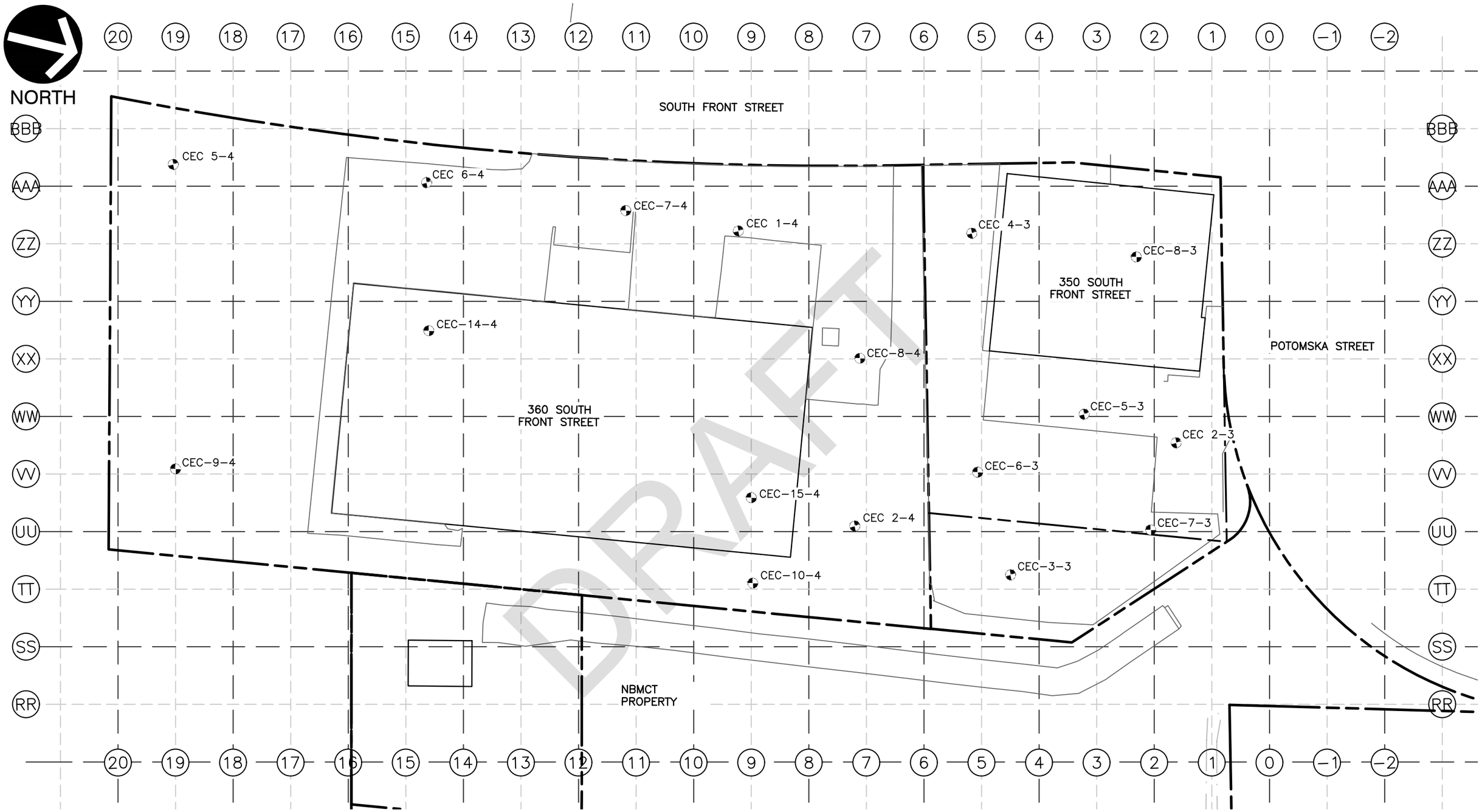
SITE 3 SOIL RESULTS - PCBS

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:	9
DATE:	MARCH 2025	DWG SCALE:	1"=50'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg{FIGURE 9} LS:(3/19/2025 - abucco) - LP: 3/25/2025 1:14 PM



LEGEND

CEC-11-4 EXISTING SOIL BORING LOCATION – DECEMBER 2023 THROUGH SEPTEMBER 2024

50'x50' GRID SPACING

25'x25' GRID SPACING

SCALE IN FEET

0 40 80

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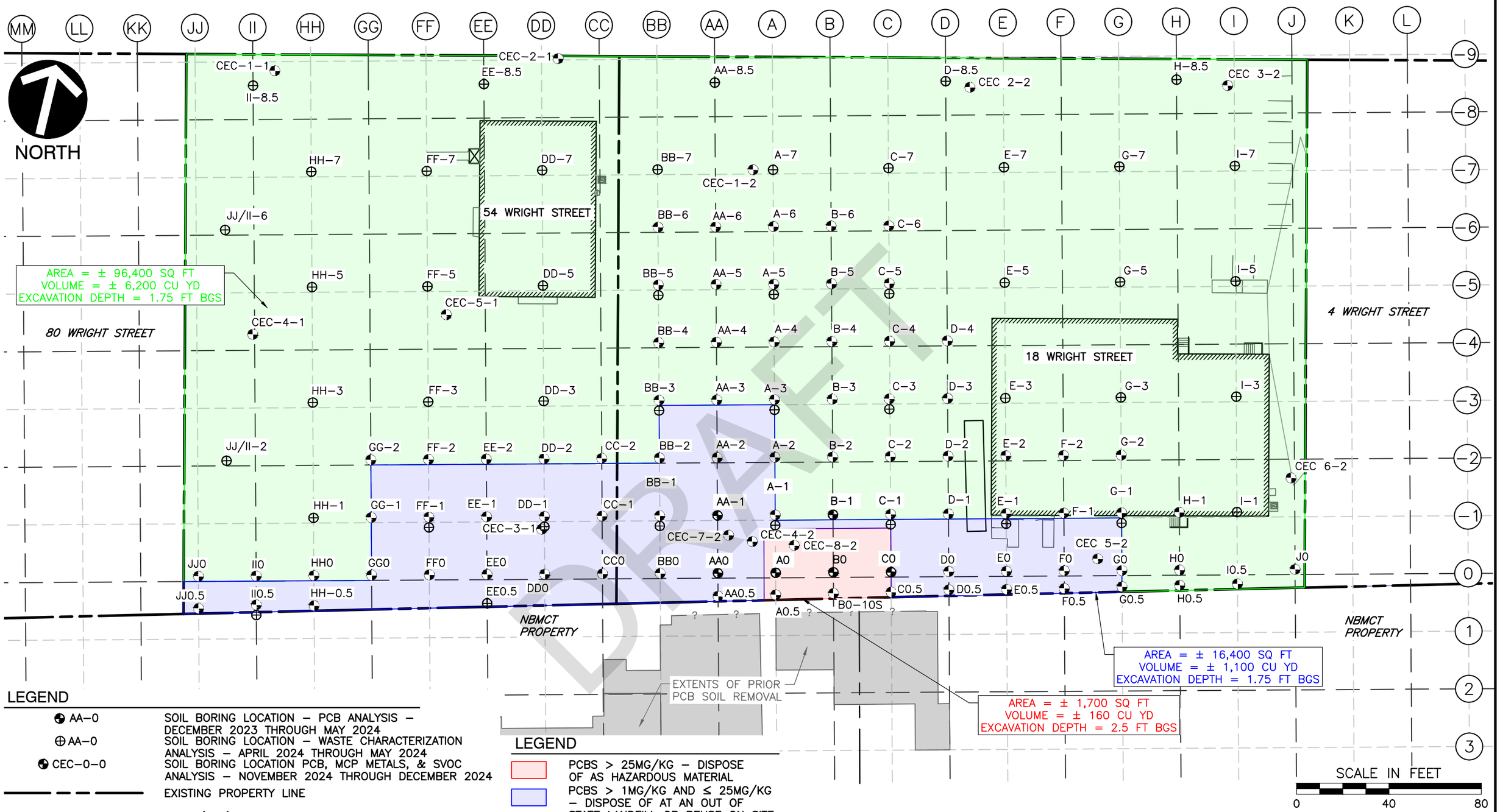
SITE 2 - BORING LOCATION PLAN AND SAMPLING GRID

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:	10
DATE:	MARCH 2025	DWG SCALE:	1"=40'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN06 - Site 2\332344-EN06-Site 2-Boring Location Plan.dwg{FIGURE 10} LS:(3/6/2025 - abucco) - LP: 3/19/2025 5:05 PM



LEGEND

- AA–0 — SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024
- AA–0 — SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024
- CEC–0–0 — SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024
- EXISTING PROPERTY LINE
- 50'x50' GRID SPACING
- 25'x25' GRID SPACING

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0–1	PCB RESULT <1MG/KG
1–2	PCB RESULT 1 ≤ 25MG/KG
2–3	PCB RESULT >25MG/KG
3–4	NO SAMPLE ANALYZED
4–5	
5–10	

LEGEND

- PCBS > 25MG/KG – DISPOSE OF AS HAZARDOUS MATERIAL
- PCBS > 1MG/KG AND ≤ 25MG/KG – DISPOSE OF AT AN OUT OF STATE LANDFILL OR REUSE ON SITE
- PCBS < 1MG/KG – DISPOSE OF AT A COMM–97 LANDFILL OR REUSE ON SITE

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

	RESULT
0–5	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE
5–10	PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE

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SITE 1 SOIL EXCAVATION CHARACTERIZATION AREAS

DRAWN BY:	AMB	CHECKED BY:	CDB	APPROVED BY:	JDK	EXHIBIT:	11
DATE:	MARCH 2025	DWG SCALE:	1"=40'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\EN04 – Soil Remediation\332344-EN04-Soil Remediation Figures.dwg{FIGURE 11} LS:(3/12/2025 – abucco) – LP: 3/19/2025 4:44 PM

EXHIBIT B
TABLES BY CEC

DRAFT

Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin															
Location	**A-1**	**A-3**	**A-5**	**A-7**	**AA-8.5**	**B-1**	**B-2**	**B0**	**BB-1**	**BB-3**	**BB-5**	**BB-7**	**C-1**	**MCP Concentrations**	
Sample ID	A-1	A-3	A-5	A-7	**AA-8.5**	B-1 4-5	B-2 2-3	B0 3-4	BB-1	BB-3	BB-5	BB-7	C-1		
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	4-5	2-3	3-4	0-5	0-5	0-5	0-5	0-5		
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	4/30/2024	5/1/2024	5/1/2024	5/1/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0050-03	24E0050-02	24E0050-01	24E0050-05	24E0026-09	24E0051-15	24F0473-01	24E0814-06	24E0026-08	24E0026-07	24E0026-06	24E0026-05	24E0124-01		
VOCs (mg/kg)															
Acetone	< 0.043	< 0.048	< 0.048	< 0.060	< 0.046	--	--	--	< 0.056	< 0.049	< 0.050	< 0.047	< 0.054	6	50
Naphthalene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	--	--	--	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	4	20
SVOCs (mg/kg)															
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	--	--	--	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05	6
2-Methylnaphthalene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	80
Acenaphthylene	< 0.29	< 0.28	< 0.28	< 0.28	0.48	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	2	10
Anthracene	< 0.29	1.41	< 0.28	< 0.28	0.67	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000
Benzo(A)anthracene	0.33	7.33	0.51	< 0.28	2.38	--	--	--	0.45	0.32	0.28	< 0.28	< 0.28	20	300
Benzo(A)pyrene	0.35	7.30	0.52	< 0.28	2.33	--	--	--	0.49	0.32	0.30	< 0.28	< 0.28	2	30
Benzo(B)fluoranthene	< 0.29	6.25	0.39	< 0.28	2.53	--	--	--	0.52	0.35	0.29	< 0.28	< 0.28	20	300
Benzo(g,h,i)Perylene	0.45	4.44	0.37	< 0.28	1.52	--	--	--	0.36	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000
Benzo(K)fluoranthene	< 0.29	4.84	0.32	< 0.28	0.97	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000
Bis (2-ethylhexyl) phthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	0.40	100	700
Butylbenzylphthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	100	1000
Chrysene	0.31	6.28	0.48	< 0.28	2.27	--	--	--	0.44	0.34	0.31	< 0.28	< 0.28	200	3000
Di-n-octyl phthalate	< 0.57	< 0.55	< 0.56	< 0.56	< 0.55	--	--	--	< 0.56	< 0.58	< 0.55	< 0.56	< 0.55	1000	10000
Dibenzo(A,H)anthracene	< 0.29	1.28	< 0.28	< 0.28	0.35	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	2	30
Dibenzofuran	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	100	1000
Fluoranthene	0.69	10.00	0.92	< 0.28	5.39	--	--	--	0.87	0.60	0.50	0.42	< 0.28	1000	3000
Fluorene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000
Indeno (1,2,3-cd) pyrene	< 0.29	5.31	0.34	< 0.28	1.46	--	--	--	0.35	< 0.29	< 0.28	< 0.28	< 0.28	20	300
Naphthalene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	--	--	--	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	4	20
Phenanthrene	0.37	3.82	0.58	< 0.28	2.83	--	--	--	0.47	0.34	0.29	< 0.28	< 0.28	10	1000
Pyrene	0.64	9.49	1.07	< 0.28	4.59	--	--	--	0.74	0.54	0.51	0.40	< 0.28	1000	3000
Total SVOCs	3.15	67.75	5.51	0	27.32	--	--	--	4.70	2.82	2.48	0.82	0.40		--
Petroleum Hydrocarbons (mg/kg)															
Hydrocarbon, Oil, Petroleum	31.30	36.2	39.1	14	66.4	--	--	--	42.5 D	21.9	16.4	18.8	< 11	1000	3000
Pesticides/Herbicides (mg/kg)															
4,4'-DDD	< 0.003	< 0.003	< 0.003	0.008	< 0.003	--	--	--	< 0.003	< 0.0027	< 0.0028	< 0.0028	< 0.0027	10	40
BHC-alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	< 0.003	< 0.0027	< 0.0028	< 0.0028	< 0.0027	50	500
Dieldrin	< 0.003	0.003	0.007	< 0.003	0.003	--	--	--	< 0.003	< 0.0027	< 0.0028	< 0.0028	< 0.0027	0.09	0.6
Endosulfan, beta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	< 0.003	< 0.0027	< 0.0028	< 0.0028	< 0.0027	0.5	1
Total Metals (mg/kg)															
Arsenic	2.52	4.04	2.93	4.2	3.2	--	--	--	2.36	2.84	2.75	2.74	3.84	20	20
Barium	10.6	63.4	21.0	37.5	21.8	--	--	--	17.5	20.7	11.7	24	15.4	1000	3000
Beryllium	--	--	--	--	--	--	--	--	--	--	--	--	--	100	200
Cadmium	< 0.41	0.52	< 0.38	< 0.42	< 0.4	--	--	--	< 0.39	< 0.44	< 0.42	< 0.44	< 0.41	80	80
Chromium	7.77	24.2	8.58	7.62	5.85	--	--	--	10.6	10.1	8.38	4.85	13.2	100	200
Lead	15.8	164	72.7	105	125	46.3	57.3	64.5	34	39.3	20.6	96	53.3	200	600
Mercury	0.06	0.12	0.15	0.44	0.20	--	--	--	0.08	0.13	0.08	< 0.04	< 0.04	20	40
Nickel	--	--	--	--	--	--	--	--	--	--	--	--	--	700	1000
Silver	< 0.41	< 0.41	< 0.38	< 0.42	< 0.4	--	--	--	< 0.39	< 0.44	< 0.42	< 0.44	< 0.41	100	200
Vanadium	--	--	--	--	--	--	--	--	--	--	--	--	--	500	800
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

DRAFT

Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts															
Location	**C-1**	**C-3**	**C-5**	**C-7**	**C0**	**CEC-1-1**	**CEC-1-1**	**CEC-1-2**	**CEC-2-1**	**CEC-2-1**	**CEC-2-2**	**CEC-3-1**	**CEC-3-2**	**MCP Concentrations**	
Sample ID	C-1 3-4	C-3	C-5	C-7	C0 4-5	CEC-1-1 0-4	CEC-1-1 8-9.5	CEC-1-2 0-4	CEC-2-1 0-4	CEC-2-1 8.8-10	CEC-2-2 0-4	CEC-3-1 0-4	CEC-3-2 0.3-4		
Sample Depth (feet)	3-4	0-5	0-5	0-5	4-5	0-4	8-9.5	0-4	0-4	8.8-10	0-4	0-4	0.3-4		
Sample Date	5/2/2024	5/2/2024	5/2/2024	5/2/2024	5/1/2024	11/9/2023	11/9/2023	12/5/2023	11/9/2023	11/9/2023	12/6/2023	11/10/2023	12/6/2023	RCS-1	RCS-2
Laboratory Sample ID	24F0155-01	24E0124-02	24E0124-03	24E0124-04	24E0050-09	23K0414-01	23K0414-02	23L0197-04	23K0414-05	23K0414-06	23L0197-12	23K0414-09	23L0197-11		
VOCs (mg/kg)															
Acetone	--	< 0.054	< 0.049	< 0.065	--	--	--	--	--	--	--	--	--	6	50
Naphthalene	--	< 0.005	< 0.005	< 0.007	--	--	--	--	--	--	--	--	--	4	20
SVOCs (mg/kg)															
1,1-Biphenyl	--	< 0.03	< 0.026	< 0.026	--	--	--	--	--	--	--	--	--	0.05	6
2-Methylnaphthalene	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	0.7	80
Acenaphthylene	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	2	10
Anthracene	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	1000	3000
Benzo(A)anthracene	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	20	300
Benzo(A)pyrene	--	< 0.26	< 0.26	< 0.264	--	0.37	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	2	30
Benzo(B)fluoranthene	--	< 0.26	< 0.26	< 0.264	--	0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	20	300
Benzo(g,h,i)Perylene	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	1000	3000
Benzo(K)fluoranthene	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	1000	3000
Bis (2-ethylhexyl) phthalate	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	100	700
Butylbenzylphthalate	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	100	1000
Chrysene	--	< 0.26	< 0.26	< 0.264	--	0.34	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	200	3000
Di-n-octyl phthalate	--	< 0.52	< 0.52	< 0.528	--	--	--	--	--	--	--	--	--	1000	10000
Dibenzo(A,H)anthracene	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	2	30
Dibenzofuran	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	100	1000
Fluoranthene	--	< 0.26	< 0.26	< 0.264	--	0.61	< 1.33	< 0.267	< 0.32	0.43	< 0.26	< 0.30	< 0.27	1000	3000
Fluorene	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	1000	3000
Indeno (1,2,3-cd) pyrene	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	20	300
Naphthalene	--	< 0.26	< 0.26	< 0.264	--	--	--	--	--	--	--	--	--	4	20
Phenanthrene	--	< 0.26	< 0.26	< 0.264	--	< 0.32	< 1.33	< 0.267	< 0.32	< 0.41	< 0.26	< 0.30	< 0.27	10	1000
Pyrene	--	< 0.26	< 0.26	0.319	--	0.61	< 1.33	< 0.267	< 0.32	0.50	< 0.26	0.33	< 0.27	1000	3000
Total SVOCs	--	0	0	0.319	--	2.25	0	0	0	0.92	0	1.134	0		--
Petroleum Hydrocarbons (mg/kg)															
Hydrocarbon, Oil, Petroleum	--	< 10.8	19.1	< 10.8	--	--	--	--	--	--	--	--	--	1000	3000
Pesticides/Herbicides (mg/kg)															
4,4'-DDD	--	< 0.0027	< 0.0027	< 0.0026	--	--	--	--	--	--	--	--	--	10	40
BHC-alpha	--	< 0.0027	< 0.0027	< 0.0026	--	--	--	--	--	--	--	--	--	50	500
Dieldrin	--	< 0.0027	< 0.0027	< 0.0026	--	--	--	--	--	--	--	--	--	0.09	0.6
Endosulfan, beta	--	< 0.0027	< 0.0027	< 0.0026	--	--	--	--	--	--	--	--	--	0.5	1
Total Metals (mg/kg)															
Arsenic	--	4.05	2.96	1.71	--	4.51	< 4.57	< 2	2.59	3.26	< 2.02	< 1.9	< 2.01	20	20
Barium	--	14.1	15	9.04	--	74.7	22.8	12	44.3	44.2	18.1	23.1	9.51	1000	3000
Beryllium	--	--	--	--	--	0.25	0.28	0.21	0.24	0.42	0.22	0.17	0.29	100	200
Cadmium	--	< 0.36	< 0.39	< 0.4	--	< 0.46	< 0.91	< 0.4	< 0.46	0.84	< 0.4	< 0.38	< 0.4	80	80
Chromium	--	6.84	5.88	4.11	--	8.63	13.2	6.44	21.2	17.8	7.15	12.9	6.65	100	200
Lead	54.6	24.6	169	10.9	4210 D	307	13.8	11.5	310	136	32	28.6	8.6	200	600
Mercury	--	< 0.04	0.035	< 0.035	--	1.9 D	< 0.16	< 0.04	< 0.04	1.17 D	0.05	0.07	0.05	20	40
Nickel	--	--	--	--	--	5.44	11	5.56	6.15	8.28	5.44	5.82	4.59	700	1000
Silver	--	< 0.36	< 0.39	< 0.4	--	< 0.46	< 0.91	< 0.4	< 0.46	< 0.62	< 0.4	< 0.38	< 0.4	100	200
Vanadium	--	--	--	--	--	10.6	28.1	9.65	14.4	17.9	9.97	9.31	7.4	500	800
Zinc	--	--	--	--	--	101	17.2	23.1	76	68.6	26.2	41	18	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts															
Location	**CEC-4-1**	**CEC-4-1**	**CEC-4-2**	**CEC-5-1**	**CEC-5-1**	**CEC-5-2**	**CEC-6-2**	**CEC-7-2**	**CEC-8-2**	**D-4**	**D-8.5**	**DD-1**	**DD-3**	**MCP Concentrations**	
Sample ID	CEC-4-1 0-4	CEC-4-1 8-10	CEC-4-2 0-4	CEC-5-1 0-4	CEC-5-1 8-10	CEC-5-2 0-4	CEC-6-2 0-4	CEC-7-2 0-4	CEC-8-2 2-4	D-4 4-5	D-8.5	DD-1	DD-3		
Sample Depth (feet)	0-4	8-10	0-4	0-4	8-10	0-4	0-4	0-4	2-4	4-5	0-5	0-5	0-5		
Sample Date	11/9/2023	11/9/2023	12/5/2023	11/10/2023	11/10/2023	12/6/2023	12/6/2023	12/5/2023	12/5/2023	5/2/2024	5/2/2024	4/29/2024	4/30/2024	RCS-1	RCS-2
Laboratory Sample ID	23K0414-03	23K0414-04	23L0197-05	23K0414-08	23K0414-07	23L0197-09	23L0197-10	23L0197-07	23L0197-02	24E0125-09	24E0124-05	24D1044-18	24E0026-03		
VOCs (mg/kg)															
Acetone	--	--	--	--	--	--	--	--	--	--	< 0.063	< 0.047	< 0.045	6	50
Naphthalene	--	--	--	--	--	--	--	--	--	--	< 0.006	< 0.005	< 0.005	4	20
SVOCs (mg/kg)															
1,1-Biphenyl	--	--	--	--	--	--	--	--	--	--	< 0.03	0.03	< 0.03	0.05	6
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	0.7	80
Acenaphthylene	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	2	10
Anthracene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.34	< 0.28	< 0.28	< 0.28	--	< 0.27	0.53	< 0.27	1000	3000
Benzo(A)anthracene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.69	< 0.28	< 0.28	0.51	--	< 0.27	0.76	< 0.27	20	300
Benzo(A)pyrene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.60	< 0.28	< 0.28	0.49	--	< 0.27	0.69	< 0.27	2	30
Benzo(B)fluoranthene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.55	< 0.28	< 0.28	0.42	--	< 0.27	0.72	< 0.27	20	300
Benzo(g,h,i)Perylene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.34	< 0.28	< 0.28	0.34	--	< 0.27	0.41	< 0.27	1000	3000
Benzo(K)fluoranthene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.44	< 0.28	< 0.28	0.37	--	< 0.27	0.29	< 0.27	1000	3000
Bis (2-ethylhexyl) phthalate	< 0.27	0.35	< 0.28	< 0.26	< 0.33	< 0.27	< 0.28	< 0.28	< 0.28	--	< 0.27	< 0.29	< 0.27	100	700
Butylbenzylphthalate	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	100	1000
Chrysene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.63	< 0.28	< 0.28	0.45	--	< 0.27	0.72	< 0.27	200	3000
Di-n-octyl phthalate	--	--	--	--	--	--	--	--	--	--	< 0.54	< 0.58	< 0.54	1000	10000
Dibenzo(A,H)anthracene	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	2	30
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	100	1000
Fluoranthene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	1.38	< 0.28	< 0.28	1.01	--	< 0.27	1.85	< 0.27	1000	3000
Fluorene	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	1000	3000
Indeno (1,2,3-cd) pyrene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	0.37	< 0.28	< 0.28	0.33	--	< 0.27	0.40	< 0.27	20	300
Naphthalene	--	--	--	--	--	--	--	--	--	--	< 0.27	< 0.29	< 0.27	4	20
Phenanthrene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	1.27	< 0.28	< 0.28	0.52	--	< 0.27	1.97	< 0.27	10	1000
Pyrene	< 0.27	< 0.34	< 0.28	< 0.26	< 0.33	1.26	< 0.28	< 0.28	0.89	--	< 0.27	1.51	0.27	1000	3000
Total SVOCs	0	0.35	0	0	0	7.86	0	0	5.34	--	0	9.88	0.27		--
Petroleum Hydrocarbons (mg/kg)															
Hydrocarbon, Oil, Petroleum	--	--	--	--	--	--	--	--	--	--	< 11.6	19.8	146 D	1000	3000
Pesticides/Herbicides (mg/kg)															
4,4'-DDD	--	--	--	--	--	--	--	--	--	--	< 0.0027	< 0.0029	< 0.0026	10	40
BHC-alpha	--	--	--	--	--	--	--	--	--	--	< 0.0027	< 0.0029	< 0.0026	50	500
Dieldrin	--	--	--	--	--	--	--	--	--	--	< 0.0027	< 0.0029	< 0.0026	0.09	0.6
Endosulfan, beta	--	--	--	--	--	--	--	--	--	--	< 0.0027	< 0.0029	< 0.0026	0.5	1
Total Metals (mg/kg)															
Arsenic	< 2.02	< 1.08	< 2.08	< 1.9	2.58	< 1.91	< 1.92	< 2.13	< 1.88	--	1.77	7.09	2.35	20	20
Barium	11.9	5.87	8.36	17.7	60.4	19	15.9	9.95	20.5	--	22.1	37.8	15.2	1000	3000
Beryllium	0.16	0.31	0.17	0.15	0.24	0.18	0.16	0.16	0.23	--	--	--	--	100	200
Cadmium	< 0.4	< 0.22	< 0.42	< 0.38	< 0.49	< 0.38	< 0.38	< 0.43	< 0.38	--	< 0.43	< 0.39	< 0.37	80	80
Chromium	4.55	6.97	4.05	7.65	7.81	7.68	8.49	6.12	11.5	--	4.17	23.3	10.8	100	200
Lead	16.3	4.16	7.64	5.94	15.4	52.6	30.9	15.2	49.7	411	73.8	76.2	19.5	200	600
Mercury	< 0.03	< 0.04	< 0.03	< 0.03	0.07	< 0.03	0.11	0.03	0.09	--	0.09	0.08	0.06	20	40
Nickel	4.11	3.62	3.7	5.66	4.18	4.81	5.04	4.02	7.02	--	--	--	--	700	1000
Silver	< 0.4	0.43	< 0.42	< 0.38	< 0.49	< 0.38	< 0.38	< 0.43	< 0.38	--	< 0.43	< 0.39	< 0.37	100	200
Vanadium	6.01	13.9	7.7	6.02	14.4	9.95	9.47	9.18	13	--	--	--	--	500	800
Zinc	73.1	55.2	14.9	15.2	18.9	36.9	24.4	21.9	47.3	--	--	--	--	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
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Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts															
Location	**DD-5**	**DD-7**	**E-1**	**E-1**	**E-1**	**E-1**	**E-1**	**E-2**	**E-3**	**E-3**	**E-5**	**E-7**	**E0**	**MCP Concentrations**	
Sample ID	DD-5	DD-7	E-1	E-1 1-2	E-1 2-3	E-1 4-5	E-1 9-10	E-2 4-5	E-3 0-3	E-3 3-7	E-5	E-7	**E-0 9-10**		
Sample Depth (feet)	0-5	0-5	0-5	1-2	2-3	4-5	9-10	4-5	0-3	3-7	0-5	0-5	9-10		
Sample Date	4/30/2024	4/30/2024	5/2/2024	5/2/2024	5/2/2024	5/2/2024	6/21/2024	5/3/2024	5/3/2024	5/3/2024	5/2/2024	5/2/2024	6/21/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0026-02	24E0026-01	24E0124-08	24E0125-10	24E1060-01	24E0125-15	24F0929-08	24E0126-02	24E0124-16	24E0124-17	24E0124-07	24E0124-06	24F0927-01		
VOCs (mg/kg)															
Acetone	< 0.051	< 1.52	< 0.053	--	--	--	--	--	< 0.066	< 0.058	< 0.060	< 0.068	--	6	50
Naphthalene	< 0.005	0.857	< 0.005	--	--	--	--	--	< 0.007	< 0.006	< 0.006	< 0.007	--	4	20
SVOCs (mg/kg)															
1,1-Biphenyl	< 0.03	0.08	< 0.03	--	--	--	--	--	< 0.03	< 0.03	< 0.03	< 0.03	--	0.05	6
2-Methylnaphthalene	< 0.28	0.31	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	0.7	80
Acenaphthylene	< 0.28	0.75	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	2	10
Anthracene	< 0.28	0.60	< 0.29	--	--	--	--	--	< 0.27	< 0.25	0.44	< 0.30	--	1000	3000
Benzo(A)anthracene	< 0.28	1.02	1.00	--	--	--	--	--	0.29	0.33	1.29	< 0.30	--	20	300
Benzo(A)pyrene	< 0.28	0.93	1.17	--	--	--	--	--	0.32	0.36	1.21	< 0.30	--	2	30
Benzo(B)fluoranthene	< 0.28	1.04	0.93	--	--	--	--	--	0.36	0.37	0.92	< 0.30	--	20	300
Benzo(g,h,i)Perylene	< 0.28	0.51	0.84	--	--	--	--	--	< 0.27	< 0.25	0.75	< 0.30	--	1000	3000
Benzo(K)fluoranthene	< 0.28	0.41	0.85	--	--	--	--	--	< 0.27	< 0.25	0.90	< 0.30	--	1000	3000
Bis (2-ethylhexyl) phthalate	< 0.28	< 0.27	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	100	700
Butylbenzylphthalate	< 0.28	< 0.27	0.39	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	100	1000
Chrysene	< 0.28	1.02	0.93	--	--	--	--	--	0.32	0.32	1.20	< 0.30	--	200	3000
Di-n-octyl phthalate	< 0.56	< 0.54	< 0.57	--	--	--	--	--	< 0.53	< 0.50	< 0.57	< 0.60	--	1000	10000
Dibenzo(A,H)anthracene	< 0.28	< 0.27	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	2	30
Dibenzofuran	< 0.28	0.43	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	100	1000
Fluoranthene	< 0.28	3.07	1.48	--	--	--	--	--	0.53	0.51	2.28	< 0.30	--	1000	3000
Fluorene	< 0.28	0.59	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	1000	3000
Indeno (1,2,3-cd) pyrene	< 0.28	0.55	0.92	--	--	--	--	--	< 0.27	< 0.25	0.80	< 0.30	--	20	300
Naphthalene	< 0.28	0.79	< 0.29	--	--	--	--	--	< 0.27	< 0.25	< 0.28	< 0.30	--	4	20
Phenanthrene	< 0.28	3.23	0.56	--	--	--	--	--	0.27	< 0.25	1.78	< 0.30	--	10	1000
Pyrene	< 0.28	2.20	1.48	--	--	--	--	--	0.52	0.60	2.54	< 0.30	--	1000	3000
Total SVOCs	--	17.53	10.55	--	--	--	--	--	2.59	2.47	14.1	0	--		--
Petroleum Hydrocarbons (mg/kg)															
Hydrocarbon, Oil, Petroleum	< 10.5	53.2	72.3 D	--	--	--	--	--	36.8	20.6	70.3	19.6	--	1000	3000
Pesticides/Herbicides (mg/kg)															
4,4'-DDD	< 0.0027	< 0.0027	< 0.0027	--	--	--	--	--	< 0.0027	< 0.0026	< 0.0028	< 0.0029	--	10	40
BHC-alpha	< 0.0027	< 0.0027	< 0.0027	--	--	--	--	--	< 0.0027	< 0.0026	< 0.0028	< 0.0029	--	50	500
Dieldrin	< 0.0027	< 0.0027	< 0.0027	--	--	--	--	--	< 0.0027	< 0.0026	< 0.0028	< 0.0029	--	0.09	0.6
Endosulfan, beta	< 0.0027	< 0.0027	< 0.0027	--	--	--	--	--	< 0.0027	< 0.0026	< 0.0028	< 0.0029	--	0.5	1
Total Metals (mg/kg)															
Arsenic	1.31	2.86	6.72	--	--	--	--	--	5.39	2.99	8.09	6.38	--	20	20
Barium	5.93	8.73	216	--	--	--	--	--	31.9	14.9	104	58	--	1000	3000
Beryllium	--	--	--	--	--	--	--	--	--	--	--	--	--	100	200
Cadmium	< 0.4	< 0.39	< 0.39	--	--	--	--	--	< 0.36	< 0.39	< 0.38	< 0.44	--	80	80
Chromium	4.29	4.36	26.7	--	--	--	--	--	11.1	5.89	12.5	11.8	--	100	200
Lead	9.18	5.02	676	340	183	1890	413	1230	188	53.5	368	171	235	200	600
Mercury	0.04	< 0.03	0.24	--	--	--	--	--	0.15	0.36	0.99 D	0.33	--	20	40
Nickel	--	--	--	--	--	--	--	--	--	--	--	--	--	700	1000
Silver	< 0.4	< 0.39	0.53	--	--	--	--	--	< 0.36	< 0.39	< 0.38	< 0.44	--	100	200
Vanadium	--	--	--	--	--	--	--	--	--	--	--	--	--	500	800
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts															
Location	**EE-8.5**	**EE-0.5**	**FF-1**	**FF-3**	**FF-5**	**FF-7**	**G-1**	**G-1**	**G-1**	**G-2**	**G-3**	**G-3**	**G-5**	**MCP Concentrations**	
Sample ID	EE-8.5	EE-0.5	FF-1	**FF-3**	**FF-5**	**FF-7**	G-1	G-1 4-5	G-1 9-10	G-2 4-5	G-3 0-4	G-3 4-8	G-5		
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	0-5	0-5	4-5	9-10	4-5	0-4	4-8	0-5		
Sample Date	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	5/2/2024	5/2/2024	6/21/2024	5/3/2024	5/1/2024	5/1/2024	5/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24D1044-13	24D1044-14	24D1044-12	24D1044-11	24D1044-10	24D1044-09	24E0124-11	24E0125-16	24F0929-07	24E0126-07	24E0050-06	24E0050-07	24E0124-10		
VOCs (mg/kg)															
Acetone	< 0.048	< 0.068	< 0.045	< 0.045	< 0.046	< 0.047	< 0.055	--	--	--	< 0.049	< 0.051	< 0.050	6	50
Naphthalene	< 0.005	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	< 0.005	< 0.005	< 0.005	4	20
SVOCs (mg/kg)															
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	--	--	--	< 0.03	0.03	< 0.03	0.05	6
2-Methylnaphthalene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	0.7	80
Acenaphthylene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	2	10
Anthracene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.40	< 0.27	1000	3000
Benzo(A)anthracene	< 0.29	< 0.29	0.42	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.78	< 0.27	20	300
Benzo(A)pyrene	< 0.29	< 0.29	0.42	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.80	< 0.27	2	30
Benzo(B)fluoranthene	< 0.29	< 0.29	0.44	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.55	< 0.27	20	300
Benzo(g,h,i)Perylene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.52	< 0.27	1000	3000
Benzo(K)fluoranthene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.47	< 0.27	1000	3000
Bis (2-ethylhexyl) phthalate	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	100	700
Butylbenzylphthalate	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	100	1000
Chrysene	< 0.29	< 0.29	0.41	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.77	< 0.27	200	3000
Di-n-octyl phthalate	< 0.57	< 0.58	< 0.54	< 0.54	< 0.54	< 0.57	< 0.56	--	--	--	< 0.55	< 0.56	< 0.54	1000	10000
Dibenzo(A,H)anthracene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	2	30
Dibenzofuran	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	100	1000
Fluoranthene	< 0.29	< 0.29	0.88	< 0.27	< 0.27	< 0.29	0.31	--	--	--	0.58	1.39	0.35	1000	3000
Fluorene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	1000	3000
Indeno (1,2,3-cd) pyrene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	0.48	< 0.27	20	300
Naphthalene	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	< 0.27	< 0.28	< 0.27	4	20
Phenanthrene	< 0.29	< 0.29	0.45	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	0.56	1.51	< 0.27	10	1000
Pyrene	< 0.29	< 0.29	0.76	< 0.27	< 0.27	< 0.29	0.29	--	--	--	0.56	1.67	0.44	1000	3000
Total SVOCs	0	0	3.77	0	0	0	0.60	--	--	--	1.70	9.38	0.78		--
Petroleum Hydrocarbons (mg/kg)															
Hydrocarbon, Oil, Petroleum	< 11.1	72.8 D	42	< 11.4	< 10.5	16.2	27.5	--	--	--	19.6	44.7	20.7	1000	3000
Pesticides/Herbicides (mg/kg)															
4,4'-DDD	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	< 0.003	< 0.003	< 0.003	10	40
BHC-alpha	< 0.003	< 0.003	0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	< 0.003	< 0.003	< 0.003	50	500
Dieldrin	< 0.003	< 0.003	0.025	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	< 0.003	< 0.003	< 0.003	0.09	0.6
Endosulfan, beta	< 0.003	< 0.003	0.006	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	< 0.003	< 0.003	< 0.003	0.5	1
Total Metals (mg/kg)															
Arsenic	6.02	4.39	1.47	4.08	3.12	4.41	4.4	--	--	--	4.93	4.95	3.38	20	20
Barium	66.6	28.6	16.6	16.4	16.4	20.7	50	--	--	--	21.5	24.9	18.1	1000	3000
Beryllium	--	--	--	--	--	--	--	--	--	--	--	--	--	100	200
Cadmium	< 0.37	< 0.41	< 0.38	< 0.42	< 0.4	< 0.43	< 0.42	--	--	--	< 0.37	< 0.42	< 0.36	80	80
Chromium	12	10.7	5.23	9.93	7.16	9.44	12.3	--	--	--	10.2	13	6.3	100	200
Lead	134	37.6	22.1	13.9	6.21	61.3	441	5420 D	31.6	863	24.2	59.7	51.1	200	600
Mercury	0.14	< 0.03	0.13	< 0.036	< 0.033	0.048	0.138	--	--	--	< 0.03	0.05	0.18	20	40
Nickel	--	--	--	--	--	--	--	--	--	--	--	--	--	700	1000
Silver	< 0.37	< 0.41	< 0.38	< 0.42	< 0.4	< 0.43	< 0.42	--	--	--	< 0.37	< 0.42	< 0.36	100	200
Vanadium	--	--	--	--	--	--	--	--	--	--	--	--	--	500	800
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts															
Location	**G-5**	**G-5**	**G-7**	**H-1**	**H-8.5**	**HH-1**	**HH-3**	**HH-5**	**HH-7**	**I-1**	**I-3**	**I-3**	**I-5**	**MCP Concentrations**	
Sample ID	G-5 5-6	G-5 9-10	G-7	H-1 4-5	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1	I-3	I-3 4-8	I-5		
Sample Depth (feet)	5-6	9-10	0-5	4-5	0-5	0-5	0-5	0-5	0-5	0-5	0-4	4-8	0-5		
Sample Date	6/21/2024	6/21/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/29/2024	4/29/2024	5/2/2024	5/1/2024	6/21/2024	5/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24F0928-19	24F0929-11	24E0124-09	24E0125-17	24E0124-12	24D1044-08	24E0026-04	24D1044-06	24D1044-05	24E0124-15	24E0050-04	24F0927-02	24E0124-14		
VOCs (mg/kg)															
Acetone	--	--	< 0.055	--	< 0.054	< 0.044	< 0.046	< 0.043	< 0.063	< 0.047	< 0.046	< 0.049	< 0.048	6	50
Naphthalene	--	--	< 0.006	--	< 0.005	< 0.004	0.013	< 0.004	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	4	20
SVOCs (mg/kg)															
1,1-Biphenyl	--	--	< 0.03	--	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.04	0.05	6
2-Methylnaphthalene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	< 0.27	0.7	80
Acenaphthylene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	1.05	2	10
Anthracene	--	--	< 0.28	--	< 0.26	< 0.28	0.47	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	0.82	1000	3000
Benzo(A)anthracene	--	--	< 0.28	--	< 0.26	< 0.28	0.48	< 0.28	< 0.29	0.38	< 0.27	< 0.28	3.22	20	300
Benzo(A)pyrene	--	--	< 0.28	--	< 0.26	< 0.28	0.40	< 0.28	< 0.29	0.40	< 0.27	< 0.28	2.23	2	30
Benzo(B)fluoranthene	--	--	< 0.28	--	< 0.26	< 0.28	0.41	< 0.28	< 0.29	0.46	< 0.27	< 0.28	2.20	20	300
Benzo(g,h,i)Perylene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	1.19	1000	3000
Benzo(K)fluoranthene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	0.71	1000	3000
Bis (2-ethylhexyl) phthalate	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	0.53	< 0.28	< 0.27	< 0.28	< 0.27	100	700
Butylbenzylphthalate	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	1.32	< 0.28	< 0.27	< 0.28	< 0.27	100	1000
Chrysene	--	--	< 0.28	--	< 0.26	< 0.28	0.42	< 0.28	< 0.29	0.43	< 0.27	< 0.28	4.09	200	3000
Di-n-octyl phthalate	--	--	< 0.55	--	< 0.51	< 0.56	< 0.55	< 0.55	1.03	< 0.56	< 0.54	< 0.55	< 0.54	1000	10000
Dibenzo(A,H)anthracene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	0.38	2	30
Dibenzofuran	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	< 0.27	100	1000
Fluoranthene	--	--	0.28	--	< 0.26	0.39	1.28	< 0.28	< 0.29	0.73	0.41	0.33	3.58	1000	3000
Fluorene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	< 0.27	1000	3000
Indeno (1,2,3-cd) pyrene	--	--	< 0.28	--	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	1.00	20	300
Naphthalene	--	--	< 0.28	--	< 0.26	< 0.28	0.35	< 0.28	< 0.29	< 0.28	< 0.27	< 0.28	< 0.27	4	20
Phenanthrene	--	--	< 0.28	--	< 0.26	< 0.28	1.56	< 0.28	< 0.29	0.38	< 0.27	< 0.28	2.48	10	1000
Pyrene	--	--	0.37	--	< 0.26	0.33	0.97	< 0.28	< 0.29	0.69	0.44	0.41	5.88	1000	3000
Total SVOCs	--	--	0.64	--	0	0.71	6.37	0	2.80	3.48	0.86	0.74	28.87		--
Petroleum Hydrocarbons (mg/kg)															
Hydrocarbon, Oil, Petroleum	--	--	63.4	--	17.9	298	< 11.2	< 10.6	15.5	28.1	73.8	73.2	16	1000	3000
Pesticides/Herbicides (mg/kg)															
4,4'-DDD	--	--	< 0.003	--	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	10	40
BHC-alpha	--	--	< 0.003	--	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	50	500
Dieldrin	--	--	< 0.003	--	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.6
Endosulfan, beta	--	--	< 0.003	--	< 0.003	0.004	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.5	1
Total Metals (mg/kg)															
Arsenic	--	--	< 0.86	--	2.79	4.83	2.67	1.8	3.24	6.3	2.58	< 0.99	3.94	20	20
Barium	--	--	< 0.86	--	21.6	21.9	12.9	8.93	19.4	44.7	35.2	13	14.2	1000	3000
Beryllium	--	--	--	--	--	--	--	--	--	--	--	--	--	100	200
Cadmium	--	--	< 0.43	--	< 0.4	< 0.38	< 0.4	< 0.41	< 0.42	< 0.41	< 0.36	< 0.49	< 0.39	80	80
Chromium	--	--	< 0.86	--	10.1	7.16	4.97	3.9	5.41	15.4	7.1	5.09	9.6	100	200
Lead	46.5	101	< 4.3	89.4 D	17.6	86.2	18.8	< 4.12	53.6	107	34	35.2	19.4	200	600
Mercury	--	--	0.13	--	0.07	0.05	< 0.03	< 0.03	0.13	0.26	0.08	< 0.03	0.13	20	40
Nickel	--	--	--	--	--	--	--	--	--	--	--	--	--	700	1000
Silver	--	--	< 0.43	--	< 0.4	< 0.38	< 0.4	< 0.41	< 0.42	< 0.41	< 0.36	--	< 0.39	100	200
Vanadium	--	--	--	--	--	--	--	--	--	--	--	--	--	500	800
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts								
Location	**I-7**	**II-8.5**	**II-8.5**	**II0.5**	**JJ/II-2**	**JJ/II-6**	**MCP Concentrations**	
Sample ID	I-7	**II-8.5**	II-8.5 5-6	**II-0.5**	**JJ/II-2**	**JJ/II-6**		
Sample Depth (feet)	0-5	0-5	5-6	0-5	0-5	0-5	RCS-1	RCS-2
Sample Date	5/2/2024	4/29/2024	5/3/2024	4/29/2024	4/29/2024	4/29/2024		
Laboratory Sample ID	24E0124-13	24D1044-03	24E0124-18	24D1044-04	24D1044-02	24D1044-01		
VOCs (mg/kg)								
Acetone	0.091	0.071	0.246	< 0.047	< 0.047	< 0.048	6	50
Naphthalene	< 0.006	< 0.006	< 0.015	< 0.005	< 0.005	< 0.005	4	20
SVOCs (mg/kg)								
1,1-Biphenyl	< 0.03	< 0.03	< 0.10	< 0.03	< 0.027	< 0.028	0.05	6
2-Methylnaphthalene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	0.7	80
Acenaphthylene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	2	10
Anthracene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	1000	3000
Benzo(A)anthracene	< 0.27	< 0.31	< 0.99	0.65	< 0.271	< 0.28	20	300
Benzo(A)pyrene	< 0.27	< 0.31	< 0.99	0.62	< 0.271	< 0.28	2	30
Benzo(B)fluoranthene	< 0.27	< 0.31	< 0.99	0.67	< 0.271	< 0.28	20	300
Benzo(g,h,i)Perylene	< 0.27	< 0.31	< 0.99	0.38	< 0.271	< 0.28	1000	3000
Benzo(K)fluoranthene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	1000	3000
Bis (2-ethylhexyl) phthalate	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	100	700
Butylbenzylphthalate	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	100	1000
Chrysene	< 0.27	< 0.31	< 0.99	0.66	< 0.271	< 0.28	200	3000
Di-n-octyl phthalate	< 0.55	< 0.61	< 1.98	< 0.53	< 0.542	< 0.561	1000	10000
Dibenzo(A,H)anthracene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	2	30
Dibenzofuran	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	100	1000
Fluoranthene	< 0.27	0.42	0.99	1.44	< 0.271	< 0.28	1000	3000
Fluorene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	1000	3000
Indeno (1,2,3-cd) pyrene	< 0.27	< 0.31	< 0.99	0.37	< 0.271	< 0.28	20	300
Naphthalene	< 0.27	< 0.31	< 0.99	< 0.26	< 0.271	< 0.28	4	20
Phenanthrene	< 0.27	< 0.31	< 0.99	0.98	< 0.271	< 0.28	10	1000
Pyrene	< 0.27	0.40	0.99	1.24	< 0.271	< 0.28	1000	3000
Total SVOCs	0	0.82	1.98	6.63	0	0		--
Petroleum Hydrocarbons (mg/kg)								
Hydrocarbon, Oil, Petroleum	< 11.9	36.2	273	32	< 10.6	< 11	1000	3000
Pesticides/Herbicides (mg/kg)								
4,4'-DDD	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	< 0.003	10	40
BHC-alpha	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	< 0.003	50	500
Dieldrin	< 0.003	< 0.003	< 0.005	0.037	< 0.003	< 0.003	0.09	0.6
Endosulfan, beta	< 0.003	< 0.003	< 0.005	0.009	< 0.003	< 0.003	0.5	1
Total Metals (mg/kg)								
Arsenic	5.81	6.55	6.92	1.83	2.62	3.29	20	20
Barium	24.1	86.3	55.4	18.4	11.3	13	1000	3000
Beryllium	--	--	--	--	--	--	100	200
Cadmium	< 0.46	< 0.45	< 0.7	< 0.37	< 0.39	< 0.38	80	80
Chromium	19.8	12.1	9.25	3.76	5.07	6.43	100	200
Lead	27.3	347	21.4	39.4	6.81	12.8	200	600
Mercury	0.09	0.58	< 0.06	0.07	< 0.035	< 0.031	20	40
Nickel	--	--	--	--	--	--	700	1000
Silver	< 0.46	< 0.45	< 0.7	< 0.37	< 0.39	< 0.38	100	200
Vanadium	--	--	--	--	--	--	500	800
Zinc	--	--	--	--	--	--	1000	3000

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**A-1**	**A-1**	**A-1**	**A-1**	**A-2**	**A-2**	**A-2**	**A-2**	**A-3**	**A-3**	**A-3**	**A-3**		
Sample ID	A-1	A-1 0-1	A-1 1-2	A-1 3-4	A-2 0-1	A-2 1-2	A-2 2-3	A-2 3-4	A-3	A-3 1-2	A-3 2-3	A-3 4-5		
Sample Depth (feet)	0-5	0-1	1-2	4-5	0-1	1-2	2-3	3-4	0-5	1-2	2-3	4-5		
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	12/29/2023	12/29/2023	12/29/2023	6/20/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024		
Laboratory Sample ID	24E0050-03	24G0454-03	24E0051-02	24E0051-11	23L0931-01	23L0931-02	23L0931-03	24F0928-16	24E0050-02	24E0051-03	24E0814-07	24E0051-12	RCS-1	RCS-2
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	0.3	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1254	0.1	0.3	< 0.05	0.2	< 0.06	< 0.06	0.6	0.2	0.3	0.4	1.1	0.2	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
Total PCBs	0.1	0.3	--	0.2	--	--	0.9	0.2	0.3	0.4	1.1	0.2	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**A-4**	**A-4**	**A-4**	**A-4**	**A-5**	**A-5**	**A-5**	**A-5**	**A-6**	**A-6 DUP**	**A-6**	**A-7**		
Sample ID	A-4 0-1	A-4 1-2	A-4 2-3	A-4 3-4	A-5	A-5 1-2	A-5 2-3	A-5 4-5	A-6 1-2	A-6 DUP 1-2	A-6 4-5	A-7		
Sample Depth (feet)	0-1	1-2	2-3	3-4	0-5	1-2	2-3	4-5	1-2	1-2	4-5	0-5		
Sample Date	12/29/2023	12/29/2023	12/29/2023	12/29/2023	5/1/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024		
Laboratory Sample ID	23L0931-07	23L0931-08	23L0931-09	23L0931-10	24E0050-01	24E0051-04	24E0814-09	24E0051-13	24E0051-05	24E0051-18	24E0051-14	24E0050-05	RCS-1	RCS-2
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
PCB Aroclor 1221	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
PCB Aroclor 1232	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
PCB Aroclor 1242	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
PCB Aroclor 1248	< 0.06	< 0.06	0.3	0.08	< 0.05	< 0.05	< 0.06	0.1	< 0.05	< 0.05	< 0.07	0.1	--	--
PCB Aroclor 1254	< 0.06	0.5	1.3 D	0.6	0.1	0.3	0.09	0.2	< 0.05	< 0.05	0.09	0.3	--	--
PCB Aroclor 1260	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
PCB Aroclor 1262	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
PCB Aroclor 1268	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.07	< 0.06	--	--
Total PCBs	--	0.5	1.6	0.68	0.1	0.3	0.09	0.3	--	--	0.09	0.4	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts												MCP Concentrations	
Location	**A0**	**A0**	**A0-5W**	**A0-10W**	**A0-10W**	**A0-20N10W**	**A0-20N10W**	**A0.5**	**AA-1**	**AA-1**	**AA-1**		
Sample ID	A0 0-1	A-0 1-2	A0-5W 0-1	A0-10W 0-1	A0-10W 2-3	A0-20N10W 0-1	A0-20N10W 1-2	A0.5 0-1	AA-1 0-1	AA-1 1-2	AA-1 2-3		
Sample Depth (feet)	0-1	1-2	0-1	0-1	2-3	0-1	1-2	0-1	0-1	1-2	2-3		
Sample Date	5/1/2024	5/1/2024	7/17/2024	7/17/2024	7/17/2024	7/17/2024	7/17/2024	7/17/2024	4/30/2024	4/30/2024	4/30/2024		
Laboratory Sample ID	24G0151-02	24E0051-01	24G1155-03	24G0737-01	24G0737-02	24G0737-03	24G0737-04	24G0736-01	24G0454-02	24E0029-07	24E0814-03	RCS-1	RCS-2
PCBs (mg/kg)													
PCB Aroclor 1016	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1254	125 D	0.4	4.5 D	15.7 D	0.4	0.3	< 0.05	68 D	< 0.05	< 0.05	0.2	--	--
PCB Aroclor 1260	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 10.4	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05	< 6.6	< 0.05	< 0.05	< 0.05	--	--
Total PCBs	125	0.4	4.5	15.7	0.4	0.3	--	68	--	--	0.2	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**AA-1**	**AA-2**	**AA-2**	**AA-2**	**AA-3**	**AA-3**	**AA-3**	**AA-3**	**AA-4**	**AA-4 DUP**	**AA-4**	**AA-4**		
Sample ID	AA-1 4-5	AA-2 1-2	AA-2 DUP 1-2	AA-2 4-5	AA-3 0-1	AA-3 1-2	AA-3 2-3	AA-3 3-4	AA-4 1-2	AA-4 DUP 1-2	AA-4 2-3	AA-4 4-5		
Sample Depth (feet)	4-5	1-2	1-2	4-5	0-1	1-2	2-3	3-4	1-2	1-2	2-3	4-5		
Sample Date	4/30/2024	4/30/2024	4/30/2024	4/30/2024	12/29/2023	12/29/2023	12/29/2023	6/20/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024		
Laboratory Sample ID	24E0027-06	24E0029-08	24E0029-09	24E0027-07	23L0931-04	23L0931-05	23L0931-06	24F0928-15	24E0029-10	24E0027-09	24E0814-08	24E0027-08	RCS-1	RCS-2
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1254	0.6	1.4 D	0.6	0.6	0.1	0.7	0.2	0.4	0.6	0.4	0.5	0.2	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
Total PCBs	0.6	1.4	0.6	0.6	0.1	0.8	0.2	0.4	0.6	0.4	0.5	0.2	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**AA-5**	**AA-5**	**AA-6**	**AA-6**	**AA-8.5**	**AA0**	**AA0**	**AA0 DUP**	**AA0**	**AA0.5**	**B-1**	**B-1**		
Sample ID	AA-5 1-2	AA-5 4-5	AA-6 1-2	AA-6 4-5	**AA-8.5**	AA0 0-1	AA-0 1-2	AA-0 DUP 1-2	AA-0 4-5	AA0.5 0-1	B-1 0-1	B-1 1-2		
Sample Depth (feet)	1-2	4-5	1-2	4-5	0-5	0-1	1-2	1-2	4-5	0-1	0-1	1-2		
Sample Date	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	7/17/2024	5/1/2024	5/1/2024		
Laboratory Sample ID	24E0027-10	24E0027-11	24E0027-12	24E0027-13	24E0026-09	24G0454-01	24E0029-05	24E0029-06	24E0027-05	24G0736-02	24G0151-03	24E0051-07	RCS-1	RCS-2
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1248	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1254	0.06	0.2	< 0.05	0.08	0.2	2 D	0.2	0.2	0.2	7.1 D	2.5 D	< 0.05	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	0.2	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1262	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
Total PCBs	0.06	0.2	--	0.08	0.2	2	0.2	0.2	0.4	7.1	2.5	--	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**B-1**	**B-2**	**B-2**	**B-2**	**B-3**	**B-3**	**B-3**	**B-3**	**B-4**	**B-5**	**B-5**	**B-5**		
Sample ID	B-1 4-5	B-2 0-1	B-2 1-2	B-2 4-5	B-3 0-1	B-3 1-2	B-3 2-3	B-3 2-3	B-4 2-3	B-5 1-2	B-5 2-3	B-5 4-5		
Sample Depth (feet)	4-5	0-1	1-2	4-5	0-1	1-2	2-3	2-3	2-3	1-2	2-3	4-5		
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	12/29/2023	12/29/2023	12/29/2023	6/20/2024	6/20/2024	5/1/2024	5/1/2024	5/1/2024		
Laboratory Sample ID	24E0051-15	24G0453-07	24E0051-08	24E0051-16	23L0931-11	23L0931-12	23L0932-01	24F0928-13	24F0928-13	24E0051-09	24E0814-10	24E0051-17	RCS-1	RCS-2
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1248	0.3	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1254	0.4	< 0.06	< 0.05	0.2	< 0.05	0.09	0.09	< 0.06	< 0.05	< 0.06	< 0.05	0.2	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
Total PCBs	0.7	--	--	0.2	--	0.09	0.09	--	--	--	--	0.2	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**B-6**	**B0**	**B0**	**B0**	**B0**	**B0-10E**	**B0-10E**	**B0-10N**	**B0-10N15E**	**B0-10N15W**	**B0-10N15E**	**B0-10N15W**		
Sample ID	B-6 1-2	B0 0-1	B-0 1-2	B0 2-3	B0 3-4	B0-10E 0-1	B0-10E 2-3	B0-10N 0-1	B0-10N15E 2-3	B0-10N15W 2-3	B0-10N15E 0-1	B0-10N15W 0-1		
Sample Depth (feet)	1-2	0-1	1-2	2-3	3-4	0-1	2-3	0-1	2-3	2-3	0-1	0-1		
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024	6/21/2024	6/21/2024	6/21/2024	7/2/2024	7/2/2024	7/2/2024	7/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0051-10	24E0814-04	24E0051-06	24E0814-05	24E0814-06	24F0929-09	24G0151-05	24F0929-05	24G0453-04	24G0453-01	24G0152-05	24G0152-01		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
PCB Aroclor 1221	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
PCB Aroclor 1232	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
PCB Aroclor 1242	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
PCB Aroclor 1248	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
PCB Aroclor 1254	< 0.05	240 D	102 D	0.07	0.1	3040 D	0.8	12.8 D	0.07	0.2	83.1 D	174 D	--	--
PCB Aroclor 1260	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	0.06	< 5.3	< 10.9	--	--
PCB Aroclor 1262	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
PCB Aroclor 1268	< 0.05	< 23.1	< 5.8	< 0.05	< 0.05	< 270	< 0.05	< 1	< 0.05	< 0.05	< 5.3	< 10.9	--	--
Total PCBs	--	240	102	0.07	0.1	3040	0.8	12.8	0.07	0.26	83.1	174	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**B0-10S**	**B0-10S**	**B0-10S15E**	**B0-10S15W**	**B0-10S15E**	**B0-10S15W**	**B0-10W**	**B0-10W**	**B0-15E**	**B0-15N15E**	**B0-15N15W**	**B0-15W**		
Sample ID	B0-10S 0-1	B0-10S 2-3	B0-10S15E 2-3	B0-10S15W 2-3	B0-10S15E 0-1	BO-10S15W 0-1	B0-10W 0-1	B0-10W 2-3	B0-15E 0-1	B0-15N15E 0-1	B0-15N15W 0-1	B0-15W 0-1		
Sample Depth (feet)	0-1	2-3	2-3	2-3	0-1	0-1	0-1	2-3	0-1	0-1	0-1	0-1		
Sample Date	6/21/2024	6/21/2024	7/2/2024	7/2/2024	7/2/2024	7/2/2024	6/21/2024	6/21/2024	7/2/2024	7/17/2024	7/17/2024	7/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24F0928-20	24G0151-06	24G0453-06	24G0453-03	24G0152-08	24G0152-04	24F0929-02	24G0151-07	24G0152-06	24G1155-02	24G1155-01	24G0152-02		
PCBs (mg/kg)														
PCB Aroclor 1016	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1221	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1232	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1242	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1248	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1254	317 D	0.4	6.3 D	0.08	54.3 D	257 D	139 D	0.5	136 D	49.9 D	72.2 D	456 D	--	--
PCB Aroclor 1260	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1262	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
PCB Aroclor 1268	< 21.2	< 0.05	< 0.06	< 0.06	< 2.8	< 21.3	< 10.2	< 0.05	< 10.4	< 5.1	< 5.1	< 26.5	--	--
Total PCBs	317	0.4	6.3	0.08	54.3	257	139	0.5	136	49.9	72.2	456	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**B0-20E**	**B0-20E**	**B0-20N15E**	**B0-20N15W**	**B0-20N15W**	**B0-20W**	**B0-20W**	**B0-5E**	**B0-5N**	**B0-5S**	**B0-5W**	**BB-0**		
Sample ID	B0-20E 0-1	B0-20E 2-3	B0-20N15E 0-1	B0-20N15W 0-1	B0-20N15W 1-2	B0-20W 0-1	B0-20W 2-3	B0-5E 0-1	B0-5N 0-1	B0-5S 0-1	B0-5W 0-1	BB-0 0-1		
Sample Depth (feet)	0-1	2-3	0-1	0-1	1-2	0-1	2-3	0-1	0-1	0-1	0-1	0-1		
Sample Date	7/2/2024	7/2/2024	7/17/2024	7/17/2024	7/17/2024	7/2/2024	7/2/2024	6/21/2024	6/21/2024	6/21/2024	6/21/2024	12/29/2023	RCS-1	RCS-2
Laboratory Sample ID	24G0152-07	24G0453-05	24G0736-07	24G0736-08	24G0736-09	24G0152-03	24G0453-02	24F0929-04	24F0929-06	24F0929-03	24F0929-01	23L0932-02		
PCBs (mg/kg)														
PCB Aroclor 1016	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1221	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1232	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1242	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1248	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1254	67.6 D	0.2	3.1 D	0.5	0.1	81.8 D	0.3	93.7 D	35.3 D	180 D	167 D	0.8	--	--
PCB Aroclor 1260	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1262	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
PCB Aroclor 1268	< 5.4	< 0.05	< 0.05	< 0.05	< 0.05	< 5.6	< 0.05	< 5.1	< 2.6	< 10.2	< 10.1	< 0.05	--	--
Total PCBs	67.6	0.2	3.1	0.5	0.1	81.8	0.3	93.7	35.3	180	167	0.8	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**BB-0**	**BB-0**	**BB-0**	**BB-1**	**BB-1**	**BB-1**	**BB-1**	**BB-1**	**BB-1**	**BB-2**	**BB-2**	**BB-2**		
Sample ID	BB-0 1-2	BB-0 2-3	BB-0 3-4	BB-1 0-1	BB-1 1-2	BB-1 2-3	BB-1	BB-1 3-4	BB-1 4-5	BB-2 1-2	BB-2 2-3	BB-2 3-4		
Sample Depth (feet)	1-2	2-3	3-4	0-1	1-2	2-3	0-5	3-4	4-5	1-2	2-3	3-4		
Sample Date	12/29/2023	12/29/2023	6/20/2024	12/29/2023	12/29/2023	12/29/2023	4/30/2024	6/20/2024	6/20/2024	12/29/2023	12/29/2023	12/29/2023	RCS-1	RCS-2
Laboratory Sample ID	23L0932-03	23L0932-04	24F0928-18	23L0932-05	23L0932-06	23L0932-07	24E0026-08	24F0928-17	24F0927-10	23L0932-08	23L0932-09	23L0932-10		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	0.1	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	0.09	--	--
PCB Aroclor 1254	< 0.06	1.5 D	0.2	< 0.06	0.3	0.7	0.6	0.7	0.5	< 0.06	0.5	0.4	--	--
PCB Aroclor 1260	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	0.1	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	--	--
Total PCBs	0	1.5	0.2	0	0.3	0.8	0.7	0.7	0.5	--	0.5	0.49	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**BB-3**	**BB-3**	**BB-3**	**BB-4**	**BB-4**	**BB-5**	**BB-5**	**BB-5**	**BB-6**	**BB-6**	**BB-7**	**C-1**		
Sample ID	BB-3	BB-3 1-2	BB-3 4-5	BB-4 1-2	BB-4 4-5	BB-5	BB-5 1-2	BB-5 4-5	BB-6 1-2	BB-6 4-5	BB-7	C-1		
Sample Depth (feet)	0-5	1-2	4-5	1-2	4-5	0-5	1-2	4-5	1-2	4-5	0-5	0-5		
Sample Date	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0026-07	24E0029-04	24E0027-04	24E0029-03	24E0027-03	24E0026-06	24E0029-02	24E0027-02	24E0029-01	24E0027-01	24E0026-05	24E0124-01		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	0.08	< 0.06	--	--
PCB Aroclor 1248	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1254	0.2	0.4	0.3	0.08	0.09	0.07	0.2	0.08	< 0.06	0.09	0.06	0.2	--	--
PCB Aroclor 1260	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1262	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
Total PCBs	0.2	0.4	0.3	0.08	0.09	0.07	0.2	0.08	--	0.09	0.14	0.2	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**C-1**	**C-1**	**C-2**	**C-2**	**C-2**	**C-2**	**C-3**	**C-3**	**C-3**	**C-4**	**C-4**	**C-4**		
Sample ID	C-1 0-1	C-1 1-2	C-2 0-1	C-2 1-2	C-2 2-3	C-2 3-4	C-3	C-3 1-2	C-3 4-5	C-4 0-1	C-4 1-2	C-4 2-3		
Sample Depth (feet)	0-1	1-2	0-1	1-2	2-3	3-4	0-5	1-2	4-5	0-1	1-2	2-3		
Sample Date	5/2/2024	5/2/2024	12/29/2023	12/29/2023	12/29/2023	12/29/2023	5/2/2024	5/2/2024	5/2/2024	12/29/2023	12/29/2023	12/29/2023	RCS-1	RCS-2
Laboratory Sample ID	24G0151-04	24E0125-05	23L0932-11	23L0932-12	23L0932-13	23L0932-14	24E0124-02	24E0125-04	24E0125-06	23L0932-15	23L0932-16	23L0932-17		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1254	0.2	< 0.05	< 0.06	< 0.05	< 0.05	0.3	0.08	< 0.05	< 0.06	< 0.05	0.1	0.1	--	--
PCB Aroclor 1260	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
Total PCBs	0.2	--	--	--	--	0.4	0.08	--	--	--	0.1	0.1	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**C-5**	**C-5**	**C-5**	**C-6**	**C-7**	**C0**	**C0**	**C0 DUP**	**C0**	**C0.5**	**CC-1**	**CC-1**		
Sample ID	C-5	C-5 1-2	C-5 4-5	C-6 1-2	C-7	C0 0-1	C0 1-2	C0 DUP 1-2	C0 4-5	C0.5 0-1	CC-1 3-4	CC-1 1-2		
Sample Depth (feet)	0-5	1-2	4-5	1-2	0-5	0-1	1-2	1-2	4-5	0-1	3-4	1-2		
Sample Date	5/2/2024	5/2/2024	5/2/2024	5/2/2024	5/2/2024	5/1/2024	5/1/2024	5/1/2024	5/1/2024	5/17/2024	4/25/2024	4/29/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0124-03	24E0125-03	24E0125-01	24E0125-02	24E0124-04	24G0151-01	24E0050-08	24E0050-10	24E0050-09	24G0736-03	24E0814-01	24D1045-10		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	0.1	--	--
PCB Aroclor 1254	0.1	< 0.05	0.2	0.1	< 0.05	3.4 D	< 0.05	< 0.05	0.3	9.3 D	8.2 D	0.5	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
Total PCBs	0.1	--	0.2	0.1	--	3.4	--	--	0.4	9.3	8.2	0.6	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**CC-1**	**CC-2**	**CC-2 DUP**	**CC-2**	**CC0**	**CC0**	**CC0**	**CEC-1-1**	**CEC-1-1**	**CEC-1-2**	**CEC-2-1**	**CEC-2-1**		
Sample ID	CC-1 5-6	CC-2 1-2	CC-2 DUP 1-2	CC-2 4-5	CC-0 3-4	CC-0 1-2	CC-0 5-6	CEC-1-1 0-4	CEC-1-1 8-9.5	CEC-1-2 0-4	CEC-2-1 0-4	CEC-2-1 8.8-10		
Sample Depth (feet)	5-6	1-2	1-2	4-5	3-4	1-2	5-6	0-4	8-9.5	0-4	0-4	8.8-10		
Sample Date	6/20/2024	4/29/2024	4/29/2024	4/29/2024	4/25/2024	4/29/2024	6/20/2024	11/9/2023	11/9/2023	12/5/2023	11/9/2023	11/9/2023	RCS-1	RCS-2
Laboratory Sample ID	24F0928-10	24D1045-10	24D1045-19	24D1045-16	24E0814-02	24D1045-08	24F0928-09	23K0414-01	23K0414-02	23L0197-04	23K0414-05	23K0414-06		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1254	0.6	0.2	< 0.05	0.6	2.5 D	0.08	0.2	0.1	< 0.3	0.4	< 0.06	< 0.08	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.3	< 0.05	< 0.06	< 0.08	--	--
Total PCBs	0.6	0.2	--	0.6	2.5	0.08	0.2	0.1	--	0.4	--	--	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**CEC-2-2**	**CEC-3-1**	**CEC-3-2**	**CEC-4-1**	**CEC-4-1**	**CEC-4-2**	**CEC-4-2**	**CEC-5-1**	**CEC-5-1**	**CEC-5-2**	**CEC-6-2**	**CEC-7-2**		
Sample ID	CEC-2-2 0-4	CEC-3-1 0-4	CEC-3-2 0.3-4	CEC-4-1 0-4	CEC-4-1 8-10	CEC-4-2 0-4	CEC-4-2 4.5-7.5	CEC-5-1 0-4	CEC-5-1 8-10	CEC-5-2 0-4	CEC-6-2 0-4	CEC-7-2 0-4		
Sample Depth (feet)	0-4	0-4	0.3-4	0-4	8-10	0-4	4.5-5.75	0-4	8-10	0-4	0-4	0-4		
Sample Date	12/6/2023	11/10/2023	12/6/2023	11/9/2023	11/9/2023	12/5/2023	12/5/2023	11/10/2023	11/10/2023	12/6/2023	12/6/2023	12/5/2023	RCS-1	RCS-2
Laboratory Sample ID	23L0197-12	23K0414-09	23L0197-11	23K0414-03	23K0414-04	23L0197-05	23L0197-06	23K0414-08	23K0414-07	23L0197-09	23L0197-10	23L0197-07		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1248	< 0.05	0.2	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1254	0.1	0.6	< 0.05	< 0.05	< 0.06	11.2 D	< 0.05	< 0.05	< 0.06	0.06	0.09	0.4	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 1.1	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.05	--	--
Total PCBs	0.1	0.8	--	--	--	11.2	--	--	--	0.06	0.09	0.4	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**CEC-7-2**	**CEC-7-2**	**CEC-8-2**	**CEC-8-2**	**D-0**	**D-0**	**D-0**	**D-1**	**D-1**	**D-1**	**D-2**	**D-3**		
Sample ID	CEC-7-2 4-8	CEC-7-2 8-10	CEC-8-2 2-4	CEC-8-2 4-8	D-0 0-1	D-0 1-2	D-0 2-3	D-1 0-1	D-1 1-2	D-1 2-3	D-2 1-2	D-3 0-1		
Sample Depth (feet)	4-8	8-10	2-4	4-8	0-1	1-2	2-3	0-1	1-2	2-3	1-2	0-1		
Sample Date	12/5/2024	12/5/2024	12/5/2023	12/5/2024	12/29/2023	12/29/2023	12/29/2023	12/29/2023	12/29/2023	12/29/2023	5/2/2024	12/29/2023	RCS-1	RCS-2
Laboratory Sample ID	23L0197-08	23L0197-01	23L0197-02	23L0197-03	23L0933-01	23L0933-02	23L0933-03	23L0933-04	23L0933-05	23L0933-06	24E0125-08	23L0933-07		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1254	0.3	0.3	6.9 D	3.5 D	0.3	< 0.05	< 0.05	0.2	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1260	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.06	< 0.06	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	--	--
Total PCBs	0.3	0.3	6.9	3.5	0.3	--	--	0.2	--	--	--	--	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**D-3**	**D-3**	**D-4**	**D-4**	**D-8.5**	**D0.5**	**DD-1**	**DD-1**	**DD-1**	**DD-2**	**DD-3**	**DD-5**		
Sample ID	D-3 1-2	D-3 2-3	D-4 1-2	D-4 4-5	D-8.5	D0.5 0-1	DD-1	DD-1 1-2	DD-1 4-5	DD-2 3-4	DD-3	DD-5		
Sample Depth (feet)	1-2	2-3	1-2	4-5	0-5	0-1	0-5	1-2	4-5	3-4	0-5	0-5		
Sample Date	12/29/2023	12/29/2023	5/2/2024	5/2/2024	5/2/2024	7/17/2024	4/29/2024	4/29/2024	4/29/2024	6/20/2024	4/30/2024	4/30/2024	RCS-1	RCS-2
Laboratory Sample ID	23L0933-08	23L0933-09	24E0125-07	24E0125-09	24E0124-05	24G0736-04	24D1044-18	24D1045-09	24D1045-14	24F0928-12	24E0026-03	24E0026-02		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	0.08	0.1	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1254	< 0.05	0.2	0.09	0.1	0.1	0.8	0.6	0.4	0.4	< 0.05	0.09	0.08	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
Total PCBs	--	0.2	0.09	0.1	0.1	0.8	0.7	0.48	0.5	--	0.09	0.08	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**DD-7**	**DD0**	**DD0**	**E-1**	**E-1**	**E-1**	**E-1**	**E-2**	**E-2**	**E-2**	**E-3**	**E-3**		
Sample ID	DD-7	DD-0 1-2	DD-0 4-5	E-1	E-1 0-1	E-1 1-2	E-1 4-5	E-2 1-2	E-2 DUP 1-2	E-2 4-5	E-3 0-3	E-3 3-7		
Sample Depth (feet)	0-5	1-2	4-5	0-5	0-1	1-2	4-5	1-2	1-2	4-5	0-3	3-7		
Sample Date	4/30/2024	4/29/2024	4/29/2024	5/2/2024	5/2/2024	5/2/2024	5/2/2024	5/3/2024	5/3/2024	5/3/2024	5/3/2024	5/3/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0026-01	24D1045-07	24D1045-13	24E0124-08	24E0814-11	24E0125-10	24E0125-15	24E0126-01	24E0126-03	24E0126-02	24E0124-16	24E0124-17		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 0.05	< 0.05	0.4	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1254	< 0.05	0.06	0.8	0.1	0.3	0.09	0.3	0.07	0.07	0.2	0.1	0.2	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	0.1	< 0.05	< 0.05	0.07	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--	--
Total PCBs	--	0.06	1.2	0.1	0.3	0.09	0.4	0.07	0.07	0.27	0.1	0.2	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**E-5**	**E-7**	**E0**	**E0**	**E0**	**E0.5**	**E0.5 DUP**	**EE-1**	**EE-2**	**EE-8.5**	**EE0**	**EE0.5**		
Sample ID	E-5	E-7	E-0 0-1	E-0 1-2	E-0 2-3	E0.5 0-1	E0.5 Dup	EE-1 3-4	EE-2 3-4	EE-8.5	EE-0 1-2	EE-0.5		
Sample Depth (feet)	0-5	0-5	0-1	1-2	2-3	0-1	0-1	3-4	3-4	0-5	1-2	0-5		
Sample Date	5/2/2024	5/2/2024	12/29/2023	12/29/2023	12/29/2023	7/17/2024	7/17/2024	6/20/2024	6/20/2024	4/29/2024	4/29/2024	4/29/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0124-07	24E0124-06	23L0933-10	23L0933-11	23L0933-12	24G0736-05	24G0736-06	24F0928-08	24F0928-11	24D1044-13	24D1045-06	24D1044-14		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1248	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	0.1	< 0.05	< 0.06	--	--
PCB Aroclor 1254	0.09	< 0.06	0.1	< 0.05	< 0.05	19.9 D	12.4 D	0.1	0.2	0.2	0.3	0.08	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 1.1	< 1.1	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
Total PCBs	0.09	--	0.1	--	--	19.9	12.4	0.1	0.2	0.3	0.3	0.08	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**F-0**	**F-0**	**F-0**	**F-0**	**F-1**	**F-1**	**F-2**	**F-2**	**F0.5**	**FF-1**	**FF-1**	**FF-1**		
Sample ID	F-0 0-1	F-0 1-2	F-0 2-3	F-0 3-4	F-1 0-1	F-1 1-2	F-2 1-2	F-2 4-5	F-0.5 0-1	FF-1	FF-1 0-1	FF-1 1-2		
Sample Depth (feet)	0-1	1-2	2-3	3-4	0-1	1-2	1-2	4-5	0-1	0-5	0-1	1-2		
Sample Date	12/29/2023	12/29/2023	12/29/2023	12/29/2023	5/2/2024	5/2/2024	5/3/2024	5/3/2024	8/26/2024	4/29/2024	6/20/2024	6/20/2024	RCS-1	RCS-2
Laboratory Sample ID	23L0933-19	23L0933-13	23L0933-14	23L0933-15	24E0814-12	24E0125-12	24E0126-04	24E0126-05	24I0015-01	24D1044-12	24G0455-01	24F0928-06		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1221	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1232	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1242	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1248	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1254	2.2 D	< 0.05	< 0.05	< 0.05	0.2	0.2	0.1	0.2	1	2.3 D	< 0.05	0.3	--	--
PCB Aroclor 1260	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1262	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
PCB Aroclor 1268	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--
Total PCBs	2.2	--	--	--	0.2	0.2	0.1	0.2	1	2.3	--	0.3	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**FF-1**	**FF-1**	**FF-1**	**FF-2**	**FF-2**	**FF-3**	**FF-5**	**FF-7**	**FF0**	**FF0 DUP**	**FF0**	**G-1**		
Sample ID	FF-1 2-3	FF-1 3-4	FF-1 4-5	FF-2 1-2	FF-2 4-5	FF-3	FF-5	FF-7	FF-0 1-2	FF-0 DUP 1-2	FF-0 4-5	G-1		
Sample Depth (feet)	2-3	3-4	4-5	1-2	4-5	0-5	0-5	0-5	1-2	1-2	4-5	0-5		
Sample Date	6/20/2024	6/20/2024	6/20/2024	6/20/2024	6/20/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	5/2/2024	RCS-1	RCS-2
Laboratory Sample ID	24G0455-02	24G0455-03	24F0927-08	24F0928-07	24F0927-09	24D1044-11	24D1044-10	24D1044-09	24D1045-05	24D1045-18	24D1045-12	24E0124-11		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1248	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1254	0.09	9.1 D	< 0.06	0.08	< 0.06	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	0.2	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	0.1	--	--
PCB Aroclor 1262	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	--	--
Total PCBs	0.09	9.1	--	0.08	--	--	--	0.15	--	--	--	0.3	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**G-1**	**G-1**	**G-1**	**G-2**	**G-2**	**G-3**	**G-3**	**G-5**	**G-7**	**G0**	**G0.5**	**GG-1**		
Sample ID	G-1 0-1	G-1 1-2	G-1 4-5	G-2 1-2	G-2 4-5	G-3 0-4	G-3 4-8	G-5	G-7	G0 0-1	G-0.5 0-1	GG-1 1-2		
Sample Depth (feet)	0-1	1-2	4-5	1-2	4-5	0-4	4-8	0-5	0-5	0-1	0-1	1-2		
Sample Date	5/2/2024	5/2/2024	5/2/2024	5/3/2024	5/3/2024	5/1/2024	5/1/2024	5/2/2024	5/2/2024	6/21/2024	8/26/2024	6/20/2024	RCS-1	RCS-2
Laboratory Sample ID	24E0814-13	24E0125-13	24E0125-16	24E0126-06	24E0126-07	24E0050-06	24E0050-07	24E0124-10	24E0124-09	24F0929-10	24I0015-02	24F0928-05		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1248	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	0.1	< 0.05	0.2	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1254	0.1	0.2	0.8	0.1	0.3	< 0.05	0.1	0.1	0.2	0.4	0.9	< 0.05	--	--
PCB Aroclor 1260	< 0.05	< 0.06	0.2	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1262	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	--	--
Total PCBs	0.1	0.2	1	0.1	0.3	--	0.2	0.1	0.4	0.4	0.9	--	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**GG-1**	**GG-2**	**GG-2**	**GG0**	**H-0**	**H-0**	**H-0**	**H-1**	**H-1 DUP**	**H-1**	**H-8.5**	**H0.5**		
Sample ID	GG-1 4-5	GG-2 1-2	GG-2 4-5	GG-0 1-2	H-0 0-1	H-0 1-2	H-0 2-3	H-1 1-2	H-1 DUP 1-2	H-1 4-5	H-8.5	H-0.5 0-1		
Sample Depth (feet)	4-5	1-2	4-5	1-2	0-1	1-2	2-3	1-2	1-2	4-5	0-5	0-1		
Sample Date	6/20/2024	6/20/2024	6/20/2024	4/29/2024	12/29/2023	12/29/2023	12/29/2023	5/2/2024	5/2/2024	5/2/2024	5/2/2024	8/29/2024	RCS-1	RCS-2
Laboratory Sample ID	24F0927-07	24F0928-04	24F0927-06	24D1045-04	23L0933-16	23L0933-17	23L0933-18	24E0125-14	24E0125-11	24E0125-17	24E0124-12	24I0015-03		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1248	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	0.2	< 0.06	< 0.06	0.07	< 0.05	< 0.06	--	--
PCB Aroclor 1254	< 0.06	< 0.05	< 0.06	< 0.05	0.08	0.06	0.3	0.07	0.1	0.2	0.1	0.5	--	--
PCB Aroclor 1260	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1262	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.05	< 0.06	--	--
Total PCBs	--	--	--	--	0.08	0.06	0.5	0.07	0.1	0.27	0.1	0.5	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**HH-1**	**HH-3**	**HH-5**	**HH-7**	**HH0**	**HH0 DUP**	**HH0**	**HH0.5**	**HH-0.5**	**I-1**	**I-3**	**I-3**		
Sample ID	HH-1	HH-3	HH-5	HH-7	HH-0 1-2	HH-0 DUP 1-2	HH-0 4-5	HH-0.5 1-2	HH-0.5 4-5	I-1	I-3	**I-3 4-8**		
Sample Depth (feet)	0-5	0-5	0-5	0-5	1-2	1-2	4-5	1-2	4-5	0-5	0-4	4-8		
Sample Date	4/29/2024	4/30/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	6/20/2024	6/20/2024	5/2/2024	5/1/2024	6/21/2024	RCS-1	RCS-2
Laboratory Sample ID	24D1044-08	24E0026-04	24D1044-06	24D1044-05	24D1045-03	24D1045-17	24D1045-11	24F0928-03	24F0927-05	24E0124-15	24E0050-04	24F0927-02		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.06	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1254	0.5	0.2	< 0.06	0.09	< 0.05	< 0.05	< 0.05	1.3 D	< 0.06	< 0.05	0.1	0.3	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--
Total PCBs	0.5	0.2	--	0.16	--	--	--	1.3	--	--	0.1	0.3	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts													MCP Concentrations	
Location	**I-5**	**I-7**	**I0.5**	**II-8.5**	**II-8.5**	**II0**	**II0.5**	**II0.5**	**II-0.5**	**J-0**	**J-0**	**J-0**		
Sample ID	I-5	I-7	I-0.5 0-1	II-8.5	II-8.5 5-6	II-0 1-2	II-0.5	II-0.5 1-2	II-0.5 4-5	J-0 0-1	J-0 1-2	J-0 2-3		
Sample Depth (feet)	0-5	0-5	0-1	0-5	5-6	1-2	0-5	1-2	4-5	0-1	1-2	2-3		
Sample Date	5/2/2024	5/2/2024	8/29/2024	4/29/2024	5/3/2024	4/29/2024	4/29/2024	6/20/2024	6/20/2024	12/29/2023	12/29/2023	12/29/2023	RCS-1	RCS-2
Laboratory Sample ID	24E0124-14	24E0124-13	24I0015-04	24D1044-03	24E0124-18	24D1045-01	24D1044-04	24F0928-02	24F0927-04	23L0931-13	23L0931-14	23L0931-15		
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1248	< 0.05	0.2	< 0.06	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1254	0.1	0.3	0.8	0.08	< 0.1	< 0.05	1.2 D	0.4	0.09	< 0.05	< 0.06	0.2	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.06	< 0.06	< 0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.06	< 0.06	--	--
Total PCBs	0.1	0.5	0.8	0.18	--	--	1.2	0.4	0.09	--	--	0.2	1	4

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts							MCP Concentrations	
Location	**J-0**	**JJ/II-2**	**JJ/II-6**	**JJ0**	**JJ0.5**	**JJ0.5**		
Sample ID	J-0 3-4	JJ/II-2	JJ/II-6	JJ-0 1-2	JJ-0.5 1-2	JJ-0.5 4-5		
Sample Depth (feet)	3-4	0-5	0-5	1-2	1-2	4-5		
Sample Date	12/29/2023	4/29/2024	4/29/2024	4/29/2024	6/20/2024	6/20/2024	RCS-1	RCS-2
Laboratory Sample ID	23L0931-16	24D1044-02	24D1044-01	24D1045-02	24F0928-01	24F0927-03		
PCBs (mg/kg)								
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1248	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1254	0.3	< 0.05	< 0.05	< 0.05	0.1	0.6	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	--	--
Total PCBs	0.5	--	--	--	0.1	0.6	1	4

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 3
Site 2 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 2 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts														MCP Concentrations
Location	**CEC-1-4**	**CEC-10-4**	**CEC-14-4**	**CEC-15-4**	**CEC-2-3**	**CEC-2-4**	**CEC-3-3**	**CEC-4-3**	**CEC-5-3**	**CEC-5-4**	**CEC-6-3**	**CEC-6-3**	**CEC-6-4**	
Sample ID	CEC-1-4	CEC-10-4	CEC-14-4	CEC-15-4	CEC-2-3	CEC-2-4	CEC-3-3	CEC-4-3	CEC-5-3	CEC-5-4	CEC-6-3	CEC-6-3	CEC-6-4	
Sample Depth (feet)	0-4	0-5	0.6-4.6	0.6-4.6	0-6	0-4	0-4	0-4	0-4	0-4	0-4	5-7	0-4	
Sample Date	11/13/2023	9/19/2024	9/18/2024	9/18/2024	11/13/2023	11/13/2023	11/10/2023	11/10/2023	11/10/2023	11/13/2023	9/19/2024	9/19/2024	11/13/2023	RCS-1
Laboratory Sample ID	23K0441-01	24I0766-07	24I0766-02	24I0766-01	23K0440-04	23K0441-02	23K0440-01	23K0440-02	23K0440-03	23K0441-04	24I0766-10	24I0766-11	23K0441-03	
SVOCs (mg/kg)														
1,1-Biphenyl	0.05	0.03	< 0.03	< 0.03	0.08 D	< 0.05	< 0.03	0.08 D	0.03	< 0.03	< 0.03	< 0.03	< 0.05	0.05
2,4-Dinitrotoluene	< 0.28	< 0.27	< 0.27	< 0.28	< 0.55	< 0.52	< 0.28	< 0.55	< 0.28	< 0.25	< 0.28	< 0.28	< 0.54	0.7
2-Methylnaphthalene	< 0.28	< 0.27	< 0.27	< 0.28	< 0.55	< 0.52	< 0.28	< 0.55	< 0.28	< 0.25	< 0.28	< 0.28	< 0.54	0.7
Acenaphthene	0.55	< 0.27	< 0.27	< 0.28	0.62 D	< 0.52	< 0.28	< 0.55	< 0.28	< 0.25	< 0.28	< 0.28	< 0.54	4
Acenaphthylene	< 0.28	0.65	< 0.27	0.38	< 0.55	< 0.52	< 0.28	2.60 D	0.39	< 0.25	0.59	< 0.28	< 0.54	2
Anthracene	0.97	0.95	< 0.27	0.38	1.69 D	< 0.52	< 0.28	4.89 D	0.98	< 0.25	0.41	< 0.28	< 0.54	1000
Benzo(A)anthracene	2.50	3.65	0.66	2.20	5.96 D	0.70 D	< 0.28	13.50 D	4.43	0.31	3.20	< 0.28	< 0.54	20
Benzo(A)pyrene	2.60	3.33	0.63	2.45	6.63 D	0.81 D	< 0.28	13.20 D	5.13	0.31	3.62	< 0.28	< 0.54	2
Benzo(B)fluoranthene	1.86	3.66	0.54	2.14	5.74 D	0.64 D	< 0.28	10.00 D	4.05	0.28	4.02	< 0.28	< 0.54	20
Benzo(g,h,i)Perylene	1.50	2.31	0.38	1.68	4.14 D	< 0.52	< 0.28	6.80 D	3.54	< 0.25	2.47	< 0.28	< 0.54	1000
Benzo(K)fluoranthene	1.94	1.47	0.53	1.91	4.55 D	0.62 D	< 0.28	10.50 D	3.59	< 0.25	1.56	< 0.28	< 0.54	200
Chrysene	2.51	3.70	0.64	2.00	5.63 D	0.65 D	< 0.28	11.60 D	4.21	0.30	3.02	< 0.28	< 0.54	200
Dibenzo(A,H)anthracene	0.38	0.41	< 0.27	0.33	0.93 D	< 0.52	< 0.28	1.81 D	0.75	< 0.25	0.44	< 0.28	< 0.54	2
Dibenzofuran	0.39	< 0.27	< 0.27	< 0.28	< 0.55	< 0.52	< 0.28	0.84 D	< 0.28	< 0.25	< 0.28	< 0.28	< 0.54	--
Fluoranthene	4.32	5.97	1.71	4.88	10.10 D	1.16 D	< 0.28	25.80 D	8.45	0.63	5.24	< 0.28	< 0.54	1000
Fluorene	0.45	0.42	< 0.27	< 0.28	0.65 D	< 0.52	< 0.28	0.88 D	0.34	< 0.25	< 0.28	< 0.28	< 0.54	1000
Indeno (1,2,3-cd) pyrene	1.54	2.13	0.41	1.67	4.50 D	< 0.52	< 0.28	7.93 D	3.78	< 0.25	2.51	< 0.28	< 0.54	20
Naphthalene	< 0.28	< 0.27	< 0.27	< 0.28	0.70 D	< 0.52	< 0.28	< 0.55	< 0.28	< 0.25	< 0.28	< 0.28	< 0.54	4
Phenanthrene	4.37	3.71	0.92	1.11	6.32 D	0.71 D	< 0.28	19.60 D	3.20	0.43	0.87	< 0.28	< 0.54	10
Pyrene	5.24	7.21	1.12	3.33	11.60 D	1.21 D	< 0.28	24.80 D	9.13	0.59	5.25	< 0.28	< 0.54	1000
VPH (mg/kg)														
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	0.7
Aliphatic Petroleum Hydrocarbons C19-C36	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aliphatic Petroleum Hydrocarbons C5-C8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aliphatic Petroleum Hydrocarbons C9-C12	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aliphatic Petroleum Hydrocarbons C9-C18	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aromatic Petroleum Hydrocarbons C11-C22	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aromatic Petroleum Hydrocarbons C9-C10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--	--	--	--	--	--	1000
o-Xylenes	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	10
PCBs (mg/kg)														
PCB Aroclor 1254	< 0.06	--	--	--	< 0.05	< 0.05	< 0.06	< 0.05	0.3	< 0.05	--	--	< 0.06	--
PCB Aroclor 1260	< 0.06	--	--	--	< 0.05	< 0.05	< 0.06	< 0.05	0.1	< 0.05	--	--	< 0.06	--
PCB Aroclor 1262	< 0.06	--	--	--	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--	< 0.06	--
PCB Aroclor 1268	< 0.06	--	--	--	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	--	--	< 0.06	--
Total PCBs	0	--	--	--	0	0	0	0	0.4	0	--	--	0	1
Total Metals (mg/kg)														
Arsenic	2.64	--	--	--	3.42	< 2.11	< 2.31	< 2.3	< 2.13	< 1.84	--	--	< 1.83	20
Barium	39.2	--	--	--	252	55.8	20.9	58	50.6	28.6	--	--	31.8	1000
Beryllium	0.32	--	--	--	0.22	0.28	0.18	0.19	0.16	0.21	--	--	0.16	100
Chromium	13.8	--	--	--	9.85	17	5.51	9.05	17.1	7.76	--	--	11	100
Lead	85.3	--	--	--	113	43.2	7	101	86.5	113	--	--	27.2	200
Mercury	0.067	--	--	--	0.096	0.055	< 0.034	0.294	0.065	0.069	--	--	0.075	20
Nickel	8.95	--	--	--	7.09	10	3.27	5.83	10.2	5.14	--	--	6.35	700
Vanadium	14.1	--	--	--	15.4	26.6	10.3	11.1	15.7	13.3	--	--	12	500
Zinc	58.4	--	--	--	181	51.2	15.3	75.7	43.3	34.1	--	--	26	1000

Notes:
Laboratory analytical results compared to RCS-1 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls; VPH = Volatile Petroleum Hydrocarbons
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1

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Table 3
Site 2 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 2 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts										MCP Concentrations
Location	**CEC-7-3**	**CEC-7-4**	**CEC-7-4**	**CEC-8-3**	**CEC-8-3**	**CEC-8-3**	**CEC-8-4**	**CEC-9-4**	**CEC-9-4**	
Sample ID	CEC-7-3	CEC-7-4	CEC-7-4	CEC-8-3	CEC-8-3	CEC-8-3	CEC-8-4	CEC-9-4	CEC-9-4	
Sample Depth (feet)	0-4	0-4	5-10	2-4	7-8	12-14.5	0-4	2-6	6-8	
Sample Date	9/19/2024	9/19/2024	9/19/2024	9/23/2024	9/23/2024	9/23/2024	9/19/2024	9/19/2024	9/19/2024	RCS-1
Laboratory Sample ID	24I0766-09	24I0766-05	24I0766-06	24I0819-01	24I0819-02	24I0819-03	24I0766-08	24I0766-03	24I0766-04	
SVOCs (mg/kg)										
1,1-Biphenyl	0.06	0.04	< 0.03	< 0.03	< 0.06	< 0.03	< 0.03	< 0.03	< 0.03	0.05
2,4-Dinitrotoluene	< 0.27	< 0.28	< 0.27	< 0.29	1.13	< 0.27	< 0.27	< 0.33	< 0.28	0.7
2-Methylnaphthalene	< 0.27	< 0.28	< 0.27	4.47	< 0.58	< 0.27	< 0.27	< 0.33	< 0.28	0.7
Acenaphthene	0.90	1.00	< 0.27	0.54	1.31	< 0.27	< 0.27	< 0.33	< 0.28	4
Acenaphthylene	0.47	0.62	< 0.27	< 0.29	< 0.58	< 0.27	< 0.27	< 0.33	< 0.28	2
Anthracene	1.96	2.63	< 0.27	< 0.29	< 0.58	< 0.27	0.29	< 0.33	< 0.28	1000
Benzo(A)anthracene	6.17	9.24	< 0.27	< 0.29	< 0.58	< 0.27	0.86	0.34	< 0.28	20
Benzo(A)pyrene	5.83	7.84	< 0.27	< 0.29	< 0.58	< 0.27	0.95	< 0.33	< 0.28	2
Benzo(B)fluoranthene	6.72	7.96	< 0.27	< 0.29	< 0.58	< 0.27	1.07	1.38	< 0.28	20
Benzo(g,h,i)Perylene	3.39	4.38	< 0.27	< 0.29	< 0.58	< 0.27	0.68	1.05	< 0.28	1000
Benzo(K)fluoranthene	2.75	6.27	< 0.27	< 0.29	< 0.58	< 0.27	0.40	0.60	< 0.28	200
Chrysene	6.30	8.60	< 0.27	< 0.29	< 0.58	< 0.27	0.86	0.52	< 0.28	200
Dibenzo(A,H)anthracene	0.71	1.23	< 0.27	< 0.29	< 0.58	< 0.27	< 0.27	< 0.33	< 0.28	2
Dibenzofuran	0.51	0.43	< 0.27	< 0.29	0.63	< 0.27	< 0.27	< 0.33	< 0.28	--
Fluoranthene	13.50	17.30 D	< 0.27	< 0.29	< 0.58	< 0.27	1.75	0.54	< 0.28	1000
Fluorene	0.80	0.93	< 0.27	0.57	1.55	< 0.27	< 0.27	< 0.33	< 0.28	1000
Indeno (1,2,3-cd) pyrene	3.35	4.75	< 0.27	< 0.29	< 0.58	< 0.27	0.65	0.97	< 0.28	20
Naphthalene	0.39	0.29	< 0.27	< 0.29	< 0.58	< 0.27	< 0.27	< 0.33	< 0.28	4
Phenanthrene	9.12	10.40	< 0.27	1.21	3.06	< 0.27	1.02	0.40	< 0.28	10
Pyrene	12.00	16.90 D	< 0.27	0.33	< 0.58	< 0.27	1.62	0.38	< 0.28	1000
VPH (mg/kg)										
2-Methylnaphthalene	--	--	--	--	< 0.24	3.62	--	--	--	0.7
Aliphatic Petroleum Hydrocarbons C19-C36	--	--	--	--	85.6	39.7	--	--	--	--
Aliphatic Petroleum Hydrocarbons C5-C8	--	--	--	--	< 13.2	12.7	--	--	--	--
Aliphatic Petroleum Hydrocarbons C9-C12	--	--	--	--	140 D	42.8 D	--	--	--	--
Aliphatic Petroleum Hydrocarbons C9-C18	--	--	--	--	649	262	--	--	--	--
Aromatic Petroleum Hydrocarbons C11-C22	--	--	--	--	344	158	--	--	--	--
Aromatic Petroleum Hydrocarbons C9-C10	--	--	--	--	155	48	--	--	--	--
Fluorene	--	--	--	--	0.84	< 0.43	--	--	--	1000
o-Xylenes	--	--	--	--	1.17	0.31	--	--	--	--
Phenanthrene	--	--	--	--	1.71	0.94	--	--	--	10
PCBs (mg/kg)										
PCB Aroclor 1254	--	--	--	--	--	--	--	--	--	--
PCB Aroclor 1260	--	--	--	--	--	--	--	--	--	--
PCB Aroclor 1262	--	--	--	--	--	--	--	--	--	--
PCB Aroclor 1268	--	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--	1
Total Metals (mg/kg)										
Arsenic	--	--	--	--	--	--	--	--	--	20
Barium	--	--	--	--	--	--	--	--	--	1000
Beryllium	--	--	--	--	--	--	--	--	--	100
Chromium	--	--	--	--	--	--	--	--	--	100
Lead	--	--	--	--	--	--	--	--	--	200
Mercury	--	--	--	--	--	--	--	--	--	20
Nickel	--	--	--	--	--	--	--	--	--	700
Vanadium	--	--	--	--	--	--	--	--	--	500
Zinc	--	--	--	--	--	--	--	--	--	1000

Notes:
Laboratory analytical results compared to RCS-1 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls; VPH = Volatile Petroleum Hydrocarbons
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1

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Table 4
Site 3 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 3 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts												MCP Concentrations
Location	A'-1	A'-3	A'-5	A'-7	C'-1	C'-3	C'-5	C'-7	E'-1	E'-3	E'-5	
Sample ID	A'-1	A'-3	A'-5	A'-7	C'-1	C'-3	C'-5	C'-7	E'-1	E'-3	E'-5	
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	
Sample Date	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	
Laboratory Sample ID	24G0131-07 24G0131-08	24G0131-09 24G0131-10	24G0131-11 24G0131-12	24G0131-13 24G0131-14	24G0132-05 24G0132-06	24G0132-03 24G0132-04	24G0132-01 24G0132-02	24G0132-19 24G0132-20	24G0132-11 24G0132-12	24G0132-13 24G0132-14	24G0132-15 24G0132-16	RCS-2
SVOCs (mg/kg)												
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	6
2-Methylnaphthalene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	80
Acenaphthene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Acenaphthylene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	10
Anthracene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Benzo(A)anthracene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	300
Benzo(A)pyrene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	30
Benzo(B)fluoranthene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	300
Benzo(g,h,i)Perylene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Benzo(K)fluoranthene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Chrysene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Dibenzo(A,H)anthracene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	30
Dibenzofuran	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	NS
Fluoranthene	0.29	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Fluorene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Hydrocarbon, Oil, Petroleum	41.4	< 10.4	20	13.2	< 10.5	< 11.2	17.0	15.7	< 11.1	< 10.7	< 11	NS
Indeno (1,2,3-cd) pyrene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	300
Naphthalene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	20
Phenanthrene	< 0.27	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	1000
Pyrene	0.34	< 0.26	< 0.27	< 0.26	< 0.27	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	3000
Total SVOCs	42.02	0	20	13.2	0	0	17	15.7	0	0	0	NS
Total Metals (mg/kg)												
Arsenic	2.35	2.27	2.45	2.18	2.33	2.51	2.21	2.52	2.37	2.40	2.67	20
Barium	9.00	11.7	10.5	10.6	22.8	9.16	30.8	10.0	11.1	8.78	8.01	3000
Cadmium	< 0.47	< 0.45	< 0.49	< 0.44	< 0.47	< 0.5	< 0.44	< 0.5	< 0.47	< 0.48	< 0.53	80
Chromium	8.09	8.95	6.43	6.81	7.6	7.21	7.13	8.76	6.12	6.58	5.72	200
Lead	12.4	12.2	10	12.1	32.8	12.2	73.7	11.2	10.7	7.44	6.12	600
Mercury	0.05	< 0.03	< 0.03	< 0.04	0.06	< 0.04	0.05	< 0.03	< 0.03	< 0.03	< 0.04	40
Pesticides/Herbicides (mg/kg)												
4,4'-DDT	< 0.003	< 0.003	0.010	0.007	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	30
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.6
PCBs (mg/kg)												
PCB Aroclor 1248	< 0.06	< 0.05	0.10	0.10	< 0.05	< 0.06	< 0.05	0.08	< 0.05	< 0.05	< 0.05	--
PCB Aroclor 1254	< 0.06	0.10	0.20	0.20	< 0.05	0.10	0.20	0.30	< 0.05	< 0.05	0.10	--
Total PCBs	0	0.10	0.31	0.31	0	0.10	0.20	0.38	0	0	0.10	4

Notes:
Laboratory analytical results compared to RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
Exceeds MassDEP MCP RCS-2

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Table 4
Site 3 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 3 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts												MCP Concentrations
Location	E'-7	K-1	K-3	K-4.5	L/M-1	L/M-4.5	L0	M0	N0	O-0.5	Q-0.5	
Sample ID	E'-7	K-1	K-3	K-4.5	L/M-1	L/M-4.5	L0 0-1	M0 0-1	N0 0-1	O-0.5	Q-0.5	
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	0-5	0-1	0-1	0-1	0-5	0-5	
Sample Date	7/1/2024	7/2/2024		7/2/2024	7/2/2024	7/2/2024	7/17/2024	7/17/2024	7/17/2024	7/2/2024	7/1/2024	
Laboratory Sample ID	24G0132-17 24G0132-18	24G0130-03 24G0130-04	24G0130-07 24G0130-08	24G0130-09 24G0130-10	24G0130-05 24G0130-06	24G0130-11 24G0130-12	24G0738-01	24G0738-02	24G0738-03	24G0130-01 24G0130-02	24G0131-09 24G0131-10	RCS-2
SVOCs (mg/kg)												
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	--	--	--	0.24	< 0.03	6
2-Methylnaphthalene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	0.87	< 0.26	80
Acenaphthene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	2.09	< 0.26	3000
Acenaphthylene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	0.71	< 0.26	10
Anthracene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	7.84	< 0.26	3000
Benzo(A)anthracene	< 0.27	0.33	< 0.27	< 0.26	0.37	0.50	--	--	--	15.1 D	< 0.26	300
Benzo(A)pyrene	< 0.27	0.39	< 0.27	< 0.26	0.43	0.41	--	--	--	13.2	< 0.26	30
Benzo(B)fluoranthene	< 0.27	0.33	< 0.27	< 0.26	0.35	0.34	--	--	--	12.3	< 0.26	300
Benzo(g,h,i)Perylene	< 0.27	< 0.29	< 0.27	< 0.26	0.37	< 0.281	--	--	--	7.43	< 0.26	3000
Benzo(K)fluoranthene	< 0.27	< 0.29	< 0.27	< 0.26	0.35	0.39	--	--	--	9.13	< 0.26	3000
Chrysene	< 0.27	0.33	< 0.27	< 0.26	0.38	0.51	--	--	--	13.6 D	< 0.26	3000
Dibenzo(A,H)anthracene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	1.89	< 0.26	30
Dibenzofuran	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	2.32	< 0.26	NS
Fluoranthene	< 0.27	0.48	< 0.27	0.29	0.62	0.98	--	--	--	32 D	< 0.26	3000
Fluorene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	3.26	< 0.26	3000
Hydrocarbon, Oil, Petroleum	< 10.30	55.7	64.5	45.9	29.8	64.2	--	--	--	72.2	15.90	NS
Indeno (1,2,3-cd) pyrene	< 0.27	< 0.29	< 0.27	< 0.26	0.33	< 0.28	--	--	--	8.47	< 0.26	300
Naphthalene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	2.47	< 0.26	20
Phenanthrene	< 0.27	< 0.29	< 0.27	< 0.26	< 0.28	< 0.28	--	--	--	26.3 D	< 0.26	1000
Pyrene	< 0.27	0.44	< 0.27	0.28	0.59	0.80	--	--	--	25.1 D	< 0.26	3000
Total SVOCs	0	58.0	64.5	46.47	34.96	69.53	--	--	--	256.52	15.90	NS
Total Metals (mg/kg)												
Arsenic	2.26	2.38	2.59	2.51	2.18	2.33	--	--	--	2.59	2.23	20
Barium	10.6	77.3	28.4	32.9	104	16.8	--	--	--	15.1	12.9	3000
Cadmium	< 0.45	< 0.48	< 0.52	< 0.5	< 0.44	< 0.47	--	--	--	< 0.52	< 0.45	80
Chromium	7.58	10.3	9.71	10.2	10.5	7.29	--	--	--	8.7	7.93	200
Lead	6.95	167	55.1	53.2	455	24.3	--	--	--	48.3	31.4	600
Mercury	< 0.03	0.06	0.07	0.06	0.07	0.05	--	--	--	0.06	0.03	40
Pesticides/Herbicides (mg/kg)												
4,4'-DDT	< 0.003	0.01	0.01	0.01	0.01	0.01	--	--	--	0.02	0.01	30
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	0.003	< 0.003	0.6
PCBs (mg/kg)												
PCB Aroclor 1248	< 0.05	0.08	0.10	0.07	< 0.05	0.10	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	--
PCB Aroclor 1254	0.07	0.20	0.10	0.20	0.10	0.10	2.9 D	0.10	0.09	0.20	0.20	--
Total PCBs	0.07	0.29	0.20	0.27	0.10	0.20	2.9	0.10	0.09	0.20	0.20	4

Notes:
Laboratory analytical results compared to RCS-2, S3 GW-2, and S3 GW-3 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
Exceeds MassDEP MCP RCS-2

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Table 4
Site 3 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 3 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts												MCP Concentrations
Location	Q-7	S-0.5	S-7	U-0.5	U-7	W-0.5	W-7	Y-0.5	Y-3	Y-5	Y-7	
Sample ID	Q-7	S-0.5	S-7	U-0.5	U-7	W-0.5	W-7	Y-0.5	Y-3	Y-5	Y-7	
Sample Depth (feet)	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	
Sample Date	7/2/2024	7/1/2024	7/2/2024	7/1/2024	7/2/2024	7/1/2024	7/2/2024	7/1/2024	7/1/2024	7/1/2024	7/1/2024	RCS-2
Laboratory Sample ID	24G0130-13 24G0130-14	24G0131-07 24G0131-08	24G0130-15 24G0130-16	24G0131-05 24G0131-06	24G0130-17 24G0130-18	24G0131-03 24G0131-04	24G0130-19 24G0130-20	24G0131-01 24G0131-02	24G0131-19 24G0131-20	24G0131-15 24G0131-16	24G0131-17 24G0131-18	
SVOCs (mg/kg)												
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	6
2-Methylnaphthalene	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	80
Acenaphthene	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Acenaphthylene	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	10
Anthracene	< 0.27	0.46	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Benzo(A)anthracene	< 0.27	0.97	< 0.28	< 0.27	< 0.25	0.41	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	300
Benzo(A)pyrene	< 0.27	0.90	< 0.28	< 0.27	< 0.25	0.51	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	30
Benzo(B)fluoranthene	< 0.27	0.84	< 0.28	< 0.27	< 0.25	0.34	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	300
Benzo(g,h,i)Perylene	< 0.27	0.64	< 0.28	< 0.27	< 0.25	0.45	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Benzo(K)fluoranthene	< 0.27	0.75	< 0.28	< 0.27	< 0.25	0.37	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Chrysene	< 0.27	1.00	< 0.28	< 0.27	< 0.25	0.44	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Dibenzo(A,H)anthracene	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	30
Dibenzofuran	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	NS
Fluoranthene	< 0.27	2.51	< 0.28	0.52	< 0.25	0.56	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Fluorene	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.254	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Hydrocarbon, Oil, Petroleum	30.9	18.8	11.4	26.1	< 10.5	56.9	< 10.6	46.1	25.2	< 10.6	10.8	NS
Indeno (1,2,3-cd) pyrene	< 0.27	0.62	< 0.28	< 0.27	< 0.25	0.33	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	300
Naphthalene	< 0.27	< 0.28	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	20
Phenanthrene	< 0.27	2.16	< 0.28	< 0.27	< 0.25	< 0.25	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	1000
Pyrene	< 0.27	1.81	< 0.28	0.45	< 0.25	0.81	< 0.25	< 0.25	< 0.26	< 0.27	< 0.26	3000
Total SVOCs	30.9	31.44	11.4	26.82	0	4.62	0	46.1	25.2	0	10.8	NS
Total Metals (mg/kg)												
Arsenic	2.56	2.71	2.22	2.15	2.53	2.37	2.22	2.26	2.13	2.17	2.47	20
Barium	13	20.9	11.7	19.3	10.1	24	6.88	11	8.96	7.84	8.04	3000
Cadmium	< 0.51	< 0.54	< 0.44	< 0.43	< 0.51	< 0.47	< 0.44	< 0.45	< 0.43	< 0.43	< 0.49	80
Chromium	8.35	15.3	11	14	5.74	21.5	6.42	6.65	5.41	5.38	6.87	200
Lead	17	47.6	14.1	43.3	7.9	36.2	9.57	11	14.4	7.24	7.14	600
Mercury	0.10	0.131	< 0.03	0.11	< 0.03	0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	40
Pesticides/Herbicides (mg/kg)												
4,4'-DDT	0.010	0.024	0.009	0.01	0.003	0.01	0.003	0.005	< 0.003	< 0.003	0.004	30
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.6
PCBs (mg/kg)												
PCB Aroclor 1248	0.09	0.20	0.06	< 0.05	< 0.05	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	--
PCB Aroclor 1254	0.20	0.60	0.10	0.20	< 0.05	0.30	< 0.05	< 0.05	< 0.05	0.07	< 0.05	--
Total PCBs	0.29	0.80	0.16	0.20	0.00	0.41	0	0	0	0.07	0	4

Notes:
Laboratory analytical results compared to RCS-2, S3 GW-2, and S3 GW-3 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
Exceeds MassDEP MCP RCS-2

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts											MCP Concentrations			
Location	A-1	A-3	A-5	A-7	AA-8.5	BB-1	BB-3	BB-5	BB-7	C-1				
Sample ID	A-1	A-3	A-5	A-7	AA-8.5	BB-1	BB-3	BB-5	BB-7	C-1				
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-4	0-4				
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-03	24E0050-02	24E0050-01	24E0050-05	24E0026-09	24E0026-08	24E0026-07	24E0026-06	24E0026-05	24E0124-01				
VOCs (mg/kg)														
1,1,1,2-Tetrachloroethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	0.1	--	--
1,1,1-Trichloroethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	30	600	--	--
1,1,2,2-Tetrachloroethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.02	--	--
1,1,2-Trichloroethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	2	--	--
1,1-Dichloroethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.4	9	--	--
1,1-Dichloroethylene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	3	40	--	--
1,1-Dichloropropene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,2,3-Trichlorobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,2,3-Trichloropropane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,2,4-Trichlorobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	2	6	--	--
1,2-Dibromo-3-chloropropane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,2-Dibromoethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	0.1	--	--
1,2-Dichlorobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	9	100	--	--
1,2-Dichloroethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	0.1	--	--
1,2-Dichloropropane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	0.1	--	--
1,3,4-Trimethylbenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,3,5-Trimethylbenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,3-Dichlorobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	3	200	--	--
1,3-Dichloropropane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
1,4-Dioxane	< 0.086	< 0.096	< 0.095	< 0.12	< 0.092	< 0.111	< 0.098	< 0.101	< 0.094	< 0.108	0.2	5	--	--
2,2-Dichloropropane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
4-Isopropyltoluene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Acetone	< 0.043	< 0.048	< 0.048	< 0.0599	< 0.046	< 0.056	< 0.049	< 0.050	< 0.047	< 0.054	6	50	--	--
Benzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	2	200	--	--
Bromobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Bromochloromethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Bromodichloromethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	0.1	--	--
Bromoform	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	1	--	--
Bromomethane	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	0.5	0.5	--	--
Carbon Disulfide	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Carbon Tetrachloride	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	5	5	--	--
Chlorobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	1	3	--	--
Chlorodibromomethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.03	--	--
Chloroethane	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	--	--	--	--
Chloroform	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.2	0.2	--	--
Cis-1,2-dichloroethylene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	0.1	--	--
cis-1,3-Dichloropropene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Dibromomethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Dichlorodifluoromethane	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	--	--	--	--
Dichloromethane	< 0.022	< 0.024	< 0.024	< 0.03	< 0.023	< 0.028	< 0.025	< 0.025	< 0.024	< 0.027	0.1	3	--	--
Diisopropyl Ether	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Ethyl benzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	40	1000	--	--
Ethyl ether	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Ethyl tert-butyl ether	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Fluorotrichloromethane	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Hexachlorobutadiene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	30	100	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--	--	0.7	3	--	--
Isopropyl benzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
m,p-Xylenes	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	--	--	--	--
Methyl Chloride	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	--	--	--	--
Methyl ethyl ketone	< 0.043	< 0.048	< 0.048	< 0.060	< 0.046	< 0.056	< 0.049	< 0.050	< 0.047	< 0.054	4	50	--	--
Methyl isobutyl ketone	< 0.043	< 0.048	< 0.048	< 0.060	< 0.046	< 0.056	< 0.049	< 0.050	< 0.047	< 0.054	0.4	50	--	--
Methyl n-butyl ketone	< 0.043	< 0.048	< 0.048	< 0.060	< 0.046	< 0.056	< 0.049	< 0.050	< 0.047	< 0.054	--	--	--	--
Methyl-tert-butyl ether	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.1	100	--	--
n-Butylbenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
n-Propylbenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Naphthalene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	4	20	--	--
O-chlorotoluene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
o-Xylenes	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
p-Chlorotoluene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
P-dichlorobenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.7	1	--	--
sec-Butylbenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Styrene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	3	4	--	--
Tert-amyl-methyl ether	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
tert-Butylbenzene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Tetrachloroethylene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	1	4	--	--
Tetrahydrofuran	< 0.017	< 0.019	< 0.019	< 0.024	< 0.018	< 0.022	< 0.020	< 0.020	< 0.019	< 0.022	--	--	--	--
Toluene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	30	1000	--	--
Trans-1,2-dichloroethylene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	1	1	--	--
trans-1,3-Dichloropropene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--
Trichloroethylene	< 0.004	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.3	0.3	--	--
Vinyl Chloride	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	0.3	0.7	--	--
Xylene	< 0.009	< 0.010	< 0.010	< 0.012	< 0.009	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	100	100	--	--
Total VOCs	0	0	0	0	0	0	0	0	0	0	--	--	10	4

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts											MCP Concentrations			
Location	A-1	A-3	A-5	A-7	AA-8.5	BB-1	BB-3	BB-5	BB-7	C-1				
Sample ID	A-1	A-3	A-5	A-7	AA-8.5	BB-1	BB-3	BB-5	BB-7	C-1				
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-4	0-4				
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-03	24E0050-02	24E0050-01	24E0050-05	24E0026-09	24E0026-08	24E0026-07	24E0026-06	24E0026-05	24E0124-01				
SVOCs (mg/kg)														
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05	6	--	--
1,2,4-Trichlorobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	2	6	--	--
1,2-Dichlorobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	9	100	--	--
1,3-Dichlorobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	3	200	--	--
2,4,5-Trichlorophenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	4	600	--	--
2,4,6-Trichlorophenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	20	--	--
2,4-Dichlorophenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	40	--	--
2,4-Dimethylphenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	100	--	--
2,4-Dinitrophenol	< 1.15	< 1.11	< 1.12	< 1.12	< 1.10	< 1.11	< 1.15	< 1.10	< 1.11	< 1.11	3	50	--	--
2,4-Dinitrotoluene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	10	--	--
2,6-Dinitrotoluene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
2-Chloronaphthalene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
2-Chlorophenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	100	--	--
2-Methylnaphthalene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	80	--	--
2-Methylphenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
2-Nitrophenol	< 0.57	< 0.55	< 0.56	< 0.56	< 0.55	< 0.56	< 0.58	< 0.55	< 0.56	< 0.55	--	--	--	--
3 & 4 Methylphenol	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
3,3'-Dichlorobenzidine	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	3	20	--	--
4-Bromophenyl phenyl ether	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
4-Nitrophenol	< 1.15	< 1.11	< 1.12	< 1.12	< 1.10	< 1.11	< 1.15	< 1.1	< 1.11	< 1.11	--	--	--	--
Acenaphthene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	4	3000	--	--
Acenaphthylene	< 0.29	< 0.28	< 0.28	< 0.28	0.48	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	2	10	--	--
Acetophenone	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Aniline	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Anthracene	< 0.29	1.41	< 0.28	< 0.28	0.67	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000	--	--
Azobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Benzo(A)anthracene	0.33	7.33	0.51	< 0.28	2.38	0.45	0.32	0.28	< 0.28	< 0.28	20	300	--	--
Benzo(A)pyrene	0.35	7.30	0.52	< 0.28	2.33	0.49	0.32	0.30	< 0.28	< 0.28	2	30	--	--
Benzo(B)fluoranthene	< 0.29	6.25	0.39	< 0.28	2.53	0.52	0.35	0.29	< 0.28	< 0.28	20	300	--	--
Benzo(g,h,i)Perylene	0.45	4.44	0.37	< 0.28	1.52	0.36	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000	--	--
Benzo(K)fluoranthene	< 0.29	4.84	0.32	< 0.28	0.97	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	200	3000	--	--
bis (2-chloroethoxy) Methane	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
bis (2-chloroethyl) Ether	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	0.7	--	--
bis (2-chloroisopropyl) Ether	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	0.7	--	--
Bis (2-ethylhexyl) phthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	0.40	100	700	--	--
Butylbenzylphthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Chrysene	0.31	6.28	0.48	< 0.28	2.27	0.44	0.34	0.31	< 0.28	< 0.28	200	3000	--	--
Di-n-octyl phthalate	< 0.57	< 0.55	< 0.56	< 0.56	< 0.55	< 0.56	< 0.58	< 0.55	< 0.56	< 0.55	--	--	--	--
Dibenzo(A,H)anthracene	< 0.29	1.28	< 0.28	< 0.28	0.35	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	2	30	--	--
Dibenzofuran	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Diethyl phthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	10	200	--	--
Dimethyl phthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	50	--	--
Fluoranthene	0.69	10.00	0.92	< 0.28	5.39	0.87	0.60	0.50	0.42	< 0.28	1000	3000	--	--
Fluorene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	1000	3000	--	--
Hexachlorobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	0.9	--	--
Hexachlorobutadiene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	30	100	--	--
Hexachloroethane	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	3	--	--
Indeno (1,2,3-cd) pyrene	< 0.29	5.31	0.34	< 0.28	1.46	0.35	< 0.29	< 0.28	< 0.28	< 0.28	20	300	--	--
Isophorone	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
N-dibutyl phthalate	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
n-Nitrosodimethylamine	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Naphthalene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	4	20	--	--
Nitrobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
P-chloroaniline	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	1	3	--	--
P-dichlorobenzene	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.7	1	--	--
Pentachlorophenol	< 1.15	< 1.11	< 1.12	< 1.12	< 1.1	< 1.11	< 1.15	< 1.1	< 1.11	< 1.11	3	10	--	--
Phenanthrene	0.37	3.82	0.58	< 0.28	2.83	0.47	0.34	0.29	< 0.28	< 0.28	10	1000	--	--
Phenols	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	0.9	20	--	--
Pyrene	0.64	9.49	1.07	< 0.28	4.59	0.74	0.54	0.51	0.40	< 0.28	1000	3000	--	--
Pyridine	< 0.29	< 0.28	< 0.28	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	--	--	--	--
Total SVOCs	3.15	67.75	5.51	0	27.77	4.70	2.82	2.48	0.81	0.40	--	--	100	100
Petroleum Hydrocarbons (mg/kg)														
C9-C36	31.3	36.2	39.1	14	66.4	42.5 D	21.9	16.4	18.8	< 11	--	--	--	--

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts											MCP Concentrations			
Location	A-1	A-3	A-5	A-7	AA-8.5	BB-1	BB-3	BB-5	BB-7	C-1				
Sample ID	A-1	A-3	A-5	A-7	AA-8.5	BB-1	BB-3	BB-5	BB-7	C-1				
Sample Depth (feet)	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-4	0-4				
Sample Date	5/1/2024	5/1/2024	5/1/2024	5/1/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-03	24E0050-02	24E0050-01	24E0050-05	24E0026-09	24E0026-08	24E0026-07	24E0026-06	24E0026-05	24E0124-01				
Pesticides/Herbicides (mg/kg)														
2,2-Dichloropropionic acid	< 0.049	< 0.048	< 0.048	< 0.051	< 0.048	< 0.049	< 0.049	< 0.05	< 0.049	< 0.05	--	--	--	--
2,4,5-Trichlorophenoxyacetic acid	< 0.01	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	--	--	--	--
2,4,5-Trichlorophenoxypropionic acid	< 0.01	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	--	--	--	--
2,4-Dichlorophenoxyacetic acid	< 0.05	< 0.05	< 0.05	< 0.052	< 0.049	< 0.05	< 0.051	< 0.052	< 0.051	< 0.051	--	--	--	--
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	< 2.51	2.48	2.48	2.62	< 2.47	< 2.52	< 2.56	< 2.58	< 2.54	< 2.56	--	--	--	--
4,4'-DDD	< 0.003	< 0.003	< 0.003	0.01	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	10	40	--	--
4,4'-DDE	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4,4'-DDT	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4-(2,4-dichlorophenoxy)-Butanoic acid	< 0.051	< 0.050	< 0.050	< 0.053	< 0.050	< 0.051	< 0.052	< 0.052	< 0.051	< 0.052	--	--	--	--
Aldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.5	--	--
beta-BHC	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-delta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-gamma	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003	0.5	--	--
Chlordane (mixture of isomers)	< 0.022	< 0.022	< 0.022	< 0.022	< 0.021	< 0.023	< 0.021	< 0.023	< 0.022	< 0.021	--	--	--	--
Chlordane, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Dicamba	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
hloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	< 0.050	< 0.050	< 0.050	< 0.052	< 0.049	< 0.050	< 0.051	< 0.052	< 0.051	< 0.051	--	--	--	--
Dieldrin	< 0.003	0.003	0.007	< 0.003	0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.6	--	--
Dinoseb	< 0.051	< 0.050	< 0.050	< 0.053	< 0.050	< 0.051	< 0.052	< 0.052	< 0.051	< 0.052	--	--	--	--
Endosulfan sulfate	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, beta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	20	30	--	--
Endrin ketone	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Heptachlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.3	2	--	--
Heptachlor Epoxide	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.2	1	--	--
Hexachlorobenzene	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.7	0.9	--	--
Methoxychlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	300	400	--	--
Methylchlorophenoxyacetic acid	< 2.480	< 2.450	< 2.450	< 2.590	< 2.450	< 2.490	< 2.530	< 2.550	< 2.510	< 2.540	--	--	--	--
Toxaphene	< 0.139	< 0.136	< 0.137	< 0.140	< 0.130	< 0.144	< 0.134	< 0.141	< 0.138	< 0.133	--	--	--	--
trans-Chlordane	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	0.08	< 0.06	--	--	--	--
PCB Aroclor 1248	< 0.05	< 0.06	< 0.05	0.1	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--	--	--
PCB Aroclor 1254	0.1	0.3	0.1	0.3	0.2	0.6	0.2	0.07	0.06	0.2	--	--	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	0.1	< 0.06	< 0.05	< 0.05	< 0.06				
PCB Aroclor 1262	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	--	--	--	--
Total PCBs	0.1	0.3	0.1	0.4	0.2	0.7	0.2	0.07	0.14	0.2	1	4	< 2	< 2
Total Metals (mg/kg)														
Arsenic	2.52	4.04	2.93	4.2	3.2	2.36	2.84	2.75	2.74	3.84	20	20	40	40
Barium	10.6	63.4	21	37.5	21.8	17.5	20.7	11.7	24	15.4	1000	3000	--	--
Cadmium	< 0.41	0.52	< 0.38	< 0.42	< 0.4	< 0.39	< 0.44	< 0.42	< 0.44	< 0.41	80	80	80	30
Chromium	7.77	24.2	8.58	7.62	5.85	10.6	10.1	8.38	4.85	13.2	100	200	1000	1000
Lead	15.8	164	72.7	105	125	34	39.3	20.6	96	53.3	200	600	2000	1000
Mercury	0.06	0.118	0.15	0.44	0.20	0.08	0.13	0.08	< 0.04	< 0.04	20	40	10	10
Selenium	< 4.09	< 4.12	< 3.79	< 4.17	< 4.02	< 3.92	< 4.43	< 4.17	< 4.44	< 4.08	400	800	--	--
Silver	< 0.41	< 0.41	< 0.38	< 0.42	< 0.4	< 0.39	< 0.44	< 0.42	< 0.44	< 0.41	100	200	--	--
TCLP (mg/L)														
Lead TCLP (mg/L)	--	0.94	--	1.12	1.9	--	--	--	--	--	--	--	--	--
General Chemistry														
Corrosivity (pH)	7.9	8.08	8.34	8.48	6.91	7.79	8.31	7.7	6.72	8.02	--	--	--	--
Physical Conditions														
Flashpoint (^{o}F)	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	--	--	--	--
Reactivity - Cyanide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Reactivity - Sulfide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Specific Conductance @ 25°C (µmhos/cm)	50	134	141	51	8	255	89	49	9	123	--	--	8000	4000

Notes:
Laboratory analytical results compared to RCS-1, RCS-2, Massachusetts Contingency Plan Standards and Massachusetts COMM-97 Landfill standards.
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% between 2 GC columns
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	C-3	C-5	C-7	D-8.5	DD-1	DD-3	DD-5	DD-7	E-1	E-3				
Sample ID	C-3	C-5	C-7	D-8.5	DD-1	DD-3	DD-5	DD-7	E-1	E-3 0-3				
Sample Depth (feet)	0-4.8	0-5	0-4.3	0-4	0-5	0-5	0-4.5	0-3	0-5	0-3	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Sample Date	5/2/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	5/3/2024				
Laboratory Sample ID	24E0124-02	24E0124-03	24E0124-04	24E0124-05	24D1044-18	24E0026-03	24E0026-02	24E0026-01	24E0124-08	24E0124-16				
VOCs (mg/kg)														
1,1,1,2-Tetrachloroethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	0.1	--	--
1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	30	600	--	--
1,1,2,2-Tetrachloroethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.005	0.02	--	--
1,1,2-Trichloroethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	2	--	--
1,1-Dichloroethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.4	9	--	--
1,1-Dichloroethylene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	3	40	--	--
1,1-Dichloropropene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.608	< 0.005	< 0.007	--	--	--	--
1,2,3-Trichlorobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
1,2,3-Trichloropropane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
1,2,4-Trichlorobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	2	6	--	--
1,2-Dibromo-3-chloropropane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 1.52	< 0.005	< 0.007	--	--	--	--
1,2-Dibromoethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	0.1	--	--
1,2-Dichlorobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	9	100	--	--
1,2-Dichloroethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	0.1	--	--
1,2-Dichloropropane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	0.1	--	--
1,3,4-Trimethylbenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
1,3,5-Trimethylbenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
1,3-Dichlorobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	3	200	--	--
1,3-Dichloropropane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
1,4-Dioxane	< 0.107	< 0.098	< 0.131	< 0.126	< 0.093	< 0.091	< 0.101	< 30.4	< 0.106	< 0.131	0.2	5	--	--
2,2-Dichloropropane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
4-Isopropyltoluene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Acetone	< 0.054	< 0.049	< 0.065	< 0.063	< 0.047	< 0.045	< 0.051	< 1.52	< 0.053	< 0.066	6	50	--	--
Benzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	2	200	--	--
Bromobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Bromochloromethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Bromodichloromethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	0.1	--	--
Bromoform	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	1	--	--
Bromomethane	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.304	< 0.011	< 0.013	0.5	0.5	--	--
Carbon Disulfide	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Carbon Tetrachloride	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	5	5	--	--
Chlorobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	1	3	--	--
Chlorodibromomethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.005	0.03	--	--
Chloroethane	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.304	< 0.011	< 0.013	--	--	--	--
Chloroform	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.2	0.2	--	--
Cis-1,2-dichloroethylene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	0.1	--	--
cis-1,3-Dichloropropene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Dibromomethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Dichlorodifluoromethane	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.304	< 0.011	< 0.013	--	--	--	--
Dichloromethane	< 0.027	< 0.025	< 0.033	< 0.032	< 0.023	< 0.023	< 0.025	< 0.608	< 0.027	< 0.033	0.1	3	--	--
Diisopropyl Ether	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Ethyl benzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	40	1000	--	--
Ethyl ether	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Ethyl tert-butyl ether	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Fluorotrichloromethane	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Hexachlorobutadiene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	30	100	--	--
Hexachloroethane	--	--	--	--	--	--	--	< 0.304	--	--	0.7	3	--	--
Isopropyl benzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
m,p-Xylenes	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.608	< 0.011	< 0.013	--	--	--	--
Methyl Chloride	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.304	< 0.011	< 0.013	--	--	--	--
Methyl ethyl ketone	< 0.054	< 0.049	< 0.065	< 0.063	< 0.047	< 0.045	< 0.051	< 1.52	< 0.053	< 0.066	4	50	--	--
Methyl isobutyl ketone	< 0.054	< 0.049	< 0.065	< 0.063	< 0.047	< 0.045	< 0.051	< 1.52	< 0.053	< 0.066	0.4	50	--	--
Methyl n-butyl ketone	< 0.054	< 0.049	< 0.065	< 0.063	< 0.047	< 0.045	< 0.051	< 1.52	< 0.053	< 0.066	--	--	--	--
Methyl-tert-butyl ether	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.1	100	--	--
n-Butylbenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
n-Propylbenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Naphthalene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	0.857	< 0.005	< 0.007	4	20	--	--
O-chlorotoluene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
o-Xylenes	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
p-Chlorotoluene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
P-dichlorobenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.7	1	--	--
sec-Butylbenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Styrene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	3	4	--	--
Tert-amyl-methyl ether	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
tert-Butylbenzene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Tetrachloroethylene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	1	4	--	--
Tetrahydrofuran	< 0.022	< 0.020	< 0.026	< 0.025	< 0.019	< 0.018	< 0.020	< 1.52	< 0.021	< 0.026	--	--	--	--
Toluene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	30	1000	--	--
Trans-1,2-dichloroethylene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	1	1	--	--
trans-1,3-Dichloropropene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	--	--	--	--
Trichloroethylene	< 0.005	< 0.005	< 0.007	< 0.006	< 0.005	< 0.005	< 0.005	< 0.304	< 0.005	< 0.007	0.3	0.3	--	--
Vinyl Chloride	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.304	< 0.011	< 0.013	0.3	0.7	--	--
Xylene	< 0.011	< 0.010	< 0.013	< 0.013	< 0.009	< 0.009	< 0.010	< 0.608	< 0.011	< 0.013	100	100	--	--
Total VOCs	0	0	0	0	0	0	0	0.857	0	0	--	--	10	4

DRAFT

Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	C-3	C-5	C-7	D-8.5	DD-1	DD-3	DD-5	DD-7	E-1	E-3				
Sample ID	C-3	C-5	C-7	D-8.5	DD-1	DD-3	DD-5	DD-7	E-1	E-3 0-3				
Sample Depth (feet)	0-4.8	0-5	0-4.3	0-4	0-5	0-5	0-4.5	0-3	0-5	0-3				
Sample Date	5/2/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	5/3/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0124-02	24E0124-03	24E0124-04	24E0124-05	24D1044-18	24E0026-03	24E0026-02	24E0026-01	24E0124-08	24E0124-16				
SVOCs (mg/kg)														
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.08	< 0.03	< 0.03	0.05	6	--	--
1,2,4-Trichlorobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	2	6	--	--
1,2-Dichlorobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	9	100	--	--
1,3-Dichlorobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	3	200	--	--
2,4,5-Trichlorophenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	4	600	--	--
2,4,6-Trichlorophenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	20	--	--
2,4-Dichlorophenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	40	--	--
2,4-Dimethylphenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	100	--	--
2,4-Dinitrophenol	< 1.05	< 1.04	< 1.06	< 1.08	< 1.16	< 1.08	< 1.11	< 1.08	< 1.15	< 1.06	3	50	--	--
2,4-Dinitrotoluene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	10	--	--
2,6-Dinitrotoluene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
2-Chloronaphthalene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
2-Chlorophenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	100	--	--
2-Methylnaphthalene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	0.31	< 0.29	< 0.27	0.7	80	--	--
2-Methylphenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
2-Nitrophenol	< 0.52	< 0.52	< 0.53	< 0.54	< 0.58	< 0.54	< 0.56	< 0.54	< 0.57	< 0.53	--	--	--	--
3 & 4 Methylphenol	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
3,3'-Dichlorobenzidine	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	3	20	--	--
4-Bromophenyl phenyl ether	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
4-Nitrophenol	< 1.05	< 1.04	< 1.06	< 1.08	< 1.16	< 1.08	< 1.11	< 1.08	< 1.15	< 1.06	--	--	--	--
Acenaphthene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	4	3000	--	--
Acenaphthylene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	0.75	< 0.29	< 0.27	2	10	--	--
Acetophenone	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
Aniline	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
Anthracene	< 0.26	< 0.26	< 0.26	< 0.27	0.53	< 0.27	< 0.28	0.60	< 0.29	< 0.27	1000	3000	--	--
Azobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
Benzo(A)anthracene	< 0.26	< 0.26	< 0.26	< 0.27	0.76	< 0.27	< 0.28	1.02	1.00	0.29	20	300	--	--
Benzo(A)pyrene	< 0.26	< 0.26	< 0.26	< 0.27	0.69	< 0.27	< 0.28	0.93	1.17	0.32	2	30	--	--
Benzo(B)fluoranthene	< 0.26	< 0.26	< 0.26	< 0.27	0.72	< 0.27	< 0.28	1.04	0.93	0.36	20	300	--	--
Benzo(g,h,i)Perylene	< 0.26	< 0.26	< 0.26	< 0.27	0.41	< 0.27	< 0.28	0.51	0.84	< 0.27	1000	3000	--	--
Benzo(K)fluoranthene	< 0.26	< 0.26	< 0.26	< 0.27	0.29	< 0.27	< 0.28	0.41	0.85	< 0.27	200	3000	--	--
bis (2-chloroethoxy) Methane	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
bis (2-chloroethyl) Ether	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	0.7	--	--
bis (2-chloroisopropyl) Ether	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	0.7	--	--
Bis (2-ethylhexyl) phthalate	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	100	700	--	--
Butylbenzylphthalate	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	0.39	< 0.27	--	--	--	--
Chrysene	< 0.26	< 0.26	< 0.26	< 0.27	0.72	< 0.27	< 0.28	1.02	0.93	0.32	200	3000	--	--
Di-n-octyl phthalate	< 0.52	< 0.52	< 0.53	< 0.54	< 0.58	< 0.54	< 0.56	< 0.54	< 0.57	< 0.53	--	--	--	--
Dibenzo(A,H)anthracene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	2	30	--	--
Dibenzofuran	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	0.43	< 0.29	< 0.27	--	--	--	--
Diethyl phthalate	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	10	200	--	--
Dimethyl phthalate	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	50	--	--
Fluoranthene	< 0.26	< 0.26	< 0.26	< 0.27	1.85	< 0.27	< 0.28	3.07	1.48	0.53	1000	3000	--	--
Fluorene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	0.59	< 0.29	< 0.27	1000	3000	--	--
Hexachlorobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	0.9	--	--
Hexachlorobutadiene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	30	100	--	--
Hexachloroethane	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	3	--	--
Indeno (1,2,3-cd) pyrene	< 0.26	< 0.26	< 0.26	< 0.27	0.40	< 0.27	< 0.28	0.55	0.92	< 0.27	20	300	--	--
Isophorone	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
N-dibutyl phthalate	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
n-Nitrosodimethylamine	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
Naphthalene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	0.79	< 0.29	< 0.27	4	20	--	--
Nitrobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
P-chloroaniline	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	1	3	--	--
P-dichlorobenzene	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.7	1	--	--
Pentachlorophenol	< 1.05	< 1.04	< 1.06	< 1.08	< 1.16	< 1.08	< 1.11	< 1.08	< 1.15	< 1.06	3	10	--	--
Phenanthrene	< 0.26	< 0.26	< 0.26	< 0.27	1.97	< 0.27	< 0.28	3.23	0.56	0.27	10	1000	--	--
Phenols	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	0.9	20	--	--
Pyrene	< 0.26	< 0.26	0.32	< 0.27	1.51	0.27	< 0.28	2.20	1.48	0.52	1000	3000	--	--
Pyridine	< 0.26	< 0.26	< 0.26	< 0.27	< 0.29	< 0.27	< 0.28	< 0.27	< 0.29	< 0.27	--	--	--	--
Total SVOCs	0	0	0.58	0	9.85	0.27	0	17.53	10.55	2.59	--	--	100	100
Petroleum Hydrocarbons (mg/kg)														
C9-C36	< 10.8	19.1	< 10.8	< 11.6	19.8	146 D	< 10.5	53.2	72.3 D	36.8	--	--	--	--

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	C-3	C-5	C-7	D-8.5	DD-1	DD-3	DD-5	DD-7	E-1	E-3				
Sample ID	C-3	C-5	C-7	D-8.5	DD-1	DD-3	DD-5	DD-7	E-1	E-3 0-3				
Sample Depth (feet)	0-4.8	0-5	0-4.3	0-4	0-5	0-5	0-4.5	0-3	0-5	0-3				
Sample Date	5/2/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/30/2024	4/30/2024	5/2/2024	5/3/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0124-02	24E0124-03	24E0124-04	24E0124-05	24D1044-18	24E0026-03	24E0026-02	24E0026-01	24E0124-08	24E0124-16				
Pesticides/Herbicides (mg/kg)														
2,2-Dichloropropionic acid	< 0.047	< 0.047	< 0.047	< 0.049	< 0.049	< 0.048	< 0.048	< 0.048	< 0.050	< 0.047	--	--	--	--
2,4,5-Trichlorophenoxyacetic acid	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
2,4,5-Trichlorophenoxypropionic acid	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
2,4-Dichlorophenoxyacetic acid	< 0.049	< 0.049	< 0.049	< 0.051	< 0.051	< 0.05	< 0.049	< 0.050	< 0.052	< 0.048	--	--	--	--
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	< 2.45	< 2.44	< 2.44	< 2.54	< 2.53	< 2.49	< 2.470	< 2.490	< 2.590	< 2.410	--	--	--	--
4,4'-DDD	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	10	40	--	--
4,4'-DDE	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4,4'-DDT	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4-(2,4-dichlorophenoxy)-Butanoic acid	< 0.050	< 0.049	< 0.049	< 0.051	< 0.051	< 0.050	< 0.050	< 0.050	< 0.052	< 0.049	--	--	--	--
Aldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.5	--	--
beta-BHC	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-delta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-gamma	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003	0.5	--	--
Chlordane (mixture of isomers)	< 0.022	< 0.022	< 0.021	< 0.022	< 0.023	< 0.021	< 0.021	< 0.022	< 0.021	< 0.021	--	--	--	--
Chlordane, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Dicamba	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
hloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	< 0.049	< 0.049	< 0.049	< 0.051	< 0.051	< 0.050	< 0.049	< 0.050	< 0.052	< 0.048	--	--	--	--
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.6	--	--
Dinoseb	< 0.050	< 0.049	< 0.049	< 0.051	< 0.051	< 0.050	< 0.050	< 0.050	< 0.052	< 0.049	--	--	--	--
Endosulfan sulfate	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, beta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	20	30	--	--
Endrin ketone	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Heptachlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.3	2	--	--
Heptachlor Epoxide	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.2	1	--	--
Hexachlorobenzene	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.7	0.9	--	--
Methoxychlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	300	400	--	--
Methylchlorophenoxyacetic acid	< 2.420	< 2.420	< 2.420	< 2.510	< 2.500	< 2.470	< 2.450	< 2.470	< 2.560	< 2.390	--	--	--	--
Toxaphene	< 0.136	< 0.135	< 0.128	< 0.136	< 0.143	< 0.128	< 0.133	< 0.136	< 0.134	< 0.134	--	--	--	--
trans-Chlordane	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.0026	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
PCB Aroclor 1254	0.08	0.1	< 0.05	0.1	0.6	0.09	0.08	< 0.05	0.1	0.1	--	--	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05				
PCB Aroclor 1262	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	--	--	--	--
Total PCBs	0.08	0.1	0	0.1	0.7	0.09	0.08	0	0.1	0.1	1	4	< 2	< 2
Total Metals (mg/kg)														
Arsenic	4.05	2.96	1.71	1.77	7.09	2.35	1.31	2.86	6.72	5.39	20	20	40	40
Barium	14.1	15	9.04	22.1	37.8	15.2	5.93	8.73	216	31.9	1000	3000	--	--
Cadmium	< 0.36	< 0.39	< 0.4	< 0.43	< 0.39	< 0.37	< 0.4	< 0.39	< 0.39	< 0.36	80	80	80	30
Chromium	6.84	5.88	4.11	4.17	23.3	10.8	4.29	4.36	26.7	11.1	100	200	1000	1000
Lead	24.6	169	10.9	73.8	76.2	19.5	9.18	5.02	676	188	200	600	2000	1000
Mercury	< 0.04	0.04	< 0.04	0.09	0.08	0.06	0.04	< 0.03	0.24	0.15	20	40	10	10
Selenium	< 3.6	< 3.93	< 4.03	< 4.29	< 3.92	< 3.68	< 3.96	< 3.85	< 3.92	< 3.64	400	800	--	--
Silver	< 0.36	< 0.39	< 0.4	< 0.43	< 0.39	< 0.37	< 0.4	< 0.39	0.53	< 0.36	100	200	--	--
TCLP (mg/L)														
Lead TCLP (mg/L)	--	0.58	--	0.54	--	--	--	--	2.63	0.17	--	--	--	--
General Chemistry														
Corrosivity (pH)	7.75	7.68	7.46	7.11	6.62	8.06	8.95	7.95	8.5	7.96	--	--	--	--
Physical Conditions														
Flashpoint (^{o}F)	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	--	--	--	--
Reactivity - Cyanide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Reactivity - Sulfide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Specific Conductance @ 25°C (µmhos/cm)	59	186	36	35	30	57	59	72	145	124	--	--	8000	4000

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	E-3	E-5	E-7	EE-0.5	EE-8.5	FF-1	FF-3	FF-5	FF-7	G-1				
Sample ID	E-3 3-7	E-5	E-7	EE-0.5	EE-8.5	FF-1	FF-3	FF-5	FF-7	G-1				
Sample Depth (feet)	3-7	0-4.3	0-4.5	0-3.5	0-4.5	0-5	0-4	0-4	0-3.5	0-5				
Sample Date	5/3/2024	5/2/2024	5/2/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0124-17	24E0124-07	24E0124-06	24D1044-14	24D1044-13	24D1044-12	24D1044-11	24D1044-10	24D1044-09	24E0124-11				
VOCs (mg/kg)														
1,1,1,2-Tetrachloroethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	0.1	--	--
1,1,1-Trichloroethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	30	600	--	--
1,1,2,2-Tetrachloroethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.005	0.02	--	--
1,1,2-Trichloroethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	2	--	--
1,1-Dichloroethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.4	9	--	--
1,1-Dichloroethylene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	3	40	--	--
1,1-Dichloropropene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,2,3-Trichlorobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,2,3-Trichloropropane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,2,4-Trichlorobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	2	6	--	--
1,2-Dibromo-3-chloropropane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,2-Dibromoethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	0.1	--	--
1,2-Dichlorobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	9	100	--	--
1,2-Dichloroethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	0.1	--	--
1,2-Dichloropropane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	0.1	--	--
1,3,4-Trimethylbenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,3,5-Trimethylbenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,3-Dichlorobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	3	200	--	--
1,3-Dichloropropane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
1,4-Dioxane	< 0.116	< 0.121	< 0.135	< 0.136	< 0.096	< 0.090	< 0.090	< 0.092	< 0.095	< 0.111	0.2	5	--	--
2,2-Dichloropropane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
4-Isopropyltoluene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Acetone	< 0.058	< 0.060	< 0.068	< 0.068	< 0.048	< 0.045	< 0.045	< 0.046	< 0.047	< 0.055	6	50	--	--
Benzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	2	200	--	--
Bromobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Bromochloromethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Bromodichloromethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	0.1	--	--
Bromoform	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	1	--	--
Bromomethane	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	0.5	0.5	--	--
Carbon Disulfide	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Carbon Tetrachloride	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	5	5	--	--
Chlorobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	1	3	--	--
Chlorodibromomethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.005	0.03	--	--
Chloroethane	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	--	--	--	--
Chloroform	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.2	0.2	--	--
Cis-1,2-dichloroethylene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	0.1	0.1	--	--
cis-1,3-Dichloropropene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Dibromomethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Dichlorodifluoromethane	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	--	--	--	--
Dichloromethane	< 0.029	< 0.030	< 0.034	< 0.034	< 0.024	< 0.023	< 0.023	< 0.023	< 0.024	< 0.028	0.1	3	--	--
Diisopropyl Ether	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Ethyl benzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	40	1000	--	--
Ethyl ether	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Ethyl tert-butyl ether	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Fluorotrichloromethane	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
Hexachlorobutadiene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	30	100	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--	--	0.7	3	--	--
Isopropyl benzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	--	--	--	--
m,p-Xylenes	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	--	--	--	--
Methyl Chloride	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	--	--	--	--
Methyl ethyl ketone	< 0.058	< 0.060	< 0.068	< 0.068	< 0.048	< 0.045	< 0.0452	< 0.046	< 0.047	< 0.055	4	50	--	--
Methyl isobutyl ketone	< 0.058	< 0.060	< 0.068	< 0.068	< 0.048	< 0.045	< 0.0452	< 0.046	< 0.047	< 0.055	0.4	50	--	--
Methyl n-butyl ketone	< 0.058	< 0.060	< 0.068	< 0.068	< 0.048	< 0.045	< 0.0452	< 0.046	< 0.047	< 0.055	--	--	--	--
Methyl-tert-butyl ether	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	0.1	100	--	--
n-Butylbenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
n-Propylbenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
Naphthalene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	4	20	--	--
O-chlorotoluene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
o-Xylenes	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
p-Chlorotoluene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
P-dichlorobenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	0.7	1	--	--
sec-Butylbenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
Styrene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	3	4	--	--
Tert-amyl-methyl ether	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
tert-Butylbenzene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
Tetrachloroethylene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	1	4	--	--
Tetrahydrofuran	< 0.023	< 0.024	< 0.027	< 0.027	< 0.019	< 0.018	< 0.0181	< 0.018	< 0.019	< 0.022	--	--	--	--
Toluene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	30	1000	--	--
Trans-1,2-dichloroethylene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	1	1	--	--
trans-1,3-Dichloropropene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	--	--	--	--
Trichloroethylene	< 0.006	< 0.006	< 0.007	< 0.007	< 0.005	< 0.005	< 0.0045	< 0.005	< 0.005	< 0.006	0.3	0.3	--	--
Vinyl Chloride	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	0.3	0.7	--	--
Xylene	< 0.012	< 0.012	< 0.014	< 0.014	< 0.010	< 0.009	< 0.009	< 0.009	< 0.010	< 0.011	100	100	--	--
Total VOCs	0	0	0	0	0	0	0	0	0	0	--	--	10	4

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	E-3	E-5	E-7	EE-0.5	EE-8.5	FF-1	FF-3	FF-5	FF-7	G-1				
Sample ID	E-3 3-7	E-5	E-7	EE-0.5	EE-8.5	FF-1	FF-3	FF-5	FF-7	G-1				
Sample Depth (feet)	3-7	0-4.3	0-4.5	0-3.5	0-4.5	0-5	0-4	0-4	0-3.5	0-5				
Sample Date	5/3/2024	5/2/2024	5/2/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0124-17	24E0124-07	24E0124-06	24D1044-14	24D1044-13	24D1044-12	24D1044-11	24D1044-10	24D1044-09	24E0124-11				
SVOCs (mg/kg)														
1,1-Biphenyl	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05	6	--	--
1,2,4-Trichlorobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	2	6	--	--
1,2-Dichlorobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	9	100	--	--
1,3-Dichlorobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	3	200	--	--
2,4,5-Trichlorophenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	4	600	--	--
2,4,6-Trichlorophenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	20	--	--
2,4-Dichlorophenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	40	--	--
2,4-Dimethylphenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	100	--	--
2,4-Dinitrophenol	< 1.00	< 1.13	< 1.19	< 1.17	< 1.14	< 1.09	< 1.07	< 1.08	< 1.14	< 1.13	3	50	--	--
2,4-Dinitrotoluene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	10	--	--
2,6-Dinitrotoluene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
2-Chloronaphthalene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
2-Chlorophenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	100	--	--
2-Methylnaphthalene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	80	--	--
2-Methylphenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
2-Nitrophenol	< 0.50	< 0.57	< 0.60	< 0.58	< 0.57	< 0.54	< 0.54	< 0.54	< 0.57	< 0.56	--	--	--	--
3 & 4 Methylphenol	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
3,3'-Dichlorobenzidine	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	3	20	--	--
4-Bromophenyl phenyl ether	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
4-Nitrophenol	< 1.00	< 1.13	< 1.19	< 1.17	< 1.14	< 1.09	< 1.07	< 1.08	< 1.14	< 1.13	--	--	--	--
Acenaphthene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	4	3000	--	--
Acenaphthylene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	2	10	--	--
Acetophenone	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Aniline	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Anthracene	< 0.25	0.44	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	1000	3000	--	--
Azobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Benzo(A)anthracene	0.33	1.29	< 0.30	< 0.29	< 0.29	0.42	< 0.27	< 0.27	< 0.29	< 0.28	20	300	--	--
Benzo(A)pyrene	0.36	1.21	< 0.30	< 0.29	< 0.29	0.42	< 0.27	< 0.27	< 0.29	< 0.28	2	30	--	--
Benzo(B)fluoranthene	0.37	0.92	< 0.30	< 0.29	< 0.29	0.44	< 0.27	< 0.27	< 0.29	< 0.28	20	300	--	--
Benzo(g,h,i)Perylene	< 0.25	0.75	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	1000	3000	--	--
Benzo(K)fluoranthene	< 0.25	0.90	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	200	3000	--	--
bis (2-chloroethoxy) Methane	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
bis (2-chloroethyl) Ether	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	0.7	--	--
bis (2-chloroisopropyl) Ether	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	0.7	--	--
Bis (2-ethylhexyl) phthalate	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	100	700	--	--
Butylbenzylphthalate	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Chrysene	0.32	1.20	< 0.30	< 0.29	< 0.29	0.41	< 0.27	< 0.27	< 0.29	< 0.28	200	3000	--	--
Di-n-octyl phthalate	< 0.50	< 0.57	< 0.60	< 0.58	< 0.57	< 0.54	< 0.54	< 0.54	< 0.57	< 0.56	--	--	--	--
Dibenzo(A,H)anthracene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	2	30	--	--
Dibenzofuran	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Diethyl phthalate	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	10	200	--	--
Dimethyl phthalate	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	50	--	--
Fluoranthene	0.51	2.28	< 0.30	< 0.29	< 0.29	0.88	< 0.27	< 0.27	< 0.29	0.31	1000	3000	--	--
Fluorene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	1000	3000	--	--
Hexachlorobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	0.9	--	--
Hexachlorobutadiene	< 0.25	< 0.283	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	30	100	--	--
Hexachloroethane	< 0.25	< 0.283	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	3	--	--
Indeno (1,2,3-cd) pyrene	< 0.25	0.80	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	20	300	--	--
Isophorone	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
N-dibutyl phthalate	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
n-Nitrosodimethylamine	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Naphthalene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	4	20	--	--
Nitrobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
P-chloroaniline	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	1	3	--	--
P-dichlorobenzene	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.7	1	--	--
Pentachlorophenol	< 1.00	< 1.13	< 1.19	< 1.17	< 1.14	< 1.09	< 1.07	< 1.08	< 1.14	< 1.13	3	10	--	--
Phenanthrene	< 0.25	1.78	< 0.30	< 0.29	< 0.29	0.45	< 0.27	< 0.27	< 0.29	< 0.28	10	1000	--	--
Phenols	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	0.9	20	--	--
Pyrene	0.60	2.54	< 0.30	< 0.29	< 0.29	0.76	< 0.27	< 0.27	< 0.29	0.29	1000	3000	--	--
Pyridine	< 0.25	< 0.28	< 0.30	< 0.29	< 0.29	< 0.27	< 0.27	< 0.27	< 0.29	< 0.28	--	--	--	--
Total SVOCs	2.47	14.10	0	0	0	3.77	0	0	0	0.60	--	--	100	100
Petroleum Hydrocarbons (mg/kg)														
C9-C36	20.6	70.3	19.60	72.80 D	< 11.10	42.00	< 11.40	< 10.50	16.20	27.50	--	--	--	--

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	E-3	E-5	E-7	EE-0.5	EE-8.5	FF-1	FF-3	FF-5	FF-7	G-1				
Sample ID	E-3 3-7	E-5	E-7	EE-0.5	EE-8.5	FF-1	FF-3	FF-5	FF-7	G-1				
Sample Depth (feet)	3-7	0-4.3	0-4.5	0-3.5	0-4.5	0-5	0-4	0-4	0-3.5	0-5				
Sample Date	5/3/2024	5/2/2024	5/2/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	4/29/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0124-17	24E0124-07	24E0124-06	24D1044-14	24D1044-13	24D1044-12	24D1044-11	24D1044-10	24D1044-09	24E0124-11				
Pesticides/Herbicides (mg/kg)														
2,2-Dichloropropionic acid	< 0.047	< 0.048	< 0.054	< 0.049	< 0.049	< 0.048	< 0.047	< 0.049	< 0.051	< 0.049	--	--	--	--
2,4,5-Trichlorophenoxyacetic acid	< 0.010	< 0.010	< 0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.011	< 0.010	--	--	--	--
2,4,5-Trichlorophenoxypropionic acid	< 0.010	< 0.010	< 0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.011	< 0.010	--	--	--	--
2,4-Dichlorophenoxyacetic acid	< 0.048	< 0.050	< 0.056	< 0.051	< 0.050	< 0.050	< 0.049	< 0.051	< 0.053	< 0.051	--	--	--	--
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	< 2.410	< 2.480	< 2.810	< 2.540	< 2.520	< 2.500	< 2.430	< 2.540	< 2.660	< 2.530	--	--	--	--
4,4'-DDD	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	10	40	--	--
4,4'-DDE	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4,4'-DDT	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4-(2,4-dichlorophenoxy)-Butanoic acid	< 0.049	< 0.050	< 0.057	< 0.051	< 0.051	< 0.051	< 0.049	< 0.051	< 0.054	< 0.051	--	--	--	--
Aldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.5	--	--
beta-BHC	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-delta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-gamma	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003	0.5	--	--
Chlordane (mixture of isomers)	< 0.021	< 0.022	< 0.023	< 0.022	< 0.022	< 0.021	< 0.022	< 0.022	< 0.023	< 0.023	--	--	--	--
Chlordane, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Dicamba	< 0.010	< 0.010	< 0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.011	< 0.010	--	--	--	--
hloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	< 0.048	< 0.050	< 0.056	< 0.051	< 0.050	< 0.050	< 0.049	< 0.051	< 0.053	< 0.051	--	--	--	--
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.025	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.6	--	--
Dinoseb	< 0.049	< 0.050	< 0.057	< 0.051	< 0.051	< 0.051	< 0.049	< 0.051	< 0.054	< 0.051	--	--	--	--
Endosulfan sulfate	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, beta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.006	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	20	30	--	--
Endrin ketone	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Heptachlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.3	2	--	--
Heptachlor Epoxide	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.2	1	--	--
Hexachlorobenzene	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.7	0.9	--	--
Methoxychlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	300	400	--	--
Methylchlorophenoxyacetic acid	< 2.380	< 2.450	< 2.780	< 2.510	< 2.490	< 2.480	< 2.400	< 2.510	< 2.630	< 2.500	--	--	--	--
Toxaphene	< 0.129	< 0.139	< 0.146	< 0.138	< 0.136	< 0.134	< 0.140	< 0.136	< 0.146	< 0.145	--	--	--	--
trans-Chlordane	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	--	--	--	--
PCB Aroclor 1221	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	--	--	--	--
PCB Aroclor 1232	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	--	--	--	--
PCB Aroclor 1242	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	--	--	--	--
PCB Aroclor 1248	< 0.05	< 0.05	< 0.06	< 0.06	0.1	< 0.05	< 0.05	< 0.05	0.08	< 0.06	--	--	--	--
PCB Aroclor 1254	0.2	0.09	< 0.06	0.08	0.2	2.3 D	< 0.05	< 0.05	0.07	0.2	--	--	--	--
PCB Aroclor 1260	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.1				
PCB Aroclor 1262	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	--	--	--	--
PCB Aroclor 1268	< 0.05	< 0.05	< 0.06	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.06	--	--	--	--
Total PCBs	0.2	0.09	0	0.08	0.3	2.33	0	0	0.15	0.2	1	4	< 2	< 2
Total Metals (mg/kg)														
Arsenic	2.99	8.09	6.38	4.39	6.02	1.47	4.08	3.12	4.41	4.4	20	20	40	40
Barium	14.9	104	58	28.6	66.6	16.6	16.4	16.4	20.7	50	1000	3000	--	--
Cadmium	< 0.39	< 0.38	< 0.44	< 0.41	< 0.37	< 0.38	< 0.42	< 0.4	< 0.43	< 0.42	80	80	80	30
Chromium	5.89	12.5	11.8	10.7	12	5.23	9.93	7.16	9.44	12.3	100	200	1000	1000
Lead	53.5	368	171	37.6	134	22.1	13.9	6.21	61.3	441	200	600	2000	1000
Mercury	0.36	0.99 D	0.33	< 0.03	0.14	0.13	< 0.04	< 0.03	0.05	0.14	20	40	10	10
Selenium	< 3.87	< 3.84	< 4.4	< 4.13	< 3.73	< 3.78	< 4.17	< 3.98	< 4.27	< 4.16	400	800	--	--
Silver	< 0.39	< 0.38	< 0.44	< 0.41	< 0.37	< 0.38	< 0.42	< 0.4	< 0.43	< 0.42	100	200	--	--
TCLP (mg/L)														
Lead TCLP (mg/L)	--	1.38	0.4	--	0.71	--	--	--	--	3.25	--	--	--	--
General Chemistry														
Corrosivity (pH)	8.7	8.57	7.76	6.45	8.15	7.1	8.19	6.48	6.67	8.45	--	--	--	--
Physical Conditions														
Flashpoint (°F)	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	--	--	--	--
Reactivity - Cyanide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Reactivity - Sulfide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Specific Conductance @ 25°C (µmhos/cm)	206	213	129	53	136	46	119	9	56	202	--	--	8000	4000

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	G-3	G-3	G-5	G-7	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1				
Sample ID	G-3 0-4	G-3 4-8	G-5	G-7	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1				
Sample Depth (feet)	0-4	4-8	0-5	0-4.5	0-4.5	0-4	0-5	0-4	0-4	0-4				
Sample Date	5/1/2024	5/1/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/29/2024	4/29/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-06	24E0050-07	24E0124-10	24E0124-09	24E0124-12	24D1044-08	24E0026-04	24D1044-06	24D1044-05	24E0124-15				
VOCs (mg/kg)														
1,1,1,2-Tetrachloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	0.1	--	--
1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	30	600	--	--
1,1,2,2-Tetrachloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.005	0.02	--	--
1,1,2-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	2	--	--
1,1-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.4	9	--	--
1,1-Dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	3	40	--	--
1,1-Dichloropropene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,2,3-Trichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,2,3-Trichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,2,4-Trichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	2	6	--	--
1,2-Dibromo-3-chloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,2-Dibromoethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	0.1	--	--
1,2-Dichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	9	100	--	--
1,2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	0.1	--	--
1,2-Dichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	0.1	--	--
1,3,4-Trimethylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,3,5-Trimethylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,3-Dichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	3	200	--	--
1,3-Dichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
1,4-Dioxane	< 0.097	< 0.102	< 0.101	< 0.110	< 0.107	< 0.087	< 0.093	< 0.086	< 0.125	< 0.094	0.2	5	--	--
2,2-Dichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
4-Isopropyltoluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Acetone	< 0.049	< 0.051	< 0.050	< 0.055	< 0.054	< 0.044	< 0.046	< 0.043	< 0.063	< 0.047	6	50	--	--
Benzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	2	200	--	--
Bromobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Bromochloromethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Bromodichloromethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	0.1	--	--
Bromoform	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	1	--	--
Bromomethane	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	0.5	0.5	--	--
Carbon Disulfide	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Carbon Tetrachloride	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	5	5	--	--
Chlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	1	3	--	--
Chlorodibromomethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.005	0.03	--	--
Chloroethane	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	--	--	--	--
Chloroform	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.2	0.2	--	--
Cis-1,2-dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	0.1	--	--
cis-1,3-Dichloropropene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Dibromomethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Dichlorodifluoromethane	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	--	--	--	--
Dichloromethane	< 0.024	< 0.026	< 0.025	< 0.028	< 0.027	< 0.022	< 0.023	< 0.021	< 0.031	< 0.024	0.1	3	--	--
Diisopropyl Ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Ethyl benzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	40	1000	--	--
Ethyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Ethyl tert-butyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Fluorotrichloromethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Hexachlorobutadiene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	30	100	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--	--	0.7	3	--	--
Isopropyl benzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
m,p-Xylenes	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	--	--	--	--
Methyl Chloride	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	--	--	--	--
Methyl ethyl ketone	< 0.049	< 0.051	< 0.050	< 0.055	< 0.054	< 0.044	< 0.046	< 0.043	< 0.063	< 0.047	4	50	--	--
Methyl isobutyl ketone	< 0.049	< 0.051	< 0.050	< 0.055	< 0.054	< 0.044	< 0.046	< 0.043	< 0.063	< 0.047	0.4	50	--	--
Methyl n-butyl ketone	< 0.049	< 0.051	< 0.050	< 0.055	< 0.054	< 0.044	< 0.046	< 0.043	< 0.063	< 0.047	--	--	--	--
Methyl-tert-butyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.1	100	--	--
n-Butylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
n-Propylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Naphthalene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	0.013	< 0.004	< 0.006	< 0.005	4	20	--	--
O-chlorotoluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
o-Xylenes	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
p-Chlorotoluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
P-dichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.7	1	--	--
sec-Butylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Styrene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	3	4	--	--
Tert-amyl-methyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
tert-Butylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Tetrachloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	1	4	--	--
Tetrahydrofuran	< 0.019	< 0.020	< 0.020	< 0.022	< 0.021	< 0.018	< 0.019	< 0.017	< 0.025	< 0.019	--	--	--	--
Toluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	30	1000	--	--
Trans-1,2-dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	1	1	--	--
trans-1,3-Dichloropropene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	--	--	--	--
Trichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004	< 0.005	< 0.004	< 0.006	< 0.005	0.3	0.3	--	--
Vinyl Chloride	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	0.3	0.7	--	--
Xylene	< 0.010	< 0.010	< 0.010	< 0.011	< 0.011	< 0.009	< 0.009	< 0.009	< 0.013	< 0.009	100	100	--	--
Total VOCs	0	0	0	0	0	0	0.013	0	0	0	--	--	10	4

DRAFT

Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	G-3	G-3	G-5	G-7	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1				
Sample ID	G-3 0-4	G-3 4-8	G-5	G-7	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1				
Sample Depth (feet)	0-4	4-8	0-5	0-4.5	0-4.5	0-4	0-5	0-4	0-4	0-4				
Sample Date	5/1/2024	5/1/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/29/2024	4/29/2024	5/2/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-06	24E0050-07	24E0124-10	24E0124-09	24E0124-12	24D1044-08	24E0026-04	24D1044-06	24D1044-05	24E0124-15				
SVOCs (mg/kg)														
1,1-Biphenyl	< 0.03	0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03	0.05	6	--	--
1,2,4-Trichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	2	6	--	--
1,2-Dichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	9	100	--	--
1,3-Dichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	3	200	--	--
2,4,5-Trichlorophenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	4	600	--	--
2,4,6-Trichlorophenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	20	--	--
2,4-Dichlorophenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	40	--	--
2,4-Dimethylphenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	100	--	--
2,4-Dinitrophenol	< 1.09	< 1.12	< 1.08	< 1.11	< 1.03	< 1.11	< 1.09	< 1.11	< 1.14	< 1.11	3	50	--	--
2,4-Dinitrotoluene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	10	--	--
2,6-Dinitrotoluene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
2-Chloronaphthalene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
2-Chlorophenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	100	--	--
2-Methylnaphthalene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	80	--	--
2-Methylphenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
2-Nitrophenol	< 0.55	< 0.56	< 0.54	< 0.55	< 0.51	< 0.56	< 0.55	< 0.55	< 0.57	< 0.56	--	--	--	--
3 & 4 Methylphenol	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
3,3'-Dichlorobenzidine	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	3	20	--	--
4-Bromophenyl phenyl ether	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
4-Nitrophenol	< 1.09	< 1.12	< 1.08	< 1.11	< 1.03	< 1.11	< 1.09	< 1.11	< 1.14	< 1.11	--	--	--	--
Acenaphthene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	4	3000	--	--
Acenaphthylene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	2	10	--	--
Acetophenone	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
Aniline	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
Anthracene	< 0.27	0.40	< 0.27	< 0.28	< 0.26	< 0.28	0.47	< 0.28	< 0.29	< 0.28	1000	3000	--	--
Azobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
Benzo(A)anthracene	< 0.27	0.78	< 0.27	< 0.28	< 0.26	< 0.28	0.48	< 0.28	< 0.29	0.38	20	300	--	--
Benzo(A)pyrene	< 0.27	0.80	< 0.27	< 0.28	< 0.26	< 0.28	0.40	< 0.28	< 0.29	0.40	2	30	--	--
Benzo(B)fluoranthene	< 0.27	0.55	< 0.27	< 0.28	< 0.26	< 0.28	0.41	< 0.28	< 0.29	0.46	20	300	--	--
Benzo(g,h,i)Perylene	< 0.27	0.52	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	1000	3000	--	--
Benzo(K)fluoranthene	< 0.27	0.47	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	200	3000	--	--
bis (2-chloroethoxy) Methane	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
bis (2-chloroethyl) Ether	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	0.7	--	--
bis (2-chloroisopropyl) Ether	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	0.7	--	--
Bis (2-ethylhexyl) phthalate	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	0.53	< 0.28	100	700	--	--
Butylbenzylphthalate	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	1.32	< 0.28	--	--	--	--
Chrysene	< 0.27	0.77	< 0.27	< 0.28	< 0.26	< 0.28	0.42	< 0.28	< 0.29	0.43	200	3000	--	--
Di-n-octyl phthalate	< 0.55	< 0.56	< 0.54	< 0.55	< 0.51	< 0.56	< 0.55	< 0.55	1.03	< 0.56	--	--	--	--
Dibenzo(A,H)anthracene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	2	30	--	--
Dibenzofuran	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
Diethyl phthalate	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	10	200	--	--
Dimethyl phthalate	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	50	--	--
Fluoranthene	0.58	1.39	0.35	0.28	< 0.26	0.39	1.28	< 0.28	< 0.29	0.73	1000	3000	--	--
Fluorene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	1000	3000	--	--
Hexachlorobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	0.9	--	--
Hexachlorobutadiene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	30	100	--	--
Hexachloroethane	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	3	--	--
Indeno (1,2,3-cd) pyrene	< 0.27	0.48	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	20	300	--	--
Isophorone	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
N-dibutyl phthalate	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
n-Nitrosodimethylamine	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
Naphthalene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	0.35	< 0.28	< 0.29	< 0.28	4	20	--	--
Nitrobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
P-chloroaniline	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	1	3	--	--
P-dichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.7	1	--	--
Pentachlorophenol	< 1.09	< 1.12	< 1.08	< 1.11	< 1.03	< 1.11	< 1.09	< 1.11	< 1.14	< 1.11	3	10	--	--
Phenanthrene	0.56	1.51	< 0.27	< 0.28	< 0.26	< 0.28	1.56	< 0.28	< 0.29	0.38	10	1000	--	--
Phenols	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	0.9	20	--	--
Pyrene	0.56	1.67	0.44	0.37	< 0.26	0.33	0.97	< 0.28	< 0.29	0.69	1000	3000	--	--
Pyridine	< 0.27	< 0.28	< 0.27	< 0.28	< 0.26	< 0.28	< 0.27	< 0.28	< 0.29	< 0.28	--	--	--	--
Total SVOCs	1.70	9.38	0.78	0.64	0	0.71	6.37	0	2.88	3.48	--	--	100	100
Petroleum Hydrocarbons (mg/kg)														
C9-C36	19.60	44.70	20.70	63.40	17.90	298	< 11.20	< 10.60	15.50	28.10	--	--	--	--

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin											MCP Concentrations			
Location	G-3	G-3	G-5	G-7	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1				
Sample ID	G-3 0-4	G-3 4-8	G-5	G-7	H-8.5	HH-1	HH-3	HH-5	HH-7	I-1				
Sample Depth (feet)	0-4	4-8	0-5	0-4.5	0-4.5	0-4	0-5	0-4	0-4	0-4	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Sample Date	5/1/2024	5/1/2024	5/2/2024	5/2/2024	5/2/2024	4/29/2024	4/30/2024	4/29/2024	4/29/2024	5/2/2024				
Laboratory Sample ID	24E0050-06	24E0050-07	24E0124-10	24E0124-09	24E0124-12	24D1044-08	24E0026-04	24D1044-06	24D1044-05	24E0124-15				
Pesticides/Herbicides (mg/kg)														
2,2-Dichloropropionic acid	< 0.047	< 0.051	< 0.049	< 0.049	< 0.047	< 0.048	< 0.048	< 0.049	< 0.049	< 0.048	--	--	--	--
2,4,5-Trichlorophenoxyacetic acid	< 0.010	< 0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
2,4,5-Trichlorophenoxypropionic acid	< 0.010	< 0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
2,4-Dichlorophenoxyacetic acid	< 0.049	< 0.053	< 0.051	< 0.051	< 0.049	< 0.049	< 0.049	< 0.051	< 0.051	< 0.050	--	--	--	--
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	< 2.430	2.640	< 2.530	< 2.540	< 2.450	< 2.460	< 2.470	< 2.540	< 2.530	< 2.490	--	--	--	--
4,4'-DDD	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	10	40	--	--
4,4'-DDE	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	7	30	--	--
4,4'-DDT	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.008	7	30	--	--
4-(2,4-dichlorophenoxy)-Butanoic acid	< 0.049	< 0.053	< 0.051	< 0.051	< 0.049	< 0.050	< 0.050	< 0.051	< 0.051	< 0.050	--	--	--	--
Aldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.5	--	--
beta-BHC	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-delta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
BHC-gamma	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003	0.5	--	--
Chlordane (mixture of isomers)	< 0.022	< 0.023	< 0.021	< 0.023	< 0.022	< 0.022	< 0.023	< 0.022	< 0.022	< 0.023	--	--	--	--
Chlordane, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Dicamba	< 0.010	< 0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	--
hloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	< 0.049	< 0.053	< 0.051	< 0.051	< 0.049	< 0.049	< 0.049	< 0.051	< 0.051	< 0.050	--	--	--	--
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.09	0.6	--	--
Dinoseb	< 0.049	< 0.053	< 0.051	< 0.051	< 0.049	< 0.050	< 0.050	< 0.051	< 0.051	< 0.050	--	--	--	--
Endosulfan sulfate	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endosulfan, beta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.004	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Endrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	20	30	--	--
Endrin ketone	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
Heptachlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.3	2	--	--
Heptachlor Epoxide	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.2	1	--	--
Hexachlorobenzene	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.7	0.9	--	--
Methoxychlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	300	400	--	--
Methylchlorophenoxyacetic acid	< 2.410	< 2.610	< 2.500	< 2.510	< 2.420	< 2.440	< 2.450	< 2.510	< 2.510	< 2.460	--	--	--	--
Toxaphene	< 0.140	< 0.146	< 0.133	< 0.143	< 0.137	< 0.137	< 0.141	< 0.139	< 0.134	< 0.146	--	--	--	--
trans-Chlordane	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	--	--	--	--
PCBs (mg/kg)														
PCB Aroclor 1016	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1248	< 0.05	0.1	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.06	0.07	< 0.05	--	--	--	--
PCB Aroclor 1254	< 0.05	0.1	0.1	0.2	0.1	0.5	0.2	< 0.06	0.09	< 0.05	--	--	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05				
PCB Aroclor 1262	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05	< 0.05	--	--	--	--
Total PCBs	0	0.2	0.1	0.4	0.1	0.5	0.2	0	0.16	0	1	4	< 2	< 2
Total Metals (mg/kg)														
Arsenic	4.93	4.95	3.38	< 0.86	2.79	4.83	2.67	1.8	3.24	6.3	20	20	40	40
Barium	21.5	24.9	18.1	< 0.86	21.6	21.9	12.9	8.93	19.4	44.7	1000	3000	--	--
Cadmium	< 0.37	< 0.42	< 0.36	< 0.43	< 0.4	< 0.38	< 0.4	< 0.41	< 0.42	< 0.41	80	80	80	30
Chromium	10.2	13	6.3	< 0.86	10.1	7.16	4.97	3.9	5.41	15.4	100	200	1000	1000
Lead	24.2	59.7	51.1	< 4.3	17.6	86.2	18.8	< 4.12	53.6	107	200	600	2000	1000
Mercury	< 0.03	0.05	0.18	0.13	0.07	0.05	< 0.03	< 0.03	0.13	0.26	20	40	10	10
Selenium	< 3.75	< 4.16	< 3.65	< 4.3	< 4	< 3.84	< 4.05	< 4.12	< 4.23	< 4.12	400	800	--	--
Silver	< 0.37	< 0.42	< 0.36	< 0.43	< 0.4	< 0.38	< 0.4	< 0.41	< 0.42	< 0.41	100	200	--	--
TCLP (mg/L)														
Lead TCLP (mg/L)	--	--	--	--	--	--	--	--	--	0.29	--	--	--	--
General Chemistry														
Corrosivity (pH)	8.8	8.44	8.38	7.52	8.22	5.8	7.12	6.42	7	6.92	--	--	--	--
Physical Conditions														
Flashpoint (^{o}F)	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	--	--	--	--
Reactivity - Cyanide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Reactivity - Sulfide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Specific Conductance @ 25°C (µmhos/cm)	92	156	269	730	306	50	7	9	68	39	--	--	8000	4000

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin										MCP Concentrations			
Location	I-3	I-3	I-5	I-7	II-0.5	II-8.5	II-8.5	JJ II-2	JJ II-6				
Sample ID	I-3	I-3 4-8	I-5	I-7	II-0.5	II-8.5	II-8.5 5-6	JJ II-2	JJ II-6				
Sample Depth (feet)	0-5	4-8	0-4.3	0-4.3	5-6	0-5	5-6	0-3.5	0-4.5				
Sample Date	5/1/2024	6/21/2024	5/2/2024	5/2/2024	4/29/2024	4/29/2024	5/3/2024	4/29/224	4/29/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-04	24F0927-02	24E0124-14	24E0124-13	24D1044-04	24D1044-03	24E0124-18	24D1044-02	24D1044-01				
VOCs (mg/kg)													
1,1,1,2-Tetrachloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	0.1	--	--
1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	30	600	--	--
1,1,2,2-Tetrachloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.005	0.02	--	--
1,1,2-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	2	--	--
1,1-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.4	9	--	--
1,1-Dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	3	40	--	--
1,1-Dichloropropene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,2,3-Trichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,2,3-Trichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,2,4-Trichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	2	6	--	--
1,2-Dibromo-3-chloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,2-Dibromoethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	0.1	--	--
1,2-Dichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	9	100	--	--
1,2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	0.1	--	--
1,2-Dichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	0.1	--	--
1,3,4-Trimethylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,3,5-Trimethylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,3-Dichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	3	200	--	--
1,3-Dichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
1,4-Dioxane	< 0.093	< 0.098	< 0.095	< 0.110	< 0.093	< 0.112	< 0.296	< 0.093	< 0.095	0.2	5	--	--
2,2-Dichloropropane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
4-Isopropyltoluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Acetone	< 0.046	< 0.049	< 0.048	0.091	< 0.047	0.071	0.246	< 0.047	< 0.048	6	50	--	--
Benzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	2	200	--	--
Bromobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Bromochloromethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Bromodichloromethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	0.1	--	--
Bromoform	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	1	--	--
Bromomethane	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	0.5	0.5	--	--
Carbon Disulfide	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Carbon Tetrachloride	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	5	5	--	--
Chlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	1	3	--	--
Chlorodibromomethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.005	0.03	--	--
Chloroethane	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	--	--	--	--
Chloroform	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.2	0.2	--	--
Cis-1,2-dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	0.1	--	--
cis-1,3-Dichloropropene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Dibromomethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Dichlorodifluoromethane	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	--	--	--	--
Dichloromethane	< 0.023	< 0.024	< 0.024	< 0.028	< 0.023	< 0.028	< 0.074	< 0.023	< 0.024	0.1	3	--	--
Diisopropyl Ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Ethyl benzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	40	1000	--	--
Ethyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Ethyl tert-butyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Fluorotrichloromethane	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Hexachlorobutadiene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	30	100	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--	0.7	3	--	--
Isopropyl benzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
m,p-Xylenes	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	--	--	--	--
Methyl Chloride	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	--	--	--	--
Methyl ethyl ketone	< 0.046	< 0.049	< 0.048	< 0.055	< 0.047	< 0.056	< 0.148	< 0.047	< 0.048	4	50	--	--
Methyl isobutyl ketone	< 0.046	< 0.049	< 0.048	< 0.055	< 0.047	< 0.056	< 0.148	< 0.047	< 0.048	0.4	50	--	--
Methyl n-butyl ketone	< 0.046	< 0.049	< 0.048	< 0.055	< 0.047	< 0.056	< 0.148	< 0.047	< 0.048	--	--	--	--
Methyl-tert-butyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.1	100	--	--
n-Butylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
n-Propylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Naphthalene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	4	20	--	--
O-chlorotoluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
o-Xylenes	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
p-Chlorotoluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
P-dichlorobenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.7	1	--	--
sec-Butylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Styrene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	3	4	--	--
Tert-amyl-methyl ether	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
tert-Butylbenzene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Tetrachloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	1	4	--	--
Tetrahydrofuran	< 0.019	< 0.020	< 0.019	< 0.022	< 0.019	< 0.022	< 0.059	< 0.019	< 0.019	--	--	--	--
Toluene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	30	1000	--	--
Trans-1,2-dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	1	1	--	--
trans-1,3-Dichloropropene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	--	--	--	--
Trichloroethylene	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.006	< 0.015	< 0.005	< 0.005	0.3	0.3	--	--
Vinyl Chloride	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	0.3	0.7	--	--
Xylene	< 0.009	< 0.010	< 0.010	< 0.011	< 0.009	< 0.011	< 0.030	< 0.009	< 0.010	100	100	--	--
Total VOCs	0	0	0	0.091	0	0.071	0.246	0	0	--	--	10	4

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin										MCP Concentrations			
Location	I-3	I-3	I-5	I-7	II-0.5	II-8.5	II-8.5	JJ II-2	JJ II-6				
Sample ID	I-3	I-3 4-8	I-5	I-7	II-0.5	II-8.5	II-8.5 5-6	JJ II-2	JJ II-6				
Sample Depth (feet)	0-5	4-8	0-4.3	0-4.3	5-6	0-5	5-6	0-3.5	0-4.5				
Sample Date	5/1/2024	6/21/2024	5/2/2024	5/2/2024	4/29/2024	4/29/2024	5/3/2024	4/29/224	4/29/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-04	24F0927-02	24E0124-14	24E0124-13	24D1044-04	24D1044-03	24E0124-18	24D1044-02	24D1044-01				
SVOCs (mg/kg)													
1,1-Biphenyl	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03	< 0.10	< 0.03	< 0.03	0.05	6	--	--
1,2,4-Trichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	2	6	--	--
1,2-Dichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	9	100	--	--
1,3-Dichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	3	200	--	--
2,4,5-Trichlorophenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	4	600	--	--
2,4,6-Trichlorophenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	0.7	20	--	--
2,4-Dichlorophenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	0.7	40	--	--
2,4-Dimethylphenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.98	< 0.27	< 0.28	0.7	100	--	--
2,4-Dinitrophenol	< 1.08	< 1.11	< 1.07	< 1.10	< 1.06	< 1.23	< 3.95	< 1.08	< 1.12	3	50	--	--
2,4-Dinitrotoluene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	10	--	--
2,6-Dinitrotoluene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
2-Chloronaphthalene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
2-Chlorophenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	100	--	--
2-Methylnaphthalene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	80	--	--
2-Methylphenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
2-Nitrophenol	< 0.54	< 0.55	< 0.54	< 0.55	< 0.53	< 0.61	< 1.98	< 0.54	< 0.56	--	--	--	--
3 & 4 Methylphenol	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
3,3'-Dichlorobenzidine	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	3	20	--	--
4-Bromophenyl phenyl ether	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
4-Nitrophenol	< 1.08	< 1.11	< 1.07	< 1.10	< 1.06	< 1.23	< 3.95	< 1.08	< 1.12	--	--	--	--
Acenaphthene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	4	3000	--	--
Acenaphthylene	< 0.27	< 0.28	1.05	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	2	10	--	--
Acetophenone	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Aniline	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Anthracene	< 0.27	< 0.28	0.82	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	1000	3000	--	--
Azobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Benzo(A)anthracene	< 0.27	< 0.28	3.22	< 0.27	0.65	< 0.31	< 0.99	< 0.27	< 0.28	20	300	--	--
Benzo(A)pyrene	< 0.27	< 0.28	2.23	< 0.27	0.62	< 0.31	< 0.99	< 0.271	< 0.28	2	30	--	--
Benzo(B)fluoranthene	< 0.27	< 0.28	2.20	< 0.27	0.67	< 0.31	< 0.99	< 0.27	< 0.28	20	300	--	--
Benzo(g,h,i)Perylene	< 0.27	< 0.28	1.19	< 0.27	0.38	< 0.31	< 0.99	< 0.27	< 0.28	1000	3000	--	--
Benzo(K)fluoranthene	< 0.27	< 0.28	0.71	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	200	3000	--	--
bis (2-chloroethoxy) Methane	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
bis (2-chloroethyl) Ether	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	0.7	--	--
bis (2-chloroisopropyl) Ether	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	0.7	--	--
Bis (2-ethylhexyl) phthalate	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	100	700	--	--
Butylbenzylphthalate	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Chrysene	< 0.27	< 0.28	4.09	< 0.27	0.66	< 0.31	< 0.99	< 0.27	< 0.28	200	3000	--	--
Di-n-octyl phthalate	< 0.54	< 0.55	< 0.54	< 0.55	< 0.53	< 0.61	< 1.98	< 0.54	< 0.561	--	--	--	--
Dibenzo(A,H)anthracene	< 0.27	< 0.28	0.38	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	2	30	--	--
Dibenzofuran	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Diethyl phthalate	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	10	200	--	--
Dimethyl phthalate	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	50	--	--
Fluoranthene	0.41	0.33	3.58	< 0.27	1.44	0.42	< 0.99	< 0.27	< 0.28	1000	3000	--	--
Fluorene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	1000	3000	--	--
Hexachlorobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	0.9	--	--
Hexachlorobutadiene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	30	100	--	--
Hexachloroethane	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	3	--	--
Indeno (1,2,3-cd) pyrene	< 0.27	< 0.28	1.00	< 0.27	0.37	< 0.31	< 0.99	< 0.27	< 0.28	20	300	--	--
Isophorone	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
N-dibutyl phthalate	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
n-Nitrosodimethylamine	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Naphthalene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	4	20	--	--
Nitrobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
P-chloroaniline	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	1	3	--	--
P-dichlorobenzene	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.7	1	--	--
Pentachlorophenol	< 1.08	< 1.11	< 1.07	< 1.10	< 1.06	< 1.23	< 3.95	< 1.08	< 1.12	3	10	--	--
Phenanthrene	< 0.27	< 0.28	2.48	< 0.27	0.98	< 0.31	< 0.99	< 0.27	< 0.28	10	1000	--	--
Phenols	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	0.9	20	--	--
Pyrene	0.44	0.41	5.88	< 0.27	1.24	0.40	< 0.99	< 0.27	< 0.28	1000	3000	--	--
Pyridine	< 0.27	< 0.28	< 0.27	< 0.27	< 0.26	< 0.31	< 0.99	< 0.27	< 0.28	--	--	--	--
Total SVOCs	0.86	0.74	28.87	0.00	7.00	0.83	0	0	0	--	--	100	100
Petroleum Hydrocarbons (mg/kg)													
C9-C36	73.80	73.20	16.00	< 11.90	32.00	36.20	273.00	< 10.60	< 11	--	--	--	--

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

Site 1 - New Bedford Marine Commerce Termin										MCP Concentrations			
Location	I-3	I-3	I-5	I-7	II-0.5	II-8.5	II-8.5	JJ II-2	JJ II-6				
Sample ID	I-3	I-3 4-8	I-5	I-7	II-0.5	II-8.5	II-8.5 5-6	JJ II-2	JJ II-6				
Sample Depth (feet)	0-5	4-8	0-4.3	0-4.3	5-6	0-5	5-6	0-3.5	0-4.5				
Sample Date	5/1/2024	6/21/2024	5/2/2024	5/2/2024	4/29/2024	4/29/2024	5/3/2024	4/29/224	4/29/2024	RCS-1	RCS-2	Landfills Lined	Landfills Unlined
Laboratory Sample ID	24E0050-04	24F0927-02	24E0124-14	24E0124-13	24D1044-04	24D1044-03	24E0124-18	24D1044-02	24D1044-01				
Pesticides/Herbicides (mg/kg)													
2,2-Dichloropropionic acid	< 0.049	< 0.051	< 0.048	< 0.051	< 0.046	< 0.055	< 0.088	< 0.049	< 0.048	--	--	--	--
2,4,5-Trichlorophenoxyacetic acid	< 0.010	< 0.011	< 0.010	< 0.011	< 0.010	< 0.011	< 0.018	< 0.010	< 0.010	--	--	--	--
2,4,5-Trichlorophenoxypropionic acid	< 0.010	< 0.011	< 0.010	< 0.011	< 0.010	< 0.011	< 0.018	< 0.010	< 0.010	--	--	--	--
2,4-Dichlorophenoxyacetic acid	< 0.050	< 0.053	< 0.050	< 0.052	< 0.047	0.107	< 0.091	< 0.050	< 0.049	--	--	--	--
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	< 2.520	< 2.640	< 2.480	< 2.610	< 2.370	< 2.830	< 4.550	< 2.520	< 2.460	--	--	--	--
4,4'-DDD	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	10	40	--	--
4,4'-DDE	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	7	30	--	--
4,4'-DDT	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	7	30	--	--
4-(2,4-dichlorophenoxy)-Butanoic acid	< 0.051	< 0.053	< 0.050	< 0.053	< 0.048	< 0.057	< 0.092	< 0.051	< 0.050	--	--	--	--
Aldrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	0.09	0.5	--	--
beta-BHC	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
BHC-alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
BHC-delta	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
BHC-gamma	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.003	< 0.002	< 0.002	0.003	0.5	--	--
Chlordane (mixture of isomers)	< 0.021	< 0.022	< 0.023	< 0.023	< 0.021	< 0.025	< 0.041	< 0.022	< 0.022	--	--	--	--
Chlordane, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
Dicamba	< 0.010	< 0.011	< 0.010	< 0.010	< 0.009	< 0.011	< 0.018	< 0.010	< 0.010	--	--	--	--
hloroprop (2-(2,4-dichlorophenoxy) propanoic acid)	< 0.050	< 0.053	< 0.050	< 0.052	< 0.047	< 0.057	< 0.091	< 0.050	< 0.049	--	--	--	--
Dieldrin	< 0.003	< 0.003	< 0.003	< 0.003	0.037	< 0.003	< 0.005	< 0.003	< 0.003	0.09	0.6	--	--
Dinoseb	< 0.051	< 0.053	< 0.050	< 0.053	< 0.048	< 0.057	< 0.092	< 0.051	< 0.050	--	--	--	--
Endosulfan sulfate	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
Endosulfan, alpha	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
Endosulfan, beta	< 0.003	< 0.003	< 0.003	< 0.003	0.009	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
Endrin	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	20	30	--	--
Endrin ketone	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
Heptachlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	0.3	2	--	--
Heptachlor Epoxide	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	0.2	1	--	--
Hexachlorobenzene	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	0.7	0.9	--	--
Methoxychlor	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	300	400	--	--
Methylchlorophenoxyacetic acid	< 2.500	< 2.610	< 2.450	< 2.580	< 2.350	< 2.800	< 4.500	< 2.490	< 2.430	--	--	--	--
Toxaphene	< 0.132	< 0.139	< 0.143	< 0.146	< 0.131	< 0.153	< 0.257	< 0.136	< 0.135	--	--	--	--
trans-Chlordane	< 0.003	0.004	< 0.003	< 0.003	< 0.003	< 0.003	< 0.005	< 0.003	< 0.003	--	--	--	--
PCBs (mg/kg)													
PCB Aroclor 1016	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1221	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1232	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1242	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1248	< 0.05	< 0.06	< 0.05	0.2	< 0.05	0.1	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1254	0.1	0.3	0.1	0.3	1.2 D	0.08	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1260	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05				
PCB Aroclor 1262	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05	--	--	--	--
PCB Aroclor 1268	< 0.05	< 0.06	< 0.05	< 0.06	< 0.05	< 0.06	< 0.1	< 0.05	< 0.05	--	--	--	--
Total PCBs	0.1	0.3	0.1	0.5	1.2	0.18	0	0	0	1	4	< 2	< 2
Total Metals (mg/kg)													
Arsenic	2.58	< 0.99	3.94	5.81	1.83	6.55	6.92	2.62	3.29	20	20	40	40
Barium	35.2	13	14.2	24.1	18.4	86.3	55.4	11.3	13	1000	3000	--	--
Cadmium	< 0.36	< 0.49	< 0.39	< 0.46	< 0.37	< 0.45	< 0.7	< 0.39	< 0.38	80	80	80	30
Chromium	7.1	5.09	9.6	19.8	3.76	12.1	9.25	5.07	6.43	100	200	1000	1000
Lead	34	35.2	19.4	27.3	39.4	347	21.4	6.81	12.8	200	600	2000	1000
Mercury	0.08	< 0.03	0.13	0.093	0.069	0.575	< 0.063	< 0.035	< 0.031	20	40	10	10
Selenium	< 3.59	< 4.95	< 3.92	< 4.58	< 3.66	< 4.54	< 6.98	< 3.9	< 3.76	400	800	--	--
Silver	< 0.36	< 0.49	< 0.39	< 0.46	< 0.37	< 0.45	< 0.7	< 0.39	< 0.38	100	200	--	--
TCLP (mg/L)													
Lead TCLP (mg/L)	--	--	--	--	--	0.72	--	--	--	--	--	--	--
General Chemistry													
Corrosivity (pH)	7.96	7.35	7.58	6.9	7.1	6.7	7.28	6.78	6.53	--	--	--	--
Physical Conditions													
Flashpoint (°F)	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	--	--	--	--
Reactivity - Cyanide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 3.7	< 2	< 2	--	--	--	--
Reactivity - Sulfide (mg/kg)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	--	--	--	--
Specific Conductance @ 25°C (µmhos/cm)	473	71	104	177	30	562	328	9	35	--	--	8000	4000

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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EXHIBIT B
HISTORICAL FIGURES BY OTHERS

DRAFT

SHUSTER PROPERTY (FMR RIST LLC)

RTN: 4-23736

DRAFT

DRAFT

Apex Companies, LLC.

184 HIGH STREET
SUITE 502
BOSTON MA 02110
(617) 728-0070

REVISIONS

#	DATE	DESCRIPTION
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B9/MW-6 BORING/MONITORING WELL LOCATION

OVER WATER GEOTECHNICAL BORING

TP6 LARGE TEST PIT BOUNDARIES

SMALL TEST PIT LOCATION

PROPOSED EXCAVATION
PCB CONCENTRATION > 50 PPM

PROPOSED EXCAVATION
EPH/TPH CONCENTRATION > 10,000 PPM

PREPARED FOR:

MASSACHUSETTS CLEAN ENERGY CENTER

DRAWING TITLE:

SAMPLE LOCATION PLAN – UPLAND INVESTIGATION AT SHUSTER PROPERTY AND UNOCCUPIED SHUSTER PROPERTY

Scale: 1"=50'

0 25 50 100 150 FEET

Date	10/28/10
Proj. Mgr.	
Design	CWM
Check	JAB
Drawn	GCD
Job. No.	6690
Last Rev.	11/22/10

Drawing No.

FIG. 2

NOTES:

1. ONLY PCB SAMPLE LOCATIONS SHOWN
2. TEST PITS AND BORINGS NOT TESTED FOR PCBS NOT SHOWN.

Apex Companies, LLC.

184 HIGH STREET
SUITE 502
BOSTON MA 02110
(617) 728-0070

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4. STRUCTURES AND FEATURES LOCATED BEYOND THE PROJECT LIMITS, ARE TAKEN FROM AN AERIAL SURVEY CONDUCTED BY THE ARMY CORPS OF ENGINEERS AND SHOULD BE CONSIDERED APPROXIMATE.

B9/MW-6 BORING/MONITORING WELL LOCATION

OVER WATER GEOTECHNICAL BORING

TP6 LARGE TEST PIT BOUNDARIES

SMALL TEST PIT LOCATION

PROPOSED EXCAVATION PCB CONCENTRATION > 50 PPM

PROPOSED EXCAVATION EPH/TPH CONCENTRATION > 10,000 PPM

PREPARED FOR:

MASSACHUSETTS CLEAN ENERGY CENTER

DRAWING TITLE:

NEW BEDFORD MARINE COMMERCE TERMINAL PCB SAMPLE RESULTS

Scale: 1"=50'

0 25 50 100 150 FEET

Date	10/28/10
Proj. Mgr.	
Design	CWM
Check	JAB
Drawn	GCD
Job. No.	6690
Last Rev.	11/22/10

Drawing No.

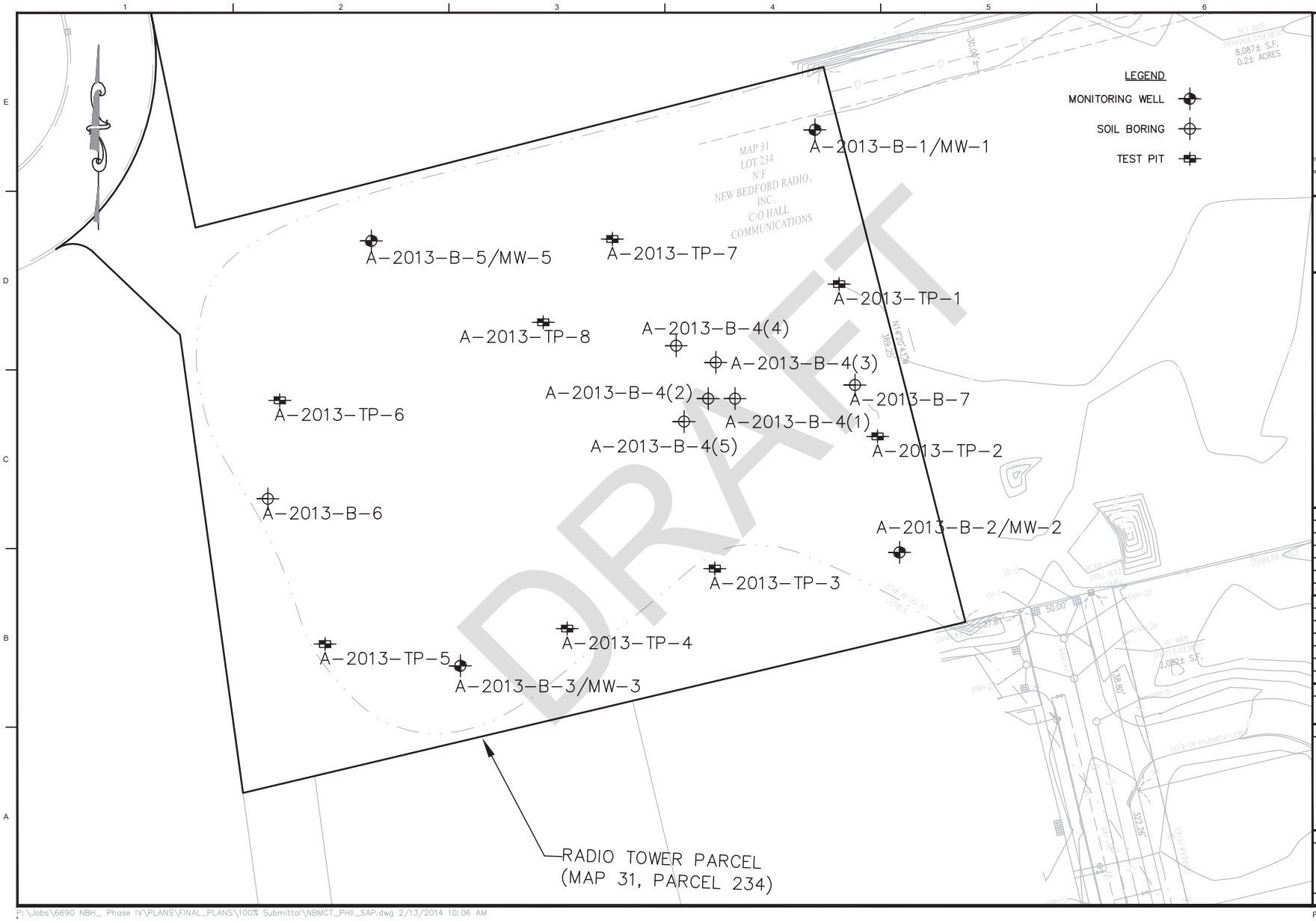
FIG. 3

P:\Jobs\6690 NBH_ Phase IV\PLANS\SHUSTER_UPLAND_9-26-11.dwg, 9/26/2011 3:23:56 PM, DWG To PDF.pc3

NEW BEDFORD RADIO (HALL COMM)

RTN: 4-25350

DRAFT



APEX

ROCKVILLE, MD
SOUTH WINDSOR, CT • BOSTON, MA • NEW BEDFORD, MA • HOLYOKE, MA

184 HIGH STREET, SUITE 502
BOSTON, MA 02210

58H CONNECTICUT AVENUE
SOUTH WINDSOR, CT

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PROJECT
NEW BEDFORD
MARINE COMMERCE
TERMINAL

OWNER
MASSACHUSETTS CLEAN ENERGY CENTER
55 SUMMER STREET, 9TH FLOOR
BOSTON, MA 02110

NO.	DATE	DESCRIPTION	BY

PROJECT NO.	6690
CADD FILE	NBMCT_PHII_SAP
DESIGNED BY	
DRAWN BY	
CHECKED BY	
DATE	2/11/14
DRAWING SCALE	1"=60'

GRAPHIC SCALE
SCALE: 1"=60'
0 30 60

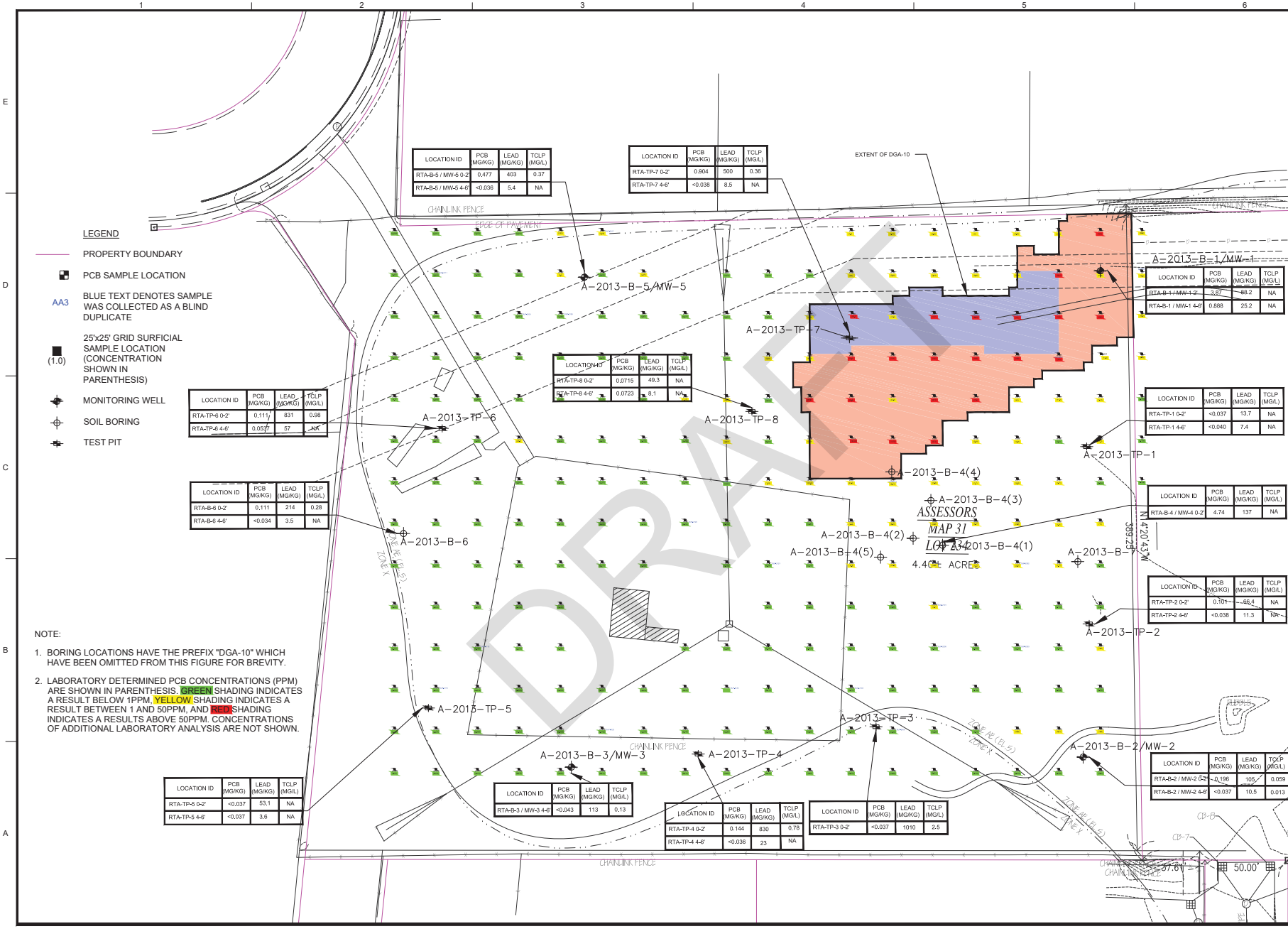
SHEET TITLE
BORING, TEST PIT, & GROUNDWATER MONITORING WELL LOCATION PLAN

DRAWING NO.
FIG. 2

2 OF 2

P:\Jobs\6690 NBH_ Phase IV\PLANS\FINAL_PLANS\100% Submittal\NBMCT_PHII_SAP.dwg 2/13/2014 10:06 AM

PLOT SCALE



LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-B-5 / MW-5 0-2'	0.477	403	0.37
RTA-B-5 / MW-5 4-6'	<0.036	5.4	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-7 0-2'	0.904	500	0.36
RTA-TP-7 4-6'	<0.038	8.5	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-B-1 / MW-1 0-2'	3.87	88.2	NA
RTA-B-1 / MW-1 4-6'	0.888	25.2	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-8 0-2'	0.0715	49.3	NA
RTA-TP-8 4-6'	0.0723	8.1	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-6 0-2'	0.111	831	0.98
RTA-TP-6 4-6'	0.0527	57	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-1 0-2'	<0.037	13.7	NA
RTA-TP-1 4-6'	<0.040	7.4	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-B-6 0-2'	0.111	214	0.28
RTA-B-6 4-6'	<0.034	3.5	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-B-4 / MW-4 0-2'	4.74	137	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-2 0-2'	0.101	66.4	NA
RTA-TP-2 4-6'	<0.038	11.3	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-5 0-2'	<0.037	53.1	NA
RTA-TP-5 4-6'	<0.037	3.6	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-B-3 / MW-3 4-6'	<0.043	113	0.13

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-4 0-2'	0.144	830	0.78
RTA-TP-4 4-6'	<0.036	23	NA

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-TP-3 0-2'	<0.037	1010	2.5

LOCATION ID	PCB (MG/KG)	LEAD (MG/KG)	TCLP (MG/L)
RTA-B-2 / MW-2 0-2'	0.196	105	0.059
RTA-B-2 / MW-2 4-6'	<0.037	10.5	0.013

NOTE:

1. BORING LOCATIONS HAVE THE PREFIX "DGA-10" WHICH HAVE BEEN OMITTED FROM THIS FIGURE FOR BREVITY.
2. LABORATORY DETERMINED PCB CONCENTRATIONS (PPM) ARE SHOWN IN PARENTHESIS. GREEN SHADING INDICATES A RESULT BELOW 1PPM, YELLOW SHADING INDICATES A RESULT BETWEEN 1 AND 50PPM, AND RED SHADING INDICATES A RESULTS ABOVE 50PPM. CONCENTRATIONS OF ADDITIONAL LABORATORY ANALYSIS ARE NOT SHOWN.

APEX

ROCKVILLE, MD
SOUTH WINDSOR, CT - BOSTON, MA - NEW BEDFORD, MA - HOLYOKE, MA

184 HIGH STREET, SUITE 502
BOSTON, MA 02210

58H CONNECTICUT AVENUE
SOUTH WINDSOR, CT

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PROJECT
NEW BEDFORD MARINE COMMERCE TERMINAL

OWNER
MASSACHUSETTS CLEAN ENERGY CENTER
55 SUMMER STREET, 9TH FLOOR
BOSTON, MASSACHUSETTS

NO.	DATE	DESCRIPTION	BY
2.	.	.	.
1.	.	.	.

PROJECT NO.	6690
CADD FILE	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
DATE	
DRAWING SCALE	1"=25'

GRAPHIC SCALE
SCALE: 1"=25
0 12.5 25 50

SHEET TITLE
DGA-10

DRAWING NO.
3

1 OF 1

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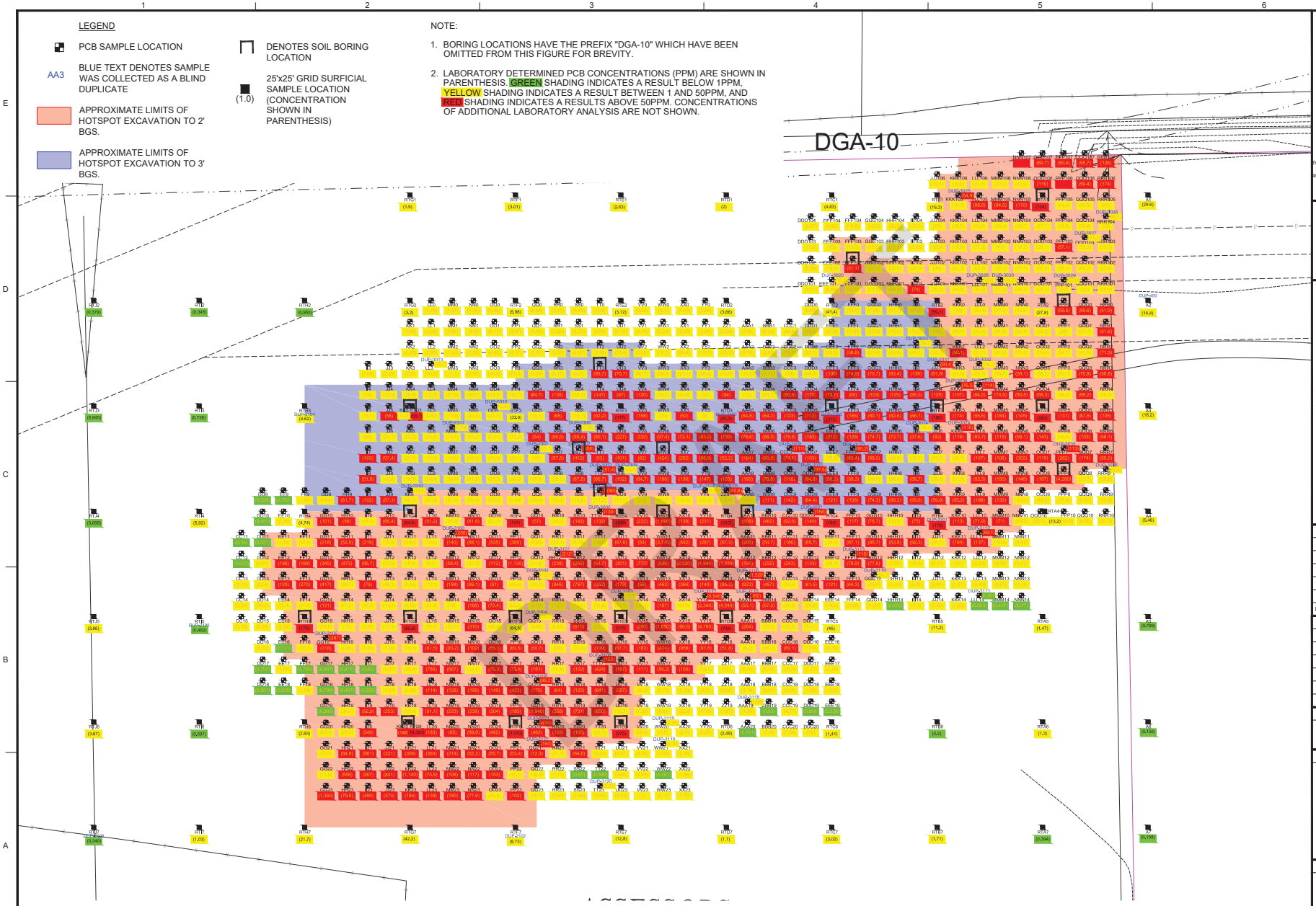
LEGEND

- PCB SAMPLE LOCATION
- AA3 — BLUE TEXT DENOTES SAMPLE WAS COLLECTED AS A BLIND DUPLICATE
- APPROXIMATE LIMITS OF HOTSPOT EXCAVATION TO 2' BGS.
- APPROXIMATE LIMITS OF HOTSPOT EXCAVATION TO 3' BGS.
- DENOTES SOIL BORING LOCATION
- (1.0) — 25'x25' GRID SURFICIAL SAMPLE LOCATION (CONCENTRATION SHOWN IN PARENTHESIS)

NOTE:

1. BORING LOCATIONS HAVE THE PREFIX "DGA-10" WHICH HAVE BEEN OMITTED FROM THIS FIGURE FOR BREVITY.
2. LABORATORY DETERMINED PCB CONCENTRATIONS (PPM) ARE SHOWN IN PARENTHESIS. GREEN SHADING INDICATES A RESULT BELOW 1PPM, YELLOW SHADING INDICATES A RESULT BETWEEN 1 AND 50PPM, AND RED SHADING INDICATES A RESULTS ABOVE 50PPM. CONCENTRATIONS OF ADDITIONAL LABORATORY ANALYSIS ARE NOT SHOWN.



APEX

ROCKVILLE, MD
SOUTH WINDSOR, CT - BOSTON, MA - NEW BEDFORD, MA - HOLYOKE, MA

184 HIGH STREET, SUITE 502
BOSTON, MA 02210

58H CONNECTICUT AVENUE
SOUTH WINDSOR, CT

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PROJECT
NEW BEDFORD MARINE COMMERCE TERMINAL

OWNER
MASSACHUSETTS CLEAN ENERGY CENTER
55 SUMMER STREET, 9TH FLOOR
BOSTON, MASSACHUSETTS

NO.	DATE	DESCRIPTION	BY
2.	.	.	.
1.	.	.	.

PROJECT NO.	6690
CADD FILE	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
DATE	
DRAWING SCALE	1"=10'

GRAPHIC SCALE
SCALE: 1"=10'
0 5 10 20

SHEET TITLE
DGA-10

DRAWING NO.
1

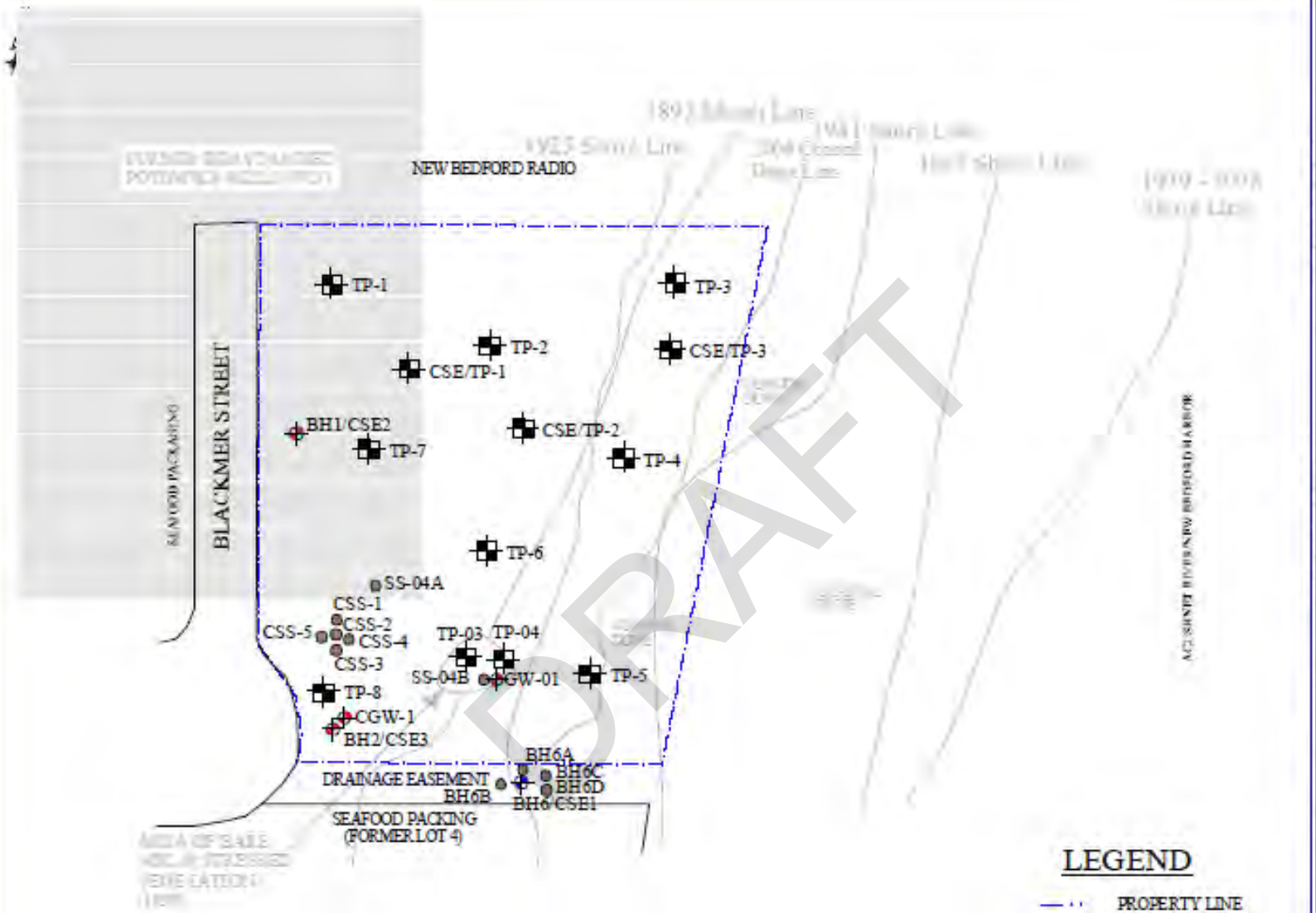
1 OF 1

P:\Jobs\6690 NBH_ Phase IV\PLANS\FINAL_PLANS\CONSTRUCTION\P-1.2_PCB_CONFIRM_SAMPLE_PLAN_RadioTower_Dec2013.dwg 6/26/2014 10:53 AM

DMF PARCEL 1 / DMF PARCEL 2

RTNS: 4-24296, 4-15490

DRAFT



DRAFT

NOTES:
1) SITE FEATURES, BOUNDARIES AND SAMPLE LOCATIONS DERIVED FROM FIELD MEASUREMENTS AND OBSERVATIONS.
2) BASE MAP GENERATED FROM HISTORIC REFERENCES AND HISTORIC ASSESSMENT REPORTS PREPARED BY M&E AND CYGNUS.
3) ALL LOCATIONS AND SCALES ARE APPROXIMATE.

GRAPHICAL SCALE
50 25 0 50

COMMON SENSE ENVIRONMENTAL, INC.
48 TIMBERA STREET
DARTMOUTH, MASSACHUSETTS 02748
PHONE: 508-991-3491

DRAWN BY: KJB
PROJ. MGR: KJB
PROJECT NO: W024
SCALE: NOTED
DATE: 9/24/08

MASTER SAMPLING PLAN

FORMER LOT 3
16 BLACKMER STREET
NEW BEDFORD, MASSACHUSETTS

FIGURE NUMBER:
8

FORMER DARTMOUTH FINISHING SITE

RTN: 4-23616

DRAFT

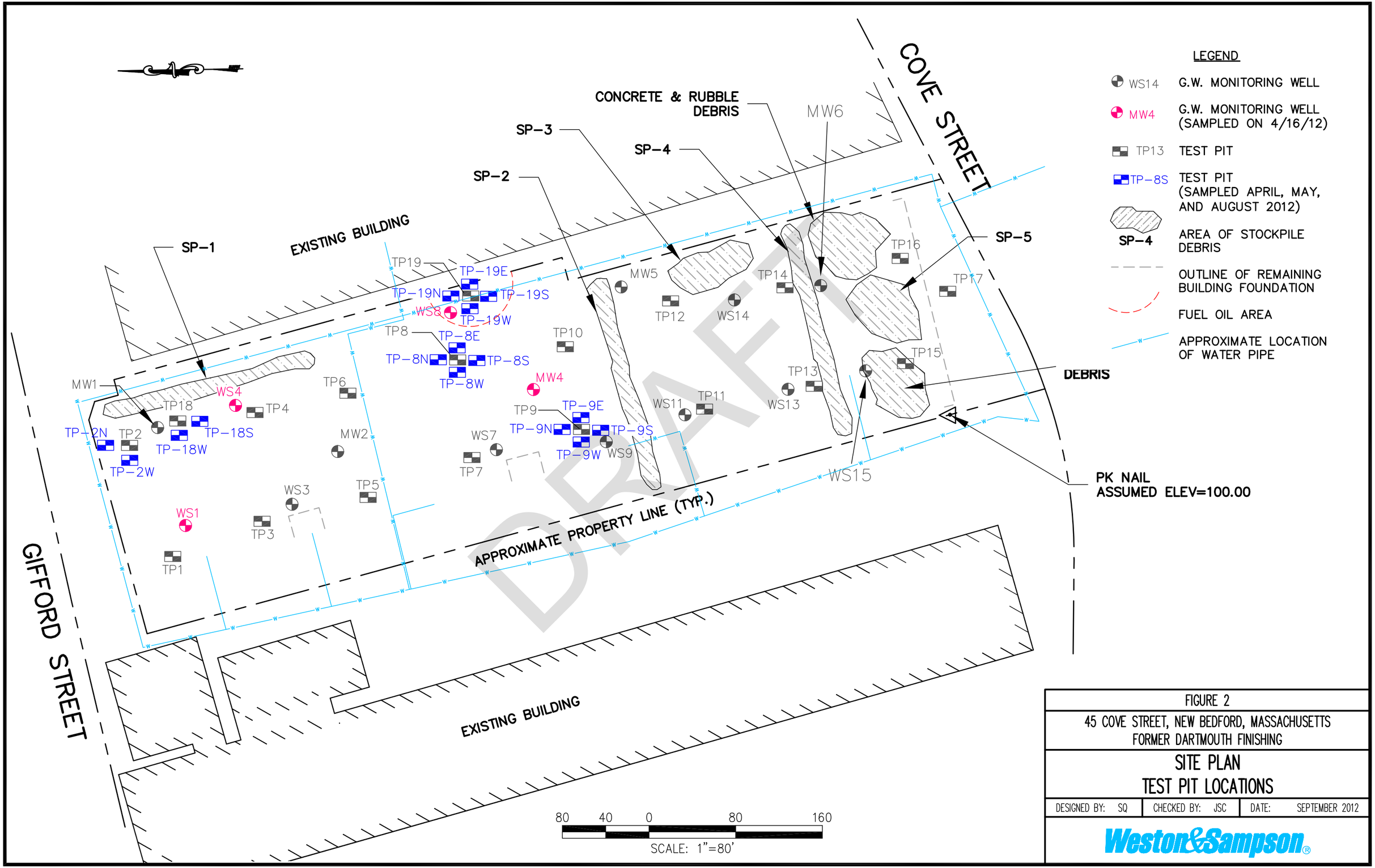


FIGURE 2

45 COVE STREET, NEW BEDFORD, MASSACHUSETTS
FORMER DARTMOUTH FINISHING

SITE PLAN
TEST PIT LOCATIONS

DESIGNED BY: SQ	CHECKED BY: JSC	DATE: SEPTEMBER 2012

Weston&Sampson®

O:\New Bedford - Cove St\Cove St\Reports\Phase II Documents\Supplemental Phase II\CADD\cove street 09212012.dwg

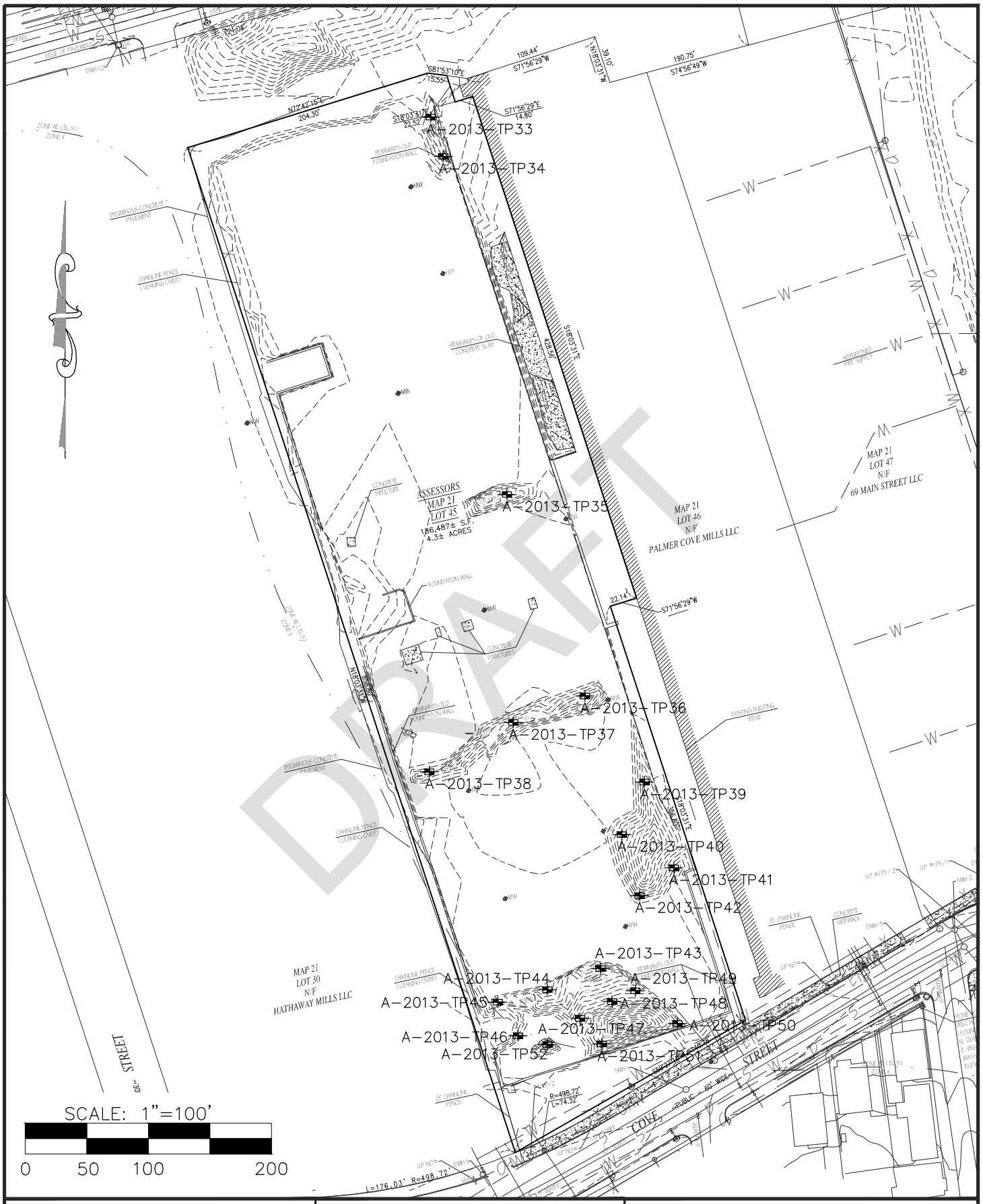


Figure 5:
STOCKPILE SAMPLING
LOCATION MAP
DARTMOUTH FINISHING

New Bedford
Marine Commerce Terminal

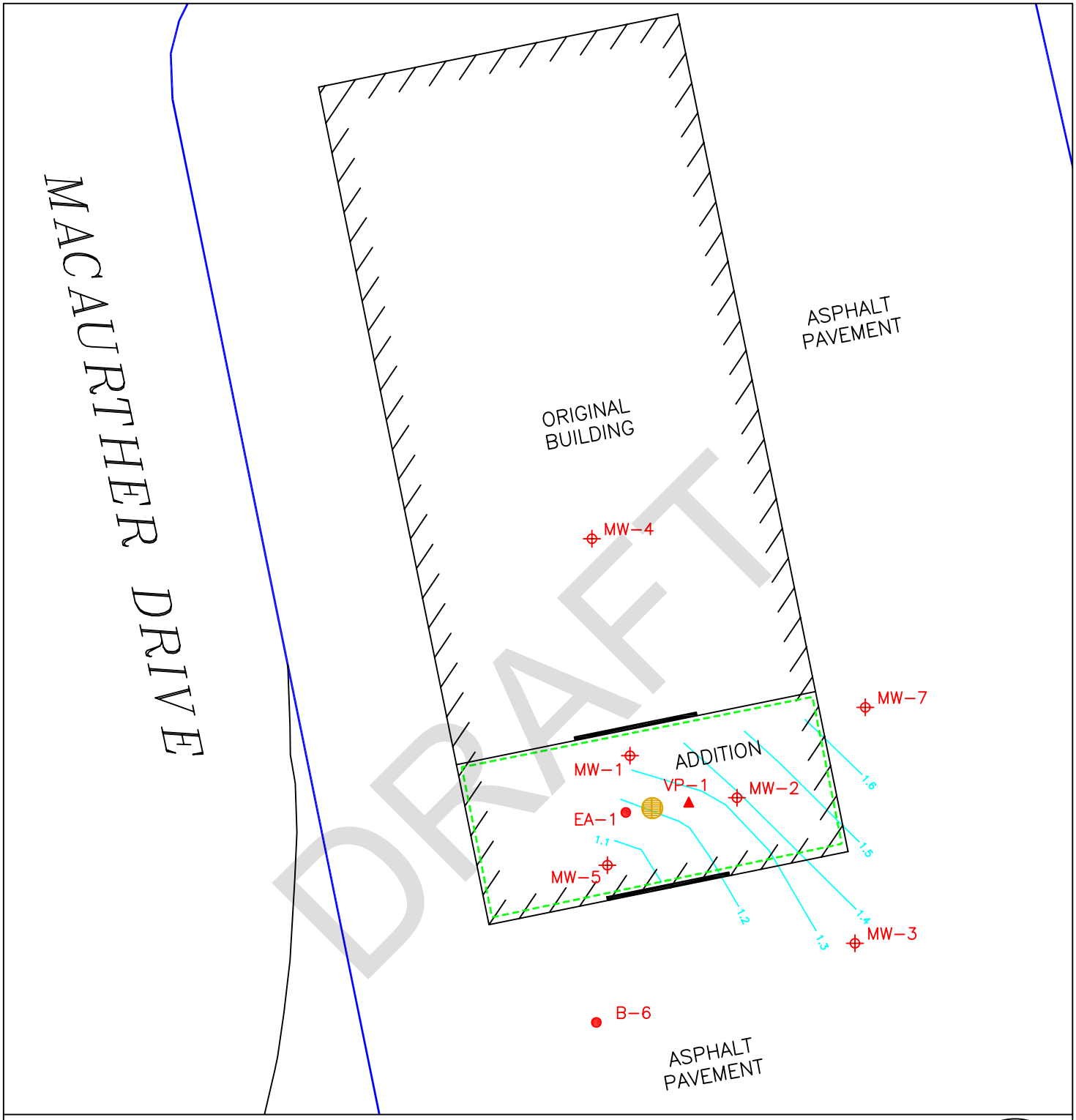
APEX

125 Broad Street
Boston, Massachusetts
Phone: (617) 728-0070

CP BRODEUR, INC.

RTN: 4-23643

DRAFT



LEGEND

- APPX. PROPERTY LINES
- MW-1 GROUNDWATER MONITORING WELL
- B-1 SOIL BORING ONLY
- VP-1 SOIL VAPOR PROBE
- OIL/WATER SEPERATOR
- INFERRED SITE/RAO BOUNDRY
- OVERHEAD DOOR
- 1.1 INFERRED GROUNDWATER CONTOUR AND ELEVATION

NOTES: ALL LOCATIONS ARE CONSIDERED APPROXIMATE

FIGURE 2	PROPERTY/SITE SKETCH	SITEC ENVIRONMENTAL
appx. scale: 1"=20' (0 10 20)	CP BRODEUR, INC. 80 WRIGHT STREET NEW BEDFORD, MASSACHUSETTS	769 Plain Street, Unit C Marshfield, MA 02050 Tel. (781) 319-0100 FAX (781) 834-4783

EXHIBIT B
HISTORICAL TABLES BY OTHERS

DRAFT

SHUSTER PROPERTY (FMR RIST LLC)

RTN: 4-23736

DRAFT

Table 1
Analytical Testing Summary: Soil
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample ID	PCBs	VOCs	SVOCs	Metals	TPH	MA VPH	MA EPH	TCLP-Pb
TP-1	x			x	x			
TP-2	x			x	x			x
TP-3	x	x	x	x	x	x	x	
TP-4	x			x	x			x
TP-5	x			x	x			x
TP-6	x	x	x	x	x	x	x	
TP-8	x			x	x			
TP-9	x			x	x			
TP-10	x			x	x			
TP-11	x			x	x			
TP-12	x			x	x			x
TP-14	x			x	x			
TP-16	x			x	x			
DUPLICATE 1	x	x	x	x	x	x	x	
DUPLICATE 2	x	x	x	x	x	x	x	
TP6-1-N-H	x	x	x				x	
TP6-2-N-M	x	x	x				x	
TP6-3-N-A	x	x	x				x	
TP6-3-N-B	x	x	x				x	
TP6-2-W-A	x	x	x				x	
TP6-2-W-M	x	x	x				x	
TP6-2-W-B	x	x	x				x	
TP6-1-NW-A	x						x	
TP6-1-NW-M	x						x	
TP6-1-NW-B	x						x	
TP6-2-NW-A	x						x	
TP6-2-NW-M	x						x	
TP6-2-NW-B	x						x	
TP6-1-NE-A	x						x	
TP6-1-NE-M	x						x	
TP6-1-NE-B	x						x	
TP6-3-NE-A	x						x	
TP6-3-NE-M	x						x	
TP6-3-NE-B	x						x	
TP6-5-NE-A	x		x				x	
TP6-5-NE-M	x		x				x	
TP6-5-NE-B	x		x				x	

DRAFT

Table 1
Analytical Testing Summary: Soil
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample ID	PCBs	VOCs	SVOCs	Metals	TPH	MA VPH	MA EPH	TCLP-Pb
TP6-7-NW-A	x		x				x	
TP6-7-NW-M	x		x				x	
TP6-7-NW-B	x		x				x	
TP2-1-W-H	x	x	x				x	
TP2-2-W-M	x	x	x				x	
TP2-4-W-A	x	x	x				x	
TP2-4-W-B	x	x	x				x	
TP3-1-S	x		x				x	
TP3-2-S-A	x		x				x	
TP3-2-S-M	x		x				x	
TP3-2-S-B	x	x	x				x	
TP4-1-E	x	x	x				x	
TP4-1-S-A	x		x				x	
TP4-1-S-M	x		x				x	
TP4-1-S-B	x		x				x	
TP4-1-W-A	x		x				x	
TP4-1-W-M	x		x				x	
TP4-1-W-B	x		x				x	
TP4-2-W	x		x				x	
TP-9-1-E	x							
TP-9-1-W	x							
TP-9-1-N	x							
TP-9-1-S	x							
B-5/MW-3	x			x				
B-6/MW-4	x			x				
B-7	x			x				
B-8/MW-5	x			x				x
B-9/MW-6	x			x				
B-11/MW-7	x	x		x		x	x	
B-12/MW-8A	x	x		x		x	x	
B-12/MW-8B	x	x		x		x	x	
TP4-2NW-A	x							
TP4-2NW-M	x							
TP4-2NW-B	x							
TP4-1N-A	x							
TP4-1N-M	x							
TP4-1N-B	x							

DRAFT

Table 1
Analytical Testing Summary: Soil
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample ID	PCBs	VOCs	SVOCs	Metals	TPH	MA VPH	MA EPH	TCLP-Pb
TP4-2N-A	x							
TP4-2N-M	x							
TP4-2N-B	x							
TP4-1NE-A	x							
TP4-1NE-M	x							
TP4-1NE-B	x							
TP4-3W-A	x							
TP4-3W-M	x							
TP4-3W-B	x							
TP4-4W-A	x							
TP4-4W-M	x							
TP4-4W-B	x							
TP4-5W-A	x							
TP4-5W-M	x							
TP4-5W-B	x							
TP4-1NW-A	x							
TP4-1NW-M	x							
TP4-1NW-B	x							
TP2-1E-A	x							
TP2-1E-M	x							
TP2-1E-B	x							
TP6-1S							x	
TP63W							x	
TP6-8NW							x	
TP6-4N							x	
TP6-6NE							x	
TP2-1E							x	
TP2-2E							x	
TP4-1NE							x	

DRAFT

Table 2
Analytical Testing Summary: Groundwater
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample ID	PCBs	VOCs	SVOCs	Metals	TPH	VPH	EPH
MW-3	x	x	x	x	x		
MW-4	x	x	x	x	x		
MW-5	x	x	x	x	x		
MW-6	x	x	x	x	x		
MW-7	x	x	x	x	x	x	x
MW-8	x	x	x	x	x	x	x

DRAFT

Table 3
PCBs (Aroclors) -
Test Pit Soil Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample Name	Collection Date	Aroclor 1016/1242	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1254	Aroclor 1260	Estimate of Total PCBs (Summation of reported Aroclors) (mg/kg)
TP-1	4/25/2011	0.06U	0.06U	0.06U	0.06U	0.086	0.06U	0.086
TP-2	4/25/2011	1.1U	1.1U	1.1U	1.1U	75	1.1U	75
TP-5	4/25/2011	0.31U	0.31U	0.31U	0.31U	0.31U	0.31U	ND
TP-4	4/25/2011	6.2U	6.2U	6.2U	6.2U	610	6.2U	610
TP-3	4/25/2011	0.53J	0.17U	0.17U	0.52J	12.0	0.17U	13.1
TP-6	4/26/2011	0.0067U	0.0067U	0.0067U	0.0067U	0.11	0.0067U	0.11
TP-8	4/26/2011	0.0058U	0.0058U	0.0058U	0.0058U	0.014	0.0058U	0.014
TP-9	4/26/2011	0.77U	0.77U	0.77U	0.77U	4.6	0.77U	4.6
TP-11	4/26/2011	0.0054U	0.0054U	0.0054U	0.0054U	0.032	0.0054U	0.032
TP-10	4/27/2011	0.0058U	0.0058U	0.0058U	0.0058U	0.22	0.0058U	0.22
TP-12	4/27/2011	0.0062U	0.0062U	0.0062U	0.0062U	0.11	0.0062U	0.11
TP-14	4/27/2011	0.0059	0.0059	0.0059	0.0059	0.1	0.0059	0.1
TP-16	4/27/2011	0.0061U	0.0061U	0.0061U	0.0061U	0.03	0.0061U	0.03
DUPLICATE 1*	4/25/2011	0.57U	0.57U	0.57U	0.57U	3.1	0.57U	3.1
DUPLICATE 2**	4/26/2011	0.0067U	0.0067U	0.0067U	0.0067U	0.1	0.0067U	0.1
TP6-1-N-H	7/18/2011	0.0099U	0.0099U	0.0099U	0.0099U	0.019	0.0099U	0.019
TP6-2-N-M	7/18/2011	0.0068U	0.0068U	0.0068U	0.0068U	0.0068U	0.0068U	ND
TP6-3-N-A	7/18/2011	0.0059U	0.0059U	0.0059U	0.0059U	0.540	0.019	0.559
TP6-3-N-B	7/18/2011	0.0062U	0.0062U	0.0062U	0.0062U	0.0062U	0.0062U	ND
TP6-2-W-A	7/19/2011	0.0058U	0.0058U	0.0058U	0.0058U	1.7	0.0058U	1.7
TP6-2-W-M	7/19/2011	0.019U	0.019U	0.019U	0.019U	0.019U	0.019U	ND
TP6-2-W-B	7/19/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.0056U	0.0056U	ND
TP6-1-NW-A	7/22/2011	0.0059U	0.0059U	0.0059U	0.0059U	1.7	0.0059U	1.7
TP6-1-NW-M	7/22/2011	0.0052U	0.0052U	0.0052U	0.0052U	0.28	0.140	0.42
TP6-1-NW-B	7/22/2011	0.006U	0.006U	0.006U	0.006U	0.047	0.006U	0.047
TP6-2-NW-A	7/22/2011	0.015U	0.015U	0.015U	0.015U	2.3	0.094	2.394
TP6-2-NW-M	7/22/2011	0.0054U	0.0054U	0.0054U	0.0054U	0.0054U	0.0054U	ND
TP6-2-NW-B	7/22/2011	0.006U	0.006U	0.006U	0.006U	0.006U	0.006U	ND
TP6-1-NE-A	7/22/2011	0.0051U	0.0051U	0.0051U	0.0051U	0.25	0.0096	0.2596
TP6-1-NE-M	7/22/2011	0.0062U	0.0062U	0.0062U	0.0062U	0.35	0.0062U	0.35
TP6-1-NE-B	7/22/2011	0.0051U	0.0051U	0.0051U	0.0051U	0.028	0.0051U	0.028
TP6-3-NE-A	7/22/2011	0.0055U	0.0055U	0.0055U	0.0055U	0.025	0.0055U	0.025
TP6-3-NE-M	7/22/2011	0.0055U	0.0055U	0.0055U	0.0055U	0.0055U	0.0055U	ND
TP6-3-NE-B	7/22/2011	0.0058U	0.0058U	0.0058U	0.0058U	0.019	0.0058U	0.019
TP6-5-NE-A	7/25/2011	0.0051U	0.0051U	0.0051U	0.0051U	0.0051U	0.0051U	ND
TP6-5-NE-M	7/25/2011	0.0059U	0.0059U	0.0059U	0.0059U	0.042	0.0059U	0.042
TP6-5-NE-B	7/25/2011	0.0066U	0.0066U	0.0066U	0.0066U	0.0066U	0.0066U	ND
TP6-7-NW-A	7/25/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.11	0.0056U	0.11
TP6-7-NW-M	7/25/2011	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	ND
TP6-7-NW-B	7/25/2011	0.0066U	0.0066U	0.0066U	0.0066U	0.0066U	0.0066U	ND
TP2-2-W-H	7/19/2011	0.0058U	0.0058U	0.0058U	0.0058U	0.0058U	0.0058U	ND
TP2-2-W-M	7/19/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.0056U	0.0056U	ND
TP2-4-W-A	7/19/2011	0.0077	0.0055U	0.0055U	0.0055U	0.170	0.012	0.0077
TP2-4-W-B	7/19/2011	0.0057U	0.0057U	0.0057U	0.0057U	0.087	0.0059	0.093
TP3-1-S	7/19/2011	0.0069U	0.0069U	0.0069U	0.0069U	0.0069U	0.0069U	ND
TP3-2-S-A	7/19/2011	0.0058U	0.0058U	0.0058U	0.0058U	1.3	0.06	1.36
TP3-2-S-M	7/19/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.42	0.019	0.439
TP3-2-S-B	7/19/2011	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	ND
TP4-1-E	7/19/2011	0.0067U	0.0067U	0.0067U	0.0067U	0.57	0.0067U	0.57
TP4-1-S-A	7/20/2011	0.0058U	0.0058U	0.0058U	0.0058U	0.360	0.041	0.401
TP4-1-S-M	7/20/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.0059	0.0056U	0.0059
TP4-1-S-B	7/20/2011	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	ND
TP4-1-W-A	7/20/2011	3.1U	3.1U	3.1U	3.1U	630	11	641
TP4-1-W-M	7/20/2011	2.9U	2.9U	2.9U	2.9U	970	19	989
TP4-1-W-B	7/20/2011	0.006U	0.006U	0.006U	0.023	0.170	0.006U	0.193
TP4-2-W	7/20/2011	12U	12U	12U	12U	480	12U	480
TP-9-1-E	7/20/2011	0.0092U	0.0092U	0.0092U	0.0092U	0.014	0.0092U	0.014
TP-9-1-W	7/20/2011	0.0075U	0.0075U	0.0075U	0.017	0.069	0.0075U	0.086
TP-9-1-N	7/20/2011	0.0097U	0.0097U	0.0097U	0.0097U	0.0097U	0.0097U	ND

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Table 3
PCBs (Aroclors) -
Test Pit Soil Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample Name	Collection Date	Aroclor 1016/1242	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1254	Aroclor 1260	Estimate of Total PCBs (Summation of reported Aroclors) (mg/kg)
TP-9-1-S	7/20/2011	0.0096U	0.0096U	0.0096U	0.0096U	0.0096U	0.0096U	ND
B-5/MW-3	5/4/2011	0.0057U	0.0057U	0.0057U	0.0057U	0.0057U	0.0057U	ND
B-6/MW-4	5/5/2011	0.0057U	0.0057U	0.0057U	0.0057U	0.040	0.0057U	0.04
B-7	5/6/2011	0.0053U	0.0053U	0.0053U	0.0053U	0.060	0.0053U	0.06
B-8/MW-5	5/6/2011	0.0057U	0.0057U	0.0057U	0.0057U	0.020	0.0057U	0.02
B-9/MW-6	5/9/2011	0.0053U	0.0053U	0.0053U	0.0053U	0.020	0.0053U	0.02
B-11/MW-7	5/12/2011	0.0057U	0.0057U	0.0057U	0.0057U	0.0057U	0.0057U	ND
B-12/MW-8A	5/13/2011	0.011U	0.011U	0.011U	0.011U	0.011U	0.011U	ND
B-12/MW-8B	5/13/2011	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	0.0059U	ND
TP4-2NW-A	8/11/2011	0.0054U	0.0054U	0.0054U	0.0054U	1.10	0.039	1.14
TP4-2NW-M	8/11/2011	0.019U	0.019U	0.019U	0.019U	0.02	0.019U	0.02
TP4-2NW-B	8/11/2011	0.006U	0.006U	0.006U	0.006U	0.006U	0.006U	ND
TP4-1N-A	8/11/2011	0.0055U	0.0055U	0.0055U	0.0055U	0.93	0.041	0.971
TP4-1N-M	8/11/2011	0.12U	0.12U	0.12U	0.12U	0.12U	0.12U	ND
TP4-1N-B	8/11/2011	0.0063U	0.0063U	0.0063U	0.0063U	0.0063U	0.0063U	ND
TP4-2N-A	8/11/2011	0.0053U	0.0053U	0.0053U	0.0053U	0.01	0.0053U	0.01
TP4-2N-M	8/11/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.01	0.0056U	0.01
TP4-2N-B	8/11/2011	0.017U	0.017U	0.017U	0.017U	0.017U	0.017U	ND
TP4-1NE-A	8/11/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.09	0.0056U	0.09
TP4-1NE-M	8/11/2011	0.19U	0.19U	0.19U	0.19U	0.19U	0.19U	ND
TP4-1NE-B	8/11/2011	0.066U	0.066U	0.066U	0.066U	0.066U	0.066U	ND
TP4-3W-A	8/11/2011	0.055U	0.055U	0.055U	0.055U	4.10	0.16	4.26
TP4-3W-M	8/11/2011	0.0057U	0.0057U	0.0057U	0.0057U	0.47	0.024	0.494
TP4-3W-B	8/11/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.01	0.0056U	0.01
TP4-4W-A	8/11/2011	0.0058U	0.0058U	0.0058U	0.0058U	0.03	0.0058U	0.03
TP4-4W-M	8/11/2011	0.059U	0.059U	0.059U	0.059U	0.059U	0.059U	ND
TP4-4W-B	8/11/2011	0.011U	0.011U	0.011U	0.011U	0.011U	0.011U	ND
TP4-5W-A	8/11/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.33	0.0056U	0.33
TP4-5W-M	8/11/2011	0.07U	0.07U	0.07U	0.07U	0.38	0.07U	0.38
TP4-5W-B	8/11/2011	0.01U	0.01U	0.01U	0.01U	0.01U	0.01U	ND
TP4-1NW-A	8/11/2011	0.0058U	0.0058U	0.0058U	0.0058U	110.00	0.0058U	110
TP4-1NW-M	8/11/2011	0.095U	0.095U	0.095U	0.095U	0.15	0.095U	0.15
TP4-1NW-B	8/11/2011	0.0055U	0.0055U	0.0055U	0.0055U	1.30	0.067	1.367
TP2-1E-A	8/11/2011	0.0052U	0.0052U	0.0052U	0.0052U	0.01	0.0052U	0.01
TP2-1E-M	8/11/2011	0.0054U	0.0054U	0.0054U	0.0054U	0.01	0.0054U	0.01
TP2-1E-B	8/11/2011	0.0056U	0.0056U	0.0056U	0.0056U	0.01	0.0056U	0.01
MCP Upper Concentration Limits (		NP	NP	NP	NP	NP	NP	100
MCP S-3/GW-2		NP	NP	NP	NP	NP	NP	3
MCP S-3/GW-3		NP	NP	NP	NP	NP	NP	3
Reporting Category - RCS-2		NP	NP	NP	NP	NP	NP	3

Notes:

U = Concentration is below the laboratory's method detection limit. One half of the method detection limit is utilized in the summation.

*Duplicate 1 is a duplicate sample of sample TP-3.

**Duplicate 2 is a duplicate sample of sample TP-6.

NP = Not Promulgated

ND = Analyzed Aroclors were non-detected.

J = Estimated value.

Exceedance of MCP Reporting Category and/or Standard, which also exceeds EPA's unrestricted use standard of 1 ppm.

Exceedance of EPA's unrestricted use Standard in High Occupancy Use Areas (e.g., residential) of 1 ppm, but not its respective MCP Reporting Category and/or Standard.

NOTE: EPA Standard for Low Occupancy Use Areas (e.g., commercial) is less than or equal to 25 ppm (and greater than 1 ppm).

A = Shallow Sample

M = Middle Sample

B = Bottom

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Table 4
Volatile Organic Compounds
Soil Analytical Data
South Terminal CDF, New Bedford, Massachusetts
concentration in ppm (mg/kg)

Sample Name	Collection Date	**Volatile Organics** (mg/kg)													
		Tetrachloroethene	Benzene	Toluene	Ethylbenzene	p/m-Xylene	o-Xylene	n-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	p-Isopropyltoluene	Naphthalene	n-Propylbenzene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene
B-11/MW-7	5/12/2011	0.1U	0.1U	0.16U	1.1	0.76	0.32	0.1U	0.1U	0.1U	0.1U	12.0	0.1U	0.41U	0.440
B-12/MW-8 (A)	5/13/2011	0.5U	6.6	0.74U	7.6	10	7.2	0.5U	0.5U	3.2	1.8	36.0	0.5U	2U	3.2
B-12/MW-8 (B)	5/13/2011	0.083U	0.52	0.12U	0.78	0.8	0.58	0.083U	0.083U	0.42	0.22	4.6	0.083U	0.33U	0.350
TP-3	4/25/2011	0.089U	0.089U	0.130U	0.089U	0.180U	0.180U	0.089U	0.089U	0.089U	0.089U	1.5	0.089U	0.350U	0.350U
Duplicate 1*	4/25/2011	0.082U	0.082U	0.120U	0.082U	0.160U	0.160U	0.082U	0.082U	0.082U	0.089	1.5	0.082U	0.330U	0.330U
TP-6	4/26/2011	4.0U	4.0U	10	2.2	20	8.1	4.0U	4.0U	5.9	4.2	180	4.0U	16.0U	16.0U
Duplicate 2**	4/26/2011	0.820U	0.820U	2.2	5.8	5.4	2.2	0.820U	0.820U	1.8	1.4	64	0.820U	3.3U	3.3U
TP6-1-N-H	7/18/2011	6.6U	6.6U	9.9U	39	15	18	6.6U	6.6U	38	43	470	6.6U	26.0U	40
TP6-2-N-M	7/18/2011	0.13U	0.13U	0.19U	0.13U	0.25U	0.25U	0.13U	0.13U	0.13U	0.13U	0.51U	0.13U	0.51U	0.51U
TP6-3-N-A	7/18/2011	0.13U	0.0013U	0.002U	0.0013U	0.0026U	0.0026U	0.0013U	0.0013U	0.0013U	0.0013U	0.0053U	0.0013U	0.0053U	0.0053U
TP6-3-N-B	7/18/2011	0.00095U	0.00095U	0.0014U	0.00095U	0.0019U	0.0019U	0.00095U	0.00095U	0.00095U	0.00095U	0.0038U	0.00095U	0.0038U	0.0038U
TP6-2-W-A	7/19/2011	0.0025U	0.0025U	0.0038U	0.0025U	0.005U	0.005U	0.0025U	0.0025U	0.0025U	0.0025U	0.01U	0.0025U	0.01U	0.01U
TP6-2-W-M	7/19/2011	.720U	2.1	1.1U	5.6	4.3	2.0	0.720U	0.720U	0.720U	0.720U	2.9U	0.720U	2.9U	2.9U
TP6-2-W-B	7/19/2011	0.087U	0.087U	0.130U	0.087U	0.170U	0.170U	0.087U	0.087U	0.087U	0.087U	0.45	0.087U	0.35U	0.35U
TP2-1-W-H	7/19/2011	0.30	0.38	0.32	4.6	5.4	2.8	1.3	0.1	1.50	1.30	340	0.77	4.70	8.80
TP2-2-W-M	7/19/2011	1.8U	1.8U	2.8U	2.9	3.7U	3.7U	1.8U	1.8U	1.8U	1.8U	92	1.8U	7.4U	7.4U
TP2-4-W-A	7/19/2011	0.0018U	0.0016U	0.0023U	0.0016U	0.0031U	0.0031U	0.0016U	0.0016U	0.0016U	0.0016U	0.0062U	0.160U	0.0062U	0.0062U
TP2-4-W-B	7/19/2011	0.0019U	0.0019U	0.0028U	0.0019U	0.0037U	0.0037U	0.0019U	0.0019U	0.0019U	0.0019U	0.0075U	0.160U	0.0075U	0.0075U
TP4-1-E	7/19/2011	0.160U	3.3	0.36	0.160U	0.320U	0.320U	0.160U	0.160U	0.160U	0.160U	0.630U	0.160U	0.630U	0.630U

MCP Upper Concentration Limit (UCL):	10000	9,000	10,000	10,000	10,000	NP	NP	NP	NP	10,000	NP	NP	NP
MCP S-1/GW-3	30	30	500	500	500	NP	NP	NP	NP	500	NP	NP	NP
MCP S-3/GW-3	1000	900	3,000	3,000	3,000	NP	NP	NP	NP	3,000	NP	NP	NP
Reporting Category - RCS-2	10	200	1,000	1,000	300	NP	NP	10,000	NP	40	NP	100	10,000

Notes:
Only detected compounds are reported in the table. Please refer to Appendix _ for a complete listing of analytes.
U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
*Duplicate 1 is a duplicate sample of sample TP-3.
**Duplicate 2 is a duplicate sample of sample TP-6.
- Exceedance of Reporting Category and/or Standard
Testing results for trip blanks analyzed during the testing program were all non-detect (ND).
Acetone and Carbon disulfide detected in TP6-N-B at low ppb levels considered an artifact of laboratory.

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Table 5
13 Priority Pollutant Metals Soil
Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample Name	Collection Date	13 Priority Pollutant Metals (mg/kg)													
		Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	TCLP lead (mg/l)
B-5/MW-3	5/4/2011	0.0900	4.11	0.298	0.079	6.48	13.0	77.2	0.061	5.25	0.434	0.094	0.104	37.3	N/A
B-6/MW-4	5/5/2011	0.2840	1.25	0.166	0.071	7.72	14.0	95.2	0.027	5.36	0.318	0.033	0.056	55.7	N/A
B-7	5/6/2011	0.035U	0.68	0.196	0.047	6.60	6.8	15.2	0.012U	4.61	0.203	0.035U	0.078U	19.0	N/A
B-8/MW-5	5/6/2011	0.0400	1.32	0.270	0.409	6.19	10.1	161.0	0.028	4.07	0.334	0.039	0.086U	126.0	0.6
B-9/MW-6	5/9/2011	0.034U	1.01	0.143	0.056	13.60	12.1	4.8	0.013U	10.40	0.117	0.034U	0.032U	18.8	N/A
B-11/MW-7	5/12/2011	0.037U	1.00	0.194	0.040	6.04	3.4	3.3	0.014U	3.38	0.279	0.037U	0.082	10.1	N/A
B-12/MW-8 (A)	5/13/2011	0.1060	3.95	0.317	0.257	8.20	3.6	4.0	0.025U	4.37	2.530	0.065U	0.219	8.0	N/A
B-12/MW-8 (B)	5/13/2011	0.0560	1.78	0.251	0.037U	9.02	2.9	4.6	0.013	4.99	0.481	0.038U	0.045	13.0	N/A
TP-1	4/25/2011	0.039U	1.66	0.124	0.066	4.08	13.8	11.7	0.073	2.92	0.273	0.074	0.085	17.4	NA
TP-2	4/25/2011	0.126	1.67	0.138	0.269	4.87	12.5	126	0.151	6.01	0.253	0.078	0.053	132	0.56
TP-5	4/25/2011	0.472	6.37	0.202	0.570	5.80	21.9	580	0.134	5.95	0.549	0.149	0.127	200	18
TP-4	4/25/2011	0.857	5.35	0.672	3.68	11.3	110	252	0.084	11.0	0.936	0.166	0.201	240	0.5U
TP-3	4/25/2011	0.037U	1.20	0.230	0.034U	8.92	6.04	4.41	0.013U	5.84	0.249	0.038	0.037	15.9	NA
TP-6	4/26/2011	0.195	5.10	0.232	0.186	3.96	44.0	74.5	0.050	7.29	0.800	0.087	0.206	27.8	NA
TP-8	4/26/2011	0.033U	0.484	0.061	0.031U	2.04	3.55	1.96	0.014U	1.34	0.129	0.033U	0.031U	4.39	NA
TP-9	4/26/2011	0.354	5.53	0.236	0.218	6.45	71.8	30.2	0.021	5.79	2.44	0.120	0.138	78.8	NA
TP-11	4/26/2011	0.162	0.641	0.090	0.072	2.90	5.03	16.2	0.012U	2.08	0.248	0.033U	0.039	12.8	NA
TP-10	4/27/2011	0.164	1.57	0.221	0.101	8.12	17.6	60.4	0.022	3.29	0.574	0.081	0.047	31.0	NA
TP-12	4/27/2011	0.186	7.46	0.451	0.237	5.92	37.7	164	0.290	7.92	1.42	0.122	0.297	85.5	0.5U
TP-14	4/27/2011	0.103	2.68	0.204	0.064	5.15	19.2	26.9	0.067	7.99	0.528	0.045	0.076	21.1	NA
TP-16	4/27/2011	0.110	1.58	0.217	0.055	5.72	6.53	10.2	0.016	3.82	0.517	0.049	0.060	28.0	NA
DUPLICATE-1	4/25/2011	0.032U	1.04	0.211	0.046	8.3	6.40	7.63	0.013U	5.5	0.256	0.032U	0.047	17.8	NA
DUPLICATE-2	4/26/2011	0.133	4.06	0.176	0.105	4.57	40.2	68.1	0.045	4.76	0.907	0.071	0.120	38.7	N/A
MCP Upper Concentration Limit (UCL)		300	200	2000	300	2000	NP	3000	300	7000	8000	2000	800	10000	NP
MCP S-3/GW-2		30	20	200	30	200	NP	300	30	700	800	200	80	5000	NP
MCP S-3/GW-3		30	20	200	30	200	NP	300	30	700	800	200	80	5000	NP
Reporting Category - RCS-2		30	20	200	30	200	10000	300	30	700	800	200	60	3000	NP

Notes:
U = below quntitation limit
N/A = Not Analyzed
NP = Not Promulgated
Exceedance of MCP Reporting Category and/or Standard
A = Shallow Sample
M = Middle Sample
B = Bottom

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Table 6
Total Petroleum Hydrocarbons, MA VPH and MA EPH
Soil Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample Name	Collection Date	Total Petroleum Hydrocarbons	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	C5-C8 Aliphatics, Adjusted	C9-C12 Aliphatics, Adjusted	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	C11-C22 Aromatics, Adjusted	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)Pyrene	Dibenzo(a,h)anthracene	Benzo(ghi)perylene
B-5/MW-3	5/4/2011	510	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-6/MW-4	5/5/2011	208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-7	5/6/2011	36.3U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-8/MW-5	5/6/2011	791	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-9/MW-6	5/9/2011	180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-11/MW-7	5/12/2011	38.4U	4.34U	13	7	4.34U	4.34U	8.17U	8.17U	17	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-12/MW-8 (A)	5/13/2011	562	14.4U	66	31	14.4U	19	14.4U	16	127	81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-12/MW-8 (B)	5/13/2011	117	4.97U	10	6	4.97U	4.97U	8.09U	8.09U	50	32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-1	4/25/2011	48.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-2	4/25/2011	2180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-5	4/25/2011	253	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-4	4/25/2011	524	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-3	4/25/2011	449	21.8U	85.4	55.2	21.8U	30.2	37.9	15.4	244	195	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-6	4/26/2011	5900	153U	342	239	153U	153U	76.0	47.3U	2490	1750	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-8	4/26/2011	36.5U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-9	4/26/2011	52.9U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-11	4/26/2011	134	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-10	4/27/2011	59.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-12	4/27/2011	124	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-14	4/27/2011	37.2U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP-16	4/27/2011	38.8U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DUPLICATE 1	4/25/2011	650	34.8	205	67.9	29.4	103	86.5	28.6	630	493	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DUPLICATE 2	4/26/2011	613	46.2U	131	90.7	46.2U	46.2U	643	432U	19300	12600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP6-1-N-H	7/18/2011	NA	NA	NA	NA	NA	NA	643U	643U	20600	17800	343	152	32.2U	410	528	850	154	73.6	157	50.6	60.1	32.2U	32.2U	34.3	32.2U	32.2U	32.2U
TP6-2-N-M	7/18/2011	NA	NA	NA	NA	NA	NA	1070	970	1100	1100	0.428U	1.28	0.648	0.428U	0.428U	2.04	0.428U	0.561	0.428U	0.428U	0.428U	0.428U	0.428U	0.428U	0.428U	0.428U	0.428U
TP6-3-N-A	7/18/2011	NA	NA	NA	NA	NA	NA	7.54U	7.54U	30	22.2	0.377U	0.377U	0.377U	0.377U	0.377U	1.2	0.377U	1.2	1.31	0.535	0.829	0.544	0.5	0.576	0.432	0.377U	0.669
TP6-3-N-B	7/18/2011	NA	NA	NA	NA	NA	NA	7.42U	7.42U	7.42U	7.42U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U	0.371U
TP6-2-W-A	7/19/2011	NA	NA	NA	NA	NA	NA	36.9U	54.8	322	253	1.85U	1.85U	1.85U	1.85U	1.85U	3.11	1.85U	10.6	13.5	7.26	8.3	5.68	4.62	7.38	4.15	1.85U	4.81
TP6-2-W-M	7/19/2011	NA	NA	NA	NA	NA	NA	25.4U	29.4	112	90.8	1.27U	1.27U	1.27U	1.27U	1.27U	2.33	1.27U	1.94	4.06	1.71	1.8	1.4	1.4	2.16	1.27U	1.27U	4.15
TP6-2-W-B	7/19/2011	NA	NA	NA	NA	NA	NA	7.18U	7.18U	56.1	38.9	0.359U	0.411	0.359U	1.13	0.757	4.57	1	1.54	2.99	0.908	0.867	0.515	0.468	0.978	0.424	0.359U	0.644
TP2-1-W-H	7/19/2011	NA	NA	NA	NA	NA	NA	130	286	2840	1870	75.4	65.7	9.58	68.9	36.4	166	40.2	70.5	147	48.1	48.3	29.6	31.2	62.7	26.7	5.76U	38.7
TP2-1-W-M	7/19/2011	NA	NA	NA	NA	NA	NA	84.6	44	837	558	35.1	29.6	2.35	15.6	10.9	49.8	11.8	18	37	10.3	10.6	7.18	8.06	13.8	7.29	2.25	9.78
TP2-4-W-A	7/19/2011	NA	NA	NA	NA	NA	NA	7.57U	65.9	47.9	47	0.378U	0.378U	0.378U	0.378U	0.378U	0.378U	0.378U	0.454	0.43	0.378U	0.378U	0.378U	0.378U	0.378U	0.378U	0.378U	0.378U
TP2-4-W-B	7/19/2011	NA	NA	NA	NA	NA	NA	7.8U	12.4	88.9	66.3	0.39U	0.39U	0.39U	0.39U	0.39U	1.79	0.39U	3.09	3.85	1.79	2.17	1.79	1.5	2.21	1.75	0.39U	2.65
TP4-1-E	7/19/2011	NA	NA	NA	NA	NA	NA	15.5	10.3	63.9	61.6	0.466	0.424U	0.424U	0.424U	0.424U	0.574	0.424U	0.424U	0.452	0.424U	0.784	0.424U	0.424U	0.424U	0.424U	0.424U	0.424U
TP3-1-S	7/19/2011	NA	NA	NA	NA	NA	NA	9.24U	9.24U	42.5	25.8	0.462U	0.462U	0.462U	0.462U	0.462U	2.42	0.462U	3.17	3	1.27	1.52	1.23	1.02	1.3	0.914	0.462U	0.907
TP3-2-S-A	7/19/2011	NA	NA	NA	NA	NA	NA	38.3U	135	558	392	1.91U	1.91U	1.91U	1.91U	1.91U	19.8	3.96	31	26.7	13	14.7	12.8	11.2	14.4	9.28	1.91U	9.61

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Table 6
Total Petroleum Hydrocarbons, MA VPH and MA EPH
Soil Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample Name	Collection Date	Total Petroleum Hydrocarbons	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	C5-C8 Aliphatics, Adjusted	C9-C12 Aliphatics, Adjusted	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	C11-C22 Aromatics, Adjusted	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)Pyrene	Dibenzo(a,h)anthracene	Benzo(ghi)perylene
TP3-2-S-M	7/19/2011	NA	NA	NA	NA	NA	NA	6.83U	7.8	34.8	25.5	0.341U	0.341U	0.341U	0.341U	0.341U	0.981	0.341U	1.93	1.71	0.833	0.902	0.583	0.341U	0.921	0.681	0.341U	0.751
TP3-2-S-B	7/19/2011	NA	NA	NA	NA	NA	NA	6.98U	6.98U	6.98U	6.98U	0.626	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U	0.349U
TP4-1-S-A	7/20/2011	NA	NA	NA	NA	NA	NA	7.32U	7.32U	34.9	24.2	0.366U	0.366U	0.366U	0.366U	0.366U	0.775	0.366U	1.5	1.86	0.886	1.07	0.912	0.781	1	0.726	0.366U	1.16
TP4-1-S-M	7/20/2011	NA	NA	NA	NA	NA	NA	14.3U	14.3U	252	163	0.715U	0.715U	0.715U	0.715U	0.715U	5.71	0.959	11.7	19.6	7.44	8.75	7.14	6.79	7.95	5.22	1.58	6.41
TP4-1-S-B	7/20/2011	NA	NA	NA	NA	NA	NA	7.22U	7.22U	7.43	7.43	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U	0.361U
TP4-1-W-A	7/20/2011	NA	NA	NA	NA	NA	NA	38U	38U	321	216	1.9U	1.9U	1.9U	1.9U	1.9U	11.5	2.09	16.8	18.2	8.08	9.02	8.23	7.92	9.24	6.4	1.9U	6.95
TP4-1-W-M	7/20/2011	NA	NA	NA	NA	NA	NA	20.6	25.4	310	217	1.84	0.997	1.16	0.751U	0.751U	5.2	1.15	9.21	17.5	7.03	8.67	7.15	7.38	10.2	6.21	1.95	7.96
TP4-1-W-B	7/20/2011	NA	NA	NA	NA	NA	NA	7.32U	7.32U	48.7	37.1	0.366U	0.366U	0.366U	0.366U	0.366U	1.01	0.366U	1.65	1.71	0.814	1.03	1.01	0.657	1.21	1.01	0.366U	1.45
TP4-2-W	7/20/2011	NA	NA	NA	NA	NA	NA	12.6	18	175	147	0.386U	0.386U	1.09	0.386U	0.386U	0.721	0.386U	2.41	2.74	1.26	2.21	2.46	1.81	3.07	3.92	0.705	6.32
TP6-1-NW-A	7/22/2011	NA	NA	NA	NA	NA	NA	6.58U	6.58U	9.53	7.64	0.329U	0.329U	0.329U	0.329U	0.329U	0.329U	0.329U	0.463	0.589	0.329U	0.337	0.329U	0.329U	0.493	0.329U	0.329U	0.329U
TP6-1-NW-M	7/22/2011	NA	NA	NA	NA	NA	NA	7.29U	7.29U	7.29U	7.29U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U	0.365U
TP6-1-NW-B	7/22/2011	NA	NA	NA	NA	NA	NA	18.3U	36	46.1	44.7	1.4	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U	0.916U
TP6-2-NW-A	7/22/2011	NA	NA	NA	NA	NA	NA	7.09U	10.5	15.3	12.8	0.354U	0.354U	0.354U	0.354U	0.354U	0.354U	0.354U	0.633	0.607	0.354U	0.375	0.354U	0.354U	0.884	0.354U	0.354U	0.354U
TP6-2-NW-M	7/22/2011	NA	NA	NA	NA	NA	NA	7.38U	7.38U	7.38U	7.38U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U
TP6-2-NW-B	7/22/2011	NA	NA	NA	NA	NA	NA	7.37U	7.37U	9.1	9.1	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U	0.369U
TP6-A-NE-A	7/22/2011	NA	NA	NA	NA	NA	NA	6.32U	6.32U	6.32U	6.32U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U	0.316U
TP6-1-NE-M	7/22/2011	NA	NA	NA	NA	NA	NA	1230U	1230U	19700	12300	142	98.5	61.7U	218	212	1620	311	1420	1340	484	490	257	290	318	149	61.7U	118
TP6-1-NE-B	7/22/2011	NA	NA	NA	NA	NA	NA	6.26U	6.26U	94	59.8	0.313U	0.313U	0.313U	0.574	0.528	5.02	0.932	5.74	5.84	2.48	3.11	2.07	2.32	2.47	1.44	0.407	1.23
TP6-3-NW-A	7/22/2011	NA	NA	NA	NA	NA	NA	6.47U	6.47U	6.47U	6.47U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U	0.324U
TP6-3-NE-M	7/22/2011	NA	NA	NA	NA	NA	NA	33.5U	33.5U	375	210	1.89	1.68U	1.68U	3.9	4.26	29.4	7.32	32.8	25.9	11.8	11.8	8.55	7.91	9.67	5.53	1.68U	4.46
TP6-3-NE-B	7/22/2011	NA	NA	NA	NA	NA	NA	6.94U	6.94U	10.2	6.94U	0.347U	0.347U	0.347U	0.347U	0.347U	0.545	0.347U	0.865	0.72	0.375	0.393	0.347U	0.347U	0.364	0.347U	0.347U	0.347U
TP6-5-NE-A	7/25/2011	NA	NA	NA	NA	NA	NA	6.44U	6.44U	6.44U	6.44U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U	0.322U
TP6-5-NE-M	7/25/2011	NA	NA	NA	NA	NA	NA	14.4U	14.4U	205	107	0.722U	0.722U	0.722U	2.05	2.39	17.4	4.19	19.3	14.8	6.92	7.29	5.44	4.8	5.84	3.73	0.758	3.02
TP6-5-NE-B	7/25/2011	NA	NA	NA	NA	NA	NA	9.18U	69	40.9	38.5	0.459U	0.459U	0.459U	0.459U	0.459U	0.459U	0.459U	0.682	0.808	0.459U	0.467	0.459U	0.459U	0.469	0.459U	0.459U	0.459U
TP6-7-NW-A	7/25/2011	NA	NA	NA	NA	NA	NA	286U	472	1690	913	18.6	14.3U	14.3U	20.1	20.5	153	35.7	151	118	51.1	50.6	37.8	35.6	41	27.3	14.3U	21.7
TP6-7-NW-M	7/25/2011	NA	NA	NA	NA	NA	NA	8.86U	8.86U	12.6	9.34	0.443U	0.443U	0.443U	0.443U	0.443U	0.475	0.443U	0.869	0.837	0.443U	0.443U	0.443U	0.443U	0.469	0.443U	0.443U	0.635
TP6-7-NW-B	7/25/2011	NA	NA	NA	NA	NA	NA	7.13U	7.13U	7.22	7.22	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U	0.357U
TP6-1S	8/11/2011	NA	NA	NA	NA	NA	NA	283U	283U	13300	10800	555	489	107	230	243	504	85.7	62.9	118	36.8	39.5	14.2U	14.2U	26.7	14.2U	14.2U	14.2U
TP6-3W	8/11/2011	NA	NA	NA	NA	NA	NA	130U	130U	2930	2240	212	130	31.3	58.4	55.1	127	23.8	13.7	25.1	7.96	8.80	6.49U	6.49U	6.49U	6.49U	6.49U	6.49U
TP6-8NW	8/11/2011	NA	NA	NA	NA	NA	NA	7.99U	7.99U	7.99U	7.99U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U	0.399U
TP6-4N	8/11/2011	NA	NA	NA	NA	NA	NA	8.07U	8.07U	152	96.4	0.404U	0.404U	0.404U	0.799	0.893	7.25	1.85	11.6	8.87	4.7	4.84	3.38	2.75	3.99	2.65	0.404U	2.09
TP6-6NE	8/11/2011	NA	NA	NA	NA	NA	NA	347U	347U	5240	2860	71.1	19.8	17.3U	61.4	78.8	491	126	451	333	162	159	111	94	120	62.2	17.3U	48.9
TP2-1E	8/11/2011	NA	NA	NA	NA	NA	NA	153	142U	3710	2480	219	61.6	8.15	102	64.8	259	56.4	76.7	149	47	45.4	21.8	24.6	50.9	18.6	7.10U	24.4
TP2-2E	8/11/2011	NA	NA	NA	NA	NA	NA	26.1	17.4U	252	194	0.871U	2.43	0.871U	4.75	4.52	20.9	4.6	5.09	8.72	1.6	1.78	0.907	0.871U	1.51	0.871U	0.871U	1.31
TP4-1NE	8/11/2011	NA	NA	NA	NA	NA	NA	8.05U	8.05U	32.4	25.8	0.403U	0.403U	0.403U	0.403U	0.403U	1.12	0.403U	1.5	1.57	0.65	0.709	0.483	0.403U	0.544	0.403U	0.403U	0.403U
MCP Upper Concentration Limit (UCL):		10000	5000	20000	5000	5000	20000	20000	20000	10000	10000	10000	5000	10000	10000	10000	10000	10000	10000	10000	3000	10000	3000	10000	300	3000	300	10000

Table 6
Total Petroleum Hydrocarbons, MA VPH and MA EPH
Soil Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Sample Name	Collection Date	Total Petroleum Hydrocarbons	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	C5-C8 Aliphatics, Adjusted	C9-C12 Aliphatics, Adjusted	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	C11-C22 Aromatics, Adjusted	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)Pyrene	Dibenzo(a,h)anthracene	Benzo(ghi)perylene
MCP S-3/GW-2		5000	500	5000	500	500	5000	5000	5000	5000	5000	40	80	600	5000	5000	3000	5000	5000	5000	300	3000	300	3000	30	300	30	5000
MCP S-3/GW-3		5000	500	5000	500	500	5000	5000	5000	5000	5000	3000	500	10	5000	5000	3000	5000	5000	5000	300	3000	300	3000	30	300	30	5000
Reporting Category - RCS-2		3000	500	3000	500	500	3000	3000	5000	3000	3000	40	80	10	3000	3000	1000	3000	3000	3000	40	400	40	400	4	40	4	3000

Notes:
U = below quntitation limit
NA = Not Analyzed
Exceedance of MCP Reporting Category and/or Standard.
NP = Not Promulgated
A = Shallow Sample
M = Middle Sample
B = Bottom

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Table 7:
Semi-Volatile Organics
Soil Analytical Data
New Bedford Marine Commerce Terminal, New Bedford, Massachusetts

Sample Name	Collection Date	acenaphthene	fluoranthene	naphthalene	benzo(a)anthracene	benzo(a)pyrene	benzo(b)fluoranthene	benzo(k)fluoranthene	chrysene	acenaphthylene	anthracene	benzo(g,h,i)perylene	fluorene	phenanthrene	dibenz(a.h)anthracene	indeno(1,2,3-cd)pyrene	pyrene	4-chloroaniline	dibenzofuran	2-methylnaphthalene	2,6-dichlorophenol	carbazole
B-5/MW-3	5/4/2011	0.96	8.9	0.56	4.6	4.0	5.3	1.9	4.4	0.36U	1.8	2.5	0.72	7.9	0.72	2.7	7.4	0.36U	0.66	0.36U	NA	NA
B-6/MW-4	5/5/2011	1.7U	16	1.7U	7.4	7.2	9.2	3.4	6.7	1.7U	3.1	4.3	1.7U	12	1	4.9	13	1.7U	1.7U	1.7U	NA	NA
B-7	5/6/2011	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.22U	0.37U	0.37U	0.37U	0.37U	0.37U	NA	NA
B-8/MW-5	5/6/2011	1.7U	37	1.7U	18	18	22	8.9	15	3.6	6.5	12	1.7	21	2.4	13	31	1.7U	1.7U	1.7U	NA	NA
B-9/MW-6	5/9/2011	2U	2.6	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	5.3	1.2U	2U	2U	2U	2U	2U	NA	NA
B-11/MW-7	5/12/2011	0.66	0.41U	6.6	0.41U	0.41U	0.41U	0.41U	0.41U	0.41U	0.41U	0.41U	0.41U	0.41U	0.24U	0.41U	0.41U	0.41U	0.41U	2.1	NA	NA
B-12/MW-8 (A)	5/13/2011	2.6	3.4	18	1.4U	1.4U	1.4	1.4U	1.4	1.4U	1.4U	1.4U	1.4U	5.3	0.84U	1.4U	3.3	1.4U	1.4U	3	NA	NA
B-12/MW-8 (B)	5/13/2011	0.6	2.1	1.8	0.88	0.78	0.97	0.4U	0.96	0.4U	0.51	0.43	0.43	2.9	0.24U	0.43	2.1	0.4U	0.4U	0.4U	NA	NA
TP-1	4/25/2011	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.24U	0.4U	0.4U	0.4U	0.4U	0.4U	NA	NA
TP-2	4/25/2011	2U	38	2U	19	18	21	9.2	17	2U	6.7	11	2.2	26	2.5	12	33	2U	2U	2U	NA	NA
TP-3	4/25/2011	1.6	3	0.88	1.6	1.6	1.2	0.4	1.6	0.39U	1.9	0.92	1.6	8.9	0.23U	0.67	6	0.39U	0.39U	6.1	NA	NA
TP-4	4/25/2011	2.2U	5.2	2.2U	3.2	3.5	4.2	3.2	2.2U	2.2U	2.2U	2.6	2.2U	2.7	2.2U	2.3	6.3	2.2U	2.2U	2.2U	NA	NA
TP-5	4/25/2011	2U	16	2U	6.9	6.5	7.6	2.7	6.7	2U	3.8	4.1	2U	18	1.2U	4	14	2U	2U	2U	NA	NA
TP-6	4/26/2011	110	4.9U	500	60	64	44	14	54	4.9U	83	35	76	390	7	25	150	4.9U	4.9U	300	NA	NA
TP-8	4/26/2011	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.38U	0.23U	0.38U	0.38U	0.38U	0.38U	0.38U	NA	NA
TP-9	4/26/2011	0.58U	1.1	0.58U	0.58U	0.58U	0.58U	0.58U	0.58U	0.58U	0.58U	0.58U	0.58U	0.58U	0.35U	0.58U	0.58U	0.58U	0.58U	0.58U	NA	NA
TP-10	4/27/2011	0.38U	0.74	0.38U	0.42	0.38U	0.38U	0.38U	0.52	0.38U	0.38U	0.38U	0.38U	0.81	0.22U	0.38U	1	0.38U	0.38U	0.38U	NA	NA
TP-11	4/26/2011	0.38U	0.38U	0.38U	0.5	0.53	0.61	0.38U	0.49	0.38U	0.38U	0.4	0.38U	0.38U	0.23U	0.38U	1.1	0.38U	0.38U	0.38U	NA	NA
TP-12	4/27/2011	0.43U	0.96	0.43U	0.43	0.47	0.72	0.43U	0.62	0.43U	0.43U	0.43U	0.43U	0.43U	0.26U	0..43	0.88	0.43U	0.43U	0.43U	NA	NA
TP-14	4/27/2011	0.37U	0.72	0.37U	0.37U	0.37U	0.37	0.37U	0.37U	0.37U	0.37U	0.37U	0.37U	0.43	0.22U	0.37U	0.7	0.37U	0.37U	0.37U	NA	NA
TP-16	4/27/2011	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.24U	0.4U	0.4U	0.4U	0.4U	0.4U	NA	NA
DUPLICATE 1	4/25/2011	3.6	5.2	2	3.3	3.1	2.6	0.73	3	0.36U	3.6	1.8	3.2	14	0.39	1.3	9.5	0.36U	0.36U	6.8	NA	NA
DUPLICATE 2	4/25/2011	0.87	0.98	3.9	0.69	0.77	0.68	0.41U	0.7	0.41	0.56	0.58	0.52	3.2	0.25U	0.41U	1.9	0.41U	0.41U	1.9	NA	NA
TP2-1-W-H	7/19/2011	110	150	410	120	140	58	72	120	24	60	100	54	290	23	92	320	3U	3U	150	120	3U
TP2-2-W-M	7/19/2011	22	20	65	15	21	8.7	6.7	15	3.1	13	17	8.3	47	1U	13	43	1U	1U	43	31	1U
TP2-4-W-A	7/19/2011	0.06U	0.6	0.06U	0.3	0.3	0.2	0.3	0.4	0.06U	0.06U	0.3	0.06U	0.3	0.06U	0.2	0.6	0.06U	0.06U	0.06U	0.06U	0.06U
TP2-4-W-B	7/19/2011	0.1	3	0.3	1.8	2	1.4	1.2	1.9	0.3	0.4	2.1	0.1	1.7	0.3	1.8	3.4	0.03U	0.07	0.06	0.07	0.1
TP3-1-S	7/19/2011	0.07U	0.3	0.07U	0.2	0.1	0.07U	0.09	0.2	0.07U	0.07U	0.07U	0.07U	0.1	0.07U	0.07U	0.3	0.07U	0.07U	0.07U	0.07U	0.07U
TP3-2-S-A	7/19/2011	0.7	19	0.6	9.8	9.4	8.5	4.7	8.7	0.8	2.4	4.5	0.8	10	1.4	4.1	17	0.06U	0.5	0.2	0.2	1
TP3-2-S-B	7/19/2011	0.03U	0.03U	0.7	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.2	0.03U
TP3-2-S-M	7/19/2011	0.1U	1.2	0.1U	0.5	0.6	0.4	0.5	0.6	0.1U	0.1	0.5	0.1U	0.6	0.2	0.4	1	0.1U	0.1U	0.1U	0.1U	0.1U
TP4-1-E	7/19/2011	1U	1U	2	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	2.2	1U	1U	1U	1U	1U
TP4-1-S-A	7/20/2011	0.08	1.8	0.09	1.1	1.2	0.9	0.8	1.1	0.1	0.2	0.7	0.1	1.1	0.2	0.7	1.8	0.04U	0.04U	0.04U	0.04U	0.1
TP4-1-S-B	7/20/2011	0.1U	0.4	0.1U	0.2	0.4	0.1U	0.1U	0.3	0.1U	0.1U	0.4	0.1U	0.1U	0.1U	0.3	0.5	0.1U	0.1U	0.1U	0.1U	0.1U
TP4-1-S-M	7/20/2011	0.3	9	0.7	7	7.2	5.7	4.4	7.4	0.9	1.1	5.6	0.4	5.4	1.4	5.1	13	0.06U	0.2	0.2	0.2	0.3
TP4-1-W-A	7/20/2011	2.7	26	1.3	14	10	6.5	9	8.8	0.7	5.9	4.5	2.5	23	1.6	4.2	22	0.06U	1.9	0.6	0.6	3
TP4-1-W-B	7/20/2011	0.2U	1	0.2U	0.7	1.7	1	0.6	0.9	0.3	0.2U	2.7	0.2U	0.6	0.3	2.5	1.3	0.2U	0.2U	0.2U	0.2U	0.2U
TP4-1-W-M	7/20/2011	0.2	6.8	1.4	5.3	5.9	4.9	2.8	5.4	1	1.1	3.6	0.3	4.3	1.1	3.2	11	0.06U	0.1	0.4	0.2	0.2
TP4-2-W	7/20/2011	0.2U	1.9	0.2U	1.7	4.7	2.6	1.3	2.1	1	0.5	9.2	0.2U	1	0.9	7.8	3.9	0.2U	0.2U	0.2U	0.2U	0.2U
TP6-1-NE-A	7/22/2011	0.06U	0.2	0.06U	0.08	0.09	0.07	0.07	0.09	0.06U	0.06U	0.06	0.06U	0.07	0.06U	0.06U	0.1	0.06U	0.06U	0.06U	0.06U	0.06U
TP6-1-NE-B	7/22/2011	0.4	3.6	0.2	1.7	1.9	1	1.4	2	0.2U	0.8	1.1	0.5	4.2	0.4	0.9	4	0.2U	0.2U	0.2	0.3	0.2U
TP6-1-NE-M	7/22/2011	200	1800	130	910	720	670	380	850	33	390	420	230	1600	120	380	1700	7U	110	83	73	150
TP6-1-N-H	7/18/2011	320	86	230	60	18	7.7	17	62	22	120	13	79	650	11	7.7	180	3U	3U	39	3U	3U
TP6-1-NW-A	7/22/2011	0.06U	0.3	0.06U	0.2	0.2	0.2	0.2	0.3	0.06U	0.06U	0.2	0.06U	0.1	0.07	0.1	0.3	0.06U	0.06U	0.06U	0.06U	0.06U
TP6-1-NW-B	7/22/2011	0.2U	0.2U	0.4	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	1.4	0.2U
TP6-1-NW-M	7/22/2011	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.2	0.06U	0.06U	0.07	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
TP6-2-N-M	7/18/2011	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U
TP6-2-N-M	7/18/2011	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U	0.8U
TP6-2-NW-A	7/22/2011	0.1U	1.6	0.1U	0.8	0.9	0.6	0.8	0.9	0.1U	0.2	0.5	0.1U	1.1	0.1U	0.4	1.5	0.1U	0.1U	0.1U	0.1U	0.1U
TP6-2-NW-A	7/22/2011	0.1U	1.6	0.1U	0.8	0.9	0.6	0.8	0.9	0.1U	0.2	0.5	0.1U	1.1	0.1U	0.4	1.5	0.1U	0.1U	0.1U	0.1U	0.1U
TP6-2-NW-B	7/22/2011	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
TP6-2-NW-M	7/22/2011	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
TP6-2-W-A	7/19/2011	0.06U	2.5	0.06U	2.8	5.1	2	2.9	3.2	0.3	0.2	4.4	0.06U	0.4	0.8	4	6	0.06U	0.06U	0.06U	0.06U	0.06U
TP6-2-W-B	7/19/2011	1.2	0.6U	0.6U	0.6U	0.6U	0.6U	0.6U	0.6U	0.6U	0.6U	0.6U	0.6U	3.6	0.6U	0.6U	2.3	0.6U	0.6U	0.6U	0.6U	0.6U
TP6-2-W-M	7/19/2011	6U	6U	6U	6U	6U	6U	6U	13	6U	16	6U	6U	6U	6U	6U	6U	6U	6U	6U	6U	6U
TP6-3-N-A	7/18/2011	0.03U	0.3	0.03U	0.2	0.2	0.1	0.2	0.2	0.03U	0.03U	0.2	0.03U	0.2	0.03U	0.2	0.3	0.03U	0.03U	0.03U	0.03U	0.03U
TP6-3-N-B	7/18/2011	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U
TP6-3-NE-A	7/22/2011	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
TP6-3-NE-B	7/22/2011	12	140	5U	52	59	40	42	53	5U	37	26	16	100	5U	30	100	5U	9.5	5U	5U	5U
TP6-3-NE-M	7/22/2011	0.06U	0.4	0.06U	0.2	0.2	0.1	0.1	0.2	0.06U	0.06U	0.06U	0.06U	0.3	0.06U	0.06U	0.3	0.06U	0.06U	0.06U	0.06U	0.06U
TP6-5-NE-A	7/25/2011	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
TP6-5-NE-B	7/25/2011	0.1U	0.3	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.4	0.1U	0.1U	0.1U	0.1U	0.1U

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Table 7:
Semi-Volatile Organics
Soil Analytical Data
New Bedford Marine Commerce Terminal, New Bedford, Massachusetts

Sample Name	Collection Date	acenaphthene	fluoranthene	naphthalene	benzo(a)anthracene	benzo(a)pyrene	benzo(b)fluoranthene	benzo(k)fluoranthene	chrysene	acenaphthylene	anthracene	benzo(g,h,i)perylene	fluorene	phenanthrene	dibenz(a.h)anthracene	indeno(1,2,3-cd)pyrene	pyrene	4-chloroaniline	dibenzofuran	2-methylnaphthalene	2,6-dichlorophenol	carbazole
TP6-5-NE-M	7/25/2011	6.9	60	3U	26	22	16	16	24	3U	13	12	7.4	57	3U	11	49	3U	3U	3U	3U	8.8
TP6-7-NW-A	7/25/2011	1.9	38	1.2	23	16	17	6.3	14	2	5.5	5.5	2.2	22	2	5.4	35	0.06U	1	0.6	0.5	2.2
TP6-7-NW-B	7/25/2011	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
TP6-7-NW-M	7/25/2011	0.4	3.3	0.2	1.5	1.4	1.1	1	1.7	0.07U	0.6	0.7	0.3	3.6	0.2	0.6	3.2	0.07U	0.07U	0.1	0.2	0.3
MCP Upper Concentration Limit (UCL):		10000	10000	10000	3000	300	3000	10000	10000	10000	10000	10000	10000	10000	300	3000	10000	NP	NP	5000	NP	NP
MCP S-3/GW-2		5000	5000	40	300	30	300	3000	3000	600	5000	5000	5000	3000	30	300	5000	NP	NP	80	NP	NP
MCP S-3/GW-3		5000	5000	3000	300	30	300	3000	3000	10	5000	5000	5000	3000	30	300	5000	NP	NP	500	NP	NP
Reporting Category - RCS-2		3000	3000	40	40	4	40	400	400	10	3000	3000	3000	1000	4	40	3000	NP	NP	80	NP	NP

Notes:
U = below quntitation limit
NA = Not Analyzed
- Exceedance of Reporting Category and/or Standard
NP = Not Promulgated
A = Shallow Sample
M = Middle Sample
B = Bottom

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Table 8
PCBs (Aroclors) - Groundwater Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

		Concentration of PCBs (µg/L)					
Sample Name	Collection Date	Aroclor 1016/1242	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1254	Aroclor 1260
MW-3	6/30/2011	0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
MW-4	6/30/2011	0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
MW-5	6/30/2011	0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
MW-6	6/29/2011	0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
MW-7	6/29/2011	0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
MW-8	6/28/2011	0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
MCP Upper Concentration Limits (UCL):		NP	NP	NP	NP	NP	NP
MCP GW-3		NP	NP	NP	NP	NP	NP
Reporting Category - RCGW-2		NP	NP	NP	NP	NP	NP

Notes:
U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
ND = Analyzed Aroclors were non-detected.

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Table 9
Total Petroleum Hydrocarbons Groundwater Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

Total Petroleum Hydrocarbons, MA VPH and MA EPH (µg/L)								
Sample Name	Collection Date	Total Petroleum Hydrocarbons	C9-C10 Aromatics	C5-C8 Aliphatics, Adjusted	C9-C12 Aliphatics, Adjusted	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics, Adjusted
MW-3	6/30/2011	500U	NA	NA	NA	NA	NA	NA
MW-4	6/30/2011	500U	NA	NA	NA	NA	NA	NA
MW-5	6/30/2011	500U	NA	NA	NA	NA	NA	NA
MW-6	6/30/2011	3350	NA	NA	NA	NA	NA	NA
MW-7	6/29/2011	500U	3730	1250U	2370	100U	100U	2710
MW-8	6/28/2011	500U	50U	50U	50U	100U	100U	148
MCP Upper Concentration Limit (UCL):		50000	100000	100000	100000	100000	100000	100000
MCP Method 1 GW-3		5000	50000	50000	50000	50000	50000	5000
Reporting Category - RCGW-2		5000	7000	3000	5000	5000	50000	5000

U = Concentration is below the laboratory's method detection limit.

Notes:
U = below quntitation limit
NA = Not Analyzed
NP = Not Promulgated

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Table 10
Semi-Volatile Organics Groundwater Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

		Volatile Organics (µg/L)						
Sample Name	Collection Date	Benzene	Toluene	Ethylbenzene	p/m-Xylene	o-Xylene	Naphthalene	1,3,5-Trimethylbenzene
MW-3	6/30/2011	0.5U	1U	1U	2U	1U	2U	2U
MW-4	6/30/2011	0.5U	1U	1U	2U	1U	2U	2U
MW-5	6/30/2011	0.5U	1U	1U	2U	1U	2U	2U
MW-6	6/29/2011	0.5U	1U	1U	2U	1U	2U	2U
MW-7	6/29/2011	370	110	940	560	280	3900	300
MW-8	6/28/2011	0.5U	1U	1U	2U	1U	42	2U
MCP Upper Concentration Limit (UCL):		100000	100000	100000	100000		100000	NP
MCP Method 1 GW-3		10000	40000	5000	5000		20000	NP
Reporting Category - RCGW-2		2000	40000	5000	5000		1000	1000

Notes:
U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
Constituent concentration exceeds MCP Reportable Concentration.

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Table 11
Semi-Volatile Organics Groundwater Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

		Semivolatile Organics (µg/L)						
Sample Name	Collection Dat	acenaphthene	fluoranthene	naphthalene	fluorene	phenanthrene	pyrene	2-methylnaphthalene
MW-3	6/30/2011	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
MW-4	6/30/2011	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
MW-5	6/30/2011	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
MW-6	6/29/2011	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
MW-7	6/29/2011	68	10U	700	20	19	10U	150
MW-8	6/28/2011	2.1	3.8	0.2U	0.28	0.28	3.2	0.2U
MCP Upper Concentration Limit (UCL):		60000	2000	100000	400	100000	800	100000
MCP Method 1 GW-3		6000	200	20000	40	10000	20	20000
Reporting Category - RCGW-2		6000	200	1000	40	10000	20	2000

Notes:
U = Concentration is below the labora U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
Note: Other analyzed compounds not detected.

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Table 12
13 Priority Pollutant Metals Groundwater Analytical Data
New Bedford Marine Commerce Terminal
New Bedford, Massachusetts

		13 Priority Pollutant Metals (mg/L)												
Sample Name	Collection Date	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
MW-3	6/30/2011	0.0036	0.0006	0.0005U	0.0005U	0.0005U	0.0018	0.0005U	0.0002U	0.0008	0.001	0.0005U	0.0005U	0.0118
MW-4	6/30/2011	0.01U	0.0055	0.005U	0.005U	0.005U	0.0124	0.005U	0.0002U	0.0064	0.024	0.005U	0.005U	0.005U
MW-5	6/30/2011	0.001U	0.0005U	0.0005U	0.0005U	0.0005U	0.0024	0.0005U	0.0002U	0.0021	0.002	0.0005U	0.0005U	0.0116
MW-6	6/29/2011	0.001U	0.0046	0.0005U	0.0005U	0.0005U	0.0009	0.0005U	0.0002U	0.0021	0.002	0.0005U	0.0005U	0.0130
MW-7	6/29/2011	0.001U	0.0013	0.0005U	0.0005U	0.0005U	0.0008	0.0005U	0.0002U	0.0011	0.001	0.0005U	0.0005U	0.0127
MW-8	6/28/2011	0.001U	0.0008	0.0005U	0.0005U	0.0008	0.0005U	0.0005U	0.0002U	0.0008	0.001	0.0005U	0.0005U	0.0090
MCP Upper Concentration Limit (UCL)		80	9	2	0.05	3	NP	0.15	0.2	2	1	1	30	50
MCP Method 1 GW-3		8	0.9	0.2	0.004	0.3	NP	0.01	0.02	0.2	0.1	0.007	3	0.9
Reporting Category - RCGW-2		8	0.9	0.2	0.004	0.3	100	0.01	0.02	0.2	0.1	0.007	3	0.9

Notes:
U = below laboratory's method detection limit
N/A = Not Analyzed
NP = Not Promulgated

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TABLE 13
SOIL HANDLING AND DISPOSAL ESTIMATE
South Terminal CDF, New Bedford, Massachusetts

TEST PIT/EXCAVATION AREA	MAIN CONTAMINANT	AREA (SF)	EXCAVATION THICKNESS (ft)	VOLUME (CY)	TONS	DISPOSAL PER TON	MA TRANSPORT FEE	TOTAL DISPOSAL COST PER TON	DISPOSAL COST PER AREA	EXCAVATION COST PER TON	EXCAVATION COST	HANDLING & DISPOSAL
TP-4	PCBs	4,000	4	593	948	$258.8	$63.9	$322.7	$305,958	$13.3	$12,610	$318,568
TP-2	PCBs	3,100	4	459	735	$258.8	$63.9	$322.7	$237,117	$13.3	$9,773	$246,890
PCBs - Estimated Cost Range												***$565,459***
TP-6	Petroleum	4,500	3	500	800	$77.6	NA	$78	$62,080	$13.3	$10,640	$72,720
Petroleum-Related Estimated Cost												***$72,720***
Total Estimated Costs - PCBs & Petroleum Related												***$638,179***

Notes:

PCB Soils: Includes 15% markup.

1. $225.00 / ton Transportation and Disposal plus Massachusetts Transport Fee of $55.60. Transport Fee is cost to transfer soils from Site to railcars for transport to disposal facility.
2. Soils are proposed for a Subtitle C landfill and EPA must approve the facility under the "Mega Rule" (approval is not an issue but must be stated in soil management plan to EPA).
3. Assumptions

(a) Disposal at Heritage Environmental's Subtitle C landfill in Indiana
(b) <10% debris and should not contain debris larger than 3 ft x 1 ft x 1 ft.
(c) Facility can accept larger debris but special arrangements will need to be made prior to shipping.
(d) Waste must pass paint filter as received at the landfill.
(e) Waste must be the minimum of 1000 lbs / sq ft shear strength or 2000 lbs / sq ft unconfined compressive strength.
(f) Samples, profile and EPA approval letter required

Petroleum Soils: Includes 15% markup.

1. $67.50 / ton Transportation and Disposal. (Massachusetts Transport Fee does not apply)
2. Soils are proposed for asphalt batch in Massachusetts.
3. Assumptions

(a) Disposal at Aggregate Industries in Stoughton MA.
(b) <15% debris and cannot contain large quantities of clay.
(c) Waste must pass paint filter test.
(d) Data, profile, site map and LSP opinion Letter required.

REGULATORY COSTS

Preparation (field and office)	$7,500.00
RAM Related	$10,000.00
TSCA Related	$20,000.00
LSP Services (disposal)	$5,000.00
Verification Sampling	$12,500.00
Apex Oversight/Documentation & Equipment	$17,250.00
Closure Reports (RAM/TSCA)	$20,000.00
Response Action Outcome	$30,000.00
includes M3 Risk Characterization	
Deed Restrictions**	$20,500.00
Project Mgt (10%)	$13,775.00
Estimated Regulatory Costs	***$156,525.00***
Estimated Cleanup Costs (Total)	***$794,704***

**Survey (metes & Bounds added to cost)

DRAFT

NEW BEDFORD RADIO (HALL COMM)

RTN: 4-25350

DRAFT

Accutest Labs of New England, Inc.

1/31/2014 8:39

Job Number:	MC27613
Account:	Apex Companies, LLC
Project:	NBMCT, Blackmer, New Bedford, MA
Project Number:	6690.027

Legend: Hit

Client Sample ID:		A-2013-B-1/MW-1 0-2'	A-2013-B-1/MW-1 4-6'	A-2013-B-2/MW-2 0-2'	A-2013-B-2/MW-2 4-6'	A-2013-B-3/MW-3 4-6'	A-2013-B-4/MW-4 0-2'
Lab Sample ID:		MC27613-1	MC27613-2	MC27613-3	MC27613-4	MC27613-5	MC27613-6
Date Sampled:		1/9/2014	1/10/2014	1/9/2014	1/9/2014	1/10/2014	1/10/2014
Matrix:		Soil	Soil	Soil	Soil	Soil	Soil
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic acid	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2-Chlorophenol	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
4-Chloro-3-methyl phenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2,4-Dichlorophenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2,4-Dimethylphenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2,4-Dinitrophenol	mg/kg	1.1 U	1.2 U	1.2 U	1.1 U	1.3 U	5.8 U
2-Methylphenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
3&4-Methylphenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2-Nitrophenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
4-Nitrophenol	mg/kg	1.1 U	1.2 U	1.2 U	1.1 U	1.3 U	5.8 U
Pentachlorophenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
Phenol	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
2,4,5-Trichlorophenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2,4,6-Trichlorophenol	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
Acenaphthene	mg/kg	0.11 U	0.12 U	0.12 U	0.11 U	0.13 U	0.892
Acenaphthylene	mg/kg	0.11 U	0.12 U	0.12 U	0.11 U	0.13 U	0.58 U
Acetophenone	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
Aniline	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
Anthracene	mg/kg	0.165	0.12 U	0.328	0.11 U	0.284	2.61
Benzo(a)anthracene	mg/kg	0.472	0.12 U	1.46	0.11 U	0.881	6.03
Benzo(a)pyrene	mg/kg	0.354	0.12 U	1.34	0.11 U	0.795	4.78
Benzo(b)fluoranthene	mg/kg	0.375	0.12 U	1.52	0.11 U	0.693	4.2
Benzo(g,h,i)perylene	mg/kg	0.2	0.12 U	0.86	0.11 U	0.444	2.55
Benzo(k)fluoranthene	mg/kg	0.369	0.12 U	0.941	0.11 U	0.577	3.93
4-Bromophenyl phenyl ether	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Butyl benzyl phthalate	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
2-Chloronaphthalene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
4-Chloroaniline	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
Chrysene	mg/kg	0.497	0.12 U	1.51	0.11 U	0.828	6.08
bis(2-Chloroethoxy)methane	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
bis(2-Chloroethyl)ether	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
bis(2-Chloroisopropyl)ether	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
1,2-Dichlorobenzene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
1,2-Diphenylhydrazine	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
1,3-Dichlorobenzene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
1,4-Dichlorobenzene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
2,4-Dinitrotoluene	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
2,6-Dinitrotoluene	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
3,3'-Dichlorobenzidine	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Dibenzo(a,h)anthracene	mg/kg	0.11 U	0.12 U	0.257	0.11 U	0.13 U	1.06
Dibenzofuran	mg/kg	0.11 U	0.12 U	0.12 U	0.11 U	0.13 U	0.787
Di-n-butyl phthalate	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Di-n-octyl phthalate	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Diethyl phthalate	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Dimethyl phthalate	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
bis(2-Ethylhexyl)phthalate	mg/kg	0.28 U	0.359	0.30 U	0.28 U	0.32 U	1.4 U
Fluoranthene	mg/kg	1.06	0.12 U	2.94	0.11 U	2.13	12.8
Fluorene	mg/kg	0.11 U	0.12 U	0.12 U	0.11 U	0.13 U	1.14
Hexachlorobenzene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Hexachlorobutadiene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Hexachlorocyclopentadiene	mg/kg	0.56 U	0.60 U	0.59 U	0.56 U	0.65 U	2.9 U
Hexachloroethane	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.206	0.12 U	0.816	0.11 U	0.445	2.32
Isophorone	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
2-Methylnaphthalene	mg/kg	0.11 U	0.12 U	0.12 U	0.11 U	0.13 U	0.58 U
Naphthalene	mg/kg	0.118	0.12 U	0.12 U	0.11 U	0.13 U	0.803
Nitrobenzene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
N-Nitroso-di-n-propylamine	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
N-Nitrosodiphenylamine	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
Phenanthrene	mg/kg	0.851	0.12 U	1.4	0.11 U	1.22	11.9
Pyrene	mg/kg	1.02	0.12 U	2.88	0.11 U	2.12	11.4
1,2,4-Trichlorobenzene	mg/kg	0.28 U	0.30 U	0.30 U	0.28 U	0.32 U	1.4 U
GC Volatiles (SW846 8015)							
TPH-GRO (VOA)	mg/kg	6.3 U	7.1 U	6.6 U	4.9 U	8.2 U	6.8 U
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/kg	0.038 U	0.041 U	0.038 U	0.037 U	0.043 U	0.039 U
Aroclor 1221	mg/kg	0.038 U	0.041 U	0.038 U	0.037 U	0.043 U	0.039 U
Aroclor 1232	mg/kg	0.038 U	0.041 U	0.038 U	0.037 U	0.043 U	0.039 U
Aroclor 1242	mg/kg	0.038 U	0.041 U	0.038 U	0.037 U	0.043 U	0.039 U
Aroclor 1248	mg/kg	0.038 U	0.041 U	0.038 U	0.037 U	0.043 U	0.039 U
Aroclor 1254	mg/kg	3.87	0.888	0.196	0.037 U	0.043 U	4.74
Aroclor 1260	mg/kg	0.038 U	0.041 U	0.038 U	0.037 U	0.043 U	0.039 U
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/kg	26.3	20 U	46.8	19 U	52.4	309
Metals Analysis							
Antimony	mg/kg	0.90 U	0.98 U	0.95 U	0.89 U	0.78 U	0.98 U
Arsenic	mg/kg	3	5.2	3.8	2	4.3	2.7
Beryllium	mg/kg	0.36 U	0.39 U	0.4	0.36 U	0.31 U	0.39 U
Cadmium	mg/kg	0.36 U	0.39 U	0.38 U	0.36 U	0.31 U	0.39 U
Chromium	mg/kg	8	6.4	9.4	17.9	5	15.1
Copper	mg/kg	17.8	14.7	20.1	10.9	21	19.3
Lead	mg/kg	88.2	25.2	105	10.5	113	137
TCLP Lead	mg/L	NA	NA	0.059	0.013	0.13	NA
Mercury	mg/kg	0.037	0.040 U	0.067	0.038 U	0.036	0.11
Nickel	mg/kg	7.6	9	6.7	9.2	4.8	7.1
Selenium	mg/kg	0.90 U	3.2	0.95 U	0.89 U	0.78 U	0.98 U
Silver	mg/kg	0.45 U	0.49 U	0.48 U	0.44 U	0.39 U	0.49 U
Thallium	mg/kg	0.90 U	0.98 U	0.95 U	0.89 U	0.78 U	0.98 U
Zinc	mg/kg	49.3	33.7	62.8	31.5	43.4	61.5
General Chemistry							
Solids, Percent	%	88.4	81.1	84	86	74.8	83.9

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Client Sample ID:		A-2013-B-5/MW-5 0-2'	A-2013-B-5/MW-5 4-6'	A-2013-B-6 0-2'	A-2013-B-6 4-6'	A-2013-TP-1 0-2'	A-2013-TP-1 4-6'
Lab Sample ID:		MC27613-7	MC27613-8	MC27613-9	MC27613-10	MC27613-11	MC27613-12
Date Sampled:		1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/10/2014	1/10/2014
Matrix:		Soil	Soil	Soil	Soil	Soil	Soil
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic acid	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2-Chlorophenol	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
4-Chloro-3-methyl phenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2,4-Dichlorophenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2,4-Dimethylphenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2,4-Dinitrophenol	mg/kg	6.0 U	1.1 U	5.5 U	1.1 U	1.1 U	1.2 U
2-Methylphenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
3&4-Methylphenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2-Nitrophenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
4-Nitrophenol	mg/kg	6.0 U	1.1 U	5.5 U	1.1 U	1.1 U	1.2 U
Pentachlorophenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
Phenol	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
2,4,5-Trichlorophenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2,4,6-Trichlorophenol	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
Acenaphthene	mg/kg	2.7	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Acenaphthylene	mg/kg	0.818	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Acetophenone	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
Aniline	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
Anthracene	mg/kg	5.64	0.11 U	0.802	0.11 U	0.11 U	0.12 U
Benzo(a)anthracene	mg/kg	15.7	0.11 U	2.74	0.11 U	0.11 U	0.12 U
Benzo(a)pyrene	mg/kg	14	0.11 U	2.65	0.11 U	0.11 U	0.12 U
Benzo(b)fluoranthene	mg/kg	11.7	0.11 U	2.36	0.11 U	0.11 U	0.12 U
Benzo(g,h,i)perylene	mg/kg	7.52	0.11 U	1.55	0.11 U	0.11 U	0.12 U
Benzo(k)fluoranthene	mg/kg	11.4	0.11 U	1.94	0.11 U	0.11 U	0.12 U
4-Bromophenyl phenyl ether	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Butyl benzyl phthalate	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
2-Chloronaphthalene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
4-Chloroaniline	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
Chrysene	mg/kg	15.8	0.11 U	2.83	0.11 U	0.11 U	0.12 U
bis(2-Chloroethoxy)methane	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
bis(2-Chloroethyl)ether	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
bis(2-Chloroisopropyl)ether	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
1,2-Dichlorobenzene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
1,2-Diphenylhydrazine	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
1,3-Dichlorobenzene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
1,4-Dichlorobenzene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
2,4-Dinitrotoluene	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
2,6-Dinitrotoluene	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
3,3'-Dichlorobenzidine	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Dibenzo(a,h)anthracene	mg/kg	2.99	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Dibenzofuran	mg/kg	1.82	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Di-n-butyl phthalate	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Di-n-octyl phthalate	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Diethyl phthalate	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Dimethyl phthalate	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
bis(2-Ethylhexyl)phthalate	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Fluoranthene	mg/kg	34.5	0.11 U	5.24	0.11 U	0.11 U	0.12 U
Fluorene	mg/kg	2.25	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Hexachlorobenzene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Hexachlorobutadiene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Hexachlorocyclopentadiene	mg/kg	3.0 U	0.57 U	2.8 U	0.53 U	0.55 U	0.60 U
Hexachloroethane	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Indeno(1,2,3-cd)pyrene	mg/kg	7.44	0.11 U	1.52	0.11 U	0.11 U	0.12 U
Isophorone	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
2-Methylnaphthalene	mg/kg	0.77	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Naphthalene	mg/kg	1.66	0.11 U	0.55 U	0.11 U	0.11 U	0.12 U
Nitrobenzene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
N-Nitroso-di-n-propylamine	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
N-Nitrosodiphenylamine	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
Phenanthrene	mg/kg	27.4	0.11 U	3.75	0.11 U	0.11 U	0.12 U
Pyrene	mg/kg	33.3	0.11 U	5.37	0.11 U	0.11 U	0.12 U
1,2,4-Trichlorobenzene	mg/kg	1.5 U	0.28 U	1.4 U	0.26 U	0.27 U	0.30 U
GC Volatiles (SW846 8015)							
TPH-GRO (VOA)	mg/kg	6.6 U	6.1 U	5.7 U	5.4 U	5.7 U	7.1 U
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/kg	0.039 U	0.036 U	0.036 U	0.034 U	0.037 U	0.040 U
Aroclor 1221	mg/kg	0.039 U	0.036 U	0.036 U	0.034 U	0.037 U	0.040 U
Aroclor 1232	mg/kg	0.039 U	0.036 U	0.036 U	0.034 U	0.037 U	0.040 U
Aroclor 1242	mg/kg	0.039 U	0.036 U	0.036 U	0.034 U	0.037 U	0.040 U
Aroclor 1248	mg/kg	0.039 U	0.036 U	0.036 U	0.034 U	0.037 U	0.040 U
Aroclor 1254	mg/kg	0.477 *	0.036 U	0.111	0.034 U	0.037 U	0.040 U
Aroclor 1260	mg/kg	0.039 U	0.036 U	0.036 U	0.034 U	0.037 U	0.040 U
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/kg	428	18 U	101	18 U	29.8	20 U
Metals Analysis							
Antimony	mg/kg	0.83 U	0.94 U	0.90 U	0.87 U	0.91 U	0.98 U
Arsenic	mg/kg	11.6	3	2.9	2	2.3	2.1
Beryllium	mg/kg	0.49	0.38 U	0.36 U	0.35 U	0.37 U	0.39 U
Cadmium	mg/kg	0.33	0.38 U	0.36 U	0.35 U	0.37 U	0.39 U
Chromium	mg/kg	12.6	8.3	6.5	11.5	6.6	5.6
Copper	mg/kg	32.4	5.3	17.8	6.2	5.2	5.6
Lead	mg/kg	403	5.4	214	3.5	13.7	7.4
TCLP Lead	mg/L	0.37	NA	0.28	NA	NA	NA
Mercury	mg/kg	0.087	0.038 U	0.25	0.035 U	0.037 U	0.039 U
Nickel	mg/kg	9.6	5.6	4.9	8.1	3.7 U	3.9 U
Selenium	mg/kg	3.3	0.94 U	0.90 U	0.87 U	0.91 U	0.98 U
Silver	mg/kg	0.42 U	0.47 U	0.45 U	0.43 U	0.46 U	0.49 U
Thallium	mg/kg	0.83 U	0.94 U	0.90 U	0.87 U	0.91 U	0.98 U
Zinc	mg/kg	253	14.3	71.2	18.4	14.5	15.4
General Chemistry							
Solids, Percent	%	82.6	86.5	90.3	93.2	89	82

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Client Sample ID:		A-2013-TP-2 0-2'	A-2013-TP-2 4-6'	A-2013-TP-3 0-2'	A-2013-TP-4 0-2'	A-2013-TP-4 4-6'	A-2013-TP-5 0-2'
Lab Sample ID:		MC27613-13	MC27613-14	MC27613-15	MC27613-16	MC27613-17	MC27613-18
Date Sampled:		1/10/2014	1/10/2014	1/10/2014	1/10/2014	1/10/2014	1/10/2014
Matrix:		Soil	Soil	Soil	Soil	Soil	Soil
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic acid	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2-Chlorophenol	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
4-Chloro-3-methyl phenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2,4-Dichlorophenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2,4-Dimethylphenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2,4-Dinitrophenol	mg/kg	1.1 U	1.2 U	5.8 U	5.9 U	1.1 U	1.1 U
2-Methylphenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
3&4-Methylphenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2-Nitrophenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
4-Nitrophenol	mg/kg	1.1 U	1.2 U	5.8 U	5.9 U	1.1 U	1.1 U
Pentachlorophenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
Phenol	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
2,4,5-Trichlorophenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2,4,6-Trichlorophenol	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
Acenaphthene	mg/kg	0.229	0.465	0.743	0.914	0.11 U	0.11 U
Acenaphthylene	mg/kg	0.154	0.12 U	0.58 U	2.06	0.11 U	0.11 U
Acetophenone	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
Aniline	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
Anthracene	mg/kg	0.639	0.339	1.83	5.24	0.11 U	0.149
Benzo(a)anthracene	mg/kg	1.87	1.21	5.83	19.9	0.193	0.778
Benzo(a)pyrene	mg/kg	1.71	1.09	4.89	18.4	0.181	0.802
Benzo(b)fluoranthene	mg/kg	1.68	0.952	4.56	16.3	0.168	0.705
Benzo(g,h,i)perylene	mg/kg	1.08	0.626	2.8	10	0.111	0.528
Benzo(k)fluoranthene	mg/kg	1.17	0.854	4.01	13.6	0.133	0.636
4-Bromophenyl phenyl ether	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Butyl benzyl phthalate	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
2-Chloronaphthalene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
4-Chloroaniline	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
Chrysene	mg/kg	1.84	1.18	5.8	18.2	0.181	0.849
bis(2-Chloroethoxy)methane	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
bis(2-Chloroethyl)ether	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
bis(2-Chloroisopropyl)ether	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
1,2-Dichlorobenzene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
1,2-Diphenylhydrazine	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
1,3-Dichlorobenzene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
1,4-Dichlorobenzene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
2,4-Dinitrotoluene	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
2,6-Dinitrotoluene	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
3,3'-Dichlorobenzidine	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Dibenzo(a,h)anthracene	mg/kg	0.267	0.219	0.905	3.7	0.11 U	0.174
Dibenzofuran	mg/kg	0.179	0.315	0.58 U	1.07	0.11 U	0.11 U
Di-n-butyl phthalate	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Di-n-octyl phthalate	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Diethyl phthalate	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Dimethyl phthalate	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
bis(2-Ethylhexyl)phthalate	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Fluoranthene	mg/kg	3.84	2.56	11.6	45.1	0.397	1.4
Fluorene	mg/kg	0.208	0.309	0.767	1.45	0.11 U	0.11 U
Hexachlorobenzene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Hexachlorobutadiene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Hexachlorocyclopentadiene	mg/kg	0.55 U	0.58 U	2.9 U	3.0 U	0.56 U	0.55 U
Hexachloroethane	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.983	0.566	2.77	9.82	0.11 U	0.471
Isophorone	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
2-Methylnaphthalene	mg/kg	0.11 U	0.164	0.58 U	0.59 U	0.11 U	0.11 U
Naphthalene	mg/kg	0.129	0.492	0.58 U	0.688	0.11 U	0.11 U
Nitrobenzene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
N-Nitroso-di-n-propylamine	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
N-Nitrosodiphenylamine	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
Phenanthrene	mg/kg	2.79	2.55	9.04	25.8	0.244	0.814
Pyrene	mg/kg	3.76	2.45	10.7	41.1	0.376	1.57
1,2,4-Trichlorobenzene	mg/kg	0.28 U	0.29 U	1.4 U	1.5 U	0.28 U	0.27 U
GC Volatiles (SW846 8015)							
TPH-GRO (VOA)	mg/kg	5.8 U	6.7 U	6.5 U	6.6 U	5.9 U	6.1 U
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/kg	0.038 U	0.038 U	0.037 U	0.039 U	0.036 U	0.037 U
Aroclor 1221	mg/kg	0.038 U	0.038 U	0.037 U	0.039 U	0.036 U	0.037 U
Aroclor 1232	mg/kg	0.038 U	0.038 U	0.037 U	0.039 U	0.036 U	0.037 U
Aroclor 1242	mg/kg	0.038 U	0.038 U	0.037 U	0.039 U	0.036 U	0.037 U
Aroclor 1248	mg/kg	0.038 U	0.038 U	0.037 U	0.039 U	0.036 U	0.037 U
Aroclor 1254	mg/kg	0.101 [a]	0.038 U	0.037 U	0.144	0.036 U	0.037 U
Aroclor 1260	mg/kg	0.038 U	0.038 U	0.037 U	0.039 U	0.036 U	0.037 U
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/kg	72.6	19 U	214	737	18 U	18 U
Metals Analysis							
Antimony	mg/kg	0.90 U	0.94 U	0.94 U	0.99 U	0.91 U	0.89 U
Arsenic	mg/kg	2	5.2	7.1	5.3	2.2	3
Beryllium	mg/kg	0.36 U	0.53	0.37	0.40 U	0.36 U	0.36 U
Cadmium	mg/kg	0.36 U	0.38 U	0.37 U	0.40 U	0.36 U	0.36 U
Chromium	mg/kg	7	10.7	9.9	6.4	6.6	5.5
Copper	mg/kg	92.4	28.7	16.4	30.2	6.6	9.7
Lead	mg/kg	66.4	11.3	1010	830	23	53.1
TCLP Lead	mg/L	NA	NA	2.5	0.78	NA	NA
Mercury	mg/kg	0.047	0.037 U	0.099	0.21	0.037 U	0.12
Nickel	mg/kg	5.6	4.9	6.2	7.6	5.4	4.2
Selenium	mg/kg	0.90 U	0.94 U	0.94 U	0.99 U	0.91 U	0.89 U
Silver	mg/kg	0.45 U	0.47 U	0.47 U	0.50 U	0.45 U	0.45 U
Thallium	mg/kg	0.90 U	0.94 U	0.94 U	0.99 U	0.91 U	0.89 U
Zinc	mg/kg	34.8	46.2	373	297	22	53
General Chemistry							
Solids, Percent	%	88.5	85.3	86.1	82.7	88.3	88.8

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Client Sample ID:		A-2013-TP-5 4'-6'	A-2013-TP-6 0-2'	A-2013-TP-6 4-6'	A-2013-TP-7 0-2'	A-2013-TP-7 4-6'	A-2013-TP-8-0-2'
Lab Sample ID:		MC27613-19	MC27613-20	MC27613-21	MC27613-22	MC27613-23	MC27613-24
Date Sampled:		1/10/2014	1/10/2014	1/10/2014	1/10/2014	1/10/2014	1/10/2014
Matrix:		Soil	Soil	Soil	Soil	Soil	Soil
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic acid	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2-Chlorophenol	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
4-Chloro-3-methyl phenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2,4-Dichlorophenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2,4-Dimethylphenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2,4-Dinitrophenol	mg/kg	1.1 U	5.4 U	1.1 U	11 U	1.1 U	1.3 U
2-Methylphenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
3&4-Methylphenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2-Nitrophenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
4-Nitrophenol	mg/kg	1.1 U	5.4 U	1.1 U	11 U	1.1 U	1.3 U
Pentachlorophenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
Phenol	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
2,4,5-Trichlorophenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2,4,6-Trichlorophenol	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
Acenaphthene	mg/kg	0.11 U	0.54 U	0.11 U	26.1	0.11 U	0.13 U
Acenaphthylene	mg/kg	0.11 U	0.54 U	0.123	7.28	0.11 U	0.13 U
Acetophenone	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
Aniline	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
Anthracene	mg/kg	0.11 U	0.754	0.262	44.7	0.11 U	0.13 U
Benzo(a)anthracene	mg/kg	0.11 U	4.36	1.3	92.6	0.11 U	0.164
Benzo(a)pyrene	mg/kg	0.11 U	4.4	1.35	83.2	0.11 U	0.174
Benzo(b)fluoranthene	mg/kg	0.11 U	3.85	1.22	70.3	0.11 U	0.154
Benzo(g,h,i)perylene	mg/kg	0.11 U	2.88	0.863	46.9	0.11 U	0.13 U
Benzo(k)fluoranthene	mg/kg	0.11 U	3.29	1.02	51.8	0.11 U	0.13 U
4-Bromophenyl phenyl ether	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Butyl benzyl phthalate	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
2-Chloronaphthalene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
4-Chloroaniline	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
Chrysene	mg/kg	0.11 U	4.05	1.3	90.8	0.11 U	0.145
bis(2-Chloroethoxy)methane	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
bis(2-Chloroethyl)ether	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
bis(2-Chloroisopropyl)ether	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
1,2-Dichlorobenzene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
1,2-Diphenylhydrazine	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
1,3-Dichlorobenzene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
1,4-Dichlorobenzene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
2,4-Dinitrotoluene	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
2,6-Dinitrotoluene	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
3,3'-Dichlorobenzidine	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Dibenzo(a,h)anthracene	mg/kg	0.11 U	0.673	0.266	16	0.11 U	0.13 U
Dibenzofuran	mg/kg	0.11 U	0.54 U	0.11 U	18.9	0.11 U	0.13 U
Di-n-butyl phthalate	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Di-n-octyl phthalate	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Diethyl phthalate	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Dimethyl phthalate	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
bis(2-Ethylhexyl)phthalate	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Fluoranthene	mg/kg	0.11 U	7.41	2.42	224	0.211	0.314
Fluorene	mg/kg	0.11 U	0.54 U	0.11 U	22.2	0.11 U	0.13 U
Hexachlorobenzene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Hexachlorobutadiene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Hexachlorocyclopentadiene	mg/kg	0.57 U	2.7 U	0.54 U	5.5 U	0.57 U	0.63 U
Hexachloroethane	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.11 U	2.65	0.81	43.4	0.11 U	0.13 U
Isophorone	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
2-Methylnaphthalene	mg/kg	0.11 U	0.54 U	0.11 U	6.83	0.11 U	0.13 U
Naphthalene	mg/kg	0.11 U	0.54 U	0.11 U	12.9	0.11 U	0.13 U
Nitrobenzene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
N-Nitroso-di-n-propylamine	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
N-Nitrosodiphenylamine	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
Phenanthrene	mg/kg	0.11 U	2.88	1.22	235	0.201	0.13
Pyrene	mg/kg	0.11 U	7.78	2.42	200	0.196	0.311
1,2,4-Trichlorobenzene	mg/kg	0.28 U	1.4 U	0.27 U	2.8 U	0.28 U	0.31 U
GC Volatiles (SW846 8015)							
TPH-GRO (VOA)	mg/kg	6.3 U	5.7 U	5.8 U	5.8 U	6.4 U	7.6 U
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/kg	0.037 U	0.036 U	0.037 U	0.036 U	0.038 U	0.042 U
Aroclor 1221	mg/kg	0.037 U	0.036 U	0.037 U	0.036 U	0.038 U	0.042 U
Aroclor 1232	mg/kg	0.037 U	0.036 U	0.037 U	0.036 U	0.038 U	0.042 U
Aroclor 1242	mg/kg	0.037 U	0.036 U	0.037 U	0.036 U	0.038 U	0.042 U
Aroclor 1248	mg/kg	0.037 U	0.036 U	0.037 U	0.036 U	0.038 U	0.042 U
Aroclor 1254	mg/kg	0.037 U	0.111	0.0537 [a]	0.904	0.038 U	0.0715
Aroclor 1260	mg/kg	0.037 U	0.036 U	0.037 U	0.036 U	0.038 U	0.042 U
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/kg	19 U	105	48.4	3310	19 U	20 U
Metals Analysis							
Antimony	mg/kg	0.92 U	0.89 U	0.90 U	0.88 U	0.96 U	1.0 U
Arsenic	mg/kg	1.9	5.2	2	6.9	3.7	3.6
Beryllium	mg/kg	0.37 U	0.36 U	0.36 U	0.35 U	0.38 U	0.41 U
Cadmium	mg/kg	0.37 U	0.36 U	0.36 U	0.35 U	0.38 U	0.41 U
Chromium	mg/kg	4.5	7.6	6.1	6.6	6.9	8
Copper	mg/kg	4.1	47.6	8.2	36.1	4.2	17.4
Lead	mg/kg	3.6	831	57	500	8.5	49.3
TCLP Lead	mg/L	NA	0.98	NA	0.36	NA	NA
Mercury	mg/kg	0.038 U	0.46	0.036 U	0.34	0.038 U	0.077
Nickel	mg/kg	4.2	7.9	4.5	4.9	4.5	4.1 U
Selenium	mg/kg	0.92 U	0.89 U	0.90 U	0.88 U	0.96 U	1.0 U
Silver	mg/kg	0.46 U	0.44 U	0.45 U	0.44 U	0.48 U	0.51 U
Thallium	mg/kg	0.92 U	0.89 U	0.90 U	0.88 U	0.96 U	1.0 U
Zinc	mg/kg	15.5	359	46.2	182	19.5	24.2
General Chemistry							
Solids, Percent	%	85.5	89.3	90.5	90.7	84.4	79.3

DRAFT

Client Sample ID:		A-2013-TP-8-4-6'	DUP-2320	DUP-2321			
Lab Sample ID:		MC27613-25	MC27613-26	MC27613-27			
Date Sampled:		1/10/2014	1/10/2014	1/10/2014			
Matrix:		Soil	Soil	Soil			
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic acid	mg/kg	0.57 U	0.56 U	0.54 U			
2-Chlorophenol	mg/kg	0.28 U	0.28 U	0.27 U			
4-Chloro-3-methyl phenol	mg/kg	0.57 U	0.56 U	0.54 U			
2,4-Dichlorophenol	mg/kg	0.57 U	0.56 U	0.54 U			
2,4-Dimethylphenol	mg/kg	0.57 U	0.56 U	0.54 U			
2,4-Dinitrophenol	mg/kg	1.1 U	1.1 U	1.1 U			
2-Methylphenol	mg/kg	0.57 U	0.56 U	0.54 U			
3&4-Methylphenol	mg/kg	0.57 U	0.56 U	0.54 U			
2-Nitrophenol	mg/kg	0.57 U	0.56 U	0.54 U			
4-Nitrophenol	mg/kg	1.1 U	1.1 U	1.1 U			
Pentachlorophenol	mg/kg	0.57 U	0.56 U	0.54 U			
Phenol	mg/kg	0.28 U	0.28 U	0.27 U			
2,4,5-Trichlorophenol	mg/kg	0.57 U	0.56 U	0.54 U			
2,4,6-Trichlorophenol	mg/kg	0.57 U	0.56 U	0.54 U			
Acenaphthene	mg/kg	0.11 U	0.11 U	0.138			
Acenaphthylene	mg/kg	0.11 U	0.11 U	0.11 U			
Acetophenone	mg/kg	0.57 U	0.56 U	0.54 U			
Aniline	mg/kg	0.57 U	0.56 U	0.54 U			
Anthracene	mg/kg	0.11 U	0.11 U	0.303			
Benzo(a)anthracene	mg/kg	0.126	0.11 U	1.22			
Benzo(a)pyrene	mg/kg	0.132	0.11 U	1.29			
Benzo(b)fluoranthene	mg/kg	0.125	0.11 U	1.22			
Benzo(g,h,i)perylene	mg/kg	0.11 U	0.11 U	0.831			
Benzo(k)fluoranthene	mg/kg	0.11 U	0.11 U	0.925			
4-Bromophenyl phenyl ether	mg/kg	0.28 U	0.28 U	0.27 U			
Butyl benzyl phthalate	mg/kg	0.28 U	0.28 U	0.27 U			
2-Chloronaphthalene	mg/kg	0.28 U	0.28 U	0.27 U			
4-Chloroaniline	mg/kg	0.57 U	0.56 U	0.54 U			
Chrysene	mg/kg	0.11 U	0.11 U	1.21			
bis(2-Chloroethoxy)methane	mg/kg	0.28 U	0.28 U	0.27 U			
bis(2-Chloroethyl)ether	mg/kg	0.28 U	0.28 U	0.27 U			
bis(2-Chloroisopropyl)ether	mg/kg	0.28 U	0.28 U	0.27 U			
1,2-Dichlorobenzene	mg/kg	0.28 U	0.28 U	0.27 U			
1,2-Diphenylhydrazine	mg/kg	0.28 U	0.28 U	0.27 U			
1,3-Dichlorobenzene	mg/kg	0.28 U	0.28 U	0.27 U			
1,4-Dichlorobenzene	mg/kg	0.28 U	0.28 U	0.27 U			
2,4-Dinitrotoluene	mg/kg	0.57 U	0.56 U	0.54 U			
2,6-Dinitrotoluene	mg/kg	0.57 U	0.56 U	0.54 U			
3,3'-Dichlorobenzidine	mg/kg	0.28 U	0.28 U	0.27 U			
Dibenzo(a,h)anthracene	mg/kg	0.11 U	0.11 U	0.268			
Dibenzofuran	mg/kg	0.11 U	0.11 U	0.11 U			
Di-n-butyl phthalate	mg/kg	0.28 U	0.28 U	0.27 U			
Di-n-octyl phthalate	mg/kg	0.28 U	0.28 U	0.27 U			
Diethyl phthalate	mg/kg	0.28 U	0.28 U	0.27 U			
Dimethyl phthalate	mg/kg	0.28 U	0.28 U	0.27 U			
bis(2-Ethylhexyl)phthalate	mg/kg	0.28 U	0.28 U	0.27 U			
Fluoranthene	mg/kg	0.256	0.11 U	2.43			
Fluorene	mg/kg	0.11 U	0.11 U	0.156			
Hexachlorobenzene	mg/kg	0.28 U	0.28 U	0.27 U			
Hexachlorobutadiene	mg/kg	0.28 U	0.28 U	0.27 U			
Hexachlorocyclopentadiene	mg/kg	0.57 U	0.56 U	0.54 U			
Hexachloroethane	mg/kg	0.28 U	0.28 U	0.27 U			
Indeno(1,2,3-cd)pyrene	mg/kg	0.11 U	0.11 U	0.78			
Isophorone	mg/kg	0.28 U	0.28 U	0.27 U			
2-Methylnaphthalene	mg/kg	0.11 U	0.11 U	0.11 U			
Naphthalene	mg/kg	0.11 U	0.11 U	0.11 U			
Nitrobenzene	mg/kg	0.28 U	0.28 U	0.27 U			
N-Nitroso-di-n-propylamine	mg/kg	0.28 U	0.28 U	0.27 U			
N-Nitrosodiphenylamine	mg/kg	0.28 U	0.28 U	0.27 U			
Phenanthrene	mg/kg	0.11 U	0.11 U	1.55			
Pyrene	mg/kg	0.244	0.111	2.35			
1,2,4-Trichlorobenzene	mg/kg	0.28 U	0.28 U	0.27 U			
GC Volatiles (SW846 8015)							
TPH-GRO (VOA)	mg/kg	6.4 U	6.3 U	5.8 U			
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/kg	0.038 U	0.038 U	0.037 U			
Aroclor 1221	mg/kg	0.038 U	0.038 U	0.037 U			
Aroclor 1232	mg/kg	0.038 U	0.038 U	0.037 U			
Aroclor 1242	mg/kg	0.038 U	0.038 U	0.037 U			
Aroclor 1248	mg/kg	0.038 U	0.038 U	0.037 U			
Aroclor 1254	mg/kg	0.0723	0.038 U	0.0418 [a]			
Aroclor 1260	mg/kg	0.038 U	0.038 U	0.037 U			
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/kg	18 U	19 U	121			
Metals Analysis							
Antimony	mg/kg	0.92 U	0.91 U	0.90 U			
Arsenic	mg/kg	2.1	2	2.1			
Beryllium	mg/kg	0.37 U	0.36 U	0.36 U			
Cadmium	mg/kg	0.37 U	0.36 U	0.36 U			
Chromium	mg/kg	10.7	5	6.1			
Copper	mg/kg	6.8	4.1	7.2			
Lead	mg/kg	8.1	9.9	44.5			
TCLP Lead	mg/L	NA	NA	NA			
Mercury	mg/kg	0.036 U	0.037 U	0.045			
Nickel	mg/kg	6.2	3.6 U	3.8			
Selenium	mg/kg	0.92 U	0.91 U	0.90 U			
Silver	mg/kg	0.46 U	0.46 U	0.45 U			
Thallium	mg/kg	0.92 U	0.91 U	0.90 U			
Zinc	mg/kg	16.2	10.2	41.5			
General Chemistry							
Solids, Percent	%	87.2	87.8	89.6			

Footnotes:

[a] Due to Matrix Interference less than five GC peaks characteristic for reported Aroclors are used for quantization.

NA - Not Analyzed

DRAFT

Accutest Labs of New England, Inc.

8/22/2014 12:10

Job Number:	MC27810
Account:	Apex Companies, LLC
Project:	NBMCT, Blackmer, New Bedford, MA
Project Number:	6690.027

Legend: Hit | Exceed

Client Sample ID:		MA MCP Method 1: GW-3 Standard (310 CMR 6/14)	MW-1	MW-1	MW-2	MW-2	MW-3
Lab Sample ID:			MC27810-1	MC27810-1F	MC27810-2	MC27810-2F	MC27810-3
Date Sampled:			1/21/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014
Matrix:			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic Acid	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
2-Chlorophenol	mg/l	7	0.0050 U	-	0.0050 U	-	0.0050 U
4-Chloro-3-methyl phenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
2,4-Dichlorophenol	mg/l	2	0.010 U	-	0.010 U	-	0.010 U
2,4-Dimethylphenol	mg/l	50	0.010 U	-	0.010 U	-	0.010 U
2,4-Dinitrophenol	mg/l	20	0.020 U	-	0.020 U	-	0.020 U
2-Methylphenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
3&4-Methylphenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
2-Nitrophenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
4-Nitrophenol	mg/l	-	0.020 U	-	0.020 U	-	0.020 U
Pentachlorophenol	mg/l	0.2	0.010 U	-	0.010 U	-	0.010 U
Phenol	mg/l	2	0.0050 U	-	0.0050 U	-	0.0050 U
2,4,5-Trichlorophenol	mg/l	3	0.010 U	-	0.010 U	-	0.010 U
2,4,6-Trichlorophenol	mg/l	0.5	0.010 U	-	0.010 U	-	0.010 U
Acenaphthene	mg/l	10	0.0020 U	-	0.0020 U	-	0.0020 U
Acenaphthylene	mg/l	0.04	0.0020 U	-	0.0020 U	-	0.0020 U
Acetophenone	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
Aniline	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
Anthracene	mg/l	0.03	0.0020 U	-	0.0020 U	-	0.0020 U
Benzo(a)anthracene	mg/l	1	0.0020 U	-	0.0020 U	-	0.0045
Benzo(a)pyrene	mg/l	0.5	0.0020 U	-	0.0020 U	-	0.0043
Benzo(b)fluoranthene	mg/l	0.4	0.0020 U	-	0.0020 U	-	0.0036
Benzo(g,h,i)perylene	mg/l	0.02	0.0020 U	-	0.0020 U	-	0.0027
Benzo(k)fluoranthene	mg/l	0.1	0.0020 U	-	0.0020 U	-	0.0035
4-Bromophenyl phenyl ether	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Butyl benzyl phthalate	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
2-Chloronaphthalene	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
4-Chloroaniline	mg/l	0.3	0.010 U	-	0.010 U	-	0.010 U
Chrysene	mg/l	0.07	0.0020 U	-	0.0020 U	-	0.004
bis(2-Chloroethoxy)methane	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
bis(2-Chloroethyl)ether	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
bis(2-Chloroisopropyl)ether	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
1,2-Dichlorobenzene	mg/l	2	0.0050 U	-	0.0050 U	-	0.0050 U
1,2-Diphenylhydrazine	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
1,3-Dichlorobenzene	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
1,4-Dichlorobenzene	mg/l	8	0.0050 U	-	0.0050 U	-	0.0050 U
2,4-Dinitrotoluene	mg/l	50	0.010 U	-	0.010 U	-	0.010 U
2,6-Dinitrotoluene	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
3,3'-Dichlorobenzidine	mg/l	2	0.0050 U	-	0.0050 U	-	0.0050 U
Dibenzo(a,h)anthracene	mg/l	0.04	0.0020 U	-	0.0020 U	-	0.0020 U
Dibenzofuran	mg/l	-	0.0020 U	-	0.0020 U	-	0.0020 U
Di-n-butyl phthalate	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Di-n-octyl phthalate	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Diethyl phthalate	mg/l	9	0.0050 U	-	0.0050 U	-	0.0050 U
Dimethyl phthalate	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
bis(2-Ethylhexyl)phthalate	mg/l	50	0.0020 U	-	0.0020 U	-	0.0020 U
Fluoranthene	mg/l	0.2	0.0020 U	-	0.0020 U	-	0.0099
Fluorene	mg/l	0.04	0.0020 U	-	0.0020 U	-	0.0020 U
Hexachlorobenzene	mg/l	6	0.0050 U	-	0.0050 U	-	0.0050 U
Hexachlorobutadiene	mg/l	3	0.0050 U	-	0.0050 U	-	0.0050 U
Hexachlorocyclopentadiene	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
Hexachloroethane	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
Indeno(1,2,3-cd)pyrene	mg/l	0.1	0.0020 U	-	0.0020 U	-	0.0025
Isophorone	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
2-Methylnaphthalene	mg/l	20	0.0020 U	-	0.0020 U	-	0.0020 U
Naphthalene	mg/l	20	0.0020 U	-	0.0020 U	-	0.0020 U
Nitrobenzene	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
N-Nitroso-di-n-propylamine	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
N-Nitrosodiphenylamine	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Phenanthrene	mg/l	10	0.0020 U	-	0.0020 U	-	0.0042
Pyrene	mg/l	0.02	0.0020 U	-	0.0020 U	-	0.0092
1,2,4-Trichlorobenzene	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1221	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1232	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1242	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1248	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1254	mg/l	0.01	0.0022	-	0.00031 U	-	0.00030 U
Aroclor 1260	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1262	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1268	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/l	-	0.24 U	-	0.24 U	-	0.26 U
Metals Analysis							
Antimony	mg/l	8	-	0.0060 U	-	0.0060 U	-
Arsenic	mg/l	0.9	-	0.0040 U	-	0.0040 U	-
Beryllium	mg/l	0.2	-	0.0040 U	-	0.0040 U	-
Cadmium	mg/l	0.004	-	0.0040 U	-	0.0040 U	-
Chromium	mg/l	0.3	-	0.010 U	-	0.010 U	-
Copper	mg/l	-	-	0.025 U	-	0.025 U	-
Lead	mg/l	0.01	-	0.0050 U	-	0.0050 U	-
Mercury	mg/l	0.02	-	0.00020 U	-	0.00020 U	-
Nickel	mg/l	0.2	-	0.040 U	-	0.040 U	-
Selenium	mg/l	0.1	-	0.010 U	-	0.010 U	-
Silver	mg/l	0.007	-	0.0050 U	-	0.0050 U	-
Thallium	mg/l	3	-	0.0050 U	-	0.0050 U	-
Zinc	mg/l	0.9	-	0.020 U	-	0.020 U	-

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Client Sample ID:		MA MCP Method 1: GW-3 Standard (310 CMR 6/14)	MW-3	MW-5	MW-5	DUP-C-W-100	DUP-C-W-100
Lab Sample ID:			MC27810-3F	MC27810-4	MC27810-4F	MC27810-5	MC27810-5F
Date Sampled:			1/21/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014
Matrix:			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic Acid	mg/l	-	-	0.010 U	-	0.010 U	-
2-Chlorophenol	mg/l	7	-	0.0050 U	-	0.0050 U	-
4-Chloro-3-methyl phenol	mg/l	-	-	0.010 U	-	0.010 U	-
2,4-Dichlorophenol	mg/l	2	-	0.010 U	-	0.010 U	-
2,4-Dimethylphenol	mg/l	50	-	0.010 U	-	0.010 U	-
2,4-Dinitrophenol	mg/l	20	-	0.020 U	-	0.020 U	-
2-Methylphenol	mg/l	-	-	0.010 U	-	0.010 U	-
3&4-Methylphenol	mg/l	-	-	0.010 U	-	0.010 U	-
2-Nitrophenol	mg/l	-	-	0.010 U	-	0.010 U	-
4-Nitrophenol	mg/l	-	-	0.020 U	-	0.020 U	-
Pentachlorophenol	mg/l	0.2	-	0.010 U	-	0.010 U	-
Phenol	mg/l	2	-	0.0050 U	-	0.0050 U	-
2,4,5-Trichlorophenol	mg/l	3	-	0.010 U	-	0.010 U	-
2,4,6-Trichlorophenol	mg/l	0.5	-	0.010 U	-	0.010 U	-
Acenaphthene	mg/l	10	-	0.0020 U	-	0.0020 U	-
Acenaphthylene	mg/l	0.04	-	0.0020 U	-	0.0020 U	-
Acetophenone	mg/l	-	-	0.010 U	-	0.010 U	-
Aniline	mg/l	-	-	0.010 U	-	0.010 U	-
Anthracene	mg/l	0.03	-	0.0020 U	-	0.0020 U	-
Benzo(a)anthracene	mg/l	1	-	0.0020 U	-	0.0020 U	-
Benzo(a)pyrene	mg/l	0.5	-	0.0020 U	-	0.0020 U	-
Benzo(b)fluoranthene	mg/l	0.4	-	0.0020 U	-	0.0020 U	-
Benzo(g,h,i)perylene	mg/l	0.02	-	0.0020 U	-	0.0020 U	-
Benzo(k)fluoranthene	mg/l	0.1	-	0.0020 U	-	0.0020 U	-
4-Bromophenyl phenyl ether	mg/l	-	-	0.0050 U	-	0.0050 U	-
Butyl benzyl phthalate	mg/l	-	-	0.0050 U	-	0.0050 U	-
2-Chloronaphthalene	mg/l	-	-	0.0050 U	-	0.0050 U	-
4-Chloroaniline	mg/l	0.3	-	0.010 U	-	0.010 U	-
Chrysene	mg/l	0.07	-	0.0020 U	-	0.0020 U	-
bis(2-Chloroethoxy)methane	mg/l	-	-	0.0050 U	-	0.0050 U	-
bis(2-Chloroethyl)ether	mg/l	50	-	0.0050 U	-	0.0050 U	-
bis(2-Chloroisopropyl)ether	mg/l	50	-	0.0050 U	-	0.0050 U	-
1,2-Dichlorobenzene	mg/l	2	-	0.0050 U	-	0.0050 U	-
1,2-Diphenylhydrazine	mg/l	-	-	0.0050 U	-	0.0050 U	-
1,3-Dichlorobenzene	mg/l	50	-	0.0050 U	-	0.0050 U	-
1,4-Dichlorobenzene	mg/l	8	-	0.0050 U	-	0.0050 U	-
2,4-Dinitrotoluene	mg/l	50	-	0.010 U	-	0.010 U	-
2,6-Dinitrotoluene	mg/l	-	-	0.010 U	-	0.010 U	-
3,3'-Dichlorobenzidine	mg/l	2	-	0.0050 U	-	0.0050 U	-
Dibenzo(a,h)anthracene	mg/l	0.04	-	0.0020 U	-	0.0020 U	-
Dibenzofuran	mg/l	-	-	0.0020 U	-	0.0020 U	-
Di-n-butyl phthalate	mg/l	-	-	0.0050 U	-	0.0050 U	-
Di-n-octyl phthalate	mg/l	-	-	0.0050 U	-	0.0050 U	-
Diethyl phthalate	mg/l	9	-	0.0050 U	-	0.0050 U	-
Dimethyl phthalate	mg/l	50	-	0.0050 U	-	0.0050 U	-
bis(2-Ethylhexyl)phthalate	mg/l	50	-	0.0020 U	-	0.0020 U	-
Fluoranthene	mg/l	0.2	-	0.0020 U	-	0.0020 U	-
Fluorene	mg/l	0.04	-	0.0020 U	-	0.0020 U	-
Hexachlorobenzene	mg/l	6	-	0.0050 U	-	0.0050 U	-
Hexachlorobutadiene	mg/l	3	-	0.0050 U	-	0.0050 U	-
Hexachlorocyclopentadiene	mg/l	-	-	0.010 U	-	0.010 U	-
Hexachloroethane	mg/l	50	-	0.0050 U	-	0.0050 U	-
Indeno(1,2,3-cd)pyrene	mg/l	0.1	-	0.0020 U	-	0.0020 U	-
Isophorone	mg/l	-	-	0.0050 U	-	0.0050 U	-
2-Methylnaphthalene	mg/l	20	-	0.0020 U	-	0.0020 U	-
Naphthalene	mg/l	20	-	0.0020 U	-	0.0020 U	-
Nitrobenzene	mg/l	-	-	0.0050 U	-	0.0050 U	-
N-Nitroso-di-n-propylamine	mg/l	-	-	0.0050 U	-	0.0050 U	-
N-Nitrosodiphenylamine	mg/l	-	-	0.0050 U	-	0.0050 U	-
Phenanthrene	mg/l	10	-	0.0020 U	-	0.0020 U	-
Pyrene	mg/l	0.02	-	0.0020 U	-	0.0020 U	-
1,2,4-Trichlorobenzene	mg/l	50	-	0.0050 U	-	0.0050 U	-
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1221	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1232	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1242	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1248	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1254	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1260	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1262	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1268	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/l	-	-	0.25 U	-	0.22 U	-
Metals Analysis							
Antimony	mg/l	8	0.0060 U	-	0.0060 U	-	0.0060 U
Arsenic	mg/l	0.9	0.0040 U	-	0.0040 U	-	0.0040 U
Beryllium	mg/l	0.2	0.0040 U	-	0.0040 U	-	0.0040 U
Cadmium	mg/l	0.004	0.0040 U	-	0.0040 U	-	0.0040 U
Chromium	mg/l	0.3	0.010 U	-	0.010 U	-	0.010 U
Copper	mg/l	-	0.025 U	-	0.025 U	-	0.025 U
Lead	mg/l	0.01	0.0050 U	-	0.0050 U	-	0.0050 U
Mercury	mg/l	0.02	0.00020 U	-	0.00020 U	-	0.00020 U
Nickel	mg/l	0.2	0.040 U	-	0.040 U	-	0.040 U
Selenium	mg/l	0.1	0.010 U	-	0.010 U	-	0.010 U
Silver	mg/l	0.007	0.0050 U	-	0.0050 U	-	0.0050 U
Thallium	mg/l	3	0.0050 U	-	0.0050 U	-	0.0050 U
Zinc	mg/l	0.9	0.0348	-	0.0955	-	0.098

Regulatory limits listed in this document have been obtained from the latest version of the regulations cited and are used for advisory purposes only. Accutest assumes no responsibility for errors in regulatory documents or changes to criteria detailed in later versions of the referenced regulation. It is the responsibility of the user to verify these limits before using or reporting any data.

No results exceeded regulatory criteria.

DRAFT

Accutest Labs of New England, Inc.

8/22/2014 12:10

Job Number:	MC27810
Account:	Apex Companies, LLC
Project:	NBMCT, Blackmer, New Bedford, MA
Project Number:	6690.027

Legend: Hit | Exceed

Client Sample ID:		MA MCP Method 1: GW-3 Standard (310 CMR 6/14)	MW-1	MW-1	MW-2	MW-2	MW-3
Lab Sample ID:			MC27810-1	MC27810-1F	MC27810-2	MC27810-2F	MC27810-3
Date Sampled:			1/21/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014
Matrix:			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic Acid	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
2-Chlorophenol	mg/l	7	0.0050 U	-	0.0050 U	-	0.0050 U
4-Chloro-3-methyl phenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
2,4-Dichlorophenol	mg/l	2	0.010 U	-	0.010 U	-	0.010 U
2,4-Dimethylphenol	mg/l	50	0.010 U	-	0.010 U	-	0.010 U
2,4-Dinitrophenol	mg/l	20	0.020 U	-	0.020 U	-	0.020 U
2-Methylphenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
3&4-Methylphenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
2-Nitrophenol	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
4-Nitrophenol	mg/l	-	0.020 U	-	0.020 U	-	0.020 U
Pentachlorophenol	mg/l	0.2	0.010 U	-	0.010 U	-	0.010 U
Phenol	mg/l	2	0.0050 U	-	0.0050 U	-	0.0050 U
2,4,5-Trichlorophenol	mg/l	3	0.010 U	-	0.010 U	-	0.010 U
2,4,6-Trichlorophenol	mg/l	0.5	0.010 U	-	0.010 U	-	0.010 U
Acenaphthene	mg/l	10	0.0020 U	-	0.0020 U	-	0.0020 U
Acenaphthylene	mg/l	0.04	0.0020 U	-	0.0020 U	-	0.0020 U
Acetophenone	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
Aniline	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
Anthracene	mg/l	0.03	0.0020 U	-	0.0020 U	-	0.0020 U
Benzo(a)anthracene	mg/l	1	0.0020 U	-	0.0020 U	-	0.0045
Benzo(a)pyrene	mg/l	0.5	0.0020 U	-	0.0020 U	-	0.0043
Benzo(b)fluoranthene	mg/l	0.4	0.0020 U	-	0.0020 U	-	0.0036
Benzo(g,h,i)perylene	mg/l	0.02	0.0020 U	-	0.0020 U	-	0.0027
Benzo(k)fluoranthene	mg/l	0.1	0.0020 U	-	0.0020 U	-	0.0035
4-Bromophenyl phenyl ether	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Butyl benzyl phthalate	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
2-Chloronaphthalene	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
4-Chloroaniline	mg/l	0.3	0.010 U	-	0.010 U	-	0.010 U
Chrysene	mg/l	0.07	0.0020 U	-	0.0020 U	-	0.004
bis(2-Chloroethoxy)methane	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
bis(2-Chloroethyl)ether	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
bis(2-Chloroisopropyl)ether	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
1,2-Dichlorobenzene	mg/l	2	0.0050 U	-	0.0050 U	-	0.0050 U
1,2-Diphenylhydrazine	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
1,3-Dichlorobenzene	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
1,4-Dichlorobenzene	mg/l	8	0.0050 U	-	0.0050 U	-	0.0050 U
2,4-Dinitrotoluene	mg/l	50	0.010 U	-	0.010 U	-	0.010 U
2,6-Dinitrotoluene	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
3,3'-Dichlorobenzidine	mg/l	2	0.0050 U	-	0.0050 U	-	0.0050 U
Dibenzo(a,h)anthracene	mg/l	0.04	0.0020 U	-	0.0020 U	-	0.0020 U
Dibenzofuran	mg/l	-	0.0020 U	-	0.0020 U	-	0.0020 U
Di-n-butyl phthalate	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Di-n-octyl phthalate	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Diethyl phthalate	mg/l	9	0.0050 U	-	0.0050 U	-	0.0050 U
Dimethyl phthalate	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
bis(2-Ethylhexyl)phthalate	mg/l	50	0.0020 U	-	0.0020 U	-	0.0020 U
Fluoranthene	mg/l	0.2	0.0020 U	-	0.0020 U	-	0.0099
Fluorene	mg/l	0.04	0.0020 U	-	0.0020 U	-	0.0020 U
Hexachlorobenzene	mg/l	6	0.0050 U	-	0.0050 U	-	0.0050 U
Hexachlorobutadiene	mg/l	3	0.0050 U	-	0.0050 U	-	0.0050 U
Hexachlorocyclopentadiene	mg/l	-	0.010 U	-	0.010 U	-	0.010 U
Hexachloroethane	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
Indeno(1,2,3-cd)pyrene	mg/l	0.1	0.0020 U	-	0.0020 U	-	0.0025
Isophorone	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
2-Methylnaphthalene	mg/l	20	0.0020 U	-	0.0020 U	-	0.0020 U
Naphthalene	mg/l	20	0.0020 U	-	0.0020 U	-	0.0020 U
Nitrobenzene	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
N-Nitroso-di-n-propylamine	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
N-Nitrosodiphenylamine	mg/l	-	0.0050 U	-	0.0050 U	-	0.0050 U
Phenanthrene	mg/l	10	0.0020 U	-	0.0020 U	-	0.0042
Pyrene	mg/l	0.02	0.0020 U	-	0.0020 U	-	0.0092
1,2,4-Trichlorobenzene	mg/l	50	0.0050 U	-	0.0050 U	-	0.0050 U
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1221	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1232	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1242	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1248	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1254	mg/l	0.01	0.0022	-	0.00031 U	-	0.00030 U
Aroclor 1260	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1262	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
Aroclor 1268	mg/l	0.01	0.00027 U	-	0.00031 U	-	0.00030 U
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/l	-	0.24 U	-	0.24 U	-	0.26 U
Metals Analysis							
Antimony	mg/l	8	-	0.0060 U	-	0.0060 U	-
Arsenic	mg/l	0.9	-	0.0040 U	-	0.0040 U	-
Beryllium	mg/l	0.2	-	0.0040 U	-	0.0040 U	-
Cadmium	mg/l	0.004	-	0.0040 U	-	0.0040 U	-
Chromium	mg/l	0.3	-	0.010 U	-	0.010 U	-
Copper	mg/l	-	-	0.025 U	-	0.025 U	-
Lead	mg/l	0.01	-	0.0050 U	-	0.0050 U	-
Mercury	mg/l	0.02	-	0.00020 U	-	0.00020 U	-
Nickel	mg/l	0.2	-	0.040 U	-	0.040 U	-
Selenium	mg/l	0.1	-	0.010 U	-	0.010 U	-
Silver	mg/l	0.007	-	0.0050 U	-	0.0050 U	-
Thallium	mg/l	3	-	0.0050 U	-	0.0050 U	-
Zinc	mg/l	0.9	-	0.020 U	-	0.020 U	-

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Client Sample ID:		MA MCP Method 1: GW-3 Standard (310 CMR 6/14)	MW-3	MW-5	MW-5	DUP-C-W-100	DUP-C-W-100
Lab Sample ID:			MC27810-3F	MC27810-4	MC27810-4F	MC27810-5	MC27810-5F
Date Sampled:			1/21/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014
Matrix:			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
GC/MS Semi-volatiles (SW846 8270D)							
Benzoic Acid	mg/l	-	-	0.010 U	-	0.010 U	-
2-Chlorophenol	mg/l	7	-	0.0050 U	-	0.0050 U	-
4-Chloro-3-methyl phenol	mg/l	-	-	0.010 U	-	0.010 U	-
2,4-Dichlorophenol	mg/l	2	-	0.010 U	-	0.010 U	-
2,4-Dimethylphenol	mg/l	50	-	0.010 U	-	0.010 U	-
2,4-Dinitrophenol	mg/l	20	-	0.020 U	-	0.020 U	-
2-Methylphenol	mg/l	-	-	0.010 U	-	0.010 U	-
3&4-Methylphenol	mg/l	-	-	0.010 U	-	0.010 U	-
2-Nitrophenol	mg/l	-	-	0.010 U	-	0.010 U	-
4-Nitrophenol	mg/l	-	-	0.020 U	-	0.020 U	-
Pentachlorophenol	mg/l	0.2	-	0.010 U	-	0.010 U	-
Phenol	mg/l	2	-	0.0050 U	-	0.0050 U	-
2,4,5-Trichlorophenol	mg/l	3	-	0.010 U	-	0.010 U	-
2,4,6-Trichlorophenol	mg/l	0.5	-	0.010 U	-	0.010 U	-
Acenaphthene	mg/l	10	-	0.0020 U	-	0.0020 U	-
Acenaphthylene	mg/l	0.04	-	0.0020 U	-	0.0020 U	-
Acetophenone	mg/l	-	-	0.010 U	-	0.010 U	-
Aniline	mg/l	-	-	0.010 U	-	0.010 U	-
Anthracene	mg/l	0.03	-	0.0020 U	-	0.0020 U	-
Benzo(a)anthracene	mg/l	1	-	0.0020 U	-	0.0020 U	-
Benzo(a)pyrene	mg/l	0.5	-	0.0020 U	-	0.0020 U	-
Benzo(b)fluoranthene	mg/l	0.4	-	0.0020 U	-	0.0020 U	-
Benzo(g,h,i)perylene	mg/l	0.02	-	0.0020 U	-	0.0020 U	-
Benzo(k)fluoranthene	mg/l	0.1	-	0.0020 U	-	0.0020 U	-
4-Bromophenyl phenyl ether	mg/l	-	-	0.0050 U	-	0.0050 U	-
Butyl benzyl phthalate	mg/l	-	-	0.0050 U	-	0.0050 U	-
2-Chloronaphthalene	mg/l	-	-	0.0050 U	-	0.0050 U	-
4-Chloroaniline	mg/l	0.3	-	0.010 U	-	0.010 U	-
Chrysene	mg/l	0.07	-	0.0020 U	-	0.0020 U	-
bis(2-Chloroethoxy)methane	mg/l	-	-	0.0050 U	-	0.0050 U	-
bis(2-Chloroethyl)ether	mg/l	50	-	0.0050 U	-	0.0050 U	-
bis(2-Chloroisopropyl)ether	mg/l	50	-	0.0050 U	-	0.0050 U	-
1,2-Dichlorobenzene	mg/l	2	-	0.0050 U	-	0.0050 U	-
1,2-Diphenylhydrazine	mg/l	-	-	0.0050 U	-	0.0050 U	-
1,3-Dichlorobenzene	mg/l	50	-	0.0050 U	-	0.0050 U	-
1,4-Dichlorobenzene	mg/l	8	-	0.0050 U	-	0.0050 U	-
2,4-Dinitrotoluene	mg/l	50	-	0.010 U	-	0.010 U	-
2,6-Dinitrotoluene	mg/l	-	-	0.010 U	-	0.010 U	-
3,3'-Dichlorobenzidine	mg/l	2	-	0.0050 U	-	0.0050 U	-
Dibenzo(a,h)anthracene	mg/l	0.04	-	0.0020 U	-	0.0020 U	-
Dibenzofuran	mg/l	-	-	0.0020 U	-	0.0020 U	-
Di-n-butyl phthalate	mg/l	-	-	0.0050 U	-	0.0050 U	-
Di-n-octyl phthalate	mg/l	-	-	0.0050 U	-	0.0050 U	-
Diethyl phthalate	mg/l	9	-	0.0050 U	-	0.0050 U	-
Dimethyl phthalate	mg/l	50	-	0.0050 U	-	0.0050 U	-
bis(2-Ethylhexyl)phthalate	mg/l	50	-	0.0020 U	-	0.0020 U	-
Fluoranthene	mg/l	0.2	-	0.0020 U	-	0.0020 U	-
Fluorene	mg/l	0.04	-	0.0020 U	-	0.0020 U	-
Hexachlorobenzene	mg/l	6	-	0.0050 U	-	0.0050 U	-
Hexachlorobutadiene	mg/l	3	-	0.0050 U	-	0.0050 U	-
Hexachlorocyclopentadiene	mg/l	-	-	0.010 U	-	0.010 U	-
Hexachloroethane	mg/l	50	-	0.0050 U	-	0.0050 U	-
Indeno(1,2,3-cd)pyrene	mg/l	0.1	-	0.0020 U	-	0.0020 U	-
Isophorone	mg/l	-	-	0.0050 U	-	0.0050 U	-
2-Methylnaphthalene	mg/l	20	-	0.0020 U	-	0.0020 U	-
Naphthalene	mg/l	20	-	0.0020 U	-	0.0020 U	-
Nitrobenzene	mg/l	-	-	0.0050 U	-	0.0050 U	-
N-Nitroso-di-n-propylamine	mg/l	-	-	0.0050 U	-	0.0050 U	-
N-Nitrosodiphenylamine	mg/l	-	-	0.0050 U	-	0.0050 U	-
Phenanthrene	mg/l	10	-	0.0020 U	-	0.0020 U	-
Pyrene	mg/l	0.02	-	0.0020 U	-	0.0020 U	-
1,2,4-Trichlorobenzene	mg/l	50	-	0.0050 U	-	0.0050 U	-
GC Semi-volatiles (SW846 8082)							
Aroclor 1016	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1221	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1232	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1242	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1248	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1254	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1260	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1262	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
Aroclor 1268	mg/l	0.01	-	0.00033 U	-	0.00032 U	-
GC Semi-volatiles (SW846-8015)							
TPH-DRO (Semi-VOA)	mg/l	-	-	0.25 U	-	0.22 U	-
Metals Analysis							
Antimony	mg/l	8	0.0060 U	-	0.0060 U	-	0.0060 U
Arsenic	mg/l	0.9	0.0040 U	-	0.0040 U	-	0.0040 U
Beryllium	mg/l	0.2	0.0040 U	-	0.0040 U	-	0.0040 U
Cadmium	mg/l	0.004	0.0040 U	-	0.0040 U	-	0.0040 U
Chromium	mg/l	0.3	0.010 U	-	0.010 U	-	0.010 U
Copper	mg/l	-	0.025 U	-	0.025 U	-	0.025 U
Lead	mg/l	0.01	0.0050 U	-	0.0050 U	-	0.0050 U
Mercury	mg/l	0.02	0.00020 U	-	0.00020 U	-	0.00020 U
Nickel	mg/l	0.2	0.040 U	-	0.040 U	-	0.040 U
Selenium	mg/l	0.1	0.010 U	-	0.010 U	-	0.010 U
Silver	mg/l	0.007	0.0050 U	-	0.0050 U	-	0.0050 U
Thallium	mg/l	3	0.0050 U	-	0.0050 U	-	0.0050 U
Zinc	mg/l	0.9	0.0348	-	0.0955	-	0.098

Regulatory limits listed in this document have been obtained from the latest version of the regulations cited and are used for advisory purposes only. Accutest assumes no responsibility for errors in regulatory documents or changes to criteria detailed in later versions of the referenced regulation. It is the responsibility of the user to verify these limits before using or reporting any data.

No results exceeded regulatory criteria.

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TABLE 2

Summary of Analytical Soil Data from DGA-10
Soil Analytical - PCBs
5x5 Grids
2/4/2014

Legend: Red = Exceeds 50 ppm | Green = Above MCP S1/GW-1 Criteria.

LOCATION			DGA-10 SB-G3 1'		DGA-10 SB-G3 2'		DGA-10 SB-G3 3'		DGA-10 SB-G3 4'		DGA-10 SB-G3 5'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402874-01		L1402874-02		L1402874-03		L1402874-04		L1402874-05	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1221	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1232	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1242	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1248	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1254	2	mg/kg	38		83.8		0.0423	U	0.0375	U	0.0354	U
Aroclor 1260	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1262	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U
Aroclor 1268	2	mg/kg	3.93	U	7.41	U	0.0423	U	0.0375	U	0.0354	U

LOCATION			DGA-10 SB-G4 1'		DGA-10 SB-G4 2'		DGA-10 SB-G4 3'		DGA-10 SB-G4 4'		DGA-10 SB-G4 5'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402874-11		L1402874-12		L1402874-13		L1402874-14		L1402874-15	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1221	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1232	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1242	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1248	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1254	2	mg/kg	3.91		7.13		3.36		0.74		0.3	
Aroclor 1260	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1262	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U
Aroclor 1268	2	mg/kg	0.706	U	3.67	U	0.364	U	0.189	U	0.038	U

LOCATION			DGA-10SB-H5 1'		DGA-10SB-H5 2'		DGA-10SB-H5 3'		DGA-10SB-H5 4'		DGA-10SB-H5 5'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402874-17		L1402874-18		L1402874-19		L1402874-20		L1402874-21	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1221	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1232	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1242	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1248	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1254	2	mg/kg	184		11		7.72		1.11		0.7	
Aroclor 1260	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1262	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U
Aroclor 1268	2	mg/kg	21.1	U	3.92	U	1.77	U	0.199	U	0.0844	U

LOCATION			DGA-10 SB-G6 1'		DGA-10 SB-G6 2'		DGA-10 SB-G6 3'		DGA-10 SB-G6 4'		DGA-10 SB-G6 5'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402874-23		L1402874-24		L1402874-25		L1402874-26		L1402874-27	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1221	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1232	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1242	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1248	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1254	2	mg/kg	188		33.4		1.56		0.0752		0.12	
Aroclor 1260	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1262	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U
Aroclor 1268	2	mg/kg	18.1	U	3.66	U	0.187	U	0.0363	U	0.0413	U

LOCATION			DGA-10 SB-G5 1'		DGA-10 SB-G5 2'		DGA-10 SB-G5 3'		DGA-10 SB-G5 4'		DGA-10 SB-G5 5'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402875-01		L1402875-02		L1402875-03		L1402875-04		L1402875-05	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1221	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1232	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1242	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1248	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1254	2	mg/kg	13.5		36		4.19		0.239		0.0638	
Aroclor 1260	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1262	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U
Aroclor 1268	2	mg/kg	4.57	U	3.57	U	0.716	U	0.0746	U	0.0385	U

LOCATION			DGA-10 SB-F5 1'		DGA-10 SB-F5 2'		DGA-10 SB-F5 3'		DGA-10 SB-F5 4'		DGA-10 SB-F6 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402875-07		L1402875-08		L1402875-09		L1402875-10		L1402875-11	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1221	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1232	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1242	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1248	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1254	2	mg/kg	0.749		0.0385	U	0.0354	U	0.0334	U	0.128	
Aroclor 1260	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1262	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U
Aroclor 1268	2	mg/kg	0.0726	U	0.0385	U	0.0354	U	0.0334	U	0.0358	U

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LOCATION			DGA-10 SB-F6 2'		DGA-10 SB-F6 3'		DGA-10 SB-F6 4'		DGA-10 SB-F6 5'		DGA-10 SB-E5 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402875-12		L1402875-13		L1402875-14		L1402875-15		L1402875-19	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1221	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1232	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1242	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1248	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1254	2	mg/kg	0.0551		0.0835		0.0424		0.104		46.7	
Aroclor 1260	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1262	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U
Aroclor 1268	2	mg/kg	0.039	U	0.0355	U	0.033	U	0.0337	U	4.44	U

LOCATION			DGA-10 SB-E5 2'		DGA-10 SB-E5 3'		DGA-10 SB-E5 4'		DGA-10 SB-E5 5'		DGA-10 SB-E6 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402875-20		L1402875-21		L1402875-22		L1402875-23		L1402876-01	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1221	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1232	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1242	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1248	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1254	2	mg/kg	1.57		0.0455		0.0367	U	0.0349	U	4.08	
Aroclor 1260	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1262	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U
Aroclor 1268	2	mg/kg	0.363	U	0.0348	U	0.0367	U	0.0349	U	0.728	U

LOCATION			DGA-10 SB-E6 2'		DGA-10 SB-E6 3'		DGA-10 SB-E6 4'		DGA-10 SB-E6 5'		DGA-10 SB-D5 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402876-02		L1402876-03		L1402876-04		L1402876-05		L1402876-09	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1221	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1232	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1242	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1248	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1254	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	13400	
Aroclor 1260	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1262	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U
Aroclor 1268	2	mg/kg	0.0386	U	0.0382	U	0.0376	U	0.0355	U	1330	U

LOCATION			DGA-10 SB-D5 2'		DGA-10 SB-D5 3'		DGA-10 SB-D5 4'		DGA-10 SB-D5 5'		DGA-10SB-C3 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402876-10		L1402876-11		L1402876-12		L1402876-13		L1402876-19	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1221	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1232	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1242	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1248	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1254	2	mg/kg	22.2		1.02		4.52		0.302		109	
Aroclor 1260	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1262	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U
Aroclor 1268	2	mg/kg	3.65	U	0.202	U	0.388	U	0.0371	U	9.91	U

LOCATION			DGA-10SB-C3 2'		DGA-10SB-C3 3'		DGA-10SB-C3 4'		DGA-10SB-C3 5'		DGA-10 SB-B3 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402876-20		L1402876-21		L1402876-22		L1402876-23		L1402876-27	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1221	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1232	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1242	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1248	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1254	2	mg/kg	396		4.27		0.344		0.0763		80	
Aroclor 1260	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1262	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U
Aroclor 1268	2	mg/kg	39.5	U	0.385	U	0.0374	U	0.0373	U	26.3	U

LOCATION			DGA-10 SB-B3 2'		DGA-10 SB-B3 3'		DGA-10 SB-B3 4'		DGA-10 SB-B3 5'		DGA-10 SB-A3 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402876-28		L1402876-29		L1402876-30		L1402876-31		L1402877-01	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1221	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1232	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1242	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1248	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1254	2	mg/kg	12.7		0.969		0.0619		0.0388		139	
Aroclor 1260	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1262	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U
Aroclor 1268	2	mg/kg	3.89	U	0.0764	U	0.0365	U	0.0368	U	20.8	U

LOCATION			DGA-10 SB-A3 2'		DGA-10 SB-A3 3'		DGA-10 SB-A3 4'		DGA-10 SB-A3 5'		DGA-10 SB-A1 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402877-02		L1402877-03		L1402877-04		L1402877-05		L1402877-11	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1221	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1232	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1242	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1248	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1254	2	mg/kg	8.59		0.132		0.037	U	0.0462		10.7	
Aroclor 1260	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1262	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U
Aroclor 1268	2	mg/kg	3.78	U	0.0376	U	0.037	U	0.0349	U	3.46	U

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LOCATION			DGA-10 SB-A1 2'		DGA-10 SB-A1 3'		DGA-10 SB-A1 4'		DGA-10 SB-A1 5'		DGA-10 SB-FFF102 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402877-12		L1402877-13		L1402877-14		L1402877-15		L1402877-18	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1221	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1232	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1242	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1248	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1254	2	mg/kg	3.97		0.282		0.129		0.175		1.75	
Aroclor 1260	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1262	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U
Aroclor 1268	2	mg/kg	0.721	U	0.0687	U	0.0684	U	0.0724	U	0.152	U

LOCATION			DGA-10 SB-FFF102 2'		DGA-10 SB-FFF102 3'		DGA-10 SB-FFF102 4'		DGA-10 SB-FFF102 5'		DGA-10 SB-PPP0 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402877-19		L1402877-20		L1402877-21		L1402877-22		L1402877-24	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1221	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1232	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1242	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1248	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1254	2	mg/kg	0.935		3.11		0.925		1.61		9.17	
Aroclor 1260	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1262	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U
Aroclor 1268	2	mg/kg	0.0664	U	0.175	U	0.177	U	0.171	U	2.34	U

LOCATION			DGA-10 SB-PPP0 2'		DGA-10 SB-PPP0 3'		DGA-10 SB-PPP0 4'		DGA-10 SB-PPP0 5'		DGA-10 SB-WW7 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402877-25		L1402877-26		L1402877-27		L1402877-28		L1402878-01	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1221	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1232	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1242	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1248	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1254	2	mg/kg	5.55		1.08		1.4		0.387		549	
Aroclor 1260	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1262	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U
Aroclor 1268	2	mg/kg	0.736	U	0.173	U	0.172	U	0.0703	U	44.4	U

LOCATION			DGA-10 SB-WW7 2'		DGA-10 SB-WW7 3'		DGA-10 SB-WW7 4'		DGA-10 SB-WW7 5'		DGA-10 SB-WW10 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402878-02		L1402878-03		L1402878-04		L1402878-05		L1402878-08	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1221	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1232	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1242	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1248	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1254	2	mg/kg	518		1.05		0.176		0.117		2880	
Aroclor 1260	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1262	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U
Aroclor 1268	2	mg/kg	72.1	U	0.347	U	0.0339	U	0.0328	U	202	U

LOCATION			DGA-10 SB-WW10 2'		DGA-10 SB-WW10 3'		DGA-10 SB-WW10 4'		DGA-10 SB-WW10 5'		DGA-10 SB-AAA10 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402878-09		L1402878-10		L1402878-11		L1402878-12		L1402878-15	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1221	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1232	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1242	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1248	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1254	2	mg/kg	20.7		3.26		1.03		0.387		381	
Aroclor 1260	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1262	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U
Aroclor 1268	2	mg/kg	3.63	U	0.334	U	0.331	U	0.184	U	39	U

LOCATION			DGA-10 SB-AAA10 2'		DGA-10 SB-AAA10 3'		DGA-10 SB-AAA10 4'		DGA-10 SB-AAA10 5'		DGA-10 SB-PPP8 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402878-16		L1402878-17		L1402878-18		L1402878-19		L1402881-01	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1221	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1232	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1242	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1248	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1254	2	mg/kg	44.3		0.706		0.152		0.0648		30	
Aroclor 1260	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1262	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U
Aroclor 1268	2	mg/kg	4.01	U	0.177	U	0.0387	U	0.0369	U	4.38	U

LOCATION			DGA-10 SB-PPP8 2'		DGA-10 SB-PPP8 3'		DGA-10 SB-PPP8 4'		DGA-10 SB-PPP8 5'		DGA-10 SB-TT3 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402881-02		L1402881-03		L1402881-04		L1402881-05		L1402881-09	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1221	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1232	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1242	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1248	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1254	2	mg/kg	6.36		2.61		0.0339	U	0.0352	U	52.7	
Aroclor 1260	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1262	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U
Aroclor 1268	2	mg/kg	3.61	U	0.358	U	0.0339	U	0.0352	U	4.42	U

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LOCATION			DGA-10 SB-TT3 2'		DGA-10 SB-TT3 3'		DGA-10 SB-TT3 4'		DGA-10 SB-TT3 5'		DGA-10 SB-SS7 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402881-10		L1402881-11		L1402881-12		L1402881-13		L1402881-19	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1221	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1232	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1242	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1248	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1254	2	mg/kg	120		1.32		0.245		0.036	U	8.03	
Aroclor 1260	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1262	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U
Aroclor 1268	2	mg/kg	18	U	0.179	U	0.0367	U	0.036	U	3.89	U

LOCATION			DGA-10 SB-SS7 2'		DGA-10 SB-SS7 3'		DGA-10 SB-SS7 4'		DGA-10 SB-SS7 5'		DGA-10 SB-TT9 1'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402881-20		L1402881-21		L1402881-22		L1402881-23		L1402881-26	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1221	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1232	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1242	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1248	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1254	2	mg/kg	0.164		0.156		0.072		0.632		21200	
Aroclor 1260	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1262	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U
Aroclor 1268	2	mg/kg	0.0347	U	0.041	U	0.0384	U	0.0394	U	1570	U

LOCATION			DGA-10 SB-TT9 2'		DGA-10 SB-TT9 3'		DGA-10 SB-TT9 4'		DGA-10 SB-TT9 5'	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402881-27		L1402881-28		L1402881-29		L1402881-30	
	S1/G1-08	Units		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1221	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1232	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1242	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1248	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1254	2	mg/kg	47.2		2.57		2.02		2.08	
Aroclor 1260	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1262	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U
Aroclor 1268	2	mg/kg	3.66	U	0.384	U	0.37	U	0.352	U

LOCATION			DUP 3050		DUP 3051		DUP 3052		DUP 3053		DUP 3054	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402873-01		L1402873-02		L1402873-03		L1402873-04		L1402873-05	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1221	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1232	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1242	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1248	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1254	2	mg/kg	0.457		0.159		0.0385	U	0.0363	U	12.7	
Aroclor 1260	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1262	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U
Aroclor 1268	2	mg/kg	0.0724	U	0.0407	U	0.0385	U	0.0363	U	4.06	U

LOCATION			DUP 3055		DUP 3056		DUP 3060		DUP 3058		DUP 3059	
SAMPLING DATE			04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14		04-FEB-14	
LAB SAMPLE ID			L1402873-06		L1402873-07		L1402873-08		L1402873-09		L1402873-10	
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual
Aroclor 1016	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1221	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1232	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1242	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1248	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1254	2	mg/kg	0.187		0.129		0.0421	U	1.35		0.104	
Aroclor 1260	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1262	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U
Aroclor 1268	2	mg/kg	0.0386	U	0.0387	U	0.0421	U	0.139	U	0.037	U

LOCATION			DUP 3057	
SAMPLING DATE			04-FEB-14	
LAB SAMPLE ID			L1402873-12	
	S1/G1-08	Units		Qual
Aroclor 1016	2	mg/kg	0.207	U
Aroclor 1221	2	mg/kg	0.207	U
Aroclor 1232	2	mg/kg	0.207	U
Aroclor 1242	2	mg/kg	0.207	U
Aroclor 1248	2	mg/kg	0.207	U
Aroclor 1254	2	mg/kg	1.44	
Aroclor 1260	2	mg/kg	0.207	U
Aroclor 1262	2	mg/kg	0.207	U
Aroclor 1268	2	mg/kg	0.207	U

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DMF PARCEL 1 / DMF PARCEL 2

RTN: 4-24296, 4-15490

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Table 1A
EPH, PAHs, and Coal Ash Soil Data
16 Blackmer Street
New Bedford, MA
1999, 2000, and 2006
Concentration (mg/kg)

SAMPLE IDENTIFICATION SAMPLE DEPTH (FT) COLLECTION DATE	Reportable Concentrations updated Feb. 2008 RCS-1	RSC-2	SS-04A** 0-3 09/28/99	SS-04B** 0-3 09/28/99	TP-03 M&E 01/2000	TP-04 M&E 01/2000	CSS-2 0-3 03/06/00	CSS-2 3-6 03/06/00	CSS-500* 0-3 03/06/00	CSS-500* 3-6 03/06/00	CGW1/S-3 0-2 03/07/00	BH2 2.5-4 05/25/06	BH2 4-6.5 05/25/06	Duplicate 4 (CSETP1 3-6') 05/25/06
TARGET EPH														
C9-C18 Aliphatic Hydrocarbons	1,000	3,000	3.2	ND	DU	DU	ND	ND	ND	ND	ND	<13.2	<11.8	<13.0
C19-C36 Aliphatic Hydrocarbons	3,000	5,000	50	19	DU	DU	29	17.0	27.0	16.0	32.0	32.2	19.2	<13.0
C11-C22 Aromatic Hydrocarbons	1,000	3,000	180	120	DU	DU	78.0	280.0	120.0	240.0	180.0	117.0	177.0	<13.0
PAHs														
Naphthalene	4	40	0.45	0.51	DU	DU	ND	2.200	ND	0.550	0.740	0.203	0.280	<0.0649
2-Methylnaphthalene	0.7	80	0.44	0.25	DU	DU	5.000	0.860	ND	ND	ND	<0.0658	<0.058	<0.0649
Acenaphthene	2	3,000	0.47	1.2	DU	DU	ND	2.000	0.900	0.850	2.100	0.405	0.689	<0.130
Phenanthrene	10	1,000	11	14	DU	DU	5.400	36.000	7.900	27.000	23.000	5.770	8.260	<0.0649
Acenaphthylene	1	10	1.2	0.7	DU	DU	ND	0.600	ND	0.540	ND	0.213	0.276	<0.0649
Fluorene	1,000	3,000	1.6	1.4	DU	DU	0.640	3.800	0.990	2.200	2.800	0.495	0.795	<0.0325
Anthracene	1,000	3,000	3.3	4.2	DU	DU	1.400	8.300	2.300	6.400	6.500	1.130	1.720	<0.0649
Fluoranthene	1,000	3,000	16	21	DU	DU	7.60	41.00	9.600	35.000	23.000	8.430	10.800	<0.260
Pyrene	1,000	3,000	20	19	DU	DU	7.60	38.00	9.700	32.000	22.000	7.110	8.910	<0.260
Benz[a]Anthracene	7	40	8.9	10	DU	DU	3.50	17.00	4.500	16.000	9.800	3.470	4.380	<0.130
Chrysene	70	400	8.4	9.9	DU	DU	3.80	16.00	4.900	13.000	10.000	3.470	4.470	<0.130
Benzo[b]Fluoranthene	7	40	7.7	9.1	DU	DU	3.900	18.000	5.100	14.000	9.700	<0.197	<0.176	<0.195
Benzo[k]Fluoranthene	70	400	5	11	DU	DU	1.60	3.50	2.500	5.600	4.600	<0.132	<0.118	<0.130
Benzo[a]Pyrene	2	4	**8.2**	**11**	DU	DU	**3.200**	**13.000**	**4.100**	**11.000**	**8.400**	<0.132	<0.118	<0.130
Indeno[1,2,3-c,d]Pyrene	7	40	7.5	7.4	DU	DU	2.600	10.000	4.000	9.200	6.500	<0.0658	<0.0588	<0.0649
Dibenzo[a,h]Anthracene	0.7	4	**7.5**	2.5	DU	DU	2.600	**10.000**	**4.000**	**9.200**	**6.500**	<0.132	<0.118	<0.130
Benzo[g,h,i]Perylene	1,000	3,000	5.3	8.3	DU	DU	2.000	7.300	3.600	6.700	4.700	<0.132	<0.118	<0.130
COAL ASH							NA	NA	NA	NA	NA	NA	coal ash	NA

* Duplicate of CSS-2
ND - Non Detect
NA - Not Analyzed
NS - Not Specified
Bold indicates RCS2 threshold exceeded

Cygnus TP-1 through TP-8 were NA for EPH/PAH
RCs updated in Feb 2008
** Pesticides detected at estimated concentrations less than the RSC-2 standards.
DU - Data unkown/Unavailable - data tables, missing from M&E and Cyngus reports, but discussed in body of report.

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Table 1A
EPH, PAHs, and Coal Ash Soil Data
16 Blackmer Street
New Bedford, MA
1999, 2000, and 2006
Concentration (mg/kg)

SAMPLE IDENTIFICATION SAMPLE DEPTH (FT) COLLECTION DATE	Reportable Concentrations updated Feb. 2008 RCS-1	RSC-2	BH1 0-2.5 05/25/06	BH-1 2.5-5 05/25/06	CSE TP-1 0-3 05/25/06	CSE TP-1 3-6 05/25/06	CSE TP-2 0-3 05/25/06	CSE TP-2 3-6 05/25/06	CSE TP-3 0-3 05/25/06	Duplicate 3 (CSETP3 0-3') 05/25/06	CSE TP-3 3-6 05/25/06
TARGET EPH											
C9-C18 Aliphatic Hydrocarbons	1,000	3,000	<11.5	<12.2	<14.5	<13.2	<15.2	<15.4	<12.0	<12.3	<13.3
C19-C36 Aliphatic Hydrocarbons	3,000	5,000	20.2	83.4	<14.5	<13.2	15.2	54.7	12.7	44.1	<13.3
C11-C22 Aromatic Hydrocarbons	1,000	3,000	292.0	242.0	<14.5	<13.2	902.0	84.3	337.0	613.0	<13.3
PAHs											
Naphthalene	4	40	0.147	0.239	<0.0725	<0.0658	<0.0758	<0.0769	0.210	0.185	<0.0667
2-Methylnaphthalene	0.7	80	<0.057	<0.061	<0.0725	<0.0658	<0.0758	<0.0769	<0.0602	<0.0617	<0.0667
Acenaphthene	2	3,000	0.602	0.420	<0.145	0.132	<0.152	<0.154	0.301	0.827	<0.133
Phenanthrene	10	1,000	25.800	6.740	0.380	<0.0658	36.400	1.500	9.350	21.500	<0.0667
Acenaphthylene	1	10	1.260	0.307	<0.0725	<0.0658	1.390	0.246	0.619	0.731	<0.0667
Fluorene	1,000	3,000	1.830	0.505	<0.0362	<0.0329	1.320	<0.0385	0.535	1.410	<0.0333
Anthracene	1,000	3,000	4.660	1.300	<0.0725	<0.0658	7.840	0.317	1.600	3.700	<0.0667
Fluoranthene	1,000	3,000	33.000	11.400	0.357	<0.263	64.700	3.170	20.700	33.600	<0.267
Pyrene	1,000	3,000	27.800	10.100	0.304	<0.263	59.500	2.950	18.300	33.300	<0.267
Benz[a]Anthracene	7	40	12.100	4.900	0.186	<0.132	**29.400**	1.310	**9.850**	**15.700**	<0.133
Chrysene	70	400	11.300	5.110	0.275	<0.132	26.000	1.460	9.870	16.400	<0.133
Benzo[b]Fluoranthene	7	40	<0.172	<0.183	<0.217	<0.197	<0.227	<0.231	<0.181	<0.185	<0.200
Benzo[k]Fluoranthene	70	400	<0.115	<0.122	<0.145	<0.132	<0.152	<0.154	<0.120	<0.123	<0.133
Benzo[a]Pyrene	2	4	<0.115	<0.122	<0.145	<0.132	<0.152	<0.154	<0.120	<0.123	<0.133
Indeno[1,2,3-c,d]Pyrene	7	40	<0.0575	<0.0610	<0.0725	<0.0658	<0.0758	<0.0769	<0.0602	<0.0617	<0.0667
Dibenzo[a,h]Anthracene	0.7	4	<0.115	<0.122	<0.145	<0.132	<0.152	<0.154	<0.120	<0.123	<0.133
Benzo[g,h,i]Perylene	1,000	3,000	<0.115	<0.122	<0.145	<0.132	<0.152	<0.154	<0.120	<0.123	<0.133
COAL ASH			NA	NA	COAL ASH	NA	NA	NA	NA	NA	NA

* Duplicate of CSS-2
ND - Non Detect
NA - Not Analyzed
NS - Not Specified
Bold indicates RCS2 threshold exceeded

Cygnus TP-1 through TP-8 were NA for EPH/PAH
RCs updated in Feb 2008

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Table 1B
PCBs and Asbestos Containing Materials (ACM) Soil Data
16 Blackmer Street
New Bedford, MA
1999, 2000, and 2006
Concentration (mg/kg)

Sample Location	South Area	North Area	North Area	South Area	South Area	South Area	South Area	South Area	North Area	North Area	North Area
SAMPLE IDENTIFICATION	**CGW1/S-3**	**BH1**	**BH-1**	**BH2**	**SS-04A**	**SS-04B**	**TP-03**	**TP-04**	**CSE TP-2**	**CSE TP-3**	**CSE TP-1**
SAMPLE DEPTH (FT)	**0-2**	**0-2.5**	**2.5-5**	**2.5-4**	**0-3**	**0-3**			**3-6**	**0-3**	**0-3**
COLLECTION DATE	**03/07/00**	**05/25/06**	**05/25/06**	**05/25/06**	**09/28/99**	**09/28/99**	**01/2000**	**01/2000**	**05/25/06**	**05/25/06**	**05/25/06**
ASBESTOS											
chrysotile	NA	NA	NA	<1%	NA	NA	NA	NA	ND	ND	ND
POLYCHLORINATED BIPHENYLS (PCBs)											
Aroclor 1221	ND	< .0575	< .0610	< .0658	ND	ND	DU	DU	< .0769	< .0602	< .0725
Aroclor 1232	ND	< .0575	< .0610	< .0658	ND	ND	DU	DU	< .0769	< .0602	< .0725
Aroclor 1248	ND	< .0575	< .0610	< .0658	ND	ND	DU	DU	< .0769	< .0602	< .0725
Aroclor 1254	ND	0.073	< .0610	0.105	ND	1.700	DU	capacitors observed	< .0769	0.439	< .0725
Aroclor 1260	ND	< .0575	< .0610	< .0658	ND	ND	DU	DU	< .0769	< .0602	< .0725
Aroclor 1262	ND	< .0575	< .0610	< .0658	ND	ND	DU	DU	< .0769	< .0602	< .0725
Aroclor 1268	ND	< .0575	< .0610	< .0658	ND	ND	DU	DU	< .0769	< .0602	< .0725

ND - Not Dectected by lab method
NA - Not Analyzed
NS - Not Specified
Bold indicates RCS2 threshold exceeded
DU - Data unknown/Unavailable - data tables missing from M&E and Cyngus reports but discussed in body of report

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Table 1C
Lead Soil Data
16 Blackmer Street
New Bedford, MA
1999, 2000, and 2006

Sample Identification Number	Sample Location	Sample Depth (ft)	Collection Date	Lead mg/kg
CSS-01	South Area	0-3	3/6/2000	260
CSS-1	South Area	3-6	3/6/2000	130
CSS-2	South Area	0-3	3/6/2000	**400**
CSS-500 (duplicate CSS-2)	South Area	0-3	3/6/2000	**620**
CSS-2	South Area	3-6	3/6/2000	210
CSS-500 (duplicate CSS-2)	South Area	3-6	3/6/2000	160
CSS-3	South Area	0-3	3/6/2000	**2500**
CSS-3	South Area	3-6	3/6/2000	160
CSS-4	South Area	0-3	3/6/2000	**530**
CSS-4	South Area	3-6	3/6/2000	190
CSS-5	South Area	0-3	3/6/2000	**310**
CSS-5	South Area	3-6	3/6/2000	150
CGW-1/S-3	South Area	0-2	3/7/2000	**490**
TP-1	North Area	0-3	5/9/2000	190
TP-2	North Area	0-3	5/9/2000	140
TP-3	North Area	0-3	5/9/2000	160
TP-4	North Area	0-3	5/9/2000	61
TP-5	South Area	0-3	5/9/2000	100
TP-X (TP5 duplicate)	South Area	0-3	5/9/2000	220
TP-6	South Area	0-3	5/9/2000	**930**
TP-7	North Area	0-3	5/9/2000	63
TP-8	South Area	0-3	5/9/2000	250
BH1	North Area	0-2.5	5/28/2006	111
BH1	North Area	2.5-5	5/28/2006	287
Duplicate 1 (BH1 2.5-5)	North Area	2.5-5	5/28/2006	194
BH1	North Area	5-7.5	5/28/2006	5.25
BH2	South Area	0-2.5	5/28/2006	**313**
BH2	South Area	2.5-4	5/28/2006	**339**
Duplicate 2 (BH2 2.5-4)	South Area	2.5-5	5/28/2006	**371**
BH2	South Area	4-6.5	5/28/2006	**5780**
SS-04A	South Area	0-3	9/28/99	**3640**
SS-04B	South Area	0-3	9/28/99	**379**
CSE/TP-1	North Area	0-3	5/28/2006	42.1
CSE/TP-1	North Area	3-6	5/28/2006	5.7
CSE/TP-2	North Area	0-3	5/28/2006	77.9
CSE/TP-2	North Area	3-6	5/28/2006	6.65
CSE/TP-3	North Area	0-3	5/28/2006	256
CSE/TP-3	North Area	3-6	5/28/2006	25.9
BH-6A	South Adjacent Lot	2.5-6	6/12/2006	**550**
BH-6B	South Adjacent Lot	2.5-6	6/12/2006	209
BH-6C	South Adjacent Lot	2.5-6	6/12/2006	**1380**
BH-6D	South Adjacent Lot	2.5-6	6/12/2006	**611**

Upper Concentration Limit (Method 3)	3000
Reportable Concentration S1	300
Reportable Concentration S2	300
MCP Background - urban fill	600
- undefined in MCP	

Bold indicates RC threshold has been exceeded
Underline indicates sample was non-detect and value is half method reporting limit.

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Table 2
EPH/PAHs/PCBs and Lead in Groundwater Data
16 Blackmer Street
New Bedford, MA
2000 and 2006

	North Area	Destroyed South Area	South Area		Destroyed South Area					
						Reportable Concentration		Method 1 Groundwater Standards		
SAMPLE NUMBER: COLLECTION DATE:	**CSE-2 5/28/2006**	**CSE-1 5/28/2006**	**CSE-3 5/28/2006**	**GW-01** 9/30/99**	**CGW-1 3/10/2000**	**GW-1 (ug/L)**	**GW-2 (ug/L)**	**GW-1 (ug/L)**	**GW-2 (ug/L)**	**GW-3 (ug/L)**
FULL EPH ANALYTICAL RESULTS (ug/L)										
2-Methylnaphthalene	<1.20	<1	<1.14	14.00	ND	10	3000	10	10000	3000
Acenaphthene	<1.20	<1	<1.14	ND	ND	20	5000	20	NA	5000
Acenaphthylene	<1.20	<1	<1.14	ND	ND	300	3000	300	NA	3000
Anthracene	<1.20	<1	<1.14	ND	ND	600	600	2000	NA	3000
Benz[a]Anthracene	<1.20	<1	<1.14	ND	ND	1	3000	1	NA	1000
Benzo[a]Pyrene	<0.0964	<1.5	<0.0909	ND	ND	0.2	3000	0.2	NA	500
Benzo[b]Fluoranthene	<1.20	<1	<1.14	ND	ND	1	3000	1	NA	400
Benzo[g,h,i]Perylene	<1.81	<1.5	<1.70	ND	ND	300	3000	300	NA	3000
Benzo[k]Fluoranthene	<0.145	<0.120	<0.136	ND	ND	0.1	3000	1	NA	100
Chrysene	<1.20	<1	<1.14	ND	ND	2	3000	2	NA	3000
Dibenzo[a,h]Anthracene	<0.602	<0.500	<0.568	ND	ND	0.5	3000	1	20	50000
Fluoranthene	<1.20	<1	<1.14	ND	ND	200	200	90	NA	200
Fluorene	<1.20	<1	<1.14	ND	ND	300	3000	300	NA	3000
Indeno[1,2,3-c,d]Pyrene	<1.20	<0.240	<0.273	ND	ND	0.5	3000	0.5	NA	100
Naphthalene	<1.20	<1	<1.14	8.1	ND	20	6000	140	1000	20000
Phenanthrene	<1.20	<1	<1.14	ND	ND	50	50	300	NA	50
Pyrene	<1.81	<1.5	<1.7	ND	ND	200	3000	80	NA	20
C9-C18 Aliphatic Hydrocarbons1	<120	<100	<114	ND	ND	1000	1000	4000	1000	20000
C19-C36 Aliphatic Hydrocarbons1	<120	<100	<114	ND	ND	5000	20000	5000	NA	20000
C11-C22 Aromatic Hydrocarbons1,2	<120	<100	<114	ND	ND	200	30000	200	50000	30000
POLYCHLORINATED BIPHENYLS										
Aroclor 1016/1242	<0.375	<0.303	<0.366	ND	ND	70	50000	0.5	NA	0.3
Aroclor 1221	<0.375	<0.303	<0.366	ND	ND	5	2000	0.5	NA	0.3
Aroclor 1232	<0.375	<0.303	<0.366	ND	ND	1000	6000	0.5	NA	0.3
Aroclor 1248	<0.375	<0.303	<0.366	ND	ND	700	4000	0.5	NA	0.3
Aroclor 1254*	**0.871**	**0.72**	**0.83**	**2.6**	ND	6000	6000	0.5	NA	0.3
Aroclor 1260	<0.375	<0.303	<0.366	ND	ND	6000	6000	0.5	NA	0.3
Aroclor 1262	<0.375	<0.303	<0.366	ND	ND	20	6000	0.5	NA	0.3
Aroclor 1268	<0.375	<0.303	<0.366	ND	ND	400	1000	0.5	NA	0.3
DISSOLVED LEAD	<0.0150	<0.0150	<0.0150	ND	NA	1000	1000	15	NA	10

* sample was not filtered prior to lab analysis

** Pesticides detected in sample at concentrations less than the RCGW-2 standards.

- undefined in MCP

Bold italics indicates RC threshold has been exceeded

Bold indicate laboratory method reporting limit exceeded

NA - Not Applicable

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FORMER DARTMOUTH FINISHING SITE

RTN: 4-23616

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Table 1a
Weston & Sampson
Summary of Test Pit Soil Analytical Results
45 Cove Street
New Bedford, MA

Parameters	Units	MCP RCS-1 Standards	MCP Method 1 Soil Cleanup Standards		Sample ID, Depth, and Date																	
			S-1/GW-2	S-1/GW-3	TP-1 (0-3')	TP-2 (0-3')	TP-3 (0-3')	TP-4 (0-3')	TP-5 (0-3')	TP-6 (0-3')	TP-7 (0-3')	TP-8 (0-3')	TP-9 (0-3')	TP-10 (0-3')	TP-11 (0-3')	TP-12 (0-3')	TP-13 (0-3')	TP-15 (0-3')	TP-17 (0-3')	TP-18 (0-3')	DUP-1 (TP-18)	TP-19 (0-3')
					4/7/11	4/7/11	4/7/11	4/7/11	4/7/11	4/7/11	4/7/11	4/7/11	4/7/11	4/7/11	4/6/11	4/6/11	4/6/11	4/6/11	4/6/11	4/7/11	4/7/11	4/7/11
EPH																						
C9-C18 Aliphatics	mg/kg	1,000	1,000	1,000	<35	<36	<41	<37	<51	<35	<40	<40	100	<36	<35	<39	<35	<37	<32	<34	<35	440
C19-C36 Aliphatics	mg/kg	3,000	3,000	3,000	<35	85	68	45	160	190	190	220	970	110	49	<39	50	<37	39	160	160	170
C11-C22 Aromatics	mg/kg	1,000	1,000	1,000	<35	100	56	46	170	89	120	160	3,500	82	48	45	<35	<37	49	82	88	160
Unadjusted n-C11 to n-C22 Aromatics	mg/kg	NS	NS	NS	<35	120	58	49	200	90	130	170	4,500	88	52	51	<35	<37	58	120	89	180
SVOCs																						
Anthracene	mg/kg	1,000	1,000	1,000	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	1.60
Benzo(a)anthracene	mg/kg	7	7	7	NA	NA	NA	NA	NA	NA	0.49	0.56	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	3.80
Benzo(a)pyrene	mg/kg	2	2	2	NA	NA	NA	NA	NA	NA	0.49	0.64	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	3.50
Benzo(b)fluoranthene	mg/kg	7	7	7	NA	NA	NA	NA	NA	NA	0.68	0.74	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	4.00
Benzo(g,h,i)perylene	mg/kg	1,000	1,000	1,000	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	0.53
Benzo(k)fluoranthene	mg/kg	70	70	70	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	1.50
Chrysene	mg/kg	70	70	70	NA	NA	NA	NA	NA	NA	0.55	0.65	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	3.80
Fluoranthene	mg/kg	1,000	1,000	1,000	NA	NA	NA	NA	NA	NA	0.93	0.90	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	7.00
Fluorene	mg/kg	1,000	1,000	1,000	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	0.51
Indeno(1,2,3-cd) Pyrene	mg/kg	7	7	7	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	0.77
2-Methylnaphthalene	mg/kg	0.7	80	300	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	0.62
Naphthalene	mg/kg	4	40	500	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	5.80
Phenanthrene	mg/kg	10	500	500	NA	NA	NA	NA	NA	NA	0.67	0.44	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	5.10
Pyrene	mg/kg	1,000	1,000	1,000	NA	NA	NA	NA	NA	NA	0.89	1.00	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	6.80
Bis(2-ethylhexyl)phthalate	mg/kg	200	200	200	NA	NA	NA	NA	NA	NA	<0.42	<0.43	NA	<0.41	NA	NA	<0.39	NA	NA	NA	NA	<0.410
VPH																						
C5-C8 Aliphatics	mg/kg	100	100	100	NA	NA	NA	NA	NA	NA	<1.6	<1.7	NA	<1.3	NA	NA	<1.4	NA	NA	NA	NA	32
C9-C12 Aliphatics	mg/kg	1,000	1,000	1,000	NA	NA	NA	NA	NA	NA	2	5.6	NA	3.3	NA	NA	<1.4	NA	NA	NA	NA	720
C9-C10 Aromatics	mg/kg	100	100	100	NA	NA	NA	NA	NA	NA	<1.6	4.4	NA	3.9	NA	NA	<1.4	NA	NA	NA	NA	680
Unadjusted C5-C8 Aliphatics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	<1.6	<1.7	NA	<1.3	NA	NA	<1.4	NA	NA	NA	NA	33
Unadjusted C9-C12 Aliphatics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	2.7	10	NA	7.3	NA	NA	<1.4	NA	NA	NA	NA	1,400
VOCs 8260																						
Isopropylbenzene	mg/kg	NS	NS	NS	<0.0055	<0.005	<0.006	<0.0056	<0.009	<0.005	<0.007	<0.006	<0.008	<0.250	<0.005	<0.0061	<0.005	<0.0058	<0.0064	<0.005	<0.0062	7.9
Naphthalene	mg/kg	4	40	500	<0.0055	<0.005	<0.006	<0.0056	<0.009	<0.005	<0.007	<0.006	<0.008	<0.250	<0.005	<0.0061	<0.005	<0.0058	<0.0064	<0.005	<0.0062	16
N-Propylbenzene	mg/kg	NS	NS	NS	<0.0055	<0.005	<0.006	<0.0056	<0.009	<0.005	<0.007	<0.006	<0.008	<0.250	<0.005	<0.0061	<0.005	<0.0058	<0.0064	<0.005	<0.0062	13
sec-Butylbenzene	mg/kg	NS	NS	NS	<0.0055	<0.005	<0.006	<0.0056	<0.009	<0.005	<0.007	<0.006	<0.008	<0.250	<0.005	<0.0061	<0.005	<0.0058	<0.0064	<0.005	<0.0062	13
1,2,4-Trimethylbenzene	mg/kg	NS	NS	NS	<0.0055	<0.005	<0.006	<0.0056	<0.009	<0.005	<0.007	<0.006	<0.008	<0.250	<0.005	<0.0061	<0.005	<0.0058	<0.0064	<0.005	<0.0062	140
Trace Metals																						
Arsenic	mg/kg	20	20	20	<3.7	<3.8	<4.3	<3.6	<5.1	<3.5	<4	<4	<4.4	<3.6	<3.8	<3.9	<3.5	<3.8	<3.2	<3.5	<3.8	<3.7
Barium	mg/kg	1,000	1,000	1,000	29	37	19	20	160	14	35	50	120	11	15	12	21	12	27	9.0	15	29
Cadmium	mg/kg	2	2	2	<0.61	<0.63	<0.72	<0.61	<0.85	<0.58	<0.66	0.94	<0.74	<0.6	<0.63	<0.66	<0.59	<0.63	<0.53	<0.59	<0.64	<0.61
Chromium	mg/kg	30	30	30	7.2	54	9.5	7.1	12	5.0	8.5	73	100	20	8.6	6.4	12	4.0	8.8	300	6.1	5.9
Lead	mg/kg	300	300	300	85	42	33	44	320	21	48	110	1,400	7.4	6.9	<6.6	<5.9	<6.3	34	38	26	52
Mercury	mg/kg	20	20	20	0.047	0.170	0.059	0.053	0.370	0.055	0.320	0.110	0.97	0.039	0.24	0.036	<0.023	<0.024	0.041	<0.023	0.063	0.140
Selenium	mg/kg	400	400	400	<6.1	<6.3	<7.2	<6.1	<8.5	<5.8	<6.6	<6.7	<7.4	<6	<6.3	<6.6	<5.9	<6.3	<5.3	<5.9	<6.4	<6.1
Silver	mg/kg	100	100	100	<1.2	<1.3	<1.4	<1.2	<1.7	<1.2	<1.3	<1.3	<1.5	<1.2	<1.3	<1.3	<1.2	<1.3	<1.1	<1.2	<1.3	<1.2
PCBs																						
Aroclor 1254	mg/kg	2	2	2	NA	NA	NA	NA	NA	NA	<0.11	0.12	NA	<0.1	NA	NA	<0.092	NA	NA	NA	NA	<0.1
Aroclor 1260	mg/kg	2	2	2	NA	NA	NA	NA	NA	NA	<0.11	<0.11	NA	<0.1	NA	NA	<0.092	NA	NA	NA	NA	<0.1

QC by LEM 5/31/11

O:\New Bedford MA\Brownfields 2100655\Cove Street Site\Phase II Documents\Data Tables\[Soil Analytical Results.xls]Sheet1

Abbreviations:
SVOCs = Semi-Volatile Organic Compounds
EPH = Extractable Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
mg/kg = milligrams per kilogram
NS = No Standard
NA = Not Analyzed

Notes:
Lab ID: 141086 & 141430
Standards are from the Massachusetts Contingency Plan (MCP),
310 CMR 40.0000, revised February 14, 2008.
< = indicates parameter not detected above laboratory method reporting limit, shown

DRAFT

Table 1b
Weston & Sampson
Summary of Soil Boring & Stock Pile Analytical Results
45 Cove Street
New Bedford, MA

Parameters	Units	MCP RCS-1 Standards	MCP Method 1 Soil Cleanup		Sample ID, Depth, and Date															
			S-1/GW-2	S-1/GW-3	WS-1 (0-3')	WS-3 (0-3')	WS-4 (0-3')	WS-7 (0-3')	WS-8 (0-3')	WS-9 (0-3')	WS-11 (0-3')	DUP-1 (WS-11)	WS-13 (0-3')	WS-14 (0-3')	WS-15 (0-3')	SP-1	SP-2	SP-3	SP-4	SP-5
					4/20/11	4/20/11	4/20/11	4/20/11	4/20/11	4/20/11	4/20/11	4/19/11	4/19/11	4/19/11	4/19/11	4/20/11	4/20/11	4/6/11	4/20/11	4/6/11
EPH																				
C9-C18 Aliphatics	mg/kg	1,000	1,000	1,000	<68	<35	<39	<35	66	<34	<33	<34	<33	<34	<23	<33	<34	<430	<24	<36
C19-C36 Aliphatics	mg/kg	3,000	3,000	3,000	99	78	110	210	300	71	65	68	40	79	90	260	1,000	2,900	550	200
C11-C22 Aromatics	mg/kg	1,000	1,000	1,000	140	96	98	160	500	87	50	52	33	41	98	3,400	1,000	5,000	1,700	140
Unadjusted n-C11 to n-C22 Aromati	mg/kg	NS	NS	NS	160	110	100	170	620	110	52	56	34	42	120	4,200	1,100	6,400	2,000	150
SVOCs																				
Anthracene	mg/kg	1,000	1,000	1,000	0.88	<0.38	<0.44	<0.38	0.46	<0.38	<0.37	<0.36	<0.35	<0.39	1.10	21	2.50	<24	16	0.43
Benzo(a)anthracene	mg/kg	7	7	7	2.10	1.50	<0.44	1.40	2.20	0.40	<0.37	<0.36	<0.35	<0.39	3.10	80	10	130	77	1.30
Benzo(a)pyrene	mg/kg	2	2	2	1.70	1.40	<0.44	1.10	1.90	0.38	<0.37	<0.36	<0.35	<0.39	2.70	66	10	110	62	1.20
Benzo(b)fluoranthene	mg/kg	7	7	7	2.20	2.00	<0.44	1.80	3.00	0.52	<0.37	<0.36	<0.35	0.41	4.10	89	15	140	83	1.60
Benzo(g,h,i)perylene	mg/kg	1,000	1,000	1,000	1.10	0.52	<0.44	<0.38	0.57	<0.38	<0.37	<0.36	<0.35	<0.39	0.65	30	<1.9	52	19	0.39
Benzo(k)fluoranthene	mg/kg	70	70	70	0.77	0.70	<0.44	0.63	0.95	<0.38	<0.37	<0.36	<0.35	<0.39	1.30	36	5.20	53	33	0.57
Chrysene	mg/kg	70	70	70	2.00	1.50	<0.44	1.20	2.20	0.39	<0.37	<0.36	<0.35	<0.39	2.90	81	11	130	71	1.40
Fluoranthene	mg/kg	1,000	1,000	1,000	4.90	3.00	<0.44	2.30	4.40	0.80	0.37	0.43	<0.35	0.75	6.60	160	20	230	140	2.80
Fluorene	mg/kg	1,000	1,000	1,000	<0.75	<0.38	<0.44	<0.38	<0.39	<0.38	<0.37	<0.36	<0.35	<0.39	<0.37	<18	<1.9	<24	<7.7	<0.39
Indeno(1,2,3-cd) Pyrene	mg/kg	7	7	7	1.10	0.63	<0.44	0.47	0.74	<0.38	<0.37	<0.36	<0.35	<0.39	0.89	41	2.60	71	27	0.51
2-Methylnaphthalene	mg/kg	0.7	80	300	<0.75	<0.38	<0.44	<0.38	<0.39	<0.38	<0.37	<0.36	<0.35	<0.39	<0.37	<18	<1.9	<24	<7.7	<0.39
Naphthalene	mg/kg	4	40	500	<0.75	<0.38	<0.44	<0.38	<0.39	<0.38	<0.37	<0.36	<0.35	<0.39	<0.37	<18	<1.9	<24	<7.7	<0.39
Phenanthrene	mg/kg	10	500	500	4.70	1.90	<0.44	1.10	2.60	0.51	<0.37	<0.36	<0.35	0.52	4.80	110	13	110	70	2.00
Pyrene	mg/kg	1,000	1,000	1,000	4.20	2.70	<0.44	1.70	3.50	0.65	<0.37	0.37	<0.35	0.64	5.10	140	17	210	120	2.30
Bis(2-ethylhexyl)phthalate	mg/kg	200	200	200	<0.75	<0.38	<0.44	<0.38	<0.39	0.70	<0.37	<0.36	<0.35	<0.39	<0.37	<18	<1.9	<24	<7.7	<0.39
VPH																				
C5-C8 Aliphatics	mg/kg	100	100	100	<3.7	2.1	<1.6	<1.1	1.4	<1.1	<1.0	1.0	1.4	<1.0	<1.1	<1.0	<1.4	<2.5	<1.7	<1.5
C9-C12 Aliphatics	mg/kg	1,000	1,000	1,000	<3.7	<1.3	<1.6	<1.1	20	4.3	<1.0	<1.0	<1.0	<1.0	<1.1	1.0	6.1	<2.5	<1.7	<1.5
C9-C10 Aromatics	mg/kg	100	100	100	<3.7	<1.3	<1.6	<1.1	21	2.3	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	1.8	<2.5	<1.7	<1.5
Unadjusted C5-C8 Aliphatics	mg/kg	NS	NS	NS	<3.7	2.2	<1.6	<1.1	1.5	<1.1	<1.0	1.1	1.4	<1.0	<1.1	<1.0	<1.4	<2.5	<1.7	<1.5
Unadjusted C9-C12 Aliphatics	mg/kg	NS	NS	NS	<3.7	<1.3	<1.6	<1.1	42	6.7	<1.0	<1.0	<1.0	<1.0	<1.1	1.5	8.1	<2.5	2.5	<1.5
VOCs 8260																				
Isopropylbenzene	mg/kg	NS	NS	NS	<0.014	<0.0054	<0.0065	<0.0055	<0.250	<0.250	<0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0063	<0.0065	<0.011	<0.0082	<0.0051
Naphthalene	mg/kg	4	40	500	<0.014	<0.0054	<0.0065	<0.0055	<0.250	<0.250	<0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0063	<0.0065	<0.011	<0.0082	<0.0051
N-Propylbenzene	mg/kg	NS	NS	NS	<0.014	<0.0054	<0.0065	<0.0055	<0.250	<0.250	<0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0063	<0.0065	<0.011	<0.0082	<0.0051
sec-Butylbenzene	mg/kg	NS	NS	NS	<0.014	<0.0054	<0.0065	<0.0055	<0.250	<0.250	<0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0063	<0.0065	<0.011	<0.0082	<0.0051
1,2,4-Trimethylbenzene	mg/kg	NS	NS	NS	<0.014	<0.0054	<0.0065	<0.0055	<0.250	<0.250	<0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0063	<0.0065	<0.011	<0.0082	<0.0051
Trace Metals																				
Arsenic	mg/kg	20	20	20	<6.7	<3.6	<3.9	<3.5	<3.7	<3.4	<3.3	<3.4	<3.4	<3.4	<3.6	<3.4	5.30	13	7.70	<3.7
Barium	mg/kg	1,000	1,000	1,000	19	47	18	49	27	21	18	16	26	12	39	84	280	1,500	490	410
Cadmium	mg/kg	2	2	2	<1.1	<0.6	<0.66	<0.59	<0.61	<0.56	<0.55	<0.56	<0.57	<0.57	<0.6	0.66	0.92	4.8	1.90	0.62
Chromium	mg/kg	30	30	30	8.30	15	13	8.5	17	13	12	9.30	8.00	6.90	9.5	32	20	63	28	16
Lead	mg/kg	300	300	300	100	64	12	75.0	46	36	8.50	7.10	<5.7	6.20	47	230	340	2,600	970	140
Mercury	mg/kg	20	20	20	0.05	0.110	0.095	0.540	0.100	0.30	0.180	0.140	<0.019	<0.019	0.080	0.620	0.66	11	2.30	0.320
Selenium	mg/kg	400	400	400	<11	<6.0	<6.6	<5.9	<6.1	<5.6	<5.5	<5.6	<5.7	<5.7	<6.0	<5.7	<5.6	<7.6	<6.2	<6.1
Silver	mg/kg	100	100	100	<2.2	<1.2	<1.3	<1.2	<1.2	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.5	<1.2	<1.2
PCBs																				
Aroclor 1254	mg/kg	2	2	2	<0.18	0.31	<0.1	<0.091	<0.096	<0.09	<0.089	<0.088	<0.088	<0.094	<0.094	0.86	1.3	0.73	1.3	0.18
Aroclor 1260	mg/kg	2	2	2	<0.18	<0.094	<0.1	<0.091	<0.096	<0.09	<0.089	<0.088	<0.088	<0.094	<0.094	<0.09	<0.18	0.49	<0.097	<0.094

QC by LEM 5/31/11

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Abbreviations:
SVOCs = Semi-Volatile Organic Compounds
EPH = Extractable Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
mg/kg = milligrams per kilogram
NS = No Standard
NA = Not Analyzed

Notes:
Lab ID: 141086 & 141430
Standards are from the Massachusetts Contingency Plan (MCP),
310 CMR 40.0000, revised February 14, 2008.
< = indicates parameter not detected above laboratory method reporting limit, shown

DRAFT

Table 1c
Weston & Sampson
Summary of Soil Analytical Results
45 Cove Street
New Bedford, MA
April, May, August 2012

Parameters	Units	MassDEP Reportable Concentrations[5]	Method 1 Soil Standards[1]				Sampling Location, Depth, and Date																
		RC S-1	S-1/GW2	S-1/GW3	S-2/GW2	S-2/GW3	TP-19N 0-3 ft 5/7/12	TP-19N 0-3 ft 8/9/12	TP-19S 0-3 ft 5/7/12	TP-19S 0-3 ft 8/10/12	TP-19E 0-3 ft 4/30/12	TP-19E 0-3 ft 8/9/12	TP-19W 0-3 ft 5/7/12	TP-19W 0-3 ft 8/10/12	TP-2N 0-3 ft 5/7/12	TP-2N 0-3 ft 8/10/12	TP-2W 0-3 ft 5/7/12	TP-2W 0-3 ft 8/10/12	TP-18W 0-3 ft 5/7/12	TP-18W 0-3 ft 8/10/12	TP-18S 0-3 ft 5/7/12	TP-18S 0-3 ft 8/10/12	DUP-1 0-3 ft 8/10/12
TPH																							
UNADJUSTED TPH	mg/kg	1000	1000	1000	3000	3000	150	NA	125	NA	2700 *	NA	240 *	NA	290 *	NA	800 *	NA	380 *	NA	220	NA	NA
EPH																							
C9-C18 ALIPHATICS	mg/kg	1000	1000	1000	3000	3000	NA	19	NA	120	NA	60	NA	<20	NA	<14	NA	<13	NA	<13	NA	<14	<13
C19-C36 ALIPHATICS	mg/kg	3000	3000	3000	5000	5000	NA	36	NA	350	NA	140	NA	<20	NA	41	NA	<13	NA	24	NA	<14	13
Unadjusted n-C11 to n-C22 AROMATICS	mg/kg	NS	NS	NS	NS	NS	NA	67	NA	330	NA	260	NA	<20	NA	69	NA	29	NA	39	NA	<14	17
C11-C22 AROMATICS	mg/kg	1000	1000	1000	3000	3000	NA	49	NA	300	NA	180	NA	<20	NA	55	NA	23	NA	35	NA	<14	16
ACENAPHTHENE	mg/kg	4	1000	1000	3000	3000	NA	0.26	NA	1.3	NA	0.70	NA	<0.20	NA	<0.14	NA	0.13	NA	<0.13	NA	<0.14	<0.13
ACENAPHTHYLENE	mg/kg	1	600	10	600	10	NA	<0.12	NA	0.85	NA	<0.38	NA	<0.20	NA	<0.14	NA	<0.13	NA	<0.13	NA	<0.14	<0.13
ANTHRACENE	mg/kg	1000	1000	1000	3000	3000	NA	0.46	NA	<0.80	NA	1.5	NA	<0.20	NA	0.37	NA	<0.13	NA	<0.13	NA	<0.14	<0.13
BENZO(A)ANTHRACENE	mg/kg	7	7	7	40	40	NA	1.5	NA	2.2	NA	6.8	NA	0.20	NA	1.0	NA	0.62	NA	0.45	NA	<0.14	0.35
BENZO(A)PYRENE	mg/kg	2	2	2	4	4	NA	1.2	NA	1.8	NA	5.5	NA	<0.20	NA	0.91	NA	0.43	NA	0.42	NA	<0.14	<0.13
BENZO(B)FLUORANTHENE	mg/kg	7	7	7	40	40	NA	1.7	NA	3.0	NA	8.0	NA	<0.20	NA	1.3	NA	0.51	NA	0.53	NA	<0.14	<0.13
BENZO(G,H,I)PERYLENE	mg/kg	1000	1000	1000	3000	3000	NA	0.70	NA	<0.80	NA	3.7	NA	<0.20	NA	0.53	NA	0.35	NA	0.60	NA	<0.14	<0.13
BENZO(K)FLUORANTHENE	mg/kg	70	70	70	400	400	NA	0.57	NA	1.6	NA	2.8	NA	<0.20	NA	0.46	NA	0.15	NA	0.26	NA	<0.14	<0.13
CHRYSENE	mg/kg	70	70	70	400	400	NA	1.6	NA	1.9	NA	7.1	NA	0.22	NA	1.2	NA	0.55	NA	0.33	NA	<0.14	0.16
DIBENZ(A,H)ANTHRACENE	mg/kg	0.7	0.7	0.7	4	4	NA	0.27	NA	<0.80 [6]	NA	1.2	NA	<0.20	NA	0.22	NA	<0.13	NA	<0.13	NA	<0.14	<0.13
FLUORANTHENE	mg/kg	1000	1000	1000	3000	3000	NA	2.9	NA	4.3	NA	12	NA	0.27	NA	2.5	NA	0.82	NA	0.71	NA	<0.14	<0.13
FLUORENE	mg/kg	1000	1000	1000	3000	3000	NA	0.35	NA	0.86	NA	0.78	NA	<0.20	NA	0.21	NA	<0.13	NA	<0.13	NA	<0.14	<0.13
INDENO(1,2,3-CD)PYRENE	mg/kg	7	7	7	40	40	NA	0.84	NA	<0.80	NA	3.9	NA	<0.20	NA	0.65	NA	0.27	NA	<0.13	NA	<0.14	<0.13
2-METHYLNAPHTHALENE	mg/kg	0.7	80	300	80	500	NA	<0.12	NA	11	NA	<0.38	NA	<0.20	NA	<0.14	NA	<0.13	NA	<0.13	NA	<0.14	<0.13
NAPHTHALENE	mg/kg	4	40	500	40	1000	NA	0.19	NA	0.86	NA	<0.38	NA	<0.20	NA	<0.14	NA	<0.13	NA	<0.13	NA	<0.14	<0.13
PHENANTHRENE	mg/kg	10	500	500	1000	1000	NA	2.5	NA	2.5	NA	8.4	NA	0.20	NA	1.7	NA	0.82	NA	0.19	NA	<0.14	<0.13
PYRENE	mg/kg	1000	1000	1000	3000	3000	NA	2.7	NA	4.3	NA	12	NA	0.27	NA	2.3	NA	0.93	NA	0.80	NA	<0.14	<0.13
VPH																							
C5-C8 ALIPHATICS	mg/kg	100	100	100	500	500	<7.8	NA	<4.3	NA	<83	NA	<4.4	NA	<13	NA	<16	NA	<31	NA	<21	NA	NA
C9-C12 ALIPHATICS	mg/kg	1000	1000	1000	3000	3000	20	NA	14	NA	1,800	NA	11	NA	<13	NA	<16	NA	<31	NA	<21	NA	NA
C9-C10 AROMATICS	mg/kg	100	100	100	500	500	110	NA	13	NA	1,600	NA	6.6	NA	<13	NA	<16	NA	<31	NA	<21	NA	NA
MTBE	mg/kg	0.1	100	100	100	500	<0.078	NA	<0.043	NA	<0.830	NA	<0.044	NA	<0.130	NA	<0.160	NA	<0.310	NA	<0.210	NA	NA
BENZENE	mg/kg	2	30	30	200	200	<0.390	NA	<0.210	NA	<4.1	NA	<0.220	NA	<0.670	NA	<0.780	NA	<1.5	NA	<1.0	NA	NA
TOLUENE	mg/kg	30	500	500	1000	1000	<0.390	NA	<0.210	NA	<4.1	NA	<0.220	NA	<0.670	NA	<0.780	NA	<1.5	NA	<1.0	NA	NA
ETHYLBENZENE	mg/kg	40	500	500	1000	1000	<0.390	NA	<0.210	NA	<4.1	NA	<0.220	NA	<0.670	NA	<0.780	NA	<1.5	NA	<1.0	NA	NA
M,P- XYLENES	mg/kg	300 [4]	300 [4]	500 [4]	300 [4]	1000 [4]	<0.390	NA	<0.210	NA	<4.1	NA	<0.220	NA	<0.670	NA	<0.780	NA	<1.5	NA	<1.0	NA	NA
O-XYLENE	mg/kg						<0.390	NA	<0.210	NA	<4.1	NA	<0.220	NA	<0.670	NA	<0.780	NA	<1.5	NA	<1.0	NA	NA
NAPHTHALENE	mg/kg	4	40	500	40	1000	0.400	NA	<0.210	NA	28	NA	<0.220	NA	<0.670	NA	<0.780	NA	<1.5	NA	<1.0	NA	NA
Inorganics																							
TOTAL CHROMIUM[2]	mg/kg	30	30	30	200	200	8.2	11	9.3	46	7.6	48	8.6	12	94.0	30	39.0	9.0	12.0	130	12.0	6.4	6.2
TRIVALENT CHROMIUM	mg/kg	1000	1000	1000	3000	3000	NA[3]	11	NA[3]	46	NA[3]	48	NA[3]	12	NA[3]	30	NA[3]	9.0	NA[3]	130	NA[3]	6.4	6.2
HEXAVALENT CHROMIUM	mg/kg	30	30	30	200	200	<1.3[3]	<0.39	<1.1[3]	<0.52	<1.5[3]	<0.61	<1.1[3]	<7.8	<1.6[3]	<1.1	<1.8[3]	<0.40	<2.2[3]	<1.0	<1.6[3]	<1.1	<0.41
LEAD	mg/kg	300	300	300	300	300	21	NA	20	NA	160	NA	51	NA	200	NA	200	NA	730	NA	51	NA	NA
General Chemistry																							
pH	pH units	NS	NS	NS	NS	NS	7.4	7.8	7.8	7.8	8.4	7.8	8.3	7.6	7.9	7.4	8.2	7.1	8.0	7.2	7.9	7.4	7.3
ORP	mV	NS	NS	NS	NS	NS	180	86	220	83	170	100	170	98	220	78	200	66	210	82	220	86	83
PERCENT SOLIDS	% weight	NS	NS	NS	NS	NS	NA	80.1	NA	61.2	NA	52.1	NA	50.3	NA	68.8	NA	77.2	NA	75.1	NA	72.1	77.0

QA/QC by LEM 6/7/12; JRS 8/22/12

Abbreviations:
EPH = Extractable Petroleum Hydrocarbons
TPH = Total Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
mg/kg = milligrams per kilogram
mV = millivolts
NS = No Standard
NA = Not Analyzed
RC = Reportable Concentration
ORP = Oxidation/Reduction Potential

Notes:
* = Reported result is an estimated concentration.
< = indicates parameter not detected above laboratory method reporting limit, shown
1 = Standards are from the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, revised June 26, 2009
2 = Total Chromium standard applies only in the absence of chromium speciation
3 = Laboratory results for hexavalent chromium are considered invalid due to holding time non-conformances; therefore, results are compared to the Total Chromium standard
4 = Standard is for mixed isomers, MassDEP does not publish standards for individual isomers
5 = Standards are from the MassDEP website updated February 2008
6 = Reporting limits exceed the RC S-1 standard
7 = Reporting limits exceed the applicable Method 1 standard and the RC S-1 standard

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Table 1d
Weston & Sampson
Summary of Soil Analytical Results
45 Cove Street
New Bedford, MA
April, May, August 2012

Parameters	Units	MassDEP Reportable Concentrations[5]	Method 1 Soil Standards[1]				Sampling Location, Depth, and Date																
		RC S-1	S-1/GW2	S-1/GW3	S-2/GW2	S-2/GW3	TP-8N 0-3 ft 5/7/12	TP-8N 0-3 ft 8/9/12	TP-8S 0-3 ft 5/7/12	TP-8S 0-3 ft 8/9/12	TP-8E 0-3 ft 5/7/12	TP-8E 0-3 ft 8/9/12	TP-8W 0-3 ft 5/7/12	TP-8W 0-3 ft 8/9/12	TP-9N 0-3 ft 4/30/12	TP-9N 0-3 ft 8/9/12	TP-9S 0-3 ft 4/30/12	TP-9S 0-3 ft 8/9/12	TP-9E 0-3 ft 4/30/12	TP-9E 0-3 ft 8/9/12	TP-9W 0-3 ft 4/30/12	TP-Dup 0-3 ft 4/30/12	TP-9W 0-3 ft 8/9/12
TPH																							
UNADJUSTED TPH	mg/kg	1000	1000	1000	3000	3000	260	NA	290 *	NA	390 *	NA	440 *	NA	660 *	NA	990 *	NA	180 *	NA	320 *	630 *	NA
EPH																							
C9-C18 ALIPHATICS	mg/kg	1000	1000	1000	3000	3000	NA	<14	NA	34	NA	<13	NA	<18	NA	<14	NA	<12	NA	<14	NA	NA	310
C19-C36 ALIPHATICS	mg/kg	3000	3000	3000	5000	5000	NA	20	NA	250	NA	<13	NA	23	NA	58	NA	18	NA	17	NA	NA	1100
Unadjusted n-C11 to n-C22 AROMATICS	mg/kg	NS	NS	NS	NS	NS	NA	33	NA	190	NA	<13	NA	43	NA	130	NA	240	NA	41	NA	NA	2200
C11-C22 AROMATICS	mg/kg	1000	1000	1000	3000	3000	NA	31	NA	160	NA	<13	NA	43	NA	100	NA	140	NA	35	NA	NA	2000
ACENAPHTHENE	mg/kg	4	1000	1000	3000	3000	NA	<0.14	NA	<0.27	NA	<0.13	NA	<0.18	NA	0.28	NA	0.48	NA	<0.14	NA	NA	2.0
ACENAPHTHYLENE	mg/kg	1	600	10	600	10	NA	<0.14	NA	<0.27	NA	<0.13	NA	<0.18	NA	<0.14	NA	0.41	NA	<0.14	NA	NA	<0.73
ANTHRACENE	mg/kg	1000	1000	1000	3000	3000	NA	<0.14	NA	0.47	NA	<0.13	NA	<0.18	NA	0.58	NA	3.1	NA	<0.14	NA	NA	5.3
BENZO(A)ANTHRACENE	mg/kg	7	7	7	40	40	NA	0.31	NA	5.6	NA	<0.13	NA	<0.18	NA	2.3	NA	6.8	NA	0.45	NA	NA	13
BENZO(A)PYRENE	mg/kg	2	2	2	4	4	NA	0.18	NA	2.1	NA	<0.13	NA	<0.18	NA	1.9	NA	6.1	NA	0.46	NA	NA	12
BENZO(B)FLUORANTHENE	mg/kg	7	7	7	40	40	NA	0.24	NA	3.0	NA	<0.13	NA	<0.18	NA	2.9	NA	8.3	NA	0.64	NA	NA	16
BENZO(G,H,I)PERYLENE	mg/kg	1000	1000	1000	3000	3000	NA	<0.14	NA	1.4	NA	<0.13	NA	<0.18	NA	<0.14	NA	5.5	NA	<0.14	NA	NA	4.6
BENZO(K)FLUORANTHENE	mg/kg	70	70	70	400	400	NA	<0.14	NA	1.1	NA	<0.13	NA	<0.18	NA	0.98	NA	3.1	NA	0.21	NA	NA	6.3
CHRYSENE	mg/kg	70	70	70	400	400	NA	0.25	NA	2.8	NA	<0.13	NA	<0.18	NA	2.4	NA	7.2	NA	0.54	NA	NA	13
DIBENZ(A,H)ANTHRACENE	mg/kg	0.7	0.7	0.7	4	4	NA	<0.14	NA	0.41	NA	<0.13	NA	<0.18	NA	0.39	NA	0.95	NA	<0.14	NA	NA	2.0
FLUORANTHENE	mg/kg	1000	1000	1000	3000	3000	NA	0.38	NA	4.3	NA	<0.13	NA	<0.18	NA	5.2	NA	19	NA	1.0	NA	NA	38
FLUORENE	mg/kg	1000	1000	1000	3000	3000	NA	<0.14	NA	0.30	NA	<0.13	NA	<0.18	NA	0.36	NA	1.2	NA	<0.14	NA	NA	3.1
INDENO(1,2,3-CD)PYRENE	mg/kg	7	7	7	40	40	NA	<0.14	NA	1.4	NA	<0.13	NA	<0.18	NA	1.4	NA	4.3	NA	0.36	NA	NA	5.8
2-METHYLNAPHTHALENE	mg/kg	0.7	80	300	80	500	NA	<0.14	NA	<0.27	NA	<0.13	NA	<0.18	NA	<0.14	NA	<0.12	NA	<0.14	NA	NA	<0.73 [6]
NAPHTHALENE	mg/kg	4	40	500	40	1000	NA	<0.14	NA	<0.27	NA	<0.13	NA	<0.18	NA	<0.14	NA	<0.12	NA	<0.14	NA	NA	0.81
PHENANTHRENE	mg/kg	10	500	500	1000	1000	NA	0.27	NA	2.8	NA	<0.13	NA	<0.18	NA	2.6	NA	14	NA	0.66	NA	NA	34
PYRENE	mg/kg	1000	1000	1000	3000	3000	NA	0.36	NA	4.3	NA	<0.13	NA	0.39	NA	4.8	NA	17	NA	0.97	NA	NA	40
VPH																							
C5-C8 ALIPHATICS	mg/kg	100	100	100	500	500	<14	NA	<12	NA	<26	NA	<22	NA	<9.2	NA	<78	NA	<6.3	NA	<5.9	<5.3	NA
C9-C12 ALIPHATICS	mg/kg	1000	1000	1000	3000	3000	<14	NA	<12	NA	<26	NA	<22	NA	<9.2	NA	<78	NA	23	NA	<5.9	<5.3	NA
C9-C10 AROMATICS	mg/kg	100	100	100	500	500	<14	NA	<12	NA	<26	NA	<22	NA	<9.2	NA	<78	NA	12	NA	<5.9	<5.3	NA
MTBE	mg/kg	0.1	100	100	100	500	<0.140	NA	<0.120	NA	<0.260	NA	<0.220	NA	<0.092	NA	<0.780	NA	<0.063	NA	<0.059	<0.053	NA
BENZENE	mg/kg	2	30	30	200	200	<0.720	NA	<0.620	NA	<1.3	NA	<1.1	NA	<0.460	NA	<3.9	NA	<0.310	NA	<0.300	<0.270	NA
TOLUENE	mg/kg	30	500	500	1000	1000	<0.720	NA	<0.620	NA	<1.3	NA	<1.1	NA	<0.460	NA	<3.9	NA	<0.310	NA	<0.300	<0.270	NA
ETHYLBENZENE	mg/kg	40	500	500	1000	1000	<0.720	NA	<0.620	NA	<1.3	NA	<1.1	NA	<0.460	NA	<3.9	NA	<0.310	NA	<0.300	<0.270	NA
M,P- XYLENES	mg/kg	300 [4]	300 [4]	500 [4]	300 [4]	1000 [4]	<0.720	NA	<0.620	NA	<1.3	NA	<1.1	NA	<0.460	NA	<3.9	NA	<0.310	NA	0.5	<0.270	NA
O-XYLENE	mg/kg						<0.720	NA	<0.620	NA	<1.3	NA	<1.1	NA	<0.460	NA	<3.9	NA	<0.310	NA	<0.300	<0.270	NA
NAPHTHALENE	mg/kg	4	40	500	40	1000	<0.720	NA	<0.620	NA	<1.3	NA	<1.1	NA	<0.460	NA	<3.9	NA	<0.310	NA	<0.300	<0.270	NA
Inorganics																							
TOTAL CHROMIUM[2]	mg/kg	30	30	30	200	200	18.0	11.0	28.0	36.0	15.0	11.0	9.9	20.0	28.0	25.0	8.4	11.0	13.0	10.0	10.0	12.0	170.0
TRIVALENT CHROMIUM	mg/kg	1000	1000	1000	3000	3000	NA[3]	11.0	NA[3]	36.0	NA[3]	11.0	NA[3]	20.0	NA[3]	25.0	NA[3]	11.0	NA[3]	10.0	NA[3]	NA[3]	170.0
HEXAVALENT CHROMIUM	mg/kg	30	30	30	200	200	<1.9[3]	<0.44	<1.9[3]	<0.44	<2.8[3]	1.0	<1.5[3]	<1.4	<1.4[3]	<1.1	<5.7[3]	<0.98	<1.2[3]	<1.1	<1.2[3]	<1.2[3]	<0.46
LEAD	mg/kg	300	300	300	300	300	15	NA	120	NA	50	NA	31	NA	120	NA	9.4	NA	58	NA	25	33	NA
General Chemistry																							
pH	pH units	NS	NS	NS	NS	NS	8.2	7.8	8.4	7.8	8.3	8.0	8.6	8.1	7.7	7.4	7.8	7.9	9.1	7.8	9.1	9.2	7.4
ORP	mV	NS	NS	NS	NS	NS	200	96	190	110	190	100	190	100	240	68	260	90	190	89	190	170	76
PERCENT SOLIDS	% weight	NS	NS	NS	NS	NS	NA	71.4	NA	35.9	NA	78.5	NA	54.8	NA	72.2	NA	81.3	NA	71.6	NA	NA	68

QA/QC by LEM 6/7/12; JRS 8/22/12

Abbreviations:
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Notes:
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4 = Standard is for mixed isomers, MassDEP does not publish standards for individual isomers
5 = Standards are from the MassDEP website updated February 2008
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Table 2a
Weston & Sampson
Summary of Groundwater Analytical Results
45 Cove Street
New Bedford, MA

Parameters	Units	MCP RCGW-2 Standards	MCP Method 1 Groundwater Cleanup Standards		Sample ID and Date															
			GW-2	GW-3	MW-1	MW-2	MW-4	MW-5	MW-6	WS-1	DUP-1 (WS-1)	WS-3	WS-4	WS-7	WS-8	WS-9	WS-11	WS-13	WS-14	WS-15
					4/29/11	4/29/11	4/28/11	4/29/11	4/28/11	4/29/11	4/29/11	4/29/11	4/29/11	4/28/11	4/29/11	4/28/11	4/28/11	4/28/11	4/28/11	4/28/11
EPH																				
C9-C18 Aliphatics	mg/kg	5	5	50	<0.14	<0.2	<0.12	<0.2	<0.15	<0.2	<0.2	<0.2	<0.13	<0.15	0.87	<0.16	<0.16	<0.15	<0.15	<0.15
C19-C36 Aliphatics	mg/kg	50	NS	50	<0.14	<0.2	<0.12	<0.2	<0.15	<0.2	<0.2	<0.2	<0.13	<0.15	0.72	<0.16	<0.16	<0.15	<0.15	<0.15
C11-C22 Aromatics	mg/kg	5	50	5	<0.14	<0.2	<0.12	<0.2	<0.15	<0.2	<0.2	<0.2	<0.13	<0.15	0.48	<0.16	<0.16	<0.15	<0.15	<0.15
Unadjusted n-C11 to n-C22 Aromati	mg/kg	NS	NS	NS	<0.14	<0.2	<0.12	<0.2	<0.15	<0.2	<0.2	<0.2	<0.13	<0.15	0.51	<0.16	<0.16	<0.15	<0.15	<0.15
PAHs																				
Acenaphthene		6	NS	6	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzo(a)anthracene	mg/kg	1	NS	1.0	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Benzo(a)pyrene	mg/kg	0.5	NS	0.5	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Benzo(b)fluoranthene	mg/kg	0.4	NS	0.4	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	0.0004	<0.0001	<0.0005	0.0004	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005
Benzo(g,h,i)perylene	mg/kg	0.02	NS	0.02	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	0.0002	<0.0001	<0.0005	0.0002	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005
Benzo(k)fluoranthene	mg/kg	0.1	NS	0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	0.0001	<0.0001	<0.0005	0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005
Chrysene	mg/kg	0.07	NS	0.07	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Fluoranthene	mg/kg	0.2	NS	0.2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005
Indeno(1,2,3-cd) Pyrene	mg/kg	0.1	NS	0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
2-Methylnaphthalene	mg/kg	2	2	20	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Naphthalene	mg/kg	1.0	1	20	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.011	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Pyrene	mg/kg	0.02	NS	0.02	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
VPH																				
C5-C8 Aliphatics	mg/kg	3	3	50	<0.02	<0.02	<0.020	<0.02	<0.020	<0.02	<0.02	<0.02	<0.02	<0.020	<0.04	<0.020	0.02	<0.020	0.04	<0.020
C9-C12 Aliphatics	mg/kg	5	5	50	<0.02	<0.02	<0.020	<0.02	<0.020	0.033	0.031	<0.02	<0.02	0.035	0.54	0.037	<0.020	<0.020	0.027	<0.020
C9-C10 Aromatics	mg/kg	7	7	50	<0.02	<0.02	<0.020	<0.02	<0.020	0.028	0.027	<0.02	<0.02	0.026	0.99	0.025	<0.020	<0.020	0.029	<0.020
Unadjusted C5-C8 Aliphatics	mg/kg	NS	NS	NS	<0.02	<0.02	<0.020	<0.02	<0.020	<0.02	<0.02	<0.02	<0.02	0.02	<0.04	<0.020	0.021	<0.020	0.042	<0.020
Unadjusted C9-C12 Aliphatics	mg/kg	NS	NS	NS	<0.02	<0.02	<0.020	<0.02	<0.020	0.061	0.059	0.033	0.024	0.063	1.6	0.062	0.035	<0.020	0.059	0.022
Target VOCs																				
Benzene	mg/kg	2	2	10	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Total Xylenes	mg/kg	5	9	5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	<0.010	<0.010
Naphthalene	mg/kg	1	1	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.023	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs 8260																				
Acetone	mg/kg	50	50	50	0.19	<0.01	<0.01	<0.01	<0.01	0.026	0.023	0.011	0.13	0.016	<0.1	0.073	0.046	0.016	0.14	0.022
Chloromethane	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0057	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
2-Butanone	mg/kg	50	50	50	0.0071	<0.005	<0.005	<0.005	<0.005	0.0061	<0.005	<0.005	0.0055	<0.005	<0.05	0.0065	0.0093	<0.005	0.021	<0.005
Benzene	mg/kg	2	2	10	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
2-Hexanone	mg/kg	NS	NS	NS	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	0.018	<0.005	0.0091	<0.005
4-Isopropyltoluene	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0064	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
Isopropylbenzene	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.032	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Naphthalene	mg/kg	1	1	20	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.023	0.0011	<0.0005	<0.0005	<0.0005	<0.0005
N-Propylbenzene	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.017	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
sec-Butylbenzene	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,2,4-Trimethylbenzene	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.51	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/kg	40	50	40	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00056	<0.0005	<0.0005	<0.005	0.00051	0.00064	<0.0005	0.0016	0.00069
Total Xylenes	mg/kg	5	9	5	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.013	<0.0005	<0.0005	<0.0005	0.00055	<0.0005
1,3,5-Trimethylbenzene	mg/kg	NS	NS	NS	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.044	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Trace Metals																				
Arsenic	mg/kg	0.9	NS	0.9	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	mg/kg	50	NS	50	0.14	0.11	0.40	<0.05	<0.05	0.21	0.22	0.08	0.23	0.11	0.06	0.34	<0.05	<0.05	<0.05	<0.05
Cadmium	mg/kg	0.004	NS	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Chromium	mg/kg	0.3	NS	0.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01
Mercury	mg/kg	0.02	NS	0.02	<0.0002	0.0003	<0.0002	0.0002	<0.0002	<0.0002	0.0003	0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Selenium	mg/kg	0.1	NS	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	mg/kg	0.007	NS	0.007	<0.007	<0.007	0.039	<0.007	<0.007	0.012	0.014	<0.007	0.014	<0.007	0.018	<0.007	<0.007	<0.007	<0.007	<0.007

QC by LEM 5/31/11

Abbreviations:
SVOCs = Semi-Volatile Organic Compounds
EPH = Extractable Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
mg/kg = milligrams per kilogram
NS = No Standard
NA = Not Analyzed

Notes:
Lab ID: 141550 & 141577
Standards are from the Massachusetts Contingency Plan (MCP),
310 CMR 40.0000, revised February 14, 2008.
< = indicates parameter not detected above laboratory method reporting limit, shown

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Table 2b
Weston & Sampson
Summary of Groundwater Analytical Results
45 Cove Street
New Bedford, MA
April 16, 2012

Parameter	Units	Method 1 GW-1 Standard (1)	Method 1 GW-2 Standard (1)	Method 1 GW-3 Standard (1)	Monitoring Wells				
					WS-4	WS-4 (DUP-1)	MW-4	WS-1	WS-8
Dissolved Metals									
Silver	mg/L	100	NS	0.007	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020

QC by EN

O:\New Bedford - Cove St\Cove St\Reports\Phase I Site Investigation & Tier Classification\Tables\[Table 2b - Groundwater Analytical Results REV JSC.xls]Sheet1

Abbreviations:
mg/L = milligrams per liter
NS = no standard

Notes:

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CP BRODEUR, INC.

RTN: 4-23643

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		A01	A02	A02	A02	A02	A02	A03	A04
Ramboll Sample ID		SO-A01-0-1	SO-A02-0-1	SO-A02-0-2	SO-A02-2-4	SO-A02-4-6	SO-A02-6-8	SO-A03-0-1	SO-A04-0-1
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 2	2 - 4	4 - 6	6 - 8	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.069)	0.11 (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	0.12 (0.067)	ND (0.07)
Aroclor-1016	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1221	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1232	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1242	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1248	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1254	NE	ND (0.069)	0.11 (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	0.12 (0.067)	ND (0.07)
Aroclor-1260	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1262	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
Aroclor-1268	NE	ND (0.069)	ND (0.069)	ND (0.071)	ND (0.073)	ND (0.073)	ND (0.096)	ND (0.067)	ND (0.07)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		A05	A06	A07	A08	A09	A10	B01	B01
Ramboll Sample ID		SO-A05-0-1	SO-A06-0-1	SO-A07-0-1	SO-A08-0-1	SO-A09-0-1	SO-A10-0-1	SO-B01-0-1	DUP-5
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									Field Duplicate
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1016	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1221	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1232	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1242	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1248	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1254	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1260	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1262	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
Aroclor-1268	NE	ND (0.07)	ND (0.07)	ND (0.072)	ND (0.067)	ND (0.069)	ND (0.069)	ND (0.068)	ND (0.068)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location	MCP RCS-2	B02	B04	B05	B06	B07	B08	B09	B10
Ramboll Sample ID		SO-B02-0-1	SO-B04-0-1	SO-B05-0-1	SO-B06-0-1	SO-B07-0-1	SO-B08-0-1	SO-B09-0-1	SO-B10-0-1
Collection Depth (ft bgs)		0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Method		Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1016	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1221	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1232	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1242	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1248	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1254	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1260	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1262	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
Aroclor-1268	NE	ND (0.073)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.068)	ND (0.071)	ND (0.071)	ND (0.071)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		C01	C02	C04	C05	C06	C07	C07	C07
Ramboll Sample ID		SO-C01-0-1	SO-C02-0-1	SO-C04-0-1	SO-C05-0-1	SO-C06-0-1	SO-C07-0-1	SO-C07-0-2	SO-C07-2-4
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 2	2 - 4
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1016	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1221	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1232	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1242	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1248	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1254	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1260	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1262	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
Aroclor-1268	NE	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.07)	ND (0.067)	ND (0.068)	ND (0.068)	ND (0.071)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		C07	C07	C08	C09	C09	C09	C09	C09
Ramboll Sample ID		SO-C07-4-6	SO-C07-6-8	SO-C08-0-1	SO-C09-0-1	SO-C09-0-2	SO-C09-2-4	SO-C09-4-6	SO-C09-6-8
Collection Depth (ft bgs)	MCP	4 - 6	6 - 8	0 - 1	0 - 1	0 - 2	2 - 4	4 - 6	6 - 8
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.071)	0.56 (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	0.52 (0.069)	0.038 (0.034)	0.12 (0.093)
Aroclor-1016	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1221	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1232	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1242	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1248	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1254	NE	ND (0.071)	0.56 (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	0.52 (0.069)	0.038 (0.034)	0.12 (0.093)
Aroclor-1260	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1262	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
Aroclor-1268	NE	ND (0.071)	ND (0.072)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.034)	ND (0.093)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		C09	C10	D01	D02	D03	D03	D04	D04
Ramboll Sample ID		DUP-6	SO-C10-0-1	SO-D01-0-1	SO-D02-0-1	SO-D03-0-1	DUP-2	SO-D04-0-1	SO-D04-0-2
Collection Depth (ft bgs)	MCP	4 - 6	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 2
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments		Field Duplicate					Field Duplicate		
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1016	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1221	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1232	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1242	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1248	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1254	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1260	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1262	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
Aroclor-1268	NE	ND (0.069)	ND (0.07)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.067)	ND (0.068)	ND (0.068)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		D04	D04	D04	D05	D05	D06	D07	D08
Ramboll Sample ID		SO-D04-2-4	SO-D04-4-6	SO-D04-6-8	SO-D05-0-1	DUP-1	SO-D06-0-1	SO-D07-0-1	SO-D08-0-1
Collection Depth (ft bgs)	MCP	2 - 4	4 - 6	6 - 8	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments						Field Duplicate			
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.07)	0.082 (0.076)	0.1 (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1016	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1221	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1232	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1242	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1248	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1254	NE	ND (0.07)	0.082 (0.076)	0.1 (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1260	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1262	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
Aroclor-1268	NE	ND (0.07)	ND (0.076)	ND (0.084)	ND (0.069)	ND (0.068)	ND (0.067)	ND (0.068)	ND (0.069)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		D09	D10	E01	E02	E02	E03	E04	E05
Ramboll Sample ID		SO-D09-0-1	SO-D10-0-1	SO-E01-0-1	SO-E02-0-1	DUP-3	SO-E03-0-1	SO-E04-0-1	SO-E05-0-1
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments						Field Duplicate			
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	0.076 (0.07)
Aroclor-1016	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1221	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1232	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1242	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1248	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1254	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	0.076 (0.07)
Aroclor-1260	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1262	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
Aroclor-1268	NE	ND (0.068)	ND (0.081)	ND (0.07)	ND (0.071)	ND (0.072)	ND (0.069)	ND (0.068)	ND (0.07)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		E06	E07	E08	E09	E09	E10	F01	F02
Ramboll Sample ID		SO-E06-0-1	SO-E07-0-1	SO-E08-0-1	SO-E09-0-1	DUP-4	SO-E10-0-1	SO-F01-0-1	SO-F02-0-1
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments						Field Duplicate			
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1016	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1221	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1232	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1242	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1248	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1254	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1260	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1262	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
Aroclor-1268	NE	ND (0.068)	ND (0.069)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.069)	ND (0.074)	ND (0.074)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		F03	F04	F04	F04	F04	F04	F05	F06
Ramboll Sample ID		SO-F03-0-1	SO-F04-0-1	SO-F04-0-2	SO-F04-2-4	SO-F04-4-6	SO-F04-6-8	SO-F05-0-1	SO-F06-0-1
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 2	2 - 4	4 - 6	6 - 8	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.071)	0.14 (0.073)	0.3 (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	0.3 (0.07)
Aroclor-1016	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1221	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1232	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1242	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1248	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1254	NE	ND (0.071)	0.14 (0.073)	0.3 (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	0.3 (0.07)
Aroclor-1260	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1262	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
Aroclor-1268	NE	ND (0.071)	ND (0.073)	ND (0.075)	ND (0.074)	ND (0.076)	ND (0.077)	ND (0.068)	ND (0.07)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		F07	F07	F07	F07	F07	F08	F09	F10
Ramboll Sample ID		SO-F07-0-1	SO-F07-0-2	SO-F07-2-4	SO-F07-4-6	SO-F07-6-8	SO-F08-0-1	SO-F09-0-1	SO-F10-0-1
Collection Depth (ft bgs)	MCP	0 - 1	0 - 2	2 - 4	4 - 6	6 - 8	0 - 1	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.069)	ND (0.071)	ND (0.07)	0.08 (0.073)	0.24 (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1016	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1221	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1232	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1242	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1248	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1254	NE	ND (0.069)	ND (0.071)	ND (0.07)	0.08 (0.073)	0.24 (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1260	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1262	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
Aroclor-1268	NE	ND (0.069)	ND (0.071)	ND (0.07)	ND (0.073)	ND (0.073)	ND (0.071)	ND (0.069)	ND (0.067)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		G01	G02	G02	G02	G02	G02	G03	G04
Ramboll Sample ID		SO-G01-0-1	SO-G02-0-1	SO-G02-0-2	SO-G02-2-4	SO-G02-4-6	SO-G02-6-8	SO-G03-0-1	SO-G04-0-1
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 2	2 - 4	4 - 6	6 - 8	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	0.1 (0.098)	1.7 (0.48)	ND (0.068)	0.44 (0.073)
Aroclor-1016	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1221	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1232	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1242	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1248	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1254	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	0.1 (0.098)	1.7 (0.48)	ND (0.068)	0.44 (0.073)
Aroclor-1260	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1262	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
Aroclor-1268	NE	ND (0.073)	ND (0.071)	ND (0.071)	ND (0.076)	ND (0.098)	ND (0.48)	ND (0.068)	ND (0.073)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		G05	G06	G07	G08	G09	G09	G09	G09
Ramboll Sample ID		SO-G05-0-1	SO-G06-0-1	SO-G07-0-1	SO-G08-0-1	SO-G09-0-1	SO-G09-0-2	SO-G09-2-4	SO-G09-4-6
Collection Depth (ft bgs)	MCP	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 2	2 - 4	4 - 6
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1016	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1221	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1232	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1242	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1248	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1254	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1260	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1262	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
Aroclor-1268	NE	ND (0.068)	ND (0.071)	ND (0.07)	ND (0.07)	ND (0.069)	ND (0.07)	ND (0.071)	ND (0.075)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		G09	G10	H01	H02	H03	H04	H05	H06
Ramboll Sample ID		SO-G09-6-8	SO-G10-0-1	SO-H01-0-1	SO-H02-0-1	SO-H03-0-1	SO-H04-0-1	SO-H05-0-1	SO-H06-0-1
Collection Depth (ft bgs)	MCP	6 - 8	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments									
PCBs analyzed via EPA Method SW8082									
PCBs (total)	4	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	0.16 (0.071)	ND (0.069)	ND (0.069)
Aroclor-1016	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1221	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1232	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1242	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1248	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1254	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	0.16 (0.071)	ND (0.069)	ND (0.069)
Aroclor-1260	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1262	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
Aroclor-1268	NE	ND (0.076)	ND (0.07)	ND (0.07)	ND (0.071)	ND (0.075)	ND (0.071)	ND (0.069)	ND (0.069)
PAHs analyzed via EPA Method EPH-19-2.1									
Acenaphthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	10	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	40	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	400	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	400	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	80	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,000	NA	NA	NA	NA	NA	NA	NA	NA
EPHs analyzed via EPA Method EPH-19-2.1									
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 1
Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results
80 Wright Street, New Bedford, MA

Location	MCP RCS-2	H07	H08	H09	H10	A02
Ramboll Sample ID		SO-H07-0-1	SO-H08-0-1	SO-H09-0-1	SO-H10-0-1	PS-A02-8-9
Collection Depth (ft bgs)		0 - 1	0 - 1	0 - 1	0 - 1	8 - 9
Sample Method		Direct Push	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/25/2021	10/25/2021	10/25/2021	10/25/2021	10/25/2021
Comments						
PCBs analyzed via EPA Method SW8082						
PCBs (total)	4	ND (0.07)	ND (0.074)	ND (0.07)	0.45 (0.07)	NA
Aroclor-1016	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1221	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1232	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1242	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1248	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1254	NE	ND (0.07)	ND (0.074)	ND (0.07)	0.45 (0.07)	NA
Aroclor-1260	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1262	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
Aroclor-1268	NE	ND (0.07)	ND (0.074)	ND (0.07)	ND (0.07)	NA
PAHs analyzed via EPA Method EPH-19-2.1						
Acenaphthene	3,000	NA	NA	NA	NA	ND (0.23)
Acenaphthylene	10	NA	NA	NA	NA	ND (0.23)
Anthracene	3,000	NA	NA	NA	NA	ND (0.23)
Benzo(a)anthracene	40	NA	NA	NA	NA	ND (0.23)
Benzo(a)pyrene	7	NA	NA	NA	NA	ND (0.23)
Benzo(b)fluoranthene	40	NA	NA	NA	NA	ND (0.23)
Benzo(g,h,i)perylene	3,000	NA	NA	NA	NA	ND (0.23)
Benzo(k)fluoranthene	400	NA	NA	NA	NA	ND (0.23)
Chrysene	400	NA	NA	NA	NA	ND (0.23)
Dibenz(a,h)anthracene	4	NA	NA	NA	NA	ND (0.23)
Fluoranthene	3,000	NA	NA	NA	NA	ND (0.23)
Fluorene	3,000	NA	NA	NA	NA	ND (0.23)
Indeno(1,2,3-cd)pyrene	40	NA	NA	NA	NA	ND (0.23)
2-Methylnaphthalene	80	NA	NA	NA	NA	ND (0.23)
Naphthalene	20	NA	NA	NA	NA	ND (0.23)
Phenanthrene	1,000	NA	NA	NA	NA	ND (0.23)
Pyrene	3,000	NA	NA	NA	NA	ND (0.23)
EPHs analyzed via EPA Method EPH-19-2.1						
C19-C36 Aliphatics	5,000	NA	NA	NA	NA	ND (66)
C9-C18 Aliphatic Hydrocarbons	3,000	NA	NA	NA	NA	ND (66)
C11-C22 Aromatics (Adjusted)	3,000	NA	NA	NA	NA	ND (66)
C11-C22 Aromatics (Unadjusted)	3,000	NA	NA	NA	NA	ND (66)
Petroleum Hydrocarbons (Extractable)	3,000	NA	NA	NA	NA	ND (66)

Notes:
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

Abbreviations:
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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TABLE 2
Summary of Landfill Disposal Characterization Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		Q01	Q02	Q03	Q04
Ramboll Sample ID		SO-Q1-0-2	SO-Q2-0-2	SO-Q3-0-2	SO-Q4-0-2
Collection Depth (ft bgs)	MCP	0 - 2	0 - 2	0 - 2	0 - 2
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/26/2021	10/26/2021	10/26/2021	10/26/2021
Comments					
Waste Characterization analyzed via various methods					
Corrosivity	NE	Negative	Negative	Negative	Negative
Flashpoint (^{o}F)	NE	ND (200)	ND (200)	ND (200)	ND (200)
Cyanide (Reactive)	NE	ND (5)	ND (5)	ND (5)	ND (5)
Sulfide (Reactive)	NE	ND (20)	ND (20)	ND (20)	ND (20)
Reactivity	NE	Negative	Negative	Negative	Negative
Ignitability (^{o}F)	NE	ND (140)	ND (140)	ND (140)	ND (140)
Solids (total) (%)	NE	94	90	94	95
pH (Standard Units)	NE	6.94 (1)	7.88 (1)	6.82 (1)	7.01 (1)
Volatile Organic Compound analyzed via EPA Method SW8260					
Acetone	50	ND (0.24)	ND (0.29)	ND (0.28)	ND (0.26)
Acrylonitrile	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Benzene	200	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1-Methyl-2-isopropylbenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Bromobenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Bromochloromethane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Bromodichloromethane	0.1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Bromoform	1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Bromomethane	0.5	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
2-Butanone	50	ND (0.029)	ND (0.035)	ND (0.033)	ND (0.032)
n-Butylbenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
sec-Butylbenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
tert-Butylbenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Carbon Disulfide	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Carbon Tetrachloride	5	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Chlorobenzene	3	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Chloroethane	1000	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Chloroform	0.2	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Chloromethane	1000	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
2-Chlorotoluene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
4-Chlorotoluene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Cumene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
p-Cymene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,2-Dibromo-3-chloropropane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Dibromochloromethane	0.03	ND (0.0029)	ND (0.0035)	ND (0.0033)	ND (0.0032)
1,2-Dibromoethane	0.1	ND (0.00049)	ND (0.00058)	ND (0.00055)	ND (0.00053)
Dibromomethane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
trans-1,4-Dichloro-2-butene	NE	ND (0.0098)	ND (0.012)	ND (0.011)	ND (0.011)
1,2-Dichlorobenzene	100	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,3-Dichlorobenzene	200	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,4-Dichlorobenzene	1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Dichlorodifluoromethane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1-Dichloroethane	9	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,2-Dichloroethane	0.1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1-Dichloroethene	40	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
cis-1,2-Dichloroethene	0.1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
trans-1,2-Dichloroethene	1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,2-Dichloropropane	0.1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,3-Dichloropropane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
2,2-Dichloropropane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1-Dichloropropene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,3-Dichloropropene (total)	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
cis-1,3-Dichloropropene	0.4	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
trans-1,3-Dichloropropene	0.4	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,4-Dioxane	6	ND (0.098)	ND (0.12)	ND (0.11)	ND (0.11)
Ethyl tert-butyl ether	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
t-Amyl methyl ether	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Ethyl Benzene	1000	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Diethyl ether	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
2-Hexanone	NE	ND (0.024)	ND (0.029)	ND (0.028)	ND (0.026)

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TABLE 2
Summary of Landfill Disposal Characterization Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		Q01	Q02	Q03	Q04
Ramboll Sample ID		SO-Q1-0-2	SO-Q2-0-2	SO-Q3-0-2	SO-Q4-0-2
Collection Depth (ft bgs)	MCP	0 - 2	0 - 2	0 - 2	0 - 2
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/26/2021	10/26/2021	10/26/2021	10/26/2021
Comments					
Hexachlorobutadiene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Methyl tert-butyl ether	100	ND (0.0098)	ND (0.012)	ND (0.011)	ND (0.011)
4-Methyl-2-pentanone	50	ND (0.024)	ND (0.029)	ND (0.028)	ND (0.026)
Methylene Chloride	20	ND (0.0098)	ND (0.012)	ND (0.011)	ND (0.011)
Diisopropyl ether	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Naphthalene	20	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
n-Propylbenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Styrene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1,1,2-Tetrachloroethane	0.1	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1,2,2-Tetrachloroethane	NE	ND (0.0029)	ND (0.0035)	ND (0.0033)	ND (0.0032)
Tetrachloroethene	10	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Tetrahydrofuran	NE	ND (0.0098)	ND (0.012)	ND (0.011)	ND (0.011)
Toluene	1000	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,2,3-Trichlorobenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,2,4-Trichlorobenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1,1-Trichloroethane	600	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1,2-Trichloroethane	2	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Trichloroethene	0.3	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Trichlorofluoromethane	10000	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,2,3-Trichloropropane	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,1,2-Trichloro-1,2,2-trifluoroethane	NE	ND (0.0098)	ND (0.012)	ND (0.011)	ND (0.011)
1,2,4-Trimethylbenzene	10000	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
1,3,5-Trimethylbenzene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Vinyl Chloride	0.7	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
m,p-xylene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
ortho-xylene	NE	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Xylenes (total)	100	ND (0.0049)	ND (0.0058)	ND (0.0055)	ND (0.0053)
Semivolatile Organic Hydrocarbons analyzed via EPA Method SW8270					
Acenaphthene	3000	ND (0.24)	0.62 (0.25)	ND (0.25)	ND (0.24)
Acenaphthylene	10	ND (0.24)	3.6 (0.25)	ND (0.25)	ND (0.24)
Acetophenone	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Aniline	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Anthracene	3000	ND (0.24)	5.6 (0.25)	ND (0.25)	ND (0.24)
Benzidine	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Benzo(a)anthracene	40	ND (0.24)	11 (2.5)	ND (0.25)	ND (0.24)
Benzo(a)pyrene	7	ND (0.24)	**9.1 (2.5)**	ND (0.25)	ND (0.24)
Benzo(b)fluoranthene	40	ND (0.24)	6.7 (0.25)	ND (0.25)	ND (0.24)
Benzo(g,h,i)perylene	3000	ND (0.24)	4 (0.25)	ND (0.25)	ND (0.24)
Benzo(k)fluoranthene	400	ND (0.24)	5.5 (0.25)	ND (0.25)	ND (0.24)
Benzoic Acid	NE	ND (0.7)	ND (0.72)	ND (0.7)	ND (0.69)
bis(2-Chloroethoxy)methane	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
bis(2-Chloroethyl) ether	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
4-Bromophenyl-phenyl ether	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Carbazole	NE	ND (0.35)	0.95 (0.36)	ND (0.35)	ND (0.35)
4-Chloro-3-methylphenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
4-Chloroaniline	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2-Chloronaphthalene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2-Chlorophenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
4-Chlorophenyl-phenyl ether	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Chrysene	400	ND (0.24)	9.7 (2.5)	ND (0.25)	ND (0.24)
m/p-cresol	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Dibenz(a,h)anthracene	4	ND (0.24)	1.3 (0.25)	ND (0.25)	ND (0.24)
Dibenzofuran	NE	ND (0.24)	2.3 (0.25)	ND (0.25)	ND (0.24)
1,2-Dichlorobenzene	100	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
1,3-Dichlorobenzene	200	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
1,4-Dichlorobenzene	1	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
1,2,4-Trichlorobenzene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
3,3'-Dichlorobenzidine	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2,4-Dichlorophenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2,4-Dimethylphenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
4,6-Dinitro-2-methylphenol	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
2,4-Dinitrophenol	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)

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TABLE 2
Summary of Landfill Disposal Characterization Soil Sampling Results
80 Wright Street, New Bedford, MA

Location Ramboll Sample ID Collection Depth (ft bgs) Sample Method Sample Date Comments	MCP RCS-2	Q01 SO-Q1-0-2 0 - 2 Direct Push 10/26/2021	Q02 SO-Q2-0-2 0 - 2 Direct Push 10/26/2021	Q03 SO-Q3-0-2 0 - 2 Direct Push 10/26/2021	Q04 SO-Q4-0-2 0 - 2 Direct Push 10/26/2021
2,4-Dinitrotoluene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2,6-Dinitrotoluene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
1,2-Diphenylhydrazine	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Fluoranthene	3000	ND (0.24)	32 (2.5)	ND (0.25)	ND (0.24)
Fluorene	3000	ND (0.24)	2.1 (0.25)	ND (0.25)	ND (0.24)
Hexachlorobenzene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Hexachlorobutadiene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Hexachlorocyclopentadiene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Hexachloroethane	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Indeno(1,2,3-cd)pyrene	40	ND (0.24)	5 (0.25)	ND (0.25)	ND (0.24)
Isophorone	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2-Methylnaphthalene	80	ND (0.24)	2 (0.25)	ND (0.25)	ND (0.24)
2-Methylphenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Naphthalene	20	ND (0.24)	2.2 (0.25)	ND (0.25)	ND (0.24)
2-Nitroaniline	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
3-Nitroaniline	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
4-Nitroaniline	NE	ND (0.56)	ND (0.58)	ND (0.56)	ND (0.55)
Nitrobenzene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2-Nitrophenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
4-Nitrophenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
N-Nitrosodimethylamine	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
N-Nitrosodiphenylamine	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
N-Nitroso-di-n-propylamine	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2,2'-oxybis(1-Chloropropane)	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Pentachloronitrobenzene	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Pentachlorophenol	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Phenanthrene	1000	ND (0.24)	34 (2.5)	ND (0.25)	ND (0.24)
Phenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
bis(2-Ethylhexyl)phthalate	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Butylbenzylphthalate	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Diethylphthalate	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Dimethylphthalate	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Di-n-butylphthalate	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
Di-n-octylphthalate	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Pyrene	3000	ND (0.24)	26 (2.5)	ND (0.25)	ND (0.24)
Pyridine	NE	ND (0.35)	ND (0.36)	ND (0.35)	ND (0.35)
1,2,4,5-Tetrachlorobenzene	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2,4,5-Trichlorophenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
2,4,6-Trichlorophenol	NE	ND (0.24)	ND (0.25)	ND (0.25)	ND (0.24)
Total Petroleum Hydrocarbons analyzed via EPA Method SW8015D					
#2 Fuel Oil	NE	ND (52)	ND (55)	ND (52)	ND (51)
#4 Fuel Oil	NE	ND (52)	ND (55)	ND (52)	ND (51)
#6 Fuel Oil	NE	ND (52)	ND (55)	ND (52)	ND (51)
Kerosene	NE	ND (52)	ND (55)	ND (52)	ND (51)
Motor Oil	NE	ND (52)	ND (55)	ND (52)	ND (51)
Petroleum Hydrocarbon (Unidentified)	NE	ND (52)	ND (55)	ND (52)	ND (51)
Petroleum Hydrocarbons (Extractable)	3000	ND (52)	ND (55)	ND (52)	ND (51)
Polychlorinated Biphenyls analyzed via EPA Method SW8082					
PCBs (total)	4	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1221	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1232	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1242	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1248	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1254	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1260	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1262	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)
Aroclor-1268	NE	ND (0.069)	ND (0.073)	ND (0.069)	ND (0.07)

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TABLE 2
Summary of Landfill Disposal Characterization Soil Sampling Results
80 Wright Street, New Bedford, MA

Location		Q01	Q02	Q03	Q04
Ramboll Sample ID		SO-Q1-0-2	SO-Q2-0-2	SO-Q3-0-2	SO-Q4-0-2
Collection Depth (ft bgs)	MCP	0 - 2	0 - 2	0 - 2	0 - 2
Sample Method	RCS-2	Direct Push	Direct Push	Direct Push	Direct Push
Sample Date		10/26/2021	10/26/2021	10/26/2021	10/26/2021
Comments					
Total Metals analyzed via EPA Method SW6010D					
Arsenic	20	1.23 (0.74)	2.35 (0.69)	0.91 (0.63)	0.93 (0.73)
Barium	3000	14.7 (0.37)	39.4 (0.34)	22.2 (0.32)	9.92 (0.37)
Cadmium	100	ND (0.37)	0.78 (0.34)	ND (0.32)	ND (0.37)
Chromium (total)	200	4.99 (0.37)	8.81 (0.34)	4.86 (0.32)	3.36 (0.37)
Lead	600	26.5 (0.37)	229 (0.34)	8.72 (0.32)	9.97 (0.37)
Selenium	700	ND (1.5)	ND (1.4)	ND (1.3)	ND (1.5)
Silver	200	ND (0.37)	ND (0.34)	ND (0.32)	ND (0.37)
TCLP Metals analyzed via EPA Method SW6010D (mg/L)					
Lead	NE	NA	0.27 (0.10)	NA	NA
Mercury analyzed via EPA Method SW7471					
Mercury	30	ND (0.03)	0.05 (0.03)	ND (0.03)	ND (0.03)
Pesticides analyzed via EPA Method SW8151					
2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	NE	ND (0.026)	ND (0.028)	ND (0.026)	ND (0.026)
2,4-D	NE	ND (0.053)	ND (0.055)	ND (0.053)	ND (0.052)
Dalapon	NE	ND (0.026)	ND (0.028)	ND (0.026)	ND (0.026)
2,4-DB	NE	ND (0.026)	ND (0.028)	ND (0.026)	ND (0.026)
Dicamba	NE	ND (0.026)	ND (0.028)	ND (0.026)	ND (0.026)
Dichloroprop	NE	ND (0.039)	ND (0.042)	ND (0.04)	ND (0.039)
MCPA (2-Methyl-4-chlorophenoxy acetic acid)	NE	ND (3.2)	ND (3.3)	ND (3.2)	ND (3.1)
Mecoprop	NE	ND (3.2)	ND (3.3)	ND (3.2)	ND (3.1)
2,4,5-T	NE	ND (0.026)	ND (0.028)	ND (0.026)	ND (0.026)
2,4,5-TP	NE	ND (0.026)	ND (0.028)	ND (0.026)	ND (0.026)
Pesticides analyzed via EPA Method SW8081					
Alachlor	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Aldrin	NE	ND (0.0035)	ND (0.0037)	ND (0.0035)	ND (0.0035)
alpha-BHC	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
beta-BHC	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
delta-BHC	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
gamma-BHC	NE	ND (0.0014)	ND (0.0015)	ND (0.0014)	ND (0.0014)
Chlordane (total)	NE	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.014)
4,4'-DDD	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
4,4'-DDE	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
4,4'-DDT	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Dieldrin	NE	ND (0.0035)	ND (0.0037)	ND (0.0035)	ND (0.0035)
Endosulfan I	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Endosulfan II	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Endosulfan sulfate	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Endrin	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Endrin aldehyde	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Endrin ketone	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Heptachlor	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Heptachlor epoxide	NE	ND (0.0069)	ND (0.0073)	ND (0.0069)	ND (0.007)
Hexachlorobenzene	NE	ND (0.0035)	ND (0.0037)	ND (0.0035)	ND (0.0035)
Methoxychlor	NE	ND (0.035)	ND (0.037)	ND (0.035)	ND (0.035)
Toxaphene	NE	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.14)

Notes:
1 All concentrations are presented mg/kg unless noted otherwise.
2 Concentrations that exceed the MCP RCS-2, dated April 25,2014, are **boldfaced**.

Abbreviations:
NA -- Not Analyzed.
NE -- Not Established.
ND -- Not Detected.
( ) -- Detection Limit.
TCLP -- Toxicity Characteristic Leaching Procedure

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EXHIBIT C
ACTIVITY AND USE LIMITATIONS

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MAIN TERMINAL (DRAFT) AUL

RTNS: 4-23736 4-24296, 4-15490

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Form 1075

NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Names: RIST Property (former RIST, LLC) RTN 4-23736
DMF Parcel 1, RTN 4-24296
DMF Parcel 2, RTN 4-15490
Riverfront Parcel

This Notice of Activity and Use Limitation ("Notice") is made as of this _____ day of _____, 2021, by The Massachusetts Clean Energy Technology Center, with a mailing address of 63 Franklin Street, 3rd Floor Boston, Massachusetts, 02110 and The City of New Bedford Massachusetts, with a mailing address of 133 Williams Street, New Bedford, Massachusetts 02740 together with his/her/its/their successors and assigns (collectively "Owners").

WITNESSETH:

WHEREAS, the Massachusetts Clean Energy Technology Center is the owner in fee simple of certain parcels of land depicted as:

Parcel Name: **RIST Property (former RIST, LLC), RTN 4-23736**
Address: North of Blackmer Street
Parcel ID/Size: Map 31 Parcel 288 / 7.75 acres

And, WHEREAS, the City of New Bedford, Massachusetts is the owner in fee simple of certain parcels of land, under lease to the Massachusetts Clean Energy Technology Center, and depicted as:

Parcel Name: **DMF Parcel 1, RTN 4-24296**
Address: North of 16 Blackmer Street
Parcel ID/Size: Map 25A, Parcel 53 / 1.2 acres

Parcel Name: **DMF Parcel 2, RTN 4-15490**
Address: 16 Blackmer Street
Parcel ID/Size: Map 25A, Parcel 49 / 2.2 acres

Parcel Name: **Riverfront Parcel**
Address: SE Blackmer Street
Parcel ID/Size: Map 25A, Parcel 48 / 9.227 acres
Area of Parcel Subject to AUL: 6.32 acres

WHEREAS, said four parcels of land, which are more particularly bounded and described in **Exhibit A**, attached hereto and made a part hereof ("Property"), are subject to this Notice of Activity and Use Limitation.

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WHEREAS, the Properties together comprise all of a disposal site as the result of releases of oil and/or hazardous material. **Exhibit B** is a sketch plan showing the relationship of the Properties subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Properties and to the extent such boundaries have been established. **Exhibit B** is attached hereto and made a part hereof; and,

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Properties. A description of the basis for such restrictions, and the oil and/or hazardous material release event(s) or site history that resulted in the contaminated media subject to the Activity and Use Limitation Opinion which is attached hereto as **Exhibit C** and made a part hereof;

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in this Notice of Activity and Use Limitation are as follows:

1. Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Properties pursuant to 310 CMR 40.0000:

   (i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the AUL area within the RIST property, DMF Parcel 1 and DMF Parcel 2 and Riverfront Parcel properties described above, as long as the Obligations and Conditions specified herein are followed;
   (ii) Any non-residential uses of all of the Properties, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;
   (iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil as described in Paragraph 1(i), provided that such activities are conducted in accordance with the soil management provisions of the Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;
   (iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 2 (ii);
   (v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and,
   (vi) Other activities or uses of the Properties not identified in Paragraph 2 as Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent Maintaining No Significant Risk Conditions. The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to 310 CMR 40.0000, and, as such, may not occur on the Properties:

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(i) Use of the Properties (all) as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Properties that is reasonably likely to result in an excavation greater than 3 feet below grade within the RIST property, DMF Parcel 1, DMF Parcel 2 and Riverfront Parcel properties and excavation of soil at or below the ground surface within the Shuster Bulkhead Parcel, relocation or removal of contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (i) and (ii), set forth below; and,

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the AUL area associated with the RIST property, DMF Parcel 1, DMF Parcel 2 and Riverfront Parcel properties without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Properties to maintain a Permanent Solution and a condition of No Significant Risk:

(i) Any long-term (greater than 6 months) activity at or use of the Properties that is reasonably likely to result in the excavation, relocation, or removal of contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

(ii) Any long-term (greater than 6 months) activity at or use of the Properties that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and,

(iii) Any soil removed from the Properties must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP, 310 CMR 40.0000.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Properties which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a Licensed Site Professional who shall render an Opinion,

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in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a Licensed Site Professional in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk. If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a Licensed Site Professional in accordance with 310 CMR 40.1080, the owner or operator of the Properties subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Properties or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned Licensed Site Professional, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this _____ day of _____, 20____.

_____
Name
Title
Massachusetts Clean Energy Technology Center

COMMONWEALTH OF MASSACHUSETTS

_____, ss _____, 20____

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____ (name of document signer), proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.

(as partner for _____, a partnership)
(as _____ for _____, a corporation)

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(as attorney in fact for _____, the principal)
(as _____ for Massachusetts Clean Energy Technology Center (a) (the) _____)
_____ (official signature and seal of notary)

WITNESS the execution hereof under seal this _____ day of _____, 20____.

_____
Name
Title
City of New Bedford

COMMONWEALTH OF MASSACHUSETTS

_____, ss _____, 20____

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____ (name of document signer), proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.

(as partner for _____, a partnership)
(as _____ for _____, a corporation)
(as attorney in fact for _____, the principal)

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The undersigned Licensed Site Professional hereby certifies that in his Opinion this Notice of Activity and Use Limitation is consistent with a Permanent Solution and maintaining a condition of No Significant Risk.

Date: _____ _____

David B. Sherman
Licensed Site Professional

(Licensed Site Professional SEAL)

COMMONWEALTH OF MASSACHUSETTS

_____, ss _____, 20__

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he)(she) signed it voluntarily for its stated purpose.

(as partner for _____, a partnership)
(as _____ for _____, a corporation)
(as attorney in fact for _____, the principal)
(as _____ for _____, (a) (the) _____)
_____ (official signature and seal of notary)

Upon recording, return to:

Apex Companies, LLC.
58H Connecticut Avenue
South Windsor, CT 06074

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NEW BEDFORD RADIO (HALL COMM) AUL

RTN: 4-25350

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(13)

2019 00022060
Bk: 12943 Pg: 240 Pg: 1 of 13 BE
Doc: NOTICE 09/27/2019 01:44

NOTICE OF ACTIVITY AND USE LIMITATION

M.G.L. c. 21E, § 6 and 310 CMR 40.0000
Disposal Site Name: New Bedford Radio, Inc. (Hall Comm.)
DEP Release Tracking No.: 4-25350

This Notice of Activity and Use Limitation ("Notice") is made as of this 16th day of September 2019, by The Massachusetts Clean Energy Center, with a mailing address of 63 Franklin Street, 3rd Floor Boston, New Bedford, Massachusetts, 02110, and Hall Communications, Inc. with a mailing address of 1996 Auction Road, Manheim, Pennsylvania, 17545 together with his/her/its/their successors and assigns (each an "Owner", and collectively "Owners").

WITNESSETH:

WHEREAS, the Massachusetts Clean Energy Center is the owner in fee simple of a certain parcel of land depicted as "Lot 1" on a that certain *Plan of Land, MacArthur Boulevard, Assessor's Map 31 Lot 234, New Bedford, Massachusetts,* dated March 18, 2015 (with revisions through July 13, 2016), and prepared by Thompson Farland with certification date August 8, 2016, and recorded in the Bristol County Registry of Deeds in Plan Book 174, Page 73 (the "Survey"), and Hall Communications, Inc. is the owner in fee simple of a certain parcel of land depicted as "Lot 2" on the Survey. Said "Lot 1" and said "Lot 2", having been created in a subdivision of land owned by Hall Communications, Inc. for the purpose of the sale of Lot 1 to the Massachusetts Clean Energy Center, and for Hall Communications, Inc. to retain Lot 2. For title information see deed recorded with the Bristol County Registry of Deeds in Book 11982, page 152.

WHEREAS, said parcels of land, which are more particularly bounded and described in **Exhibit A**, attached hereto and made a part hereof ("Property"), are subject to this Notice.

WHEREAS, the Property comprises all of a disposal site (the "AUL Area") as the result of releases of oil and/or hazardous material. **Exhibit B,** which is attached hereto and made a part hereof, is a copy of the Survey showing the Property subject to this Notice; and

WHEREAS, one or more response actions have been selected for the AUL Area in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 *et seq.* ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil at the Property, and/or (b) the restriction of certain activities occurring in, on, through, over or under the Property. A description of the basis for such restrictions, and the oil and/or hazardous material release event(s) or site history that resulted in the contaminated media subject to this Notice, are set forth in the Activity and Use Limitation Opinion, which is attached hereto as **Exhibit C** and made a part hereof;

NOW, THEREFORE, notice is hereby given that the activity and use limitations ("AULs") for the Property are as follows:

1. Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Property pursuant to the MCP:

   (i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within Lot 1 and

APEX COMPANIES LLC
Attn. DAVID SHERMAN
58 H Connecticut Ave
South Windsor, CT 06074

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disturbance of soil at or below the ground surface within Lot 2, as long as the Obligations and Conditions specified herein are followed;

(ii) Any non-residential uses of the Property (both Lot 1 and Lot 2), including those that are currently conducted, in which a child's presence (other than incidental) is not likely;

(iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil more than permitted in Paragraph 1(i), provided that such activities are conducted in accordance with the soil management provisions of the MCP cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;

(iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 2 (ii);

(v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this Paragraph 1; and

(vi) Other activities or uses of the Property not identified in Paragraph 2 as Activities and Uses Inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk.

2. Activities and Uses Inconsistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to the MCP, and, as such, may not occur on the Property:

(i) Use of the Property (Lot 1 and Lot 2) as a residence, for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or for any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade in Lot 1 and at or below surface grade in Lot 2, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations set forth in paragraph 3 (i) and (ii) of this Notice; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within Lot 1 and at or below surface grade in Lot 2, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations set forth in paragraph 3 (i) and (ii) of this Notice.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Property by the Owner of either Lot 1 or Lot 2, or both, as applicable, to maintain a Permanent Solution and a condition of No Significant Risk:

(i) Any long-term (greater than 6 months) activity at or use of either Lot 1 or Lot 2 of the Property that is reasonably likely to result in the excavation, relocation, or removal of contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must

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inform underground utility workers and other workers who may come into contact with soil in the AUL Area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

(ii) Any long-term (greater than 6 months) activity at or use of either Lot 1 or Lot 2 of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and

(iii) Any soil removed from either Lot 1 or Lot 2 of the Property must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a LSP who shall render an Opinion, in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a LSP in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk. If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a LSP in accordance with 310 CMR 40.1080, the Owner of either Lot 1 or Lot 2 within the Property subject to this Notice at the time that the applicable activities, uses and/or exposures change on that particular Lot, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owners hereby authorize and consent to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this 8th day of August, 2019.

By: _____
Name: Jennifer Daloisio
as: CFO
of Massachusetts Clean Energy Center

WITNESS the execution hereof under seal this 23rd day of August, 2019.

By: _____
Janet P. Hamm, CPA, CGMA
as CFO of Hall Communications, Inc.

COMMONWEALTH OF MASSACHUSETTS

Suffolk County, ss August 8, 2019

On this 8 day of August, 2019, before me, the undersigned notary public, personally appeared Jennifer Daloisio, proved to me through satisfactory evidence of identification, which were person known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose as CFO for the Massachusetts Clean Energy Technology Center, an independent public instrumentality of the Commonwealth of Massachusetts.

_____ (official signature and seal of notary)

ALEXANDRA ZALTMAN
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
September 9, 2022

STATE OF FLORIDA

County of Polk, ss August 23, 2019

On this 23 day of August, 2019, before me, the undersigned notary public, personally appeared Janet P. Hamm, proved to me through satisfactory evidence of identification, which were Known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose as CFO of Hall Communications, Inc., a Delaware corporation.

_____ (official signature and seal of notary)

LISA M. GIFFORD
Commission # GG 167582
Expires January 3, 2022
Bonded Thru Troy Fain Insurance 800-385-7019

{01319548-1 }

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The undersigned Licensed Site Professional hereby certifies that in his Opinion this Notice of Activity and Use Limitation is consistent with a Permanent Solution and maintaining a condition of No Significant Risk.

Date: 9/16/2019

David B. Sherman
Licensed Site Professional

(Licensed Site Professional SEAL)

COMMONWEALTH OF MASSACHUSETTS

_____, ss

September 16, 2019

On this 16 day of September, 2019, before me, the undersigned notary public, personally appeared David Sherman, proved to me through satisfactory evidence of identification, which were person known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he)(she) signed it voluntarily for its stated purpose.

China Starks
Notary Public-Connecticut
My Commission Expires
May 31, 2022

(as partner for _____, a partnership)
(as _____ for _____, a corporation)
(as attorney in fact for _____, the principal)
(as _____ for _____, (a) (the) _____)
China Starks (official signature and seal of notary)

Upon recording, return to:

Apex Companies, LLC.
58H Connecticut Avenue
South Windsor, CT 06074

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Exhibit A

Metes and Bounds Description of Parcel of Land Containing Area Subject to AUL

A certain parcel of land situated on the southeasterly side of Macarthur Drive in New Bedford, Massachusetts, being shown as Lots 1 and 2 on a plan entitled "Plan of Land, Macarthur Boulevard, Assessors Map 31 Lot 234, New Bedford, Massachusetts, Prepared for Apex Companies, LLC, revised July 13, 2016" prepared by Thompson Farland, Inc, being further bounded and described as follows:

Beginning at a point on the southeasterly side of Macarthur Drive, said point being the northeasterly corner of land now or formerly belonging to Carlos and Conceicao Rafael and the northwesterly corner of the herein describer parcel;

Thence running along said Macarthur Drive by a curve deflecting to the left, having a radius of 155.00 feet and an arc length of 182.67 feet to a corner and land now or formerly belonging to C P Brodeur, Inc;

Thence turning and running by said C P Brodeur, Inc land, S11°43'37"E, 148.08 feet to a corner;

Thence turning and running still by said C P Brodeur, Inc land and land now or formerly belong to R C P Realty LLC and Dennis Saluti "Trustee", Michael St. Ours "Trustee", N75°39'17"E, 440.37 feet to a corner and land now or formerly belonging to Rist LLC;

Thence turning and running along said Rist LLC land, S14°20'43"E, 389.25 feet to a corner and land now or formerly belonging to Fargo Realty Trust;

Thence turning and running along said Fargo Realty Trust land and land now or formerly belonging to DeCosta Realty Trust, S76°40'51"W, 504.23 feet to a corner and land now or formerly belonging to Gregory G. White and David R. Belzer, Trustees;

Thence turning and running along said Gregory G.White and David R. Belzer, Trustees land and land now or formerly belonging to Carlos and Conceicao Rafael, N07°51'03"W, 314.29 feet to a corner;

Thence running still by said Rafael land, N46°24'07"W, 81.49 feet to a point of curvature;

Thence running still by said Rafael land by a curve deflecting to the left, having a radius of 20.00 feet and an arc length of 27.37 feet to Macarthur Drive and the point of beginning.

Said Lots 1 (MassCEC; Map 31 Lot 234) and Lot 2 (Hall Communications, Inc.; Map 31 Lot 234) contain a total area of 4.40 Acres more or less.

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EXHIBIT B - Activity & Use Limitation

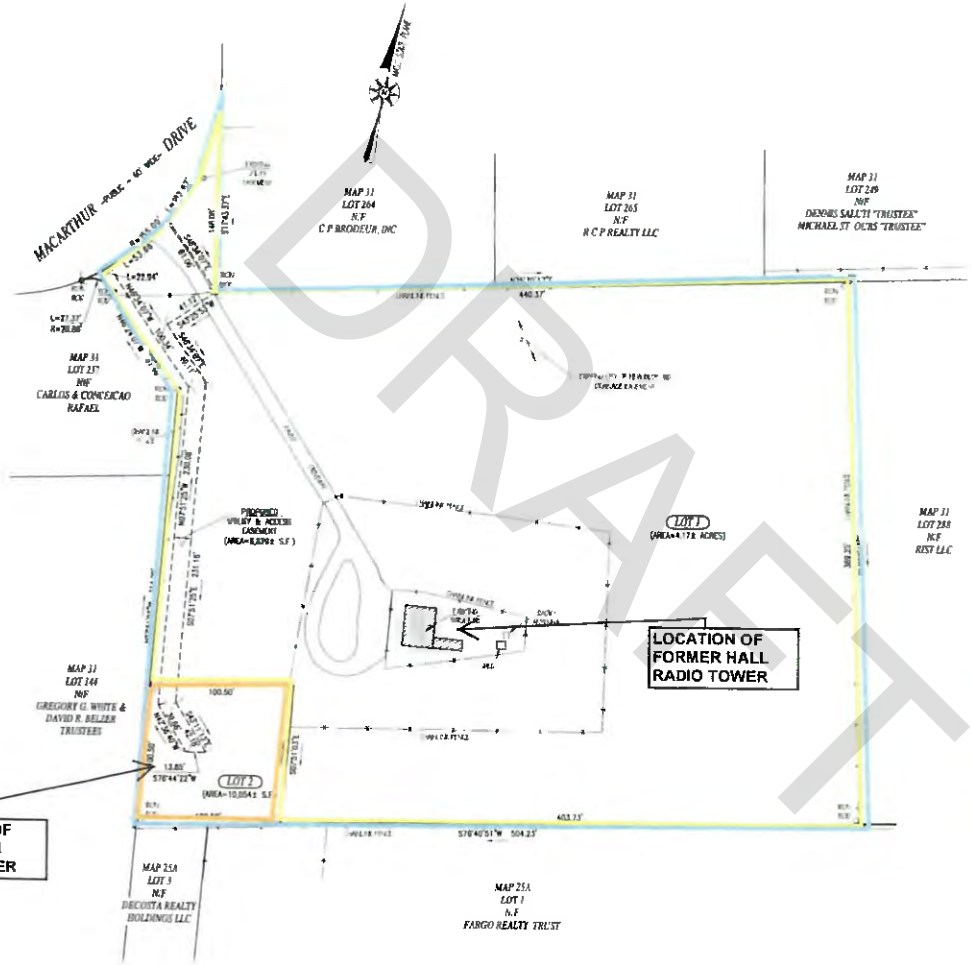
LOCUS MAP SCALE: 1"=2,000'±

— ZONING DATA —

DISTRICT: WATERFRONT INDUSTRIAL

DESCRIPTION	REQUIRED
LOT AREA	0 S.F
LOT FRONTAGE	0 FT
FRONT SETBACK	10 FT
SIDE SETBACK	10 FT
REAR SETBACK	*10 FT

*REAR SETBACK EQUALS 20 FEET FOR STRUCTURES OVER 3 STORIES



FOR REGISTRY USE ONLY

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

BRIAN MURPHY, P.L.S. 7/13/2016 DATE

NEW BEDFORD PLANNING BOARD

APPROVAL UNDER THE SUBDIVISION CONTROL LAW NOT REQUIRED

DATE:

LEGEND

DISPOSAL SITE BOUNDARY (RTN 4-25350)

AREA SUBJECT TO AUL (LOT 1)

AREA SUBJECT TO AUL (LOT 2)

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SUBDIVIDE EXISTING ASSESSORS MAP 31, LOT 234 INTO LOT 1 AND LOT 2 AND TO CREATE AN ACCESS AND UTILITY EASEMENT TO BENEFIT LOT 2.
2. BOUNDARY AND DETAIL SURVEY PERFORMED BY THOMPSON FARLAND, INC. IN MARCH 2014
3. ENDORSEMENT OF THIS PLAN AND THE PROPOSED UTILITY AND ACCESS EASEMENT WILL NOT AFFECT THE CITY OF NEW BEDFORD'S DRAINAGE EASEMENT.

RECORD OWNER:
NEW BEDFORD RADIO INC
C/O HALL COMMUNICATIONS, INC
75 OXFORD STREET, SUITE 402
PROVIDENCE, RI 02903
DEED BOOK 1536 PAGE 1120
DEED BOOK 1560 PAGE 576
DEED BOOK 1717 PAGE 56

PLAN REFERENCES:
PLAN BOOK 157 PAGE 74
PLAN BOOK 187 PAGE 49
PLAN BOOK 99 PAGE 71

REVISIONS

1	6/2/15	EASEMENT REVISION
2	7/8/15	PLANNING BOARD COMMENTS
3	7/13/15	NOTE REVISION

THOMPSONFARLAND
PROFESSIONAL ENGINEERS // LAND SURVEYORS
www.ThompsonFarland.com
(MAIN OFFICE) 395 COUNTY STREET, NEW BEDFORD, MA 02740 P.508.717.4470
NEW BEDFORD | TAUNTON | CAMBRIDGE | MARLBOROUGH

DRAWN BY: CKO
DESIGNED BY:
CHECKED BY: BJM

PLAN OF LAND
MACARTHUR BOULEVARD
ASSESSORS MAP 31 LOT 234
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: APEX COMPANIES, LLC
184 HIGH STREET, SUITE 502
BOSTON, MA 02210

MARCH 18, 2015
SCALE: 1"=40'
JOB NO. 10-540
LATEST REVISION: JULY 13, 2015

SHEET 1 OF 1

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ACTIVITY AND USE LIMITATION OPINION
RTN 4-25350

1.0 Introduction

This Licensed Site Professional (LSP) Opinion for the Notice of Activity and Use Limitation (AUL) was prepared by David B. Sherman (LSP No. 8904) on behalf of the Massachusetts Clean Energy Center (MassCEC) and N B Radio, Inc. c/o Hall Communications, for release conditions at the parcel of land located at ES R S Front Street, in New Bedford, Bristol County, Massachusetts (the Property). The MassDEP has assigned Release Tracking Number (RTN) 4-25350 to this site. The Disposal Site is comprised of 2 lots (Lot 1 and Lot 2). Lot 1 is currently owned by the MassCEC and Lot 2 is currently owned by Hall Communications and is also the location of the new radio tower. This LSP Opinion was prepared in accordance with 310 CMR 40.1074 and (1) explains why implementation of the AUL is appropriate to maintain a level of No Significant Risk at the Property (as defined in the AUL), (2) describes activities and uses prohibited in the area of the Property to be subject to the AUL, (3) identifies permitted activities and uses in the AUL area, and (4) identifies conditions or obligations for the AUL area in order to maintain a level of No Significant Risk.

The referenced parcel is part of the New Bedford Marine Commerce Terminal (Terminal) project constructed under the direction of the USEPA, by virtue of a State Enhanced Remedy provision (dated July 1, 2013) of the New Bedford Harbor Superfund Site Record of Decision, and the Final Determination for the South Terminal Project, dated November 16, 2012 and its subsequent modifications. While crafting the Final Determination, EPA:

- reviewed historic data associated with previous uses of some of the properties involved in the project;
- reviewed historic environmental investigations conducted to date on some of the properties involved in the project;
- directed the Commonwealth to conduct environmental investigations on certain properties associated with the project;
- requested proposals for environmental remediation on certain properties associated with the project, and reviewed and accepted those proposals;
- requested commitments from the MassCEC with regard to future maintenance of the existing, 3-foot engineered environmental cap on certain properties associated with the project.

EPA directly regulated the environmental investigations and proposed remediation for the New Bedford Marine Commerce Terminal project as completed by the Massachusetts Clean Energy Center (MassCEC). EPA also had an active role in regulating the investigations and proposed remediation for the project, and some aspects of the 21E/MCP process were reviewed and regulated by EPA. Additionally, various elements of MassCEC's appropriate response actions were listed in the Final Determination. The MassDEP provided an Adequately Regulated Determination for the Marine Commerce Terminal Project in a letter dated July 1, 2013, under 310 CMR 40.0110 of the Massachusetts Contingency Plan.

2.0 Property Background

Multiple environmental investigations on the property have identified elevated levels of polychlorinated biphenyls, metals (lead and cadmium) and polycyclic aromatic hydrocarbons (PAHs) in soil, likely attributed to the presence of historic urban fill emplaced along the New Bedford waterfront area. As the

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northeastern portion of the site was found to contain the most elevated concentrations of contaminants in soil, an environmental engineered cap consisting of 3 feet of imported, clean engineered fill was placed over the entire footprint to Lot 1 with the upper twelve-inches comprised of an engineered dense aggregate substrate. Based on the presence of substantially lower contaminant concentrations and federal restrictions regarding the height of the new radio tower located on Lot 2, this portion of the property did not receive the 3 feet of imported clean engineered fill. The construction activity was completed as detailed in the Release Abatement Measure Plan submitted to the MassDEP in October 20, 2014.

The Terminal project involved the construction of a multi-purpose facility designed to support the construction, assembly and deployment of offshore wind projects, as well as handle bulk, break-bulk, container and large specialty marine cargo. The Terminal is a 26-acre property that was designed to serve as a staging area for various cargoes associated with the Terminal operations. From 2013 to 2015 the entire Terminal property was remediated and backfilled with a minimum of 3 feet of clean imported engineered fill. The fill material for preparing the subgrade beneath the site was either generated during the associated Terminal channel dredging or imported fill from landside aggregate facilities. The fill material was placed in lifts and compacted to bring the final grade of the Terminal property to existing street level. An eight-foot tall security fence has been installed around the perimeter of the main Terminal property. Extensive site assessment activities and remedial actions involving localized soil excavation and removal have been conducted on the property to characterize and abate impacts to underlying subsurface media. These areas were subsequently backfilled and capped with clean materials.

The Property is relatively square in shape with maximum dimensions of 390 feet by 420 feet, encompassing an area of approximately 4.40 acres. The Property is bordered by Seatrade International to the west, North Coast Seafood to the south, the former RIST, LLC parcel to the east and C.P. Brodeur, Inc. to the north. This parcel was recently subdivided in accordance with the ANR plan dated March 18, 2015. Lot 1 of Parcel A is currently owned by the Massachusetts Clean Energy Center (MassCEC). Lot 2 of Parcel A is currently owned by NB Radio, Inc.

Current site features and parcel descriptions are depicted on **Exhibit B** to this AUL.

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2.1 Disposal Site Description

Parcel Name:	**Former Hall Radio Tower - RTN 4-25350**
Address:	ES R S Front Street
Parcel ID/Size:	Book 1536 Page 1120/ 4.40 acres (total)
Current Owner:	MassCEC Lot 1, NB Radio, Inc. Lot 2
Date Reported:	October 1, 2014
MCP Status:	Permanent Solution with Conditions

This property is currently a portion of the New Bedford Marine Commerce Terminal and is situated between Potomska Street to the north and South Front Street to the west. During subsurface investigations conducted between October 2014 and May 2016, concentrations of polychlorinated biphenyls, lead, cadmium and select PAH compounds were identified above reportable concentrations. The majority of this impact was found in the northeastern portion of Lot 1. Soil impacts in this area were excavated and

removed and 3 feet of clean, imported engineered fill was placed throughout the entire foot print of Lot 1 as an engineered environmental cap. The AUL area encompasses the entire site (Lot 1 and Lot 2) to prevent exposure to the soils.

In addition to the subsurface investigations and Release Abatement Measure (RAM) activities conducted between October 2014 and August 2016, additional remedial activities were completed over the entire New Bedford Marine Commerce Terminal Property. The remedial (RAM) activities completed at this subject property included:

- Removal of 1,876 tons of PCB, metals, total petroleum hydrocarbons and PAH impacted soil to out of state landfills under a Hazardous Waste Manifest to the Heritage Environmental Services in Roachdale, Indiana facilities;
- In accordance with the EPA's Final Determination for the South Terminal Project, soils containing concentrations of PCBs up to 50ppm were allowed to be left in place and capped as described below;
- General grading of the Disposal Site; and
- Construction of an environmental engineered cap over Lot 1 consisting of 3 feet of clean, imported engineered fill, the upper twelve-inches of which was comprised of a mixed, dense aggregate engineered layer.

3.0 Summary of the Risk Characterization

A Method 3 Risk Characterization has been prepared by Apex in anticipation of regulatory (MCP) site closure. The results of the risk characterization are the basis for the decision regarding the Permanent Solution with Conditions (PSC) for the release at the Site pursuant to 310 CMR 40.1000. A summary of the Risk Characterization is presented below.

The contaminants of concern identified at the site included, polychlorinated biphenyls (PCBs); certain polyaromatic hydrocarbons (PAHs) and certain metals (lead and cadmium).

The Terminal Property is currently a marine cargo facility that acts as a storage and staging area for marine vessels and cargo operations. Under foreseeable future conditions, receptors reasonably likely to be present on site include workers, security personnel, escorted visitors, vessel crews, trespassers, landscapers, utility workers, and construction workers. Lot 2, currently owned by Hall Communications, is occupied by a new, 600-foot tall radio tower used for transmission services for FM broadcasting. The Method 3 Risk Characterization determined that "No Significant Risk" of harm to human health exists at the Site for each receptor type considered in the risk characterization based on current and foreseeable uses. It also determined that "No Significant Risk" of harm to safety, public welfare and the environment exists at all portions of the Site. As a result of the risk characterization, an AUL is required to limit residential, and certain other construction uses of the property. In addition, due to the presence of elevated concentrations of compounds of concern in soil, the AUL includes requirements for soil management if soil intrusive work is planned to be conducted. The property is included in its entirety (Lot 1 and Lot 2) within the Disposal Site Boundary for RTN 4-25350.

4.0 Use of the AUL to Maintain a Level of No Significant Risk

As described in the Risk Characterization, a condition of No Significant Risk to human health, safety, public welfare and the environment currently exists at the Site. However, this conclusion is based on the assumption that the Property will not be used for residential purposes or for the growing of fruits or

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vegetables for human consumption. This restriction is extended to limit the use of the Property as a school, daycare, nursery, recreational area (such as a park or athletic field) and/or any other use in which a child's presence is likely to be more than incidental. All other reasonably foreseeable site uses were considered. In addition, because residual contamination is present at the site, this AUL will also provide appropriate notice to future Site users to exercise appropriate caution when encountering or handling soil, and ensure that unnecessary exposures do not occur and that contaminated soils are managed appropriately.

5.0 Acceptable Activities and Uses

The AUL Opinion provides that a condition of No Significant Risk to health, safety, or public welfare exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) as long as any of the following activities and uses occur on the Property:

(i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the entire footprint of Lot 1 and at or below surface grade within the entire footprint of Lot 2, as long as the Obligations and Conditions specified herein are followed;

(ii) Any non-residential uses of the Property, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;

(iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil, provided that such activities are conducted in accordance with the soil management provisions of the Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;

(iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 6 (ii);

(v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and

(vi) Other activities or uses of the Property not identified in Paragraph 6 as Activities and Uses Inconsistent with the AUL.

6.0 Restricted Activities and Uses

Activities and uses that are inconsistent with the objectives of this Notice of AUL, and that, if implemented at the Site, may result in a significant risk of harm to human health, safety, or public welfare, are as follows:

(i) Use of the Property as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade within the entire footprint of Lot 1 or excavation at or below surface grade within the entire footprint of Lot 2, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent

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with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (1) and (2), set forth below; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the entire footprint of Lot 1 and/or disturbance of soil located at or below surface grade within the entire footprint of Lot 2 AUL area, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

7.0 Obligations for the AUL Area

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Site to maintain a condition of No Significant Risk, as set forth in the AUL Opinion, shall include the following:

1. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a **Health and Safety Plan** under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

2. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written **Soil Management Plan** under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and

3. Any soil removed from the Property, other than the clean overburden and backfill, must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP 310 CMR 40.0000.

4. The engineered environmental cap constructed within the entire footprint of Lot 1 must be regularly inspected, maintained, repaired and/or replaced with a comparable cap to prevent future exposure to underlying contaminated soil immediately following the completion of any activity that involves its removal and/or disturbance.

5. The engineered environmental cap constructed over Lot 1 shall consist of at least 3 feet of clean engineered fill material such as Dense Graded Aggregate or an engineer and LSP approved equal, or 6 inches of pavement or a building.

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8.0 Summary and Conclusions

This LSP Opinion has been prepared for implementation of a Notice of AUL for a release at the ES R S Front Street Property, (Registry of Deeds Book 1536, Page 1120) in New Bedford, Bristol County, Massachusetts. A Method 3 Risk Characterization indicates that restrictions on activities and uses of this Property are required to maintain a condition of No Significant Risk to human health, safety or public welfare. In general, use of the Property for residential purposes, growing fruits or vegetables for human consumption, or any other use in which a child 's presence (other than incidental) is likely, are to be limited as set forth in Section 6.0. In addition, activities and uses that may result in the excavation, relocation, or removal of contaminated soil at the Property may be permitted with certain precautions.

Date: 9/16/2019

David B. Sherman, LSP

LSP Seal:

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DMF PARCEL 2 AUL

RTN: 4-15490

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BK 9630 PG 38
02/03/10 09:19 DOC. 2648
Bristol Co. S.D.

CONFIRMATORY NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: Former Standard Times Site - Lot 3, 16 Blackmer Street, New Bedford, MA
DEP Release Tracking No.(s): 4-15490

This Confirmatory Notice of Activity and Use Limitation ("Notice") is made as of this 2nd day of February, 2010, by the Commonwealth of Massachusetts Department of Fish and Game located at 251 Causeway Street, Suite 400, Boston, Massachusetts 02114, together with his/her/its/their successors and assigns (collectively "Owner").

W I T N E S S E T H:

WHEREAS, the Commonwealth of Massachusetts Department of Fish and Game, is the owner in fee simple of that certain parcel of vacant land located in New Bedford, Bristol County, Massachusetts, pursuant to a deed recorded with the Bristol County Registry of Deeds (Southern District) in Book 7642, Page 344;

WHEREAS, said parcel of land, which is more particularly bounded and described in Exhibit A, attached hereto and made a part hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Bristol County Registry of Deeds (Southern District) in Plan Book 148, Plan 92,

WHEREAS, a portion of the Property ("Portion of the Property") is subject to this Notice of Activity and Use Limitation. The Portion of the Property is more particularly bounded and described in Exhibit A-1, attached hereto and made a part hereof. The Portion of the Property is shown on a plan recorded with the Bristol County Registry of Deeds (Southern District) in Plan Book 163, Plan 106, and/or on a sketch plan attached hereto and filed herewith for registration;

WHEREAS, the Portion of the Property comprises part of a disposal site as the result of a release of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Portion of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Portion of the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Portion of the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated March 5, 2009 (which is

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attached as Exhibit C of the original Notice of Activity and Use Limitation dated March 9, 2009, and recorded with the Registry of Deeds in Book 9289, Page 7.

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in said AUL Opinion are as follows:

1. Activities and Uses Consistent with the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Portion of the Property:

(i) Commercial and industrial activities and uses including, but not limited to, vehicular parking, pedestrian and vehicular traffic, passive recreation, landscaping, routine maintenance or any other use that does not compromise the structural integrity of the protective barrier, as defined in 3.(iv) and/or disturb contaminated soil located directly beneath the barrier;

(ii) Excavation associated with emergency or short term (three months or less) underground utility and/or construction work, provided it is conducted in accordance with a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice; and involves the repair and/or replacement of the protective barrier with a comparable barrier immediately following the completion of the project;

(iii) Activities and uses that are not identified by this Notice as being inconsistent with maintaining a condition of No Significant Risk; and

(iv) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses that are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Portion of the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Use of the Property as a residence, school, nursery, daycare, recreational area and/or other such use at which a child's regular presence is likely

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(ii) Activities and/or uses which are likely to involve the removal and/or disturbance of the protective barrier in the AUL Area and/or the disturbance of the contaminated soil located beneath the protective barrier without prior development of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of the LSP Opinion;

(iii) Relocation of the contaminated soil from beneath the protective barrier in the AUL Area unless an LSP renders an Opinion that states such relocation is consistent with maintaining a condition of No Significant Risk; and

(iv) Activities and/or uses that may cause physical or chemical deterioration, breakage, or structural damage to the protective barrier.

3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Portion of the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the contaminated soil located immediately beneath the protective barrier. The Soil Management Plan must be prepared in accordance with the guidelines discussed in the Activity and Use Limitation opinion attached hereto as Exhibit C of the original Notice of Activity and Use Limitation;

(ii) A Health and Safety Plan must be prepared and implemented in accordance with the guidelines discussed in the Activity and Use Limitation Opinion attached hereto as Exhibit C of the original Notice of Activity and Use Limitation prior to the commencement of any activity that involves the removal and/or disturbance of the protective barrier and/or is likely to disturb the underlying contaminated soil within the AUL Area;.

(iii) The protective barrier within the AUL Area must be repaired and/or replaced with a comparable barrier to prevent future exposures to underlying contaminated soil immediately following the completion of any activity that involves its removal and/or disturbance;

(iv) The protective barrier shall consist of either a minimum of 3-inches of asphalt pavement (or concrete), 3-feet of clean soil or a building

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(v) The protective barrier must be maintained within the designated AUL area to ensure that the contaminated soil located beneath the barrier remains inaccessible; and

(vi) Annual inspections and associated record-keeping activities must be performed to confirm that the barrier is being properly maintained to prevent exposure(s) to contaminated soil located immediately beneath the protective barrier.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Portion of the Property that may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Portion of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Confirmatory Notice, said Confirmatory Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry(ies) of Deeds and/or Land Registration Office(s).

This Confirmatory Notice of Activity and Use Limitation is given to correct

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the inadvertent error(s) made in the Notice of Activity and Use Limitation dated March 9, 2009, and recorded with the Registry of Deeds in Book 9289, Page 7, said error(s) being as follows:

(i) Exhibit B of the recorded Notice of Activity and Use Limitation did not properly depict AUL limits relative to the defined Site boundaries.

The corrected Site Sketch has been provided and attached hereto as Exhibit B. In all other respects, the terms of the Notice of Activity and Use Limitation remain unchanged.

WITNESS the execution hereof under seal this 20th day of January, 2010.

Commonwealth of Massachusetts, Department of Fish and Game

Mary B. Griffin

By: Mary B. Griffin
Commissioner

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COMMONWEALTH OF MASSACHUSETTS

Bristol, ss January 20, 2010

On this 20th day of January, 2010, before me, the undersigned notary public, personally appeared Mary B. Griffin, proved to me through satisfactory evidence of identification, which were personally known, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose as Commissioner of the Commonwealth of Massachusetts Department of Fish and Game.

GLENDA L. DiFILIPPO
NOTARY PUBLIC
Commonwealth of Massachusetts
My Commission Expires
October 31, 2014

Glenda L DiFilippo

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Confirmatory Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: Feb 2, 2010

COMMONWEALTH OF MASSACHUSETTS
KEVIN J. BEAULIEU
NO. 1699
REGISTERED
LICENSED SITE PROFESSIONAL

Kevin J. Beaulieu, LSP

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COMMONWEALTH OF MASSACHUSETTS

Bristol, ss

February 2, 2010

On this 2nd day of February, 2010, before me, the undersigned notary public, personally appeared Kevin J. Beaulieu, proved to me through satisfactory evidence of identification, which were personally known, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose as LSP for Commonwealth of Massachusetts Department of Fish and Game.

Notary Public, Linda Mayo
My Commission Expires: 1/21/2011

Upon recording, return to:

Commonwealth of Massachusetts Department of Fish and Game
251 Causeway Street, Suite 400
Boston, MA 02114

EXHIBIT A

(Description of Parcel of Land Containing Area Subject to AUL)

A certain parcel of land shown as Lot 3B on a Plan entitled "Approval Not Required Plan of Land located in New Bedford, MA prepared for City of New Bedford Redevelopment Authority", Scale 1"=60', dated November 21, 2001, prepared by Kenneth R. Ferreira Engineering, Inc., New Bedford, MA, recorded in the Bristol County Registry of Deeds in Plan Book 148 at Page 92, and being more particularly bounded and described as follows:

BEGINNING	at a point on the easterly side of a cul-de-sac of said Blackmer Street marking the southwest corner of the parcel herein described as shown on said Plan; thence
Northwesterly	on a curve to the left with a radius of 75.00 feet an arc distance of 85.64 feet by said cul-de-sac of Blackmer Street to a point as shown on said Plan; thence
Northerly	on a curve to the right with a radius of 30.00 feet an arc distance of 24.04 feet by said cul-de-sac of Blackmer Street and by Lot 2B to a point as shown on said Plan; thence
N 13° 21' 47" W	one hundred eighty-three and 45/100 (183.45) feet by said Lot 2B to a point marking the northwest corner of the parcel herein described and the southwest corner of Lot 3A as shown on said Plan; thence
S 76° 40' 57" W	three hundred seventy-one and 74/100 (371.74) feet by said Lot 3A to a point marking the northeast corner of the parcel herein described and the southeast corner of said Lot 3A as shown on said Plan; thence
S 01° 54' 01" E	two hundred eighty-nine and 61/100 (289.61) feet to a point as shown on said Plan; thence
S 76° 40' 53" W	two hundred ninety-six and 56/100 (296.56) feet to the PLACE OF BEGINNING, containing 95,197 square feet of land, more or less, as shown on said Plan.

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EXHIBIT A-1
(Description of Area Subject to AUL)

That certain portion of a parcel of land, said parcel of land being situated in New Bedford, Bristol County, Massachusetts, and being shown as Lot 3B on the aforementioned plan recorded with said Deeds in Plan Book 148, Page 92, said portion being shown as the "Activity and Use Limitation Area" on a plan entitled, "Activity and Use Limitation Plan of Land in New Bedford, MA", dated December 2, 2008, Scale 1"=40', prepared by SITEC, Inc., Dartmouth, Massachusetts, and recorded with the Bristol County Registry of Deeds in Plan Book 163, Page 106 and being more particularly bounded and described as follows:

BEGINNING	AT A POINT IN THE EASTERLY SIDELINE OF BLACKMER STREET, SAID POINT BEING THE SOUTHWEST CORNER OF THE PARCEL SHOWN AS LOT 3B ON PLAN RECORDED AT PLAN BOOK 148 PAGE 92 IN THE BRISTOL COUNTY REGISTRY OF DEEDS; THENCE
NORTHWESTERLY	ON A CURVE TO THE LEFT WITH A RADIUS OF 75.00 FEET AN ARC DISTANCE OF 85.64 FEET TO A POINT; THENCE
NORTHERLY	ON A CURVE TO THE RIGHT WITH A RADIUS OF 30.00 FEET AN ARC DISTANCE OF 24.04 FEET TO A POINT; THENCE
N 13°21 '47" W	NINETY-SEVEN AND 28/100 FEET (97.28') TO A POINT; THENCE
N 78°21'29" E	TWO HUNDRED NINETY-SIX AND 50/100 FEET (296.50') TO A POINT; THENCE
S 10°09'28" W	TWO HUNDRED SIX AND 08/100 FEET (206.08') TO A POINT; THENCE
S 76°40'53" W	ONE HUNDRED EIGHTY-SIX AND 50/100 FEET (186.50') TO THE POINT OF BEGINNING, CONTAINING 47,368 SQUARE FEET OF LAND, MORE OR LESS.

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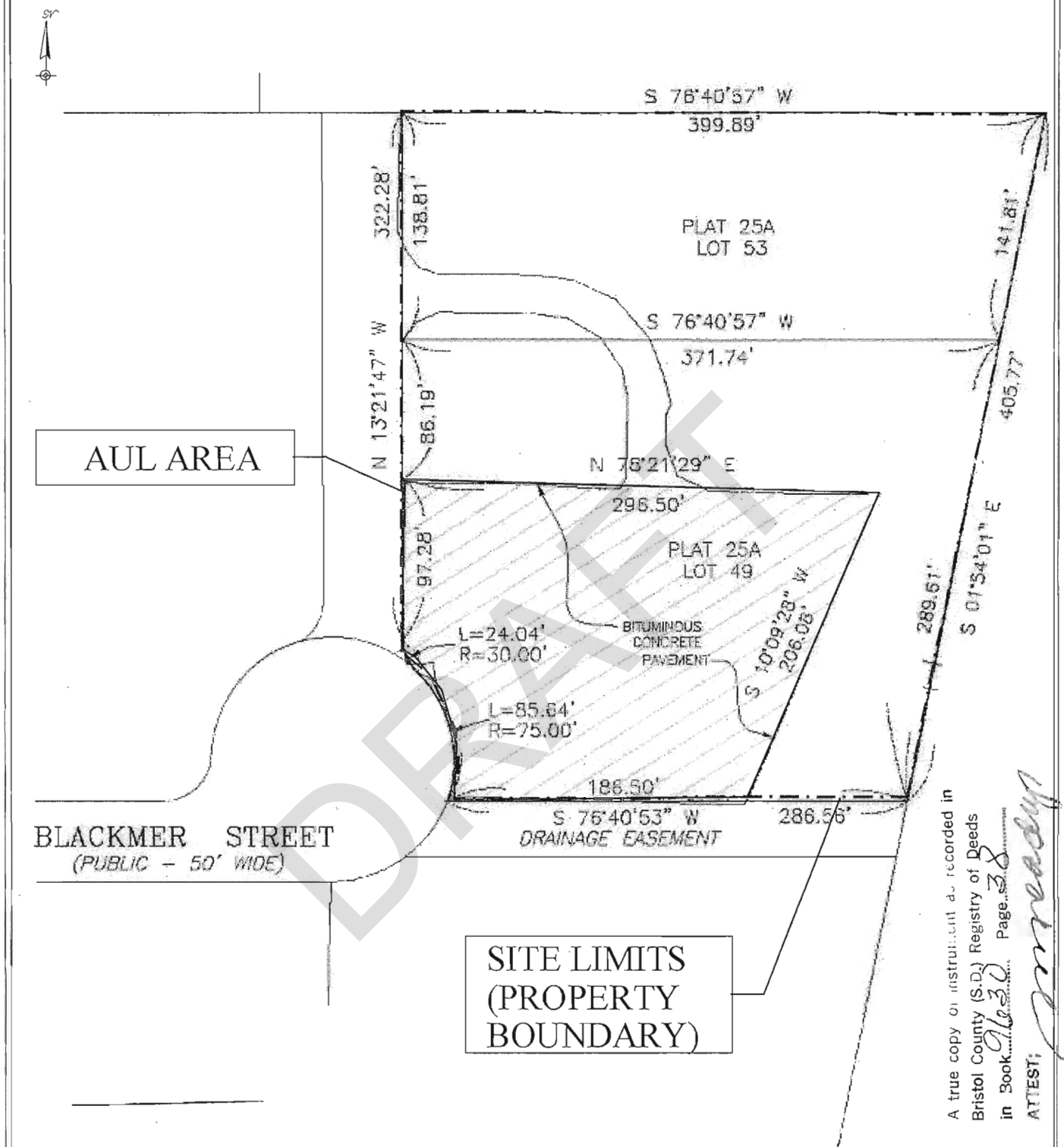

A true copy of instrument as recorded in Bristol County (S.D.) Registry of Deeds in Book 9630 Page 38
ATTEST: [signature] REGISTER

NOTES:
(1) DRAWING DETAILS OBTAINED FROM ASSESSORS MAPS, AERIAL PHOTOGRAPHS, SURVEY PLANS GENERATED BY SITEC ENGINEERING INC. AND FIELD OBSERVATIONS. ALL SCALES ARE APPROXIMATE

DRAWN BY: KJB PROJ. MGR: KJB PROJECT NO: W024 SCALE: 1" = 100' DATE: 12/04/08	GRAPHICAL SCALE 0 50 100 200 COMMON SENSE ENVIRONMENTAL, INC. 50 THERESA STREET DARTMOUTH, MASSACHUSETTS 02748 PHONE: 508-991-3491	SKETCH PLAN COMMERCIAL PROPERTY 16 BLACKMER STREET NEW BEDFORD, MASSACHUSETTS	EXHIBIT: B

Bristol County Southern District
25 N. 6th Street
New Bedford, Massachusetts 02740

02/03/10

COMMON SENSE ENVIRON SA

# 8	Rec:time 919	Type	NAUL	50.00
DOC. 2648	BK 9630-0038		C. P.	20.00
			R. D.	5.00
# 9		Copies		9.00
Total				84.00
# 10	Payment Check			84.00

THANK YOU! J. Mark Treadup
Register of Deeds

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FORMER DARTMOUTH FINISHING SITE AUL

RTN: 4-23616

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BK 11656 PG 310
04/14/16 11:04 DOC. 7877
Bristol Co. S.D.

NOTICE OF ACTIVITY AND USE LIMITATION

M.G.L. c. 21E, § 6 and 310 CMR 40.0000
Disposal Site Name: Former Dartmouth Finishing
DEP Release Tracking No.: 4-23616

This Notice of Activity and Use Limitation ("Notice") is made as of this 14th day of April, 2016, by The City of New Bedford, 133 Williams Street, New Bedford, Massachusetts, together with his/her/its/their successors and assigns (collectively "Owner").

WITNESSETH:

WHEREAS, The City of New Bedford, is the owner in fee simple of that certain parcel of vacant land located in New Bedford, Bristol County, Massachusetts, pursuant to a deed recorded with the Bristol County South Registry of Deeds in Book 8689 Page 93

WHEREAS, said parcel of land, which is more particularly bounded and described in Exhibit A, attached hereto and made a part hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Bristol County Registry of Deeds in Plan Book 34, Plan 26;

WHEREAS, the Property comprises all of a disposal site as the result of releases of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP". Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Property. A description of the basis for such restrictions, and the oil and/or hazardous material release event(s) or site history that resulted in the contaminated media subject to the Notice of Activity and Use Limitation which is attached hereto as Exhibit C and made a part hereof;

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in this Notice of Activity and Use Limitation are as follows:

1. Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Property pursuant to 310 CMR 40.0000:

   (i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the AUL area, as long as the Obligations and Conditions specified herein are followed;
   (ii) Any non-residential uses of the Property, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;
   (iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil, provided that such activities are conducted in accordance with the soil management provisions of the Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;
   (iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 2 (ii);
   (v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and
   (vi) Other activities or uses of the Property not identified in Paragraph 2 as Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent Maintaining No Significant Risk Conditions. The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to 310 CMR 40.0000, and, as such, may not occur on the Property:

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(i) Use of the Property as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (i) and (ii), set forth below; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the AUL area, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Property to maintain a Permanent Solution and a condition of No Significant Risk:

(i) Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

(ii) Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable;

(iii) Any soil removed from the Property, other than the clean backfill and overburden, must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP, 310 CMR 40.0000.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a Licensed Site Professional who shall render an Opinion, in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a Licensed Site Professional in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk. If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a Licensed Site Professional in accordance with 310 CMR 40.1080, the owner or operator of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

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6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned Licensed Site Professional, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s). Exhibit D, attached hereto, is an Affidavit of Authority of signature for Renee Fernandes.

WITNESS the execution hereof under seal this 14th day of April, 2016.

Renee Fernandes
Renee Fernandes
Treasurer/Collector
City of New Bedford

COMMONWEALTH OF MASSACHUSETTS

Bristol, ss APRIL 14, 2016

On this 14 day of APRIL, 2016, before me, the undersigned notary public, personally appeared Renee Fernandes, proved to me through satisfactory evidence of identification, which were MA LIC., to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose.

as Treasurer/Collector for The City of New Bedford, the

Deborah L. Gonzaga (official signature and seal of notary)

DEBORAH L. GONZAGA
MY COMM. EXPIRES JUNE 18, 2021
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS

The undersigned Licensed Site Professional hereby certifies that in his Opinion this Notice of Activity and Use Limitation is consistent with a Permanent Solution and maintaining a condition of No Significant Risk.

Date: April 14, 2016

Michael P. Bingham
Michael P. Bingham
Licensed Site Professional
Apex Companies, LLC

(Licensed Site Professional SEAL)

COMMONWEALTH OF MASSACHUSETTS
MICHAEL P. BINGHAM
No. 4141
REGISTERED
LICENSED SITE PROFESSIONAL

COMMONWEALTH OF MASSACHUSETTS

Bristol, ss APRIL 14, 2016

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On this 14 day of APRIL, 2016, before me, the undersigned notary public, personally appeared Michael P. Bingham, proved to me through satisfactory evidence of identification, which were MA LIC., to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he)(she) signed it voluntarily for its stated purpose.

(official signature and seal of notary)

DEBORAH L. GONZAGA
MY COMM. EXPIRES JUNE 18, 2021
NOTARY PUBLIC COMMONWEALTH OF MASSACHUSETTS

Upon recording, return to:

Apex Companies, LLC.
125 Broad Street, 5th Floor
Boston, MA 02110

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Exhibit A

Metes and Bounds Description of Parcel of Land Containing Area Subject to AUL

A certain parcel of land being shown as Activities and Use Limitation (AUL) on a plan recorded herewith. More particularly described as follows:

Beginning at a point in the north line of Cove Street distant easterly therein from the east line of Harbor Street two hundred fifty-six and 47/100 (256.47) feet; thence northerly by land of Naushon Mill, Inc., a distance of eight hundred fifty-eight and 80/100 (858.80) feet to a corner; thence easterly by last named land a distance of two hundred four and 51/100 (204.51) feet to a corner; thence southeasterly by said last named land a distance of seventeen and 1/100 (17.01) feet to a point; thence southerly a distance of twenty two and 52/100 (22.52) feet to a point; thence easterly a distance of fourteen and 80/100 (14.80) feet to a point in the westerly face of an existing two-story brick building; thence southerly by line of last named building a distance of four hundred twenty-eight and 56/100 (428.56) feet to a point; thence westerly a distance of twenty-two and 14/100 (22.14) feet to a point; thence southerly a distance of three hundred fifty-six and 80/100 (356.80) feet to a point in the north line of Cove Street being easterly therein four hundred seventy-two and 67/100 (472.67) feet from the east line of Harbor Street; thence westerly in said north line of Cove Street a distance of one hundred forty-six (146) feet to a point of curvature; thence westerly in the said north line of Cove Street along the arc of a circle having a radius of 488.72 feet a distance of seventy and 20/100 (70.20) feet to the point of beginning.

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BK 11656 PG 315

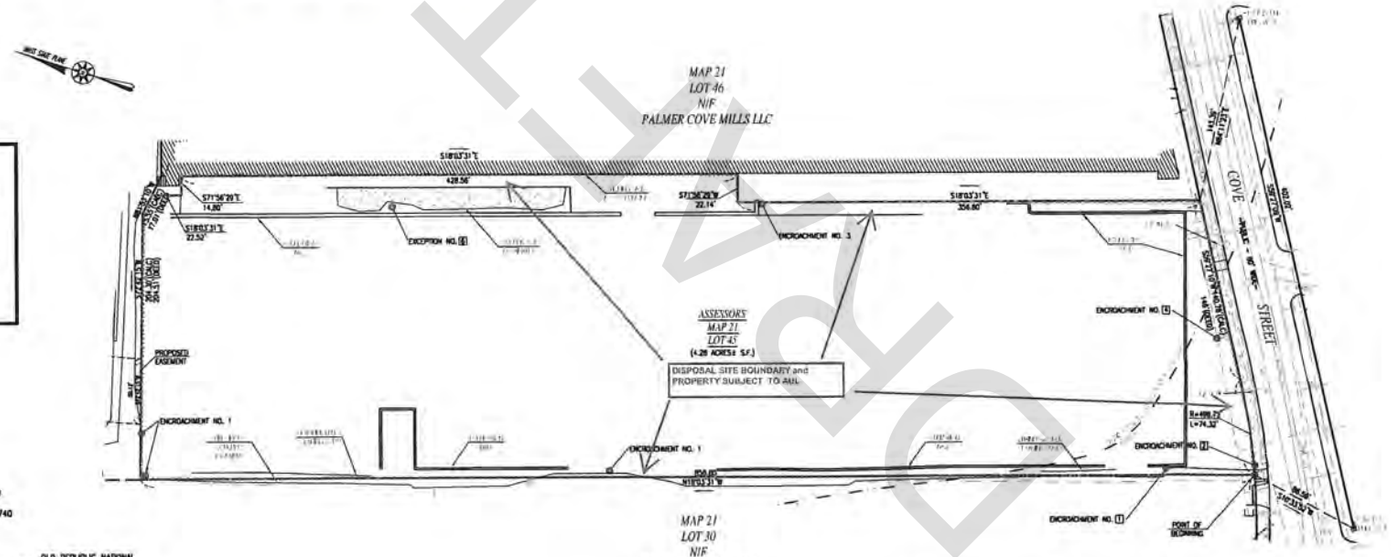
LOCUS MAP SCALE: 1"=2,000'±

LEGAL DESCRIPTION:
THE LAND IN NEW BEDFORD, BRISTOL COUNTY, MASSACHUSETTS, WITH THE BUILDINGS THEREON, BOUNDED AND DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT IN THE NORTH LINE OF COVE STREET DISTANT EASTERLY THEREIN FROM THE EAST LINE OF HARBOR STREET TWO HUNDRED FIFTY-SIX AND 47/100 (256.47) FEET; THENCE NORTHERLY BY LAND OF NAUSHON MILL, INC., A DISTANCE OF EIGHT HUNDRED FIFTY-EIGHT AND 80/100 (858.80) FEET TO A CORNER; THENCE EASTERLY BY LAST NAMED LAND A DISTANCE OF TWO HUNDRED FOUR AND 51/100 (204.51) FEET TO A CORNER; THENCE SOUTHEASTERLY BY SAID LAST NAMED LAND A DISTANCE OF SEVENTEEN AND 01/100 (17.01) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF TWENTY-TWO AND 52/100 (22.52) FEET TO A POINT; THENCE EASTERLY A DISTANCE OF FOURTEEN AND 80/100 (14.80) FEET TO A POINT IN THE WESTERLY FACE OF AN EXISTING TWO-STORY BRICK BUILDING; THENCE SOUTHERLY BY A LINE OF LAST NAMED BUILDING A DISTANCE OF FOUR HUNDRED TWENTY-EIGHT AND 56/100 (428.56) FEET TO A POINT; THENCE WESTERLY A DISTANCE OF TWENTY-TWO AND 14/100 (22.14) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF THREE HUNDRED FIFTY-SIX AND 80/100 (356.80) FEET TO A POINT IN THE NORTHERLY LINE OF COVE STREET; BEING EASTERLY THEREIN FOUR HUNDRED SEVENTY-TWO AND 67/100 (472.67) FEET FROM THE EAST LINE OF HARBOR STREET; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET A DISTANCE OF ONE HUNDRED FORTY-SIX (146) FEET TO A POINT OF CURVATURE; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET ALONG THE ARC OF A CIRCLE HAVING A RADIUS OF 488.72 FEET A DISTANCE OF SEVENTY AND 30/100 (70.20) FEET TO THE POINT OF BEGINNING.
SAID LAND IS SHOWN ON PLAN SHOWING LAND CONVEYED BY THE CITY OF NEW BEDFORD TO SPENCER GREEN DATED MAY 1942, MADE BY ABEL A. VALENTE C.E. FILED IN THE BRISTOL COUNTY S.D. REGISTRY OF DEEDS IN PLAN BOOK 34 PAGE 26.

SURVEYOR'S DESCRIPTION (DISCREPANCIES UNCOVERED DURING COURSE OF SURVEY):
THE LAND IN NEW BEDFORD, BRISTOL COUNTY, MASSACHUSETTS, WITH THE BUILDINGS THEREON, BOUNDED AND DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT IN THE NORTH LINE OF COVE STREET DISTANT EASTERLY THEREIN FROM THE EAST LINE OF HARBOR STREET TWO HUNDRED FIFTY-SEVEN AND 92/100 (257.92) FEET; THENCE NORTHERLY BY LAND OF NAUSHON MILL, INC., A DISTANCE OF EIGHT HUNDRED FIFTY-EIGHT AND 80/100 (858.80) FEET TO A CORNER; THENCE EASTERLY BY LAST NAMED LAND A DISTANCE OF TWO HUNDRED FOUR AND 30/100 (204.30) FEET TO A CORNER; THENCE SOUTHEASTERLY BY SAID LAST NAMED LAND A DISTANCE OF FIFTEEN AND 55/100 (15.55) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF TWENTY-TWO AND 52/100 (22.52) FEET TO A POINT; THENCE EASTERLY A DISTANCE OF FOURTEEN AND 80/100 (14.80) FEET TO A POINT IN THE WESTERLY FACE OF AN EXISTING TWO-STORY BRICK BUILDING; THENCE SOUTHERLY BY A LINE OF LAST NAMED BUILDING A DISTANCE OF FOUR HUNDRED TWENTY-EIGHT AND 56/100 (428.56) FEET TO A POINT; THENCE WESTERLY A DISTANCE OF TWENTY-TWO AND 14/100 (22.14) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF THREE HUNDRED FIFTY-SIX AND 80/100 (356.80) FEET TO A POINT IN THE NORTHERLY LINE OF COVE STREET; BEING EASTERLY THEREIN FOUR HUNDRED SEVENTY-THREE AND 03/100 (473.02) FEET FROM THE EAST LINE OF HARBOR STREET; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET A DISTANCE OF ONE HUNDRED FORTY AND 78/100 (140.78) FEET TO A POINT OF CURVATURE; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET ALONG THE ARC OF A CIRCLE HAVING A RADIUS OF 498.72 FEET A DISTANCE OF SEVENTY-FOUR AND 32/100 (74.32) FEET TO THE POINT OF BEGINNING.

LEGEND

EXISTING	DESCRIPTION
	PROPERTY LINE
	CHAIN LINK FENCE
	WATER LINE
	WATER GATE
	HYDRANT
	SEWER LINE
	SEWER MANHOLE
	DRAIN LINE
	DRAIN MANHOLE
	CATCH BASIN
	GAS LINE
	GAS GATE



RECORD OWNER:
CITY OF NEW BEDFORD
133 WILLIAM STREET
NEW BEDFORD, MA 02740

NOTES:
1. TITLE POLICY: OLD REPUBLIC NATIONAL LAND TITLE INSURANCE COMPANY.
2. UTILITIES TAKEN FROM VISUAL OBSERVATION AND CITY OF NEW BEDFORD RECORDS.
3. NO BUILDINGS EXISTING ON SURVEYED PROPERTY.

PLAN REFERENCES:
PLAN BOOK 34 PAGE 26

FLOOD NOTE:
BY GRAPHIC PLOTTING ONLY, THE PROPERTY DEPICTED ON THIS PLAN FALLS IN ZONE "X" AND "AE" (EL.5), AS SHOWN ON THE FLOOD INSURANCE RATE MAP No. 25005C0481F EFFECTIVE DATE: JULY 7, 2009

ENCROACHMENTS:
1. PAVEMENT ONTO LOCUS
2. CHAINLINK FENCE ONTO COVE STREET
3. FOUNDATION WALL ONTO MAP 21 LOT 46
4. WATER LINE AND HYDRANT ONTO LOCUS

0' 40' 80' 120'
1" = 40'

SCHEDULE B – SECTION 2 – EXCEPTIONS:
6. RIGHTS RESERVED IN AN AREA MARKED AS "B" ON THE PLAN REFERRED TO IN EXHIBIT "A" FOR PURPOSES OF REPAIRING, MAINTAINING AND RENEWING ANY PART OF THE BUILDING ON LAND TO THE EAST OF THE INSURED PREMISES AS SET FORTH IN A DEED FROM THE CITY OF NEW BEDFORD TO SPENCER GREEN DATED MAY 26, 1942 AND RECORDED IN BOOK 854 PAGE 482. (SHOWN ON PLAN)
7. EASEMENT FOR UTILITY PURPOSES GRANTED BY NASH REALTY CORP. TO NAUSHON MILL, INC. IN AN INSTRUMENT RECORDED ON NOVEMBER 17, 1942 IN BOOK 862 PAGE 378. (NOT PLOTTABLE)

CERTIFICATION:
TO APEX COMPANIES, LLC, CITY OF NEW BEDFORD, OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 4, 7A, 7b, 8, 11a, 11b AND 18 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MAY 18, 2012.

REVISIONS

THOMPSONFARLAND
PROFESSIONAL ENGINEERS // LAND SURVEYORS
www.ThompsonFarland.com
(MAIN OFFICE) 398 COUNTY STREET, NEW BEDFORD, MA 02740 P.508.717.2479
NEW BEDFORD (TIVERTON) CAMBRIDGE (WALTHAM)

DRAWN BY: SMB
DESIGNED BY:
CHECKED BY: BJM

ALTA ACSM LAND TITLE
COVE STREET
ASSESSORS MAP 21 LOT 45
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: APEX COMPANIES, LLC
184 HIGH STREET, SUITE 502
BOSTON, MA 02210

JULY 13, 2012
SCALE: 1"=40'
JOB NO. 10-540
LATEST REVISION:

SHEET 1 OF 1

BK 11656 PG 316

ACTIVITY AND USE LIMITATION OPINION

1.0 Introduction

This Licensed Site Professional (LSP) Opinion for the Notice of Activity and Use Limitation (AUL) was prepared by Michael Bingham (LSP No. 4141) on behalf of The City of New Bedford, for release conditions at the 45 Cove Street property in New Bedford, Bristol County, Massachusetts (the Property). The MassDEP has assigned Release Tracking Number (RTN) 4-23616 to this site. This LSP Opinion was prepared in accordance with 310 CMR 40.1074 and (1) explains why implementation of the AUL is appropriate to maintain a level of No Significant Risk at the Property (as defined in the AUL), (2) describes activities and uses prohibited in the area of the Property to be subject to the AUL, (3) identifies permitted activities and uses in the AUL area, and (4) identifies conditions or obligations for the AUL area in order to maintain a level of No Significant Risk.

2.0 Property Background

The Property consists of one vacant parcel totaling approximately 4.304 acres located at 45 Cove Street in New Bedford, Massachusetts. The Property was previously improved with a single story brick building that occupied most of the Property and was formerly occupied by Dartmouth Finishing, a fabric finishing and dyeing business, which abandoned the property in 1994. . The building demolition was completed in 2002, and except for soil stockpile and demolition debris the Property has remained vacant since. The City acquired the Property as a tax foreclosure in June 2007.

The Property was identified to be redeveloped by the nearby Marine Commerce Terminal in New Bedford (Terminal) project. The Terminal project involved the construction of a multi-purpose facility designed to support the construction, assembly and deployment of offshore wind projects, as well as handle bulk, break-bulk, container and large specialty marine cargo. The Property was selected to serve as a staging area for various cargoes associated with the Terminal operations. In 2015 the Property was graded and at least 5 feet of clean dredge material and dense graded aggregate, generated during the MCT channel dredging, was brought in to bring the final grade to street level and a fence was installed around the perimeter.

Current site features are depicted on Exhibit B to this AUL.

2.1 Disposal Site Description

A Notice of Noncompliance (NON) was issued by MassDEP to Dartmouth Finishing in 1994 for violations of state hazardous waste, air quality, and industrial wastewater programs. MassDEP and the EPA responded to a notification in 1997 by the New Bedford Fire Department that OHM present in corroded drums in the former Site building represented a threat of release. The MassDEP issued RTN 4-12810 for the Site on January 21, 1997. A total of 480 drums varying in size from 40 gallons to 85 gallons, one aboveground tank, four vats, and two No. 6 fuel oil underground storage tanks (USTs) were inventoried by the EPA. A removal action included pumping oil from the two USTs, removing sludge from the vats and troughs in the basement, and removing 480 drums of OHM for off-site disposal to abate the identified imminent hazard and stabilize site conditions.

An Immediate Response Action (IRA) for RTN 4-12810 was completed at the Property in 2004 and included the removal of two 10,000-gallon USTs and approximately 80 cubic yards of petroleum-impacted soil. Based on the results of the 2004 subsurface investigation and the completion of a Method 1 Risk Characterization, an Immediate Response Action Completion Statement and Class A-2 Response Action Outcome Statement were submitted in August 2004 for RTN 4-12810 by Roberts Consulting in August 2004. The contaminants of concern in the RAO and Method 3 Risk Characterization, identified below the concrete basement slab, were: arsenic, lead, and petroleum compounds. Mr. Charles Kibbee, of G & L Bedford Realty, Inc. was listed as the owner of the property.

Additional subsurface investigation was completed at the property as due diligence for a property transfer in 2012, which identified a new reportable release. The 2012 Phase II CSA investigation identified contaminant concentrations in soil and groundwater above applicable MassDEP Reportable Concentrations (RCs) at the Site. Specifically, the report identified additional contaminants of concern and areas of release in soil and groundwater beneath the concrete slab at the Site that were inconsistent with the previous RAO submittal filed for the Site with the MassDEP in 2004. In addition, the analysis of stockpiled soil staged above the slab identified contaminant concentrations greater than regulatory reportable thresholds. These soils were not previously sampled as part of the prior RAO and are located above the slab, suggesting a different exposure assumption. Also, the investigation identified concentrations of dissolved silver in groundwater above applicable reporting criteria, which was not addressed in the previous RAO findings. The detection of new contaminants of concern concentrations in soil and groundwater was reported on October 3, 2011 under a 120-day notification obligation to MassDEP which assigned RTN 4-23616 to the release.

Remedial activities completed at the Site during construction included:

- Crushing of concrete and construction debris in the stockpiled material in the former basement area;

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BK 11656 PG 317

- Levelling of the stockpiled construction debris within the basement footprint to evenly distribute the material into an approximately one-foot thickness;
- Removal of **approximately 76 tons** of petroleum impacted material encountered during Site construction and back fill activities under Bill of Lading protocol;
- Importing approximately 40,000 cubic yards of pre-characterized and clean dredge material, consisting of glacial-fluvial sediments, to bring the grade to approximately 0ne foot below final design grade;
- The addition of a minimum of one-foot of dense graded aggregate compacted and contoured to design specifications.

3.0 Summary of the Risk Characterization

A Method 3 Risk Characterization was prepared in November 2015 by Apex in anticipation of site closure. The results of the risk characterization are the basis for the decision regarding the Permanent Solution with Conditions (PSC) for the release at the Site pursuant to 310 CMR 40.1000. A summary of the Risk Characterization is presented below.

The contaminants of concern and the maximum remaining concentration exceeding applicable Method 1 Risk Characterization criteria, per 310 CMR 40.0975(6) are listed below:

- Total petroleum hydrocarbons – 2,00 mg/kg;
- C11-C22 Aromatic hydrocarbons – 3,500 mg/kg;
- C9-C10 Aromatic hydrocarbons – 1,600 mg/kg;
- C9-C12 Aliphatics hydrocarbons – 1,800 mg/kg;\
- Lead – 2,900 mg/kg (no TCLP exceedance);
- Total Chromium – 300 mg/kg;
- Benzo(a)anthracene – 13 mg/kg;
- Benzo9a)pyrene – 12 mg/kg;
- Benzon(b)flouranthene – 16 mg/kg; and
- Dibenzo(a,h)anthracene 2 mg/kg.

The Property is currently a storage and staging area associated with the nearby marine terminal. Under foreseeable future conditions, receptors reasonably likely to be present on site include workers, security personnel, escorted visitors, trespassers, landscapers, utility workers, and construction workers. The Risk Characterization determined that "No Significant Risk" of harm to human health exists at the Site for each receptor type considered in the risk characterization. It also determined that "No Significant Risk" of harm to safety, public welfare and the environment exists at all portions of the Site. As a result of the risk characterization, an AUL is required to limit Residential use of the property. In addition, due to the presence of elevated concentrations of compounds of concern in soil, the AUL includes requirements for soil management if soil intrusive work is planned below the environmental cap. The disposal site includes the entire property (see Exhibit B of the AUL).

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4.0 Use of the AUL to Maintain a Level of No Significant Risk

As described in the Risk Characterization, a condition of No Significant Risk to human health, safety, public welfare and the environment currently exists at the Site. However, this conclusion is based on the assumption that the Property will not be used for residential purposes or for the growing of fruits or vegetables for human consumption. This restriction is extended to limit the use of the Property as a school, daycare, nursery, recreational area (such as a park or athletic field) and/or any other use in which a child's presence is likely to be more than incidental. All other reasonably foreseeable site uses were considered. In addition, because residual contamination was documented in soil below the clean fill barrier, this AUL will also provide appropriate notice to future Site users to exercise appropriate caution when handling soil, and ensure that unnecessary exposures do not occur and that contaminated materials are handled appropriately.

5.0 Acceptable Activities and Uses

The AUL Opinion provides that a condition of No Significant Risk to health, safety, or public welfare exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) as long as any of the following activities and uses occur on the Property:

(i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the AUL area, as long as the Obligations and Conditions specified herein are followed;

(ii) Any non-residential uses of the Property, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;

(iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil, provided that such activities are conducted in accordance with the soil management provisions of the

BK 11656 PG 318

Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;

(iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 6 (ii);

(v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and

(vi) Other activities or uses of the Property not identified in Paragraph 6 as Activities and Uses Inconsistent with the AUL.

6.0 Restricted Activities and Uses

Activities and uses that are inconsistent with the objectives of this Notice of AUL, and that, if implemented at the Site, may result in a significant risk of harm to human health, safety, or public welfare, are as follows:

(i) Use of the Property as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (i) and (ii), set forth below; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the AUL area, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

7.0 Obligations for the AUL Area

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Site to maintain a condition of No Significant Risk, as set forth in the AUL Opinion, shall include the following:

1. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

2. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and

3. Any soil removed from the Property, other than the clean overburden and backfill, must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP 310 CMR 40.0000.

8.0 Summary and Conclusions

This LSP Opinion has been prepared for implementation of a Notice of AUL for a release at the 45 Cove Street property in New Bedford, Bristol County, Massachusetts. A Method 3 Risk Characterization indicates that restrictions on activities and uses of this Property are required to maintain a condition of No Significant Risk to human health, safety or public welfare. In general, use of the Property for residential purposes, growing fruits or vegetables for human consumption, or any other use in which a child 's presence (other than incidental) is likely, are to be limited as set forth in Section 6.0. In addition, activities and uses that may result in the excavation, relocation, or removal of contaminated soil at the Property may be permitted with certain precautions.

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EXHIBIT D

AFFIDAVIT OF AUTHORITY

Now comes Renee Fernandes, the Treasurer of the City of New Bedford, who upon oath hereby deposes and states:

1. The City of New Bedford, a municipal corporation existing under the laws of the Commonwealth of Massachusetts, with an address of 133 William Street, New Bedford, Bristol County, Massachusetts, is the record owner of certain real property shown as New Bedford Assessor's Map 21, Lot 45, formerly known and numbered as 45 Cove Street, New Bedford, Bristol County, Massachusetts (the "Property") pursuant to a judgment of the Land Court dated June 12, 2007 and recorded in the Bristol County (S.D.) Registry of Deeds in Book 8689, Page 93.

2. Pursuant to Section 2-102 of the Code of Ordinances of the City of New Bedford, I, as the Treasurer, am the custodian of all property acquired through the tax title process and therefore the person authorized to execute any and all documents regarding the property, including but not limited to an Activity and Use Limitation.

Signed under the pains and penalties of perjury this 11th day of April, 2016

Renee Fernandes
Treasurer, City of New Bedford

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COMMONWEALTH OF MASSACHUSETTS

BRISTOL, ss April 11, 2016

On this 11th day of April, before me, the undersigned Notary Public, personally appeared the above-named Renee Fernandes proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person who signed the preceding document in my presence, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of her knowledge and belief, as the duly authorized treasurer of the City of New Bedford.

Print Name of Notary Public: Blair S. Bailey

My Commission Expires: 02/29/2019

BLAIR S. BAILEY
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
February 29, 2019

CP BRODEUR, INC.

RTN: 4-23643

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SITEC
ENVIRONMENTAL
Civil and Environmental Engineering, Land Use
Planning, Hazardous and Solid Waste Consulting

SITEC ENVIRONMENTAL, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

449 Faunce Corner Road
Dartmouth, MA 02747
Tel. (508) 998-2125 FAX (508) 998-7554

February 17, 2012

Massachusetts Department of Environmental Protection
Southeast Regional Office
Bureau of Waste Site Cleanup
20 Riverside Drive
Lakeville, MA 02347

RE: Notice of an Activity and Use Limitation
Release Tracking Nos.: 4-23643
CP Brodeur Inc.
80 Wright Street
New Bedford, Massachusetts

To Whom It May Concern:

A Class A-3 Response Action Outcome was filed by SITEC Environmental, Inc. on February 10, 2012 concerning the above referenced disposal site. In accordance with 310 CMR 40.1074(4), please find attached the following items:

- Certified Registry copies of the Notice of the Activity and Use Limitation bearing book and page numbers; and
- Registry copies of the referenced Survey Plans Bering book and page numbers.

For SITEC Environmental, Inc.

Geoffrey Souza, LSP
Environmental Assessment Manager

Attachments
Attachment 1 - Certified Registry copy of the Notice of an Activity and Use Limitation
Attachment 2 -Certified Registry copies of the referenced Survey Plans
Attachment 3 - PRP Authorization

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ATTACHMENT 1

REGISTRY COPY OF THE CONFIRMATORY NOTICE OF AN ACTIVITY AND USE LIMITATION

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BK 10291 PG 102
02/09/12 10:32 DOC. 3200
Bristol Co. S.D.

Form 1075

NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: CP Brodeur, Inc
DEP Release Tracking No.: 4-23643

This Notice of Activity and Use Limitation ("Notice") is made as of this 9 day of February, 2012, by CP Brodeur, Inc., a Massachusetts corporation whose address is 80 Wright Street, New Bedford, Massachusetts, together with their successors and assigns (collectively "Owner").

WITNESSETH:

WHEREAS, CP Brodeur, Inc. is the owner in fee simple of that certain parcel of land located in New Bedford, Bristol County, Massachusetts with the buildings and improvements thereon pursuant to a deed recorded with the Bristol County Registry of Deeds in Book 1744 Page 996;

WHEREAS, said parcel of land, which is more particularly bounded and described in Exhibit A, attached hereto and made apart hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Bristol County Registry of Deeds in Plan Book 99, Plan 12;

WHEREAS, a portion of the Property ("Portion of the Property") is subject to this Notice of Activity and Use Limitation. The Portion of the Property is more particularly bounded and described in Exhibit A-1, attached hereto and made a part hereof. The Portion of the Property is shown as "ACTIVITY AND USE LIMITATION AREA" on a plan recorded in the Bristol County Registry of Deeds in Plan Book 168, Plan 84.

WHEREAS, the Portion of the Property comprises all a disposal site as the result of a release of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Portion of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and (b) the restriction of certain activities occurring in, on, through, over or under the Portion of the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated January 13, 2012 (which is attached hereto as Exhibit C and made apart hereof);

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NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in said AUL Opinion are as follows:

1. Activities and Uses Consistent with the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Portion of the Property:

(i) Retail, commercial and/or industrial activities and uses, including but not limited to, associated pedestrian and vehicular traffic;

(ii) Excavation associated with underground utility work and/or construction work;

(iii) Activities associated with the routine maintenance of the property; including, but not limited to, mowing, landscaping, vegetation/debris removal, street sweeping, and catch basin cleaning;

(iv) Activities and uses which are not identified by this Notice as being inconsistent with maintaining a condition of No Significant Risk;

(v) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph; and

(vi) Such other activities and uses not identified in Paragraph 2 as being Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses which are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Portion of the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Use of the Portion of the Property as a residence, school, playground, daycare facility or other use at which a child's regular presence is likely;

(ii) Use of the Portion of the Property for agriculture including, but not limited to, growing of homegrown produce except in raised planting beds;

(iii) Activities and/or uses that may cause physical or chemical deterioration, breakage, or structural damage to the concrete pavement on the Portion of the Property; and

(iv) Relocation of the contaminated soil from beneath the Portion of the Property unless an LSP renders an Opinion which states that such relocation is consistent with maintaining a condition of No Significant Risk.

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3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Portion of the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) The concrete pavement must be maintained within the Portion of the Property to prevent exposures to the underlying contaminated soil;

(ii) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the contaminated soil located below the concrete pavement on the Portion of the Property;

(iii) The concrete pavement within the Portion of the Property must be repaired or replaced with a comparable barrier following the completion of any activity that involves its removal and/or disturbance;

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Portion of the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Portion of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office.

DRAFT

WITNESS the execution hereof under seal this 8th day of February, 2012.

CP Brodeur, Inc.

Cindy Pettway, President and Treasurer

COMMONWEALTH OF MASSACHUSETTS

_____, ss February 8th, 2012

On this 8th day of February, 2012, before me, the undersigned notary public, personally appeared Cindy Pettway, proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he and she signed it voluntarily for its stated purpose.

Notary Public:
My Commission Expires: 2/8/2012
Michael J McGreary

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: 2/9/12

Geoffrey Souza, LSP No. 4123

[LSP SEAL]

COMMONWEALTH OF MASSACHUSETTS
GEOFFREY
REGISTERED
LICENSED SITE PROFESSIONAL

COMMONWEALTH OF MASSACHUSETTS

Massachusetts, Bristol County, ss February 9, 2012

On this 9th day of February, 2012, before me, the undersigned notary public, personally appeared Geoffrey Souza, provided to me through satisfactory evidence of identification, which were Drivers License, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Alexandra Woodford
Notary Public:
My Commission Expires: 10/04/2013

DRAFT

EXHIBIT A

(Description of Parcel of Land Containing Area Subject to AUL)

Beginning at a point in the southerly line of Wright Street said point being at the northwesterly corner of Parcel No. 1 Lot G of plan hereinafter described;

Thence south 12° 44' 02" east 244.41 feet;

Thence south 75° 39' 23" west 130.73 feet;

Thence north 11° 43' 32" west 148.07 feet to a point;

Thence north 11° 43' 32" west 68.66 feet to a point in the easterly line of MacArthur Drive;

Thence in an arc whose radius is 32.00 feet for a distance of 49.72 feet to a point in the southerly line of Wright Street;

Thence north 77° 17' 58" east 95.00 feet to the point of beginning, containing 31,451 square feet.

Being Lot G on plan of land entitled "The City of New Bedford, New Bedford Redevelopment Authority, Disposition Map Parcel No. 1 & 3, South Terminal Urban Renewal Project", dated September 14, 1977, Scale 1"=80', prepared by New Bedford Redevelopment Authority, New Bedford, Massachusetts and recorded with the Bristol County Registry of Deeds in Plan Book 99, Plan 12.

DRAFT

EXHIBIT A-1

(Description of Area Subject to AUL)

That certain portion of a parcel of land, said parcel of land being situated at 80 Wright Street in New Bedford, Bristol County, Massachusetts, and said portion being shown as "Activity and Use Limitation Area" on a plan entitled, "Plan of Activity and Use Limitation in New Bedford, MA", dated January 12, 2012, Scale 1"=20', prepared by SITEC, Inc., Dartmouth, Massachusetts, and recorded with the Bristol County Registry of Deeds in Plan Book 168, Plan 84, and said portion being more particularly bounded and described as follows:

Starting at a point on the southerly property line of the locus property, S 75° 39' 23" W, 114.23 feet distant from the southeastern-most corner of the locus lot, thence;

Perpendicular from said point on the southerly property line, 90.2 feet to the southeastern-most corner of the activity and use limitation area to be described.

Now beginning at said southeastern-most corner of the activity and use limitation area to be described, thence;

S 78° 19' 07" W, 49.93 feet, thence;

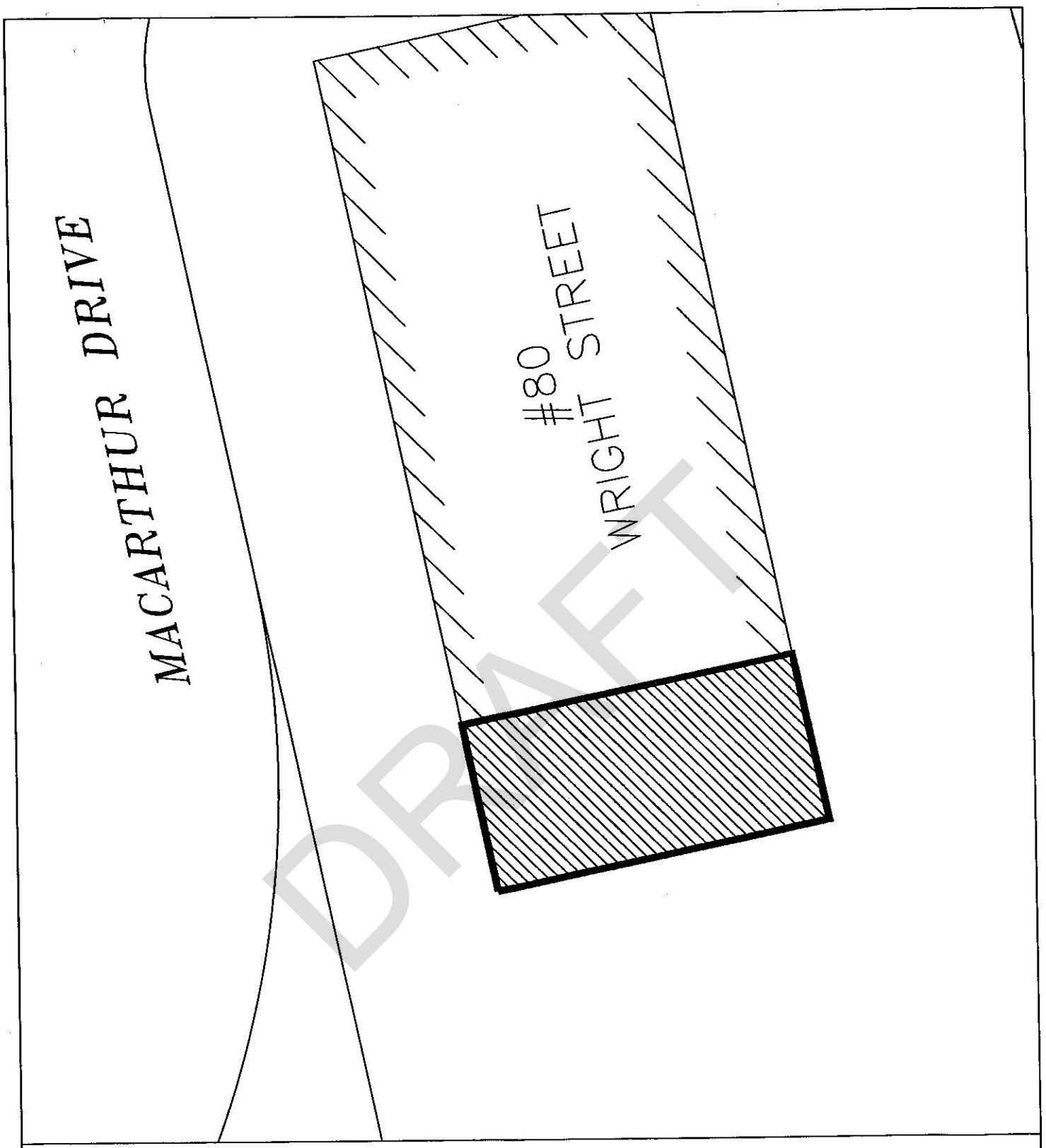
N 11° 35' 58" W, 25.02 feet, thence;

N 78° 19' 07" E 49.93 feet, thence;

S 11° 35' 58" E, 25.02 feet to the point of beginning.

Containing 1,249 square feet, more or less.

DRAFT



DRAFT

LEGEND

BOUNDRY OF AREA SUBJECT TO AUL

AREA OF THE DISPOSAL SITE (TO THE EXTENT DEFINED)

EXHIBIT B

scale: 1"=20'

0 10 20

SKETCH PLAN OF AREA SUBJECT TO AUL IN RELATION TO BOUNDRIES OF DISPOSAL SITE

SITEC ENVIRONMENTAL
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

SITEC
ENVIRONMENTAL
Civil and Environmental Engineering, Land Use
Planning, Hazardous and Solid Waste Consulting

SITEC ENVIRONMENTAL, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

449 Faunce Corner Road
Dartmouth, MA 02747
Tel. (508) 998-2125 FAX (508) 998-7554

January 13, 2012

CP Brodeur, Inc.
80 Wright Street
New Bedford, MA 02745

RE: Activity and Use Limitation (AUL) Opinion
80 Wright Street
New Bedford, Massachusetts

Dear Mrs. Pettway:

This Activity and Use Limitation (AUL) Opinion was prepared pursuant to 310 CMR 40.1074(1)(b) for a parcel of land located at 80 Wright Street, New Bedford, Bristol County, Massachusetts, and as identified as City of New Bedford Tax Assessor's Map 31, Lot 264 with the buildings and improvements thereon (the "Property").

Site History

21E investigations conducted at the Property identified elevated levels of petroleum hydrocarbons in soil and groundwater under the addition to the south of the building (the "Site"). The elevated levels of petroleum hydrocarbons are likely attributable to a leaking oil water separator located in the center of the Site. The Massachusetts Department of Environmental Protection (MassDEP) was notified of the release and a Release Abatement Measure (RAM) was completed to repair the soil water separator and stabilize the release. Site investigations were completed to define the nature and extent of the contamination and characterize the risk to human health and the environment.

DRAFT

BK 10291 PG 110

Reason for Activity and Use Limitation

A Method 3 Risk Assessment was prepared to support the Response Action Outcome (RAO) for this Site. The Site is covered with an concrete barrier and contaminated soil is located greater than 3 feet below the ground surface eliminating routine direct contact with the sub-surface contaminated soil by full time workers, visitors, and trespassers; however, if this concrete barrier is removed this exposure pathway may become available and a level of "No Significant Risk" may not be maintained. The AUL requires the maintenance of the barrier to eliminate this exposure pathway. In addition, to inhibit increased risk of harm to human health, the AUL prohibits the use of the AUL area as a residence or other use where the routine high frequency and high intensity presence of a child is likely (i.e. daycare facility). Gardening will also be prohibited in the AUL area, which may cause a condition of "Significant Risk" if produce is grown in the contaminated soil.

Permitted Uses and Activities

(i) Retail, commercial and/or industrial activities and uses, including but not limited to, associated pedestrian and vehicular traffic;

(ii) Excavation associated with underground utility work and/or construction work;

(iii) Activities associated with the routine maintenance of the property; including, but not limited to, mowing, landscaping, vegetation/debris removal, street sweeping, and catch basin cleaning;

(iv) Activities and uses which are not identified by this Notice as being inconsistent with maintaining a condition of No Significant Risk;

(v) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph; and

(iv) Such other activities and uses not identified below as being Restricted Activities ~~and Uses.~~

Restricted Uses and Activities

(i) Use of the Site as a residence, school, playground, daycare facility or other use at which a child's regular presence is likely;

(ii) Use of the Site for agriculture including, but not limited to, growing of homegrown produce except in raised planting beds;

DRAFT

(iii) Activities and/or uses that may cause physical or chemical deterioration, breakage, or structural damage to the concrete pavement on the Site; and

(iv) Relocation of the contaminated soil from beneath the Site unless an LSP renders an Opinion which states that such relocation is consistent with maintaining a condition of No Significant Risk.

Obligations and Conditions

(i) The concrete pavement must be maintained within the Site to prevent exposures to the underlying contaminated soil;

(ii) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the contaminated soil located below the concrete pavement on the Site;

(iii) The concrete pavement within the Site must be repaired or replaced with a comparable barrier following the completion of any activity that involves its removal and/or disturbance;

It is the opinion of SITEC Environmental, Inc. that implementation of the AUL insures that the residual contamination is unlikely to pose any significant risk to the public health or to present a condition of further environmental concern. Consequently, compliance with the requirements of the AUL also presents a regulatory closure which is unlikely to pose a future liability relative to MGL Chapter 21E and 310 CMR 40.0000 (MCP).

The AUL Opinion expressed herein has been developed based on the review of historical data, site reconnaissance, field observations and measurements, and site-specific analytical results. SITEC Environmental, Inc. makes no claims or representations (implicit or implied) as to the completeness or accuracy of information or data developed by others. Based on available information, research and site observations documented to date, the LSP Opinion forms a sound basis for effecting regulatory closure of this project via a Class A-3 RAO with an AUL, as defined.

For SITEC ENVIRONMENTAL, INC.

Geoffrey Souza, LSP
Licensed Site Professional #4122

COMMONWEALTH OF MASSACHUSETTS
GEOFFREY SOUZA
No. 4122
REGISTERED
LICENSED SITE PROFESSIONAL

DRAFT

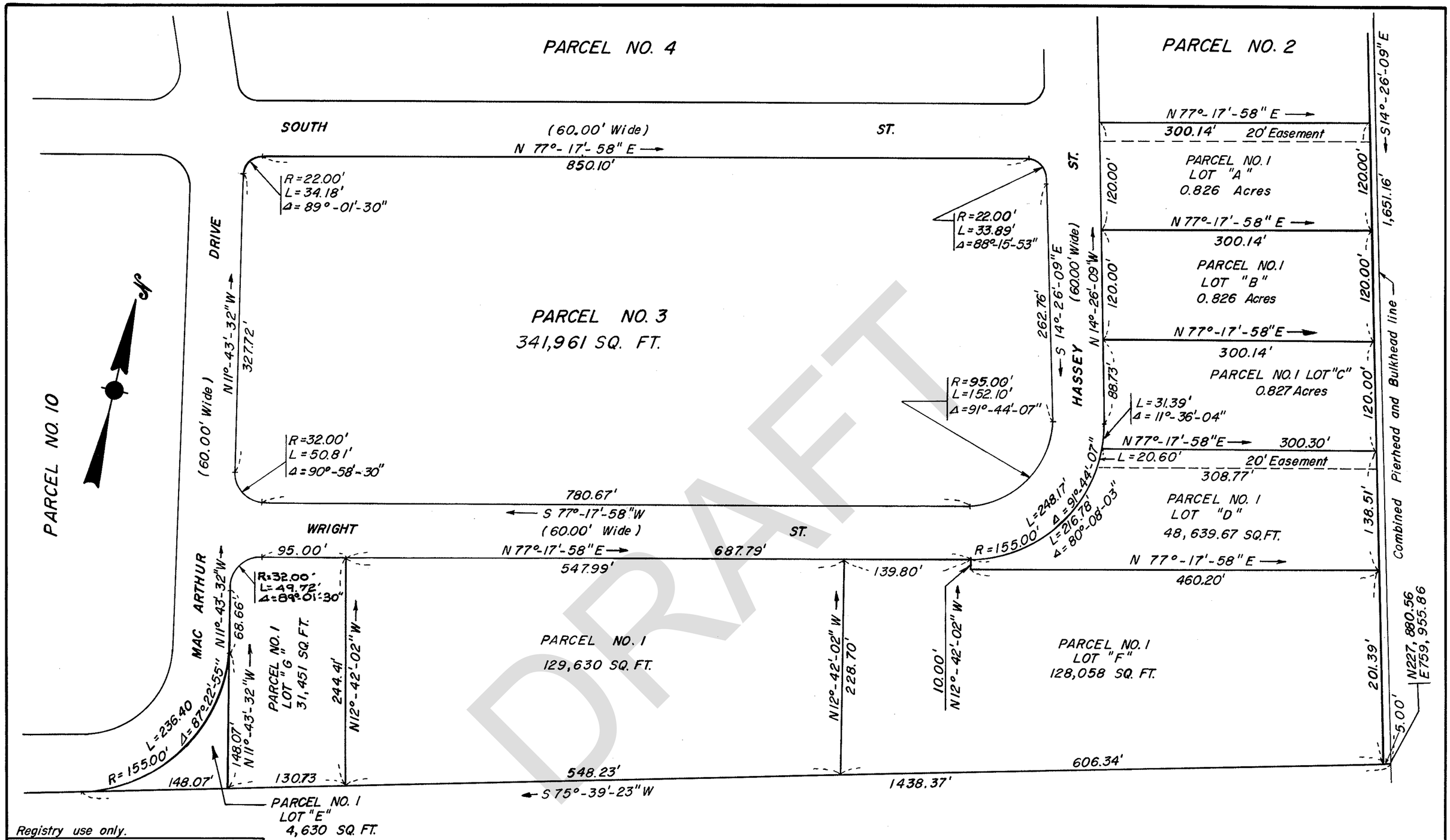
ATTACHMENT 2

CERTIFIED REGISTRY COPIES OF THE REFERENCED SURVEY PLANS

DRAFT

-61-66

99-12



Registry use only.

REC'D & RECORDED

SEP 21 11 51 AM '77

REGISTRY OF DEEDS
BRISTOL COUNTY
SOUTHERN DISTRICT

I CERTIFY THAT I HAVE CONFORMED WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS IN PREPARING THIS PLAN.

Manuel J. Viveiros 9/15/77

COMMONWEALTH OF MASSACHUSETTS
MANUEL J. VIVEIROS
REGISTERED
REGISTERED LAND SURVEYOR

9-19-77
Richard Walega
City Planner

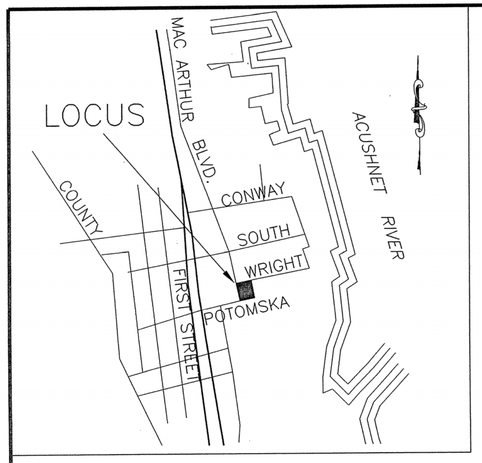
80' 40' 0 40' 80'
SCALE: 1" = 80'

THE CITY OF NEW BEDFORD
NEW BEDFORD REDEVELOPMENT AUTHORITY

DISPOSITION MAP
PARCEL NO. 1 & 3
SOUTH TERMINAL URBAN RENEWAL PROJECT
PREPARED BY
NEW BEDFORD REDEVELOPMENT AUTHORITY
NEW BEDFORD
MASS.
DATE: SEPT. 14, 1977

99-12

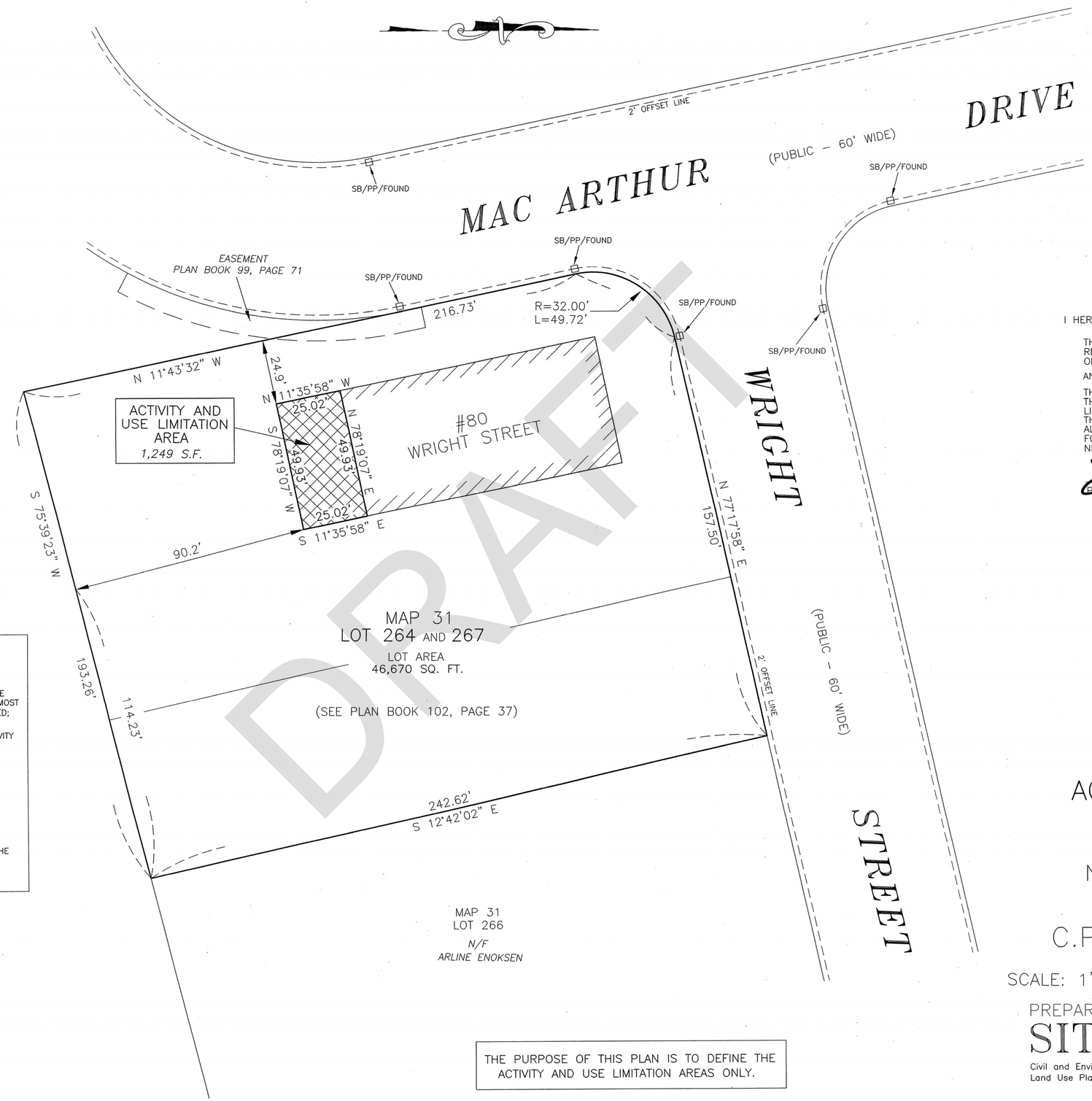
99-12



LOCUS MAP

01/09/12 DEEDS
PLAN RECORDED
BK/PGS. 3
REGISTRY
in 168-84

FOR REGISTRY USE ONLY



I HEREBY CERTIFY THAT;

THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS;

AND

THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF THE STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIPS OR FOR NEW WAYS ARE SHOWN.

PROFESSIONAL LAND SURVEYOR — DATE 1/12/2012

COMMONWEALTH OF MASSACHUSETTS
JOHN
MACKIE
JR.
No. 35535
PROFESSIONAL LAND SURVEYOR

ACTIVITY AND USE LIMITATION AREA
LEGAL DESCRIPTION

ACTIVITY AND USE LIMITATION AREA IN NEW BEDFORD, MA,:

STARTING AT A POINT WHICH IS 90.2 FEET PERPENDICULAR FROM THE SOUTHERLY PROPERTY LINE, SAID POINT BEING THE SOUTHEASTERN–MOST CORNER OF THE ACTIVITY AND USE LIMITATION AREA TO BE DESCRIBED;

NOW BEGINNING AT SAID SOUTHEASTERN–MOST CORNER OF THE ACTIVITY AND USE LIMITATION AREA TO BE DESCIBED;

THENCE, S 78°19'07" W, 49.93 FEET;

THENCE, N 11°35'58" W, 25.02 FEET;

THENCE, N 78°19'07" E, 49.93 FEET;

THENCE, S 11°35'58" E, 25.02 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,249 SQUARE FEET, MORE OR LESS.

MEANING TO DESCRIBE THE SOUTHERNMOST TWENTY–FIVE FEET OF THE BUILDING AT 80 WRIGHT STREET.

THE PURPOSE OF THIS PLAN IS TO DEFINE THE ACTIVITY AND USE LIMITATION AREAS ONLY.

0' 20' 40' 60'

PLAN OF ACTIVITY AND USE LIMITATION IN NEW BEDFORD, MA

PREPARED FOR

C.P. BRODEUR INC.

SCALE: 1"=20' JANUARY 12, 2012

PREPARED BY
SITEC
Civil and Environmental Engineering
Land Use Planning
449 Faunce Corner Road
Dartmouth, MA 02747
(508) 998–2125
FAX (508) 998–7554

168-84

168-84

ATTACHMENT 3

PRP AUTHORIZATION

DRAFT

C.P. BRODEUR, INC.

80 WRIGHT STREET
NEW BEDFORD, MA 02740
508-993-0334 PHONE
508-990-3671 FAX

October 31, 2011

Massachusetts Department of Environmental Protection

20 Riverside Drive

Lakeville, MA 02347

RE: C.P. Brodour

80 Wright Street

New Bedford, Massachusetts

Release Tracking No.: 4-23643

DRAFT

To Whom It May Concern:

In accordance 310 CMR 40.0009(2), I am authorizing SITEC Environmental, Inc. to act as my agent in electronically filing any required Massachusetts Contingency Plan documents for the above referenced release.

Sincerely,

Cindy Pettway

EXHIBIT D
BORING LOGS AND TEST PITS

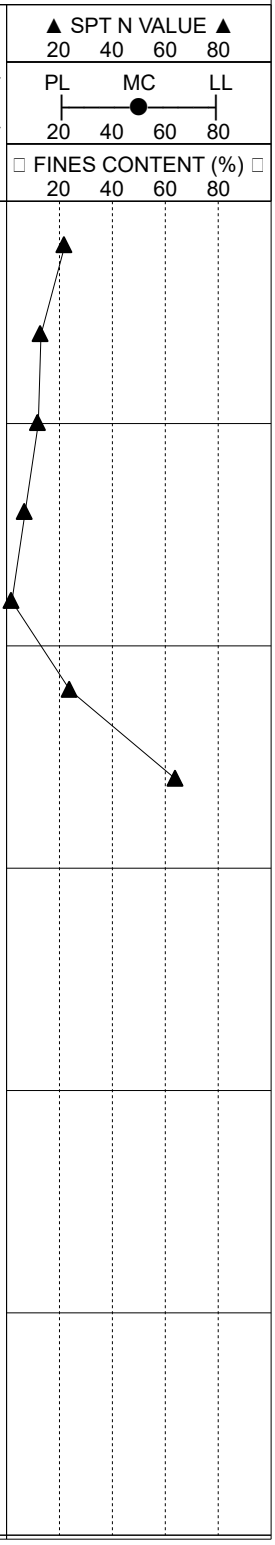
DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-1-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623886 **LONGITUDE** -70.918409
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 7.5 ft / Elev 2.5 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical Samples submitted from 0'-4' and 8'-9.5' bgs.	0.2 ft 3" Asphalt	9.8					
		Tan to Gray, Silty Sand, Trace Gravel, Medium Dense, SM, **(FILL)**		SS S-1	100	9-10-12-8 (22)		0.1
		2.0 ft Black to Brown, Slightly Organic Silty Sand, Trace Gravel, Coal, Dry, Medium Dense, Slightly Organic Odor, SM, **(FILL)**	8.0	SS S-2	75	4-5-8-9 (13)		1.4
		4.0 ft Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	6.0	SS S-3	50	7-8-4-6 (12)		0.6
5		6.0 ft Black, Slightly Organic Silt with Sand and Gravel, Trace Wood, Damp, Medium Stiff, Slightly Organic Odor, ML, **(FILL)**	4.0	SS S-4	12	5-3-4-2 (7)		0.7
		7.5 ft ▽	2.5					
		8.0 ft Gray, Silty Sand, Few Cinders, Wet, Loose, SM, **(FILL)**	2.0					0.6
		9.5 ft Brown, Fibrous PEAT, Damp, Soft, PT, Organic Content 42.4%, **(Organics)**	0.5	SS S-5	88	WOH-WOH-2-2 (2)		0.3
10		11.0 ft Gray, Silty Sand with Gravel, Trace Roots/ Wood, Wet, Very Loose to Medium Dense, SM, **(OUTWASH)**	-1.0	SS S-6	80	3-7-17-17 (24)		0.2
		Brown, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)**		SS S-7	75	13-34-30-50 (64)		0.9
	Split spoon refusal at 14' bgs.	14.0 ft End of boring at 14.0 feet	-4.0					0.8
15								
20			-10					
25								
30			-20					



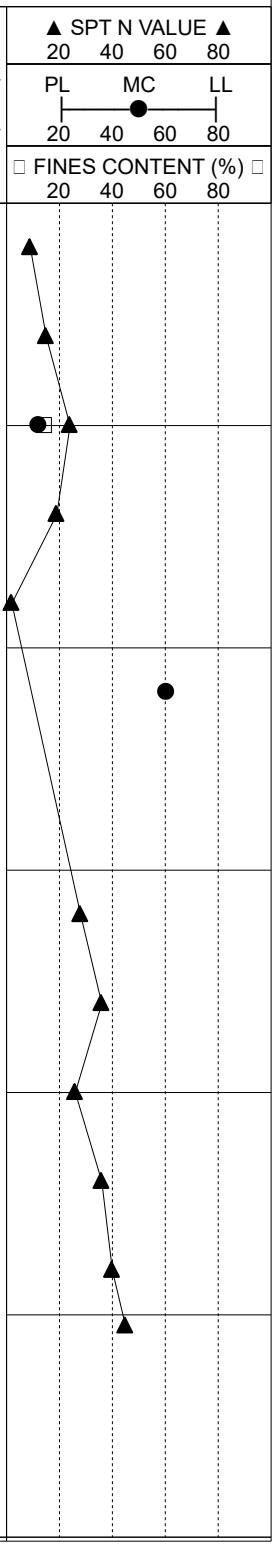
DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-2-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623973 **LONGITUDE** -70.917976
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 12.0 ft / Elev -1.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical samples submitted from 0'-4' and 8.8'-10' bgs.	Tan, Silty Sand with Gravel, Dry, Loose, SM, **(FILL)**	11	SS S-1	75	3-3-6-6 (9)		0.1
		2.0 ft Light Brown, Silty Sand, Moist, Medium Dense, SM, **(FILL)**	9.0	SS S-2	100	4-5-10-12 (15)		0.2
5		5.0 ft Dark Brown, SLIGHTLY ORGANIC SILTY SAND WITH GRAVEL, Trace Brick, Roots, Moist, Medium Dense, SM, Organic Content 2.1%, **(FILL)**	6.0	SS S-3	100	8-13-11-12 (24)		0.3
				SS S-4	90	10-11-8-9 (19)		0.3
		8.0 ft Tan, Silty Sand, Trace Gravel, Dry, Very Loose, SM, **(FILL)**	3.0	SS S-5	65	2-1-1-2 (2)		0.3
		8.8 ft Dark Brown, Organic Silt with Sand, Trace Roots, Dry, Soft, OL, **(ORGANICS)**	2.2					
10		10.0 ft Black, Organic Sand with Silt, Moist, Very Soft, OL, Organic Content 9.7%, **(ORGANICS)**	1.0	SS S-6	100	--		0.1
		12.0 ft Dark Brown, Slightly Organic Silty Sand, Trace Roots, Moist, Loose, SM, **(ORGANICS)**	-1.0	SS S-7	100	--		0.6
		14.0 ft Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)**	-3.0	SS S-8	70	11-11-17-21 (28)		0.6
15		15.0 ft Gray, Silty Sand with Gravel, Wet, Dense, SM, **(OUTWASH)**	-4.0	SS S-9	95	10-15-21-18 (36)		0.5
		17.0 ft Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)**	-6.0	SS S-10	60	12-14-12-15 (26)		0.2
20		19.0 ft Gray, Silty Sand with Gravel, Wet, Dense, GM, **(TILL)**	-8.0	SS S-11	40	11-15-21-22 (36)		0.3
		21.0 ft	-10.0	SS S-12	25	6-16-24-21 (40)		0.2
25	Split Spoon Refusal at 25.5' bgs	25.0 ft No Recovery	-14.0	SS S-13	0	45 (45)		
		25.5 ft End of boring at 25.5 feet	-14.5					
30			-19					



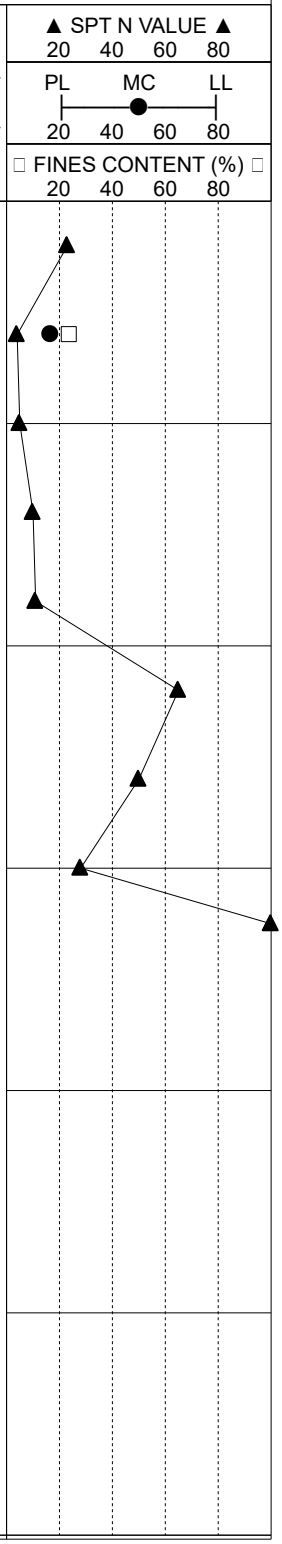
DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-3-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/10/2023 **DATE COMPLETED** 11/10/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623423 **LONGITUDE** -70.917839
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/10/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical Sample submitted from 0'-4' bgs.	Dark Brown, Silty Sand, Trace Roots, Dry, Medium Dense, SM, **(FILL)**	11	SS S-1	38	2-14-9-5 (23)		0.3
2.0 ft		Brown, SILTY SAND, Dry, Loose, SM, **(FILL)**	9.0	SS S-2	65	3-2-2-3 (4)		0.2
4.0 ft		Tan to Brown, Silty Sand, Dry, Loose, SM, **(FILL)**	7.0	SS S-3	95	2-2-3-3 (5)		0.2
5.5 ft		Brown to Black, Silty Sand with Gravel, Trace Brick, Trace Roots, Dry to Moist, Medium Dense, SM, **(FILL)**	5.5	SS S-4	50	6-6-4-4 (10)		0.8
8.0 ft	3" spoon driven after 2" spoon to obtain additional soil recovery.	Brown, Silty Gravel with Sand, Wet, Medium Dense, GM, **(OUTWASH)**	3.0	SS S-5	25	5-6-5-4 (11)		0.2
10.0 ft		Tan to Gray, Silty Sand with Gravel, Wet, Very Dense to Medium Dense, SM, **(TILL)**	1.0	SS S-6	65	10-30-35-28 (65)		0.2
	Split spoon refusal at 13' bgs			SS S-7	50	22-50		0.5
				SS S-8	55	11-14-14-17 (28)		0.3
16.0 ft	Split spoon refusal at 16.5' bgs		-5.0					
16.5 ft		No Recovery	-5.5	SS S-9	--	50		0.5
		End of boring at 16.5 feet						



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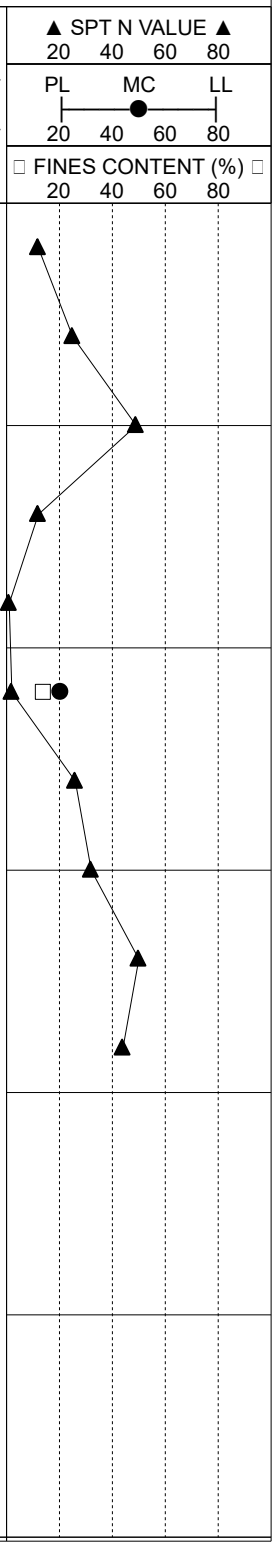
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-4-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623573 **LONGITUDE** -70.918352
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical samples submitted from 0'-4' and 8'-10' bgs.	0.5 ft: Tan, Poorly-Graded Sand with Silt and Gravel, Trace Roots, Dry, Medium Dense, SP-SM, **(FILL)**	10.5	SS S-1	95	5-6-6-5 (12)		10.0
			Brown, Silty Sand, Trace Gravel, Dry, Medium Dense to Dense, SM, **(FILL)**		SS S-2	80	9-11-14-11 (25)		0.2
			4.5 ft: Light Brown, Well-Graded Sand with Silt and Gravel, Dry, Dense, SW-SM, **(FILL)**	6.5	SS S-3	90	6-17-32-21 (49)		0.3
5			6.5 ft: Dark Brown, Slightly Organic Silt with Sand and Gravel, Trace Bricks, Damp, Stiff, Slightly Organic Odor, ML, **(FILL)**	4.5	SS S-4	95	13-3-9-9 (12)		0.3
			8.0 ft: Brown, Slightly Organic Silty Sand with Gravel, Trace Roots, Wet, Very Loose, SM, **(Organics)**	3.0	SS S-5	60	1-WOH-WOH-WOH (1)		1.7
10			10.0 ft: Brown, SILTY SAND, FEW GRAVEL, Trace Roots, Wet, Very Loose, SM, **(OUTWASH)**	1.0	SS S-6	50	WOH-WOH-2-13 (2)		
			12.0 ft: Light Brown, Well-Graded Sand with Silt and Gravel, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-1.0	SS S-7	75	13-15-11-17 (26)		0.1
			14.0 ft: Brown, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)**	-3.0	SS S-8	70	12-15-17-10 (32)		0.3
15					SS S-9	100	12-22-28-30 (50)		0.2
			18.0 ft: No Recovery	-7.0					0.3
		Sample S-11 was abandoned in the boring after snapping off of drill rods.	20.0 ft: End of boring at 20.0 feet	-9.0	SS S-10	--	11-24-20-50 (44)		
20									
25									
30									



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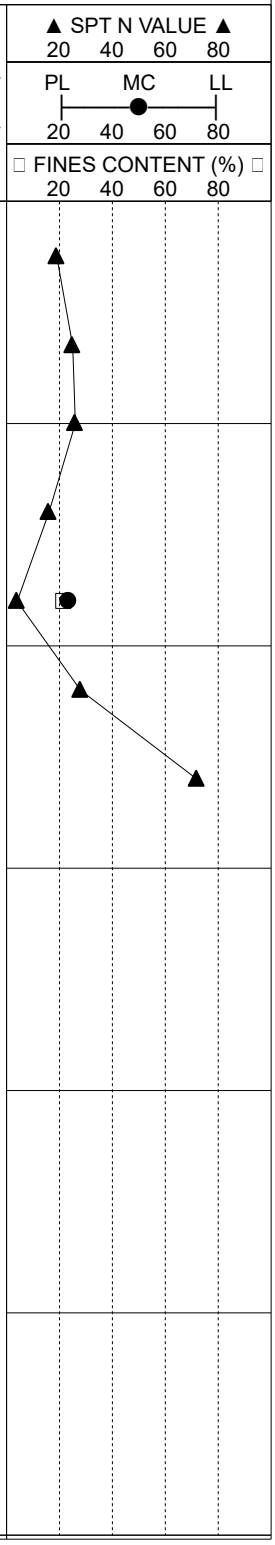
Raynham, MA 02767

BORING NUMBER CEC-5-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/10/2023 **DATE COMPLETED** 11/10/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623647 **LONGITUDE** -70.918060
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/10/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical Samples submitted from 0'-4' and 8'-10' bgs.	0.2 ft 3" Asphalt	10.8					
		Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)**		SS S-1	95	17-9-10-3 (19)		0.1
		2.0 ft Light Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	9.0	SS S-2	90	8-14-11-8 (25)		0.1
5		5.5 ft Gray To Black, Silty Sand with Gravel, Trace Wood/Brick, Moist, Medium Dense, SM, **(FILL)**	5.5	SS S-3	85	6-10-16-16 (26)		0.3
		8.0 ft	3.0	SS S-4	50	9-10-6-4 (16)		0.5
		Dark Brown, Slightly Organic SILTY SAND, FEW GRAVEL, Wet, Loose, SM, Organic Content 1.9%, **(ORGANICS)**		SS S-5	80	3-2-2-2 (4)		0.3
10		10.0 ft Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(TILL)**	1.0	SS S-6	90	10-14-14-18 (28)		0.2
		12.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(TILL)**	-1.0	SS S-7	75	12-22-50 (72)		0.1
	Split spoon refusal at 13.5' bgs.	13.5 ft End of boring at 13.5 feet	-2.5					
15								
20			-9					
25								
30			-19					



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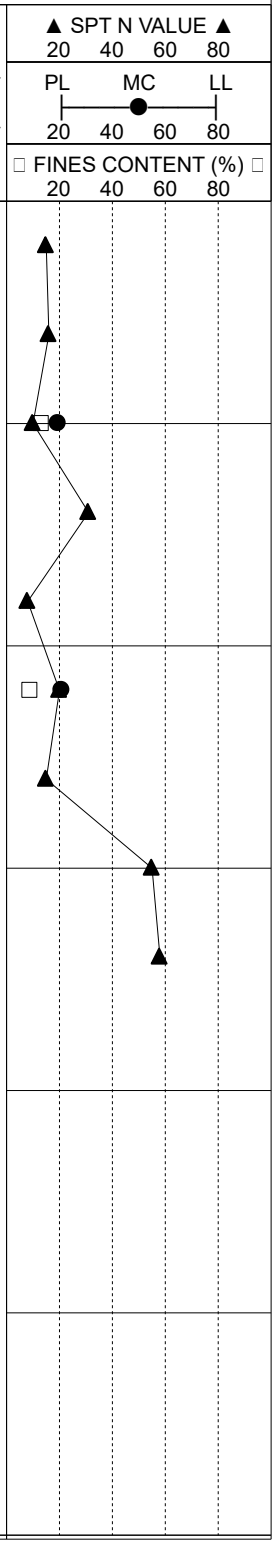
Raynham, MA 02767

BORING NUMBER CEC-1-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623895 **LONGITUDE** -70.917636
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/05/2023 4.0 ft / Elev 7.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical Sample submitted from 0'-4' bgs.	0.5 ft Brown, Silty Sand with Gravel, Trace Roots, Dry, Medium Dense, SM, **(FILL)**	10.5	SS S-1	95	3-7-8-9 (15)		0.2
		2.0 ft Tan, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	9.0	SS S-2	75	14-11-5-3 (16)		0.6
		Brown, Silty Sand with Gravel, Moist, Medium Dense, Slight Petroleum Odor, SM, **(FILL)**						
		4.5 ft Dark Brown, Slightly Organic SILTY SAND WITH GRAVEL, Trace Roots/Wood, Trace Brick, Debris, Moist, Medium Dense, SM, Organic Content 4.5%, **(FILL)**	6.5	SS S-3	90	3-4-6-28 (10)		1.0
5		6.0 ft Brown, Silty Sand with Gravel, Few Bricks, Wet, Dense, SM, **(FILL)**	5.0	SS S-4	55	25-15-16-10 (31)		0.0
	No recovery, with 2" spoon, recovered 5" with 3" spoon.	8.0 ft Red to Brown, Poorly-Graded Gravel/Brick Debris, Few Sand, Wet, Loose, Petroleum Odor, GP, **(FILL)**	3.0	SS S-5	20	7-4-4-4 (8)		0.0
10		10.0 ft Brown, Slightly Organic POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Brick, Roots, Wet, Medium Dense, Slight Organic / Petroleum Odor, SP-SM, **(FILL)**	1.0	SS S-6	65	2-5-15-15 (20)		0.2
		12.0 ft Dark Brown, Slightly Organic Silty Sand with Gravel, Trace Brick, Roots, Wet, Medium Dense, Slight Organic / Petroleum Odor, SM, **(FILL)**	-1.0	SS S-7	90	7-5-10-11 (15)		0.2
15		13.0 ft Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)**	-2.0	SS S-8	75	34-30-25-38 (55)		0.2
				SS S-9	100	21-23-35-34 (58)		0.3
		18.0 ft End of boring at 18.0 feet	-7.0					
20			-9					
25								
30			-19					



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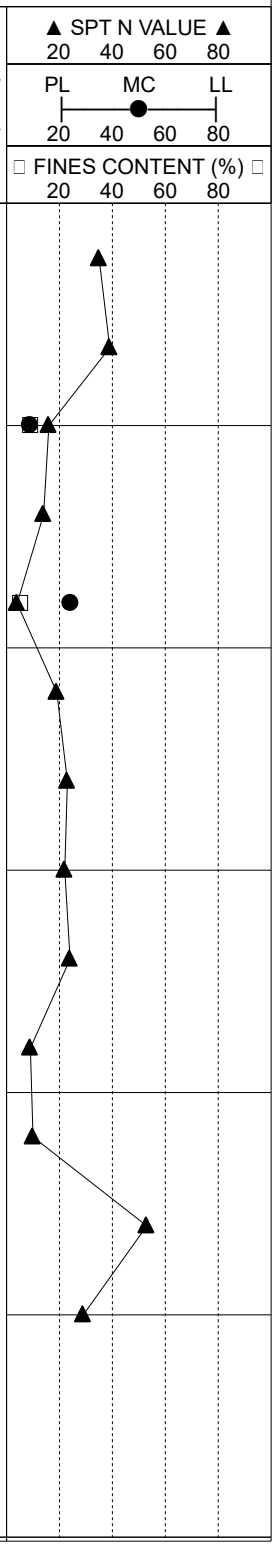
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-2-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	8.70 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624047 **LONGITUDE** -70.917329
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/06/2023 6.0 ft / Elev 2.7 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical Sample submitted from 0'-4' bgs.	0.2 ft 3" Asphalt	8.4					
		Tan to Brown, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)**		SS S-1	60	11-13-22-17 (35)		0.3
		2.2 ft Brown to Black, Poorly-Graded Gravel / Asphalt with Sand and Silt, Dry, Dense, GP, **(FILL)**	6.4	SS S-2	750	27-26-13-10 (39)		1.2
		3.8 ft Tan, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)**	5.0					
5		4.0 ft Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Few Debris / Roots, Dry, Medium Dense, SP-SM, **(FILL)**	4.7	SS S-3	70	10-8-8-7 (16)		1.0
		6.0 ft Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense, SP-SM, **(FILL)**	2.7	SS S-4	65	7-8-6-6 (14)		0.1
		8.0 ft Gray, POORLY-GRADED SAND WITH SILT, Trace Shells, Wet, Loose, Slight Petroleum Odor, SP-SM, **(FILL)**	0.7	SS S-5	45	3-2-2-4 (4)		1.3
10		10.0 ft Black to Gray, Silty Sand with Gravel, Trace Shells, Wet, Medium Dense, Petroleum Odor, SM, **(FILL)**	-1.3	SS S-6	70	5-5-14-16 (19)		1.9
		11.0 ft Gray, Silty Gravel with Sand, Trace Shells, Wet, Medium Dense, GM, **(OUTWASH)**	-2.3	SS S-7	75	16-12-11-13 (23)		0.2
		12.5 ft Grayish Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)**	-3.8	SS S-8	40	9-9-13-12 (22)		0.0
15		14.0 ft Tan, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(OUTWASH)**	-5.3	SS S-9	55	7-12-12-11 (24)		0.2
	Black, Slightly Organic Sand Seam at 18' bgs.	16.0 ft Tan, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-7.3	SS S-10	45	6-5-4-6 (9)		0.4
		18.0 ft Orange, Silty Sand with Gravel, Wet, Loose, SM, **(OUTWASH)**	-9.3	SS S-11	60	2-4-6-20 (10)		0.8
20		20.0 ft Orange / Brown, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-11.3	SS S-12	60	12-36-17-50 (53)		0.2
		22.0 ft Orange / Brown, Silty Gravel with Sand, Wet, Medium Dense to Very Dense, GM, **(TILL)**	-13.3	SS S-13	45	11-12-17-17 (29)		0.5
25		26.0 ft End of boring at 26.0 feet	-17.3					
30			-21					



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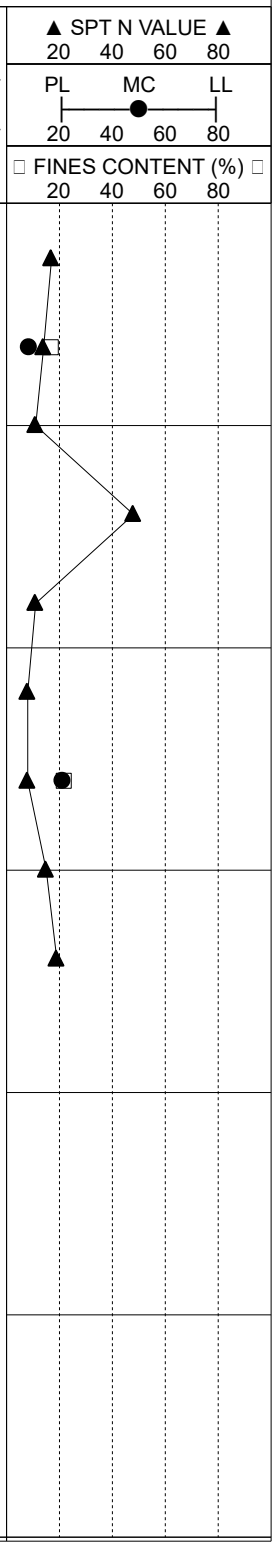
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-3-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	9.60 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624116 **LONGITUDE** -70.916931
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/06/2023 8.0 ft / Elev 1.6 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical Sample submitted from 0.3'-4' bgs.	0.2 ft 3" Asphalt	9.4					
			Tan, Silty Sand, Dry, Medium Dense, SM, **(FILL)**		SS S-1	55	4-6-11-12 (17)		0.0
			2.2 ft Brown, SILTY SAND, FEW GRAVEL, Dry, Medium Dense, SM, **(FILL)**	7.4	SS S-2	50	5-8-6-6 (14)		1.0
			4.2 ft Brown to Dark Brown, Silty Sand with Gravel, Dry, Medium Dense to Dense, SM, **(FILL)**	5.4	SS S-3	50	7-5-6-22 (11)		0.0
5					SS S-4	50	25-24-24-17 (48)		0.3
			8.0 ft Brown to Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense to Loose, SP-SM, **(OUTWASH)**	1.6	SS S-5	55	4-6-5-4 (11)		0.2
10				0	SS S-6	55	3-4-4-4 (8)		0.9
			12.0 ft Gray, Slightly Organic SILTY SAND, FEW GRAVEL, Trace Shells, Wet, Loose, Slight Organic Odor, SM, Organic Content 1.1%, **(OUTWASH)**	-2.4	SS S-7	75	5-3-5-9 (8)		1.2
			14.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(OUTWASH)**	-4.4	SS S-8	60	5-7-8-7 (15)		0.2
15					SS S-9	75	7-10-9-7 (19)		0.3
			18.0 ft End of boring at 18.0 feet	-8.4					
20				-10					
25									
30				-20					



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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-4-2

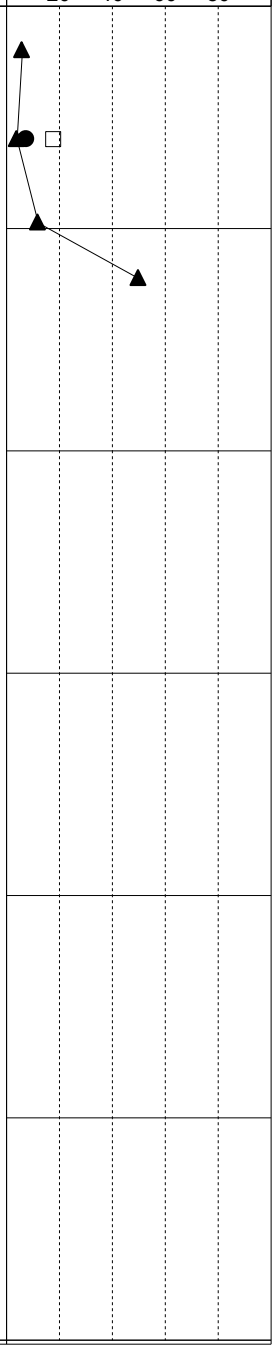
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623463 **LONGITUDE** -70.917509
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical Samples submitted from 0'-4' and 4'-5.75' bgs.	0.5 ft Dark Brown, Organic Silty Sand, Few Roots, Dry, Loose, SM, **(FILL)**	10.5	SS S-1	60	1-3-3-3 (6)		0.2
			2.0 ft Tan, Silty Sand with Gravel, Trace Glass, Dry, Loose, SM, **(FILL)**	9.0	SS S-2	80	3-2-2-2 (4)		0.1
			4.0 ft Brown, SILTY SAND, FEW GRAVEL, Dry, Loose, SM, **(FILL)**	7.0	SS S-3	74	2-5-7-45/0.3' (12)		0.3
5		Split spoon refusal at 5.75' bgs; Augers grinding 5.75-6'. Auger and split spoon refusal at 6.5'.	5.8 ft Light Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)**	5.2	SS S-4	0	50-WOH/0.2' (50)		--
			6.5 ft No Recovery	4.5					
			End of boring at 6.5 feet						
10				1					
15									
20				-9					
25									
30				-19					

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



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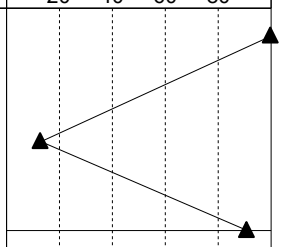
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-5-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	8.80 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623533 **LONGITUDE** -70.916969
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
0		Split spoon and auger refusal at 1.25' bgs, offset 6' north.	Brown, Silty Sand with Gravel / Concrete, Trace Roots, Dry, Very Dense, SM, **(FILL)**		SS S-1	56	3-24-50/0.2'			
			2.0 ft — Tan to Brown, Silty Sand with Gravel, Dry to Moist, Medium Dense to Very Dense, SM, **(FILL)**	6.8	SS S-2	70	5-6-7-9 (13)			
5		Split spoon refusal at 5.5' bgs	5.5 ft — End of boring at 5.5 feet	3.3	SS S-3	55	5-10-81 (91)			
10		Analytical Sample submitted from 0'-4' bgs.		-1						
15										
20				-11						
25										
30				-21						



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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-6-2

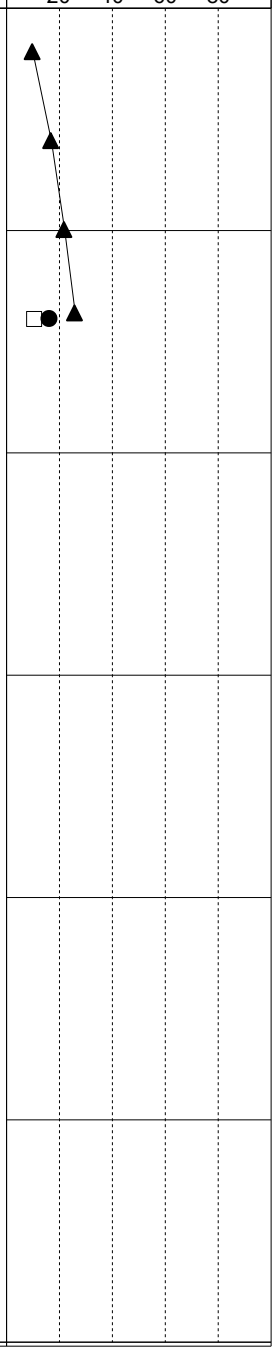
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	9.10 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623677 **LONGITUDE** -70.916698
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical Sample submitted from 0'-4' bgs.	0.5 ft Dark Brown, Organic Silty Sand, Few Roots, Dry, Medium Dense, SM, **(FILL)**	8.6	SS S-1	65	2-5-5-8 (10)		
			Brown, Silty Sand with Gravel, Trace Debris, Roots, Dry, Medium Dense, SM, **(FILL)**		SS S-2	70	7-8-9-7 (17)		
5			5.0 ft Black, Silty Sand with Gravel, Some Concrete/Brick/Wood, Dry to Moist, Medium Dense, SM, **(FILL)**	4.1	SS S-3	90	7-8-14-11 (22)		
		Split spoon refusal at 7.75' bgs	6.0 ft Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Some Concrete/Brick/Wood, Moist, Medium Dense, SP-SM, **(FILL)**	3.1	SS S-4	74	11-10-16-50 /0.3' (26)		
			7.8 ft End of boring at 7.8 feet	1.4					
10				0					
15									
20				-10					
25									
30				-20					

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



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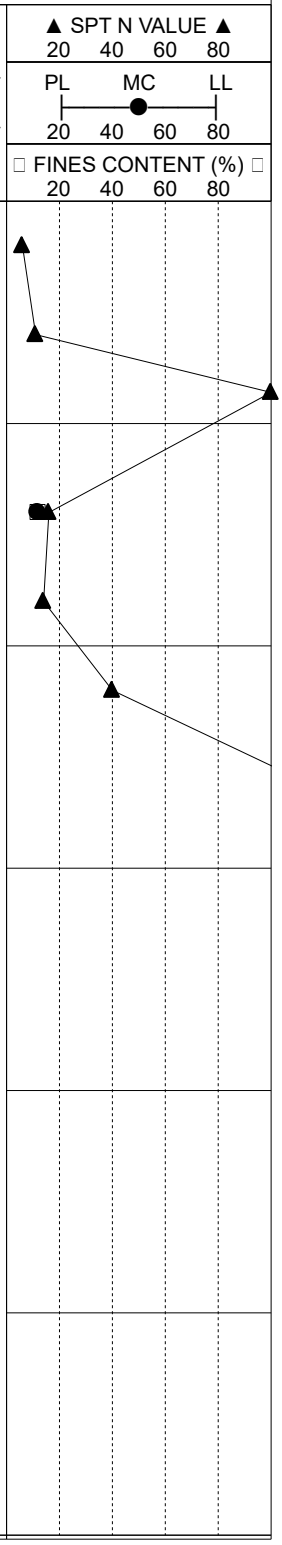
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-7-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623464 **LONGITUDE** -70.917548
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/05/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical Samples submitted from 0'-4', 4'-8', and 8'-10' bgs.	0.5 ft Brown, Silty Sand with Gravel, Trace Roots, Dry, Loose, SM, **(FILL)**	10.5	SS S-1	88	2-2-4-6 (6)		0.1
		Tan, Silty Sand, Dry, Loose, SM, **(FILL)**						
		2.0 ft Brown, Silty Sand with Gravel, Dry, Medium Dense to Very Dense, SM, **(FILL)**	9.0	SS S-2	20	4-6-5-4 (11)		0.7
5	Split spoon refusal at 4.6'. Augers grinding from 4.6-6' bgs through possible boulder or concrete.			SS S-3	100	4-50/0.1'		0.1
		6.0 ft Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Debris, Moist to Wet, Medium Dense, SP-SM, **(FILL)**	5.0	SS S-4	45	4-5-11-15 (16)		0.0
		8.0 ft Dark Brown, Silty Sand with Gravel, Trace Debris, Wet, Medium Dense, SM, **(FILL)**	3.0	SS S-5	50	4-6-8-16 (14)		0.1
10		10.0 ft Brown/Gray, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)**	1.0	SS S-6	55	5-14-26-53 (40)		0.7
	Split spoon and auger refusal at 13.8' bgs.	13.8 ft End of boring at 13.8 feet	-2.8	SS S-7	87	14-47-55 (102)		0.5
15								
20			-9					
25								
30			-19					



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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-8-2

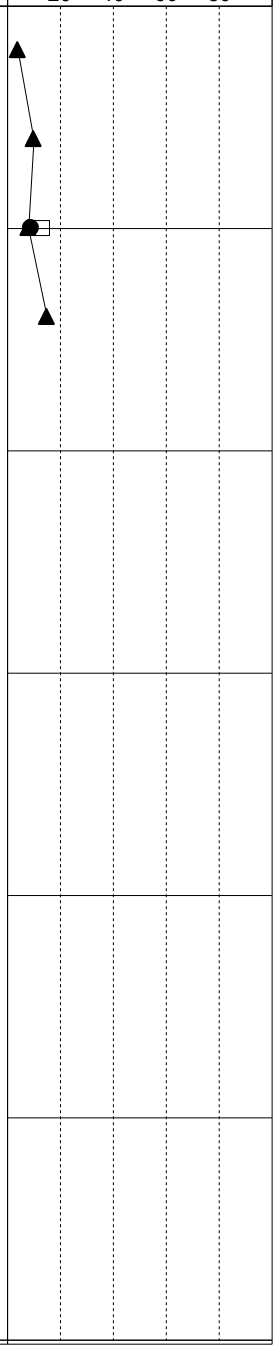
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623469 **LONGITUDE** -70.917443
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/05/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical Samples submitted from 2'-4' and 4'-8' bgs.	1.0 ft Dark Brown, Organic Silty Sand with Gravel, Few Roots, Dry, Loose, SM, **(FILL)**	11	SS S-1	60	1-1-3-7 (4)		0.1
			2.0 ft Tan, Silty Sand, Dry, Loose, SM, **(FILL)**	10.0	SS S-2	70	5-5-5-4 (10)		0.1
			4.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Debris, Dry, Medium Dense, SP-SM, **(FILL)**	9.0	SS S-3	50	4-4-4-28 (8)		0.8
5			6.0 ft Brown, SILTY SAND WITH GRAVEL, Dry, Loose, Petroleum Odor at 5', SM, **(FILL)**	7.0	SS S-4	50	9-8-7-25 (15)		0.9
		Split spoon and auger refusal at 8' bgs on possible concrete slab.	8.0 ft Dark Brown, Silty Sand with Gravel, Trace Shells/Brick/Asphalt/Glass, Wet, Medium Dense, SM, **(FILL)**	5.0					
			End of boring at 8.0 feet	3.0					
10				1					
15									
20				-9					
25									
30				-19					

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623433 **LONGITUDE** -70.917462
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' and 1'-2' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft / 9.0			
			Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
			3.5 ft / 6.5; 3.8 ft / 6.2 Asphalt			
			Brown to Tan, Silty Sand, Dry, SM, **(FILL)** 5.0 ft / 5.0			
5			Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** 6.5 ft / 3.5	DP S-2	100	
			End of boring at 6.5 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623500 **LONGITUDE** -70.917482
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 0'-1', 1'-2' & 4'-5' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft / 10.0			
			Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
			3.5 ft / 7.5; 3.8 ft / 7.2 Asphalt			
5			Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)**	DP S-2	100	
			6.5 ft / 4.5 End of boring at 6.5 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623567 **LONGITUDE** -70.917503
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3' & 3'-4' bgs.	Tan, Silty Sand, Trace Gravel, Little Roots, Dry, SM, **(FILL)**			
			2.0 ft — 9.0			
			Tan, Poorly-Graded Sand with Gravel, Trace Silt, Dry, SP, **(FILL)**	DP S-1	100	
			4.5 ft — 6.5			
5		Brick Fragments at 5.5' bgs.	Brown, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-2	100	
			7.0 ft — 4.0			
			End of boring at 7.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623634 **LONGITUDE** -70.917524
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 1'-2', 2'-3' & 4'-5' bgs.	Brown, Silty Sand, Little Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			6.3 ft – 4.7	DP S-2	100	
			End of boring at 6.3 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623700 **LONGITUDE** -70.917544
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs.	Brown, Silty Sand, Trace Gravel, Dry, SM, **(FILL)**	DP S-1	100	
4.0 ft			Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 7.0			
5				DP S-2	100	
8.0 ft			3.0 End of boring at 8.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623767 **LONGITUDE** -70.917565
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 1'-2', 2'-3', & 4'-5' bgs.	Brown, Silty Sand with Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			6.3 ft – 4.7	DP S-2	100	
			End of boring at 6.3 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-6

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623834 **LONGITUDE** -70.917585
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 4.0 ft / Elev 7.0 ft
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Brown, Silty Sand with Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand with Gravel, Dry to Wet, SM, **(FILL)**	DP S-1	100	
			4.0 ft – 7.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Moist, SP-SM, **(FILL)**			
5			5.5 ft – 5.5	DP S-2	100	
			End of boring at 5.5 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER A-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623900 **LONGITUDE** -70.917605
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite from 1'-4' bgs. Rock fragment at 2.5' bgs.	0.5 ft Brown, Silty Sand with Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand with Gravel, Dry to Moist, SM, **(FILL)**	DP S-1	100	
			4.0 ft 7.0 4.5 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM, **(FILL)** 6.5			
5			End of boring at 4.5 feet			
10						
15						
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER AA0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623418 **LONGITUDE** -70.917551
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2' & 4'-5' bgs.	Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft / 9.0			
			Tan, Silty Sand, Dry, SM, **(FILL)** 2.0 ft / 8.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			6.0 ft / 4.0	DP S-2	100	
			End of boring at 6.0 feet			
10						
15						
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER AA-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623485 **LONGITUDE** -70.917572
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 4'-5' bgs.	Brown to Tan, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** 1.5 ft – 9.5			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			6.0 ft – 5.0	DP S-2	100	
			End of boring at 6.0 feet			
10						
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER AA-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623551 **LONGITUDE** -70.917592
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Brown to Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand, Dry, SM, **(FILL)** 2.5 ft – 8.5	DP S-1	100	
			Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 5.5 ft – 5.5	DP S-2	100	
5			End of boring at 5.5 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER AA-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623618 **LONGITUDE** -70.917613
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs.	Brown to Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand, Dry, SM, **(FILL)** 2.5 ft – 8.5	DP S-1	100	
			Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 5.5 ft – 5.5	DP S-2	100	
5			End of boring at 5.5 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER AA-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623685 **LONGITUDE** -70.917633
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2', 2'-3', & 4'-5' bgs.	0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.2			
			Tan to Brown, Silty Sand, Dry, SM, **(FILL)**			
			3.0 ft 8.0	DP S-1	100	
			Brown, Silty Sand with Gravel, Trace Shell Fragments, Dry, SM, **(FILL)**			
5			6.5 ft 4.5	DP S-2	100	
			End of boring at 6.5 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER AA-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623752 **LONGITUDE** -70.917654
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	0.8 ft — Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** — 10.2			
			Tan, Silty Sand, Dry, SM, **(FILL)**			
			2.8 ft — 8.2	DP S-1	100	
			Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM, **(FILL)**			
5				DP S-2	100	
			6.5 ft — 4.5			
			End of boring at 6.5 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER AA-6

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623819 **LONGITUDE** -70.917674
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.2 ft – 7.8	DP S-1	100	
			Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 6.3 ft – 4.7	DP S-2	100	
5			End of boring at 6.3 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER AA-8.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623986 **LONGITUDE** -70.917726
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite.	0.5 ft Asphalt 10.5 Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft 8.0 Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 6.0 End of boring at 5.0 feet	DP S-1	100	
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Raynham, MA 02767

BORING NUMBER B0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623449 **LONGITUDE** -70.917373
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3, & 3'-4' bgs.	0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 9.2 Tan, Silty Sand, Dry, SM, **(FILL)** 4.5 ft 5.5 End of boring at 4.5 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
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BORING NUMBER B-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623515 **LONGITUDE** -70.917393
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', & 4'-5' bgs.	0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand, Dry, SM, **(FILL)** 3.8 ft 7.2 Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** 4.8 ft 6.2 End of boring at 4.8 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER B-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623582 **LONGITUDE** -70.917414
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2', 2'-3', & 4'-5' bgs.	0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5			
			Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
			3.2 ft 7.8			
			3.8 ft Asphalt 7.2			
			Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)**			
5			5.0 ft 6.0			
			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER B-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623649 **LONGITUDE** -70.917434
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs.	Tan, Poorly-Graded Sand with Silt, Trace Roots, SP-SM **(FILL)**			
			1.5 ft — 9.5			
			Tan, Poorly-Graded Sand with Silt and Gravel, SP-SM **(FILL)**	DP S-1	100	
			3.5 ft — 7.5			
			Brown, Poorly-Graded Sand with Silt and Gravel, SP-SM, **(FILL)**			
5				DP S-2	100	
			6.0 ft — 5.0			
			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER B-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623716 **LONGITUDE** -70.917455
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 2'-3' bgs.	Tan, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** 1.5 ft / 9.5			
		Rock Fragments at 4.5' bgs.	Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			7.0 ft / 4.0	DP S-2	100	
			End of boring at 7.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER B-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623783 **LONGITUDE** -70.917475
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2', 2'-3', & 4'-5' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			6.3 ft – 4.7	DP S-2	100	
			End of boring at 6.3 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER B-6

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623850 **LONGITUDE** -70.917496
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			6.3 ft – 4.7	DP S-2	100	
			End of boring at 6.3 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER BB0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623402 **LONGITUDE** -70.917640
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs.	Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.0 ft – 6.0	DP S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER BB-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623469 **LONGITUDE** -70.917661
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as a composite and from 0'-1', 1'-2', 2'-3', 3'-4', & 4'-5' bgs.	Gray, Silty Sand, Dry, SM, **(FILL)**			
			1.5 ft — 9.5			
			Tan, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)**	DP S-1	100	
			5.0 ft — 6.0			
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER BB-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623536 **LONGITUDE** -70.917681
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2', 2'-3', & 3'-4' bgs.	Brown, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	75	
4.0 ft			Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 7.0			
5				DP S-2	75	
8.0 ft			End of boring at 8.0 feet 3.0			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER BB-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623603 **LONGITUDE** -70.917702
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs.	Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			2.0 ft — 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shells, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			6.0 ft — 5.0	DP S-2	100	
			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER BB-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623670 **LONGITUDE** -70.917722
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			2.0 ft — 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shells, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			6.0 ft — 5.0	DP S-2	100	
			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER BB-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623737 **LONGITUDE** -70.917743
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs.	Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			2.0 ft — 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shells, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			6.0 ft — 5.0	DP S-2	100	
			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER BB-6

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623803 **LONGITUDE** -70.917763
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Trace Roots from 0-0.5' bgs. Analytical samples submitted from 1'-2' & 4'-5' bgs.	Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
			3.5 ft — 7.5 Brown, Poorly-Graded Sand with Silt and Gravel, Moist, SP-SM, **(FILL)**			
5			5.0 ft — 6.0 End of boring at 5.0 feet			
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Raynham, MA 02767

BORING NUMBER BB-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623870 **LONGITUDE** -70.917784
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Trace roots from 0-0.5' bgs. Analytical samples submitted as composite from 1'-4' bgs.	Brown to Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
3.0 ft			Gray to Brown, Poorly-Graded Sand with Silt and Gravel, Dry to Moist, SP-SM, **(FILL)** 8.0			
4.0 ft			7.0			
			End of boring at 4.0 feet			
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Raynham, MA 02767

BORING NUMBER C0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623464 **LONGITUDE** -70.917284
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2' & 4'-5' bgs.	0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 9.2			
			Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
			3.5 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM **(FILL)** 6.5			
5			5.5 ft 4.5	DP S-2	100	
			End of boring at 5.5 feet			
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BORING NUMBER C-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623531 **LONGITUDE** -70.917304
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED B** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 0'-1', 1'-2', & 3'-4' bgs.	0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand, Dry, SM, **(FILL)** 2.5 ft 8.5 Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.0 ft 7.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
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BORING NUMBER C-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623613 **LONGITUDE** -70.917236
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs.	Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.0 ft – 7.0	DP S-1	100	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER C-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623664 **LONGITUDE** -70.917345
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as a composite and from 1'-2' & 4'-5' bgs.	0.8 ft Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 10.2			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
			3.5 ft 7.5			
			Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**			
			4.8 ft 6.2			
5			End of boring at 4.8 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER C-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623731 **LONGITUDE** -70.917366
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs.	Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.0 ft – 7.0	DP S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER C-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623798 **LONGITUDE** -70.917386
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs. Rock fragments at 4' bgs.	0.5 ft Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 10.5			
			Tan, Silty Sand, Dry, SM, **(FILL)**			
			2.0 ft 9.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			5.0 ft 6.0			
			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER C-6

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623865 **LONGITUDE** -70.917407
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' bgs. Rock fragments at 2' bgs.	0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5 1.0 ft Tan, Silty Sand, Dry, SM, **(FILL)** 10.0 Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.0 ft 7.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER C-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623932 **LONGITUDE** -70.917427
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite from 1'-4' bgs.	0.5 ft Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand, Dry, SM, **(FILL)** 4.0 ft 7.0 4.3 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 6.7 End of boring at 4.3 feet	DP S-1	100	
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Raynham, MA 02767

BORING NUMBER CC0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623387 **LONGITUDE** -70.917729
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2', 3'-4', & 5'-6' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft – 7.0	DP S-1	100	
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** 6.0 ft – 4.0	DP S-2	100	
5			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER CC-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623454 **LONGITUDE** -70.917750
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2', 3'-4', & 5'-6' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)**			
			1.0 ft — 10.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			3.0 ft — 8.0	DP S-1	100	
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)**			
5			6.0 ft — 5.0	DP S-2	100	
			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CC-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623521 **LONGITUDE** -70.917770
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft – 8.0	DP S-1	100	
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** 6.0 ft – 5.0	DP S-2	100	
5			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER D0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623479 **LONGITUDE** -70.917195
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs.	Brown, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)** 4.0 ft – 6.0	DP S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER D-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623546 **LONGITUDE** -70.917215
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2' & 2'-3' bgs.	Brown, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)** 4.0 ft – 7.0	DP 'S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER D-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623613 **LONGITUDE** -70.917236
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' bgs.	0.4 ft Asphalt 10.6 Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)** 2.0 ft 9.0 Brown, Well -Graded Sand with Gravel, Dry, SW, **(FILL)**	DP S-1	100	
5			5.5 ft 5.5 End of boring at 5.5 feet	DP S-2	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER D-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623680 **LONGITUDE** -70.917256
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs.	Brown, Silty Sand, Trace Bricks, Dry, SM, **(FILL)** 4.0 ft – 7.0	DP S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER D-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623747 **LONGITUDE** -70.917277
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	0.4 ft Asphalt 10.6 Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)** 2.0 ft 9.0 Brown, Well-Graded Sand with Gravel, Dry, SW **(FILL)**	DP S-1	100	
5			5.5 ft 5.5 End of boring at 5.5 feet	DP S-2	100	
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER D-8.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624048 **LONGITUDE** -70.917369
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite from 1'-3' bgs.	0.4 ft Asphalt — 10.6 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.5 ft — 7.5 4.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** — 7.0 End of boring at 4.0 feet	DP S-1	100	
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BORING NUMBER DD0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623372 **LONGITUDE** -70.917818
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' & 4'-5' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft – 7.0	DP S-1	100	
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** 6.0 ft – 4.0	DP S-2	100	
5			End of boring at 6.0 feet			
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BORING NUMBER DD-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623438 **LONGITUDE** -70.917839
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft – 8.0	DP S-1	100	
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** 6.0 ft – 5.0	DP S-2	100	
5			End of boring at 6.0 feet			
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BORING NUMBER DD-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623505 **LONGITUDE** -70.917859
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 3'-4' bgs.	Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft 10.0			
			Brown, Poorly-Graded Sand with Silt, Trace Shell Fragments, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			6.0 ft 5.0	DP S-2	100	
			End of boring at 6.0 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER DD-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623572 **LONGITUDE** -70.917880
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.5 ft Asphalt 10.5 Tan, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)**	DP S-1	100	
5			5.0 ft 6.0 Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(OUTWASH)**	DP S-2	100	
			8.0 ft 3.0 End of boring at 8.0 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER DD-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623706 **LONGITUDE** -70.917921
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.5 ft Asphalt 10.5 Tan, Silty Sand, Dry, SM, **(FILL)** 1.5 ft 9.5 Gray, Poorly-Graded Sand with Gravel, Trace Shells, Dry, SP, **(FILL)** 4.5 ft 6.5 End of boring at 4.5 feet	DP S-1	100	
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BORING NUMBER DD-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623839 **LONGITUDE** -70.917962
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0.5'-3' bgs.	0.4 ft Concrete 10.6 Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 2.0 ft 9.0 Tan, Silty Sand, Dry, SM, **(FILL)** 3.0 ft 8.0 End of boring at 3.0 feet	DP S-1	100	
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BORING NUMBER E0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623495 **LONGITUDE** -70.917105
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 9'-10' bgs.	Dark Brown, Well-Graded Sand with Silt and Gravel, Dry, SW-SM, **(FILL)**	DP S-1	100	
5			5.0 ft — Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** — 5.0	DP S-2	100	
			8.5 ft — Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** — 1.5			
10			10.0 ft — End of boring at 10.0 feet — 0.0			
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BORING NUMBER E-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623562 **LONGITUDE** -70.917126
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as a composite and from 0'-1', 1'-2', 2'-3', 4'-5' & 9'-10' bgs.	Brown, Well-Graded Sand with Silt and Gravel, Dry, SW-SM, **(FILL)**	DP S-1	100	
5			5.0 ft — 6.0 Tan, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)**			
			6.5 ft — 4.5 Brown, Poorly-Graded Sand with Silt and Gravel, Few Asphalt/Brick Fragments, Dry, SP-SM, **(FILL)**	DP S-2	100	
10			10.0 ft — 1.0 End of boring at 10.0 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER E-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/03/2024 **DATE COMPLETED** 05/03/2024	**GROUND ELEVATION**	15.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623628 **LONGITUDE** -70.917147
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Boring located inside existing building. Analytical sample submitted from 1'-2' & 4'-5' bgs.	0.5 ft Concrete 14.5 Brown to Tan, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)**	DP S-1	100	
5			6.5 ft Tan to Brown, Silty Sand with Gravel, Dry, SM, **(OUTWASH)** 8.5	DP S-2	100	
			9.5 ft 5.5 End of boring at 9.5 feet			
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Raynham, MA 02767

BORING NUMBER E-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/03/2024 **DATE COMPLETED** 05/03/2024	**GROUND ELEVATION**	15.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623695 **LONGITUDE** -70.917167
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-3' & 3'-7' bgs.	0.5 ft Concrete 14.5			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			3.0 ft 12.0	DP S-1	100	
			Brown, Silty Sand with Gravel, Dry, SM, **(OUTWASH)**			
5				DP S-2	100	
			8.0 ft 7.0			
			End of boring at 8.0 feet			
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Raynham, MA 02767

BORING NUMBER E-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623829 **LONGITUDE** -70.917208
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.4 ft Asphalt 10.6 Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
		Rock fragments at 3.5' bgs.	4.3 ft 6.7 End of boring at 4.3 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER E-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623963 **LONGITUDE** -70.917249
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.4 ft Asphalt 10.6 1.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)** 10.0 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.5 ft 6.5 End of boring at 4.5 feet	DP S-1	100	
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BORING NUMBER EE0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623356 **LONGITUDE** -70.917907
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' bgs.	Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 1.0 ft – 9.0	DP S-1	100	
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft – 7.0			
			Brown, Poorly-Graded Sand with Clay and Gravel, Dry, SP-SC, **(FILL)** 3.5 ft – 6.5			
			End of boring at 3.5 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER EE0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623323 **LONGITUDE** -70.917897
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' bgs.	Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 1.0 ft – 9.0	DP S-1	100	
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft – 7.0			
			Brown, Poorly-Graded Sand with Clay and Gravel, Dry, SP-SC, **(FILL)** 3.5 ft – 6.5			
			End of boring at 3.5 feet			
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BORING NUMBER EE-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623423 **LONGITUDE** -70.917928
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0			Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
		Analytical sample submitted from 3'-4' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Shell Fragments, Dry, SP-SM, **(FILL)**	DP S-1	100	
5			7.0 ft – 4.0	DP S-2	100	
			End of boring at 7.0 feet			
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BORING NUMBER EE-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623490 **LONGITUDE** -70.917948
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 3'-4' bgs.	0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5			
			Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM, **(FILL)**	DP S-1	100	
5		Brick fragments at 4' bgs.	5.0 ft 6.0			
			End of boring at 5.0 feet			
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BORING NUMBER EE-8.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623924 **LONGITUDE** -70.918082
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.5 Tan, Silty Sand, Dry, SM, **(FILL)** 3.0 ft 7.0 Brown to Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.5 ft 5.5 End of boring at 4.5 feet	DP S-1	100	
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BORING NUMBER F0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623510 **LONGITUDE** -70.917016
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs.	Brown, Silty Sand, Dry, SM, **(FILL)** 4.0 ft – 6.0	DP S-1	100	
			End of boring at 4.0 feet			
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BORING NUMBER F-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623577 **LONGITUDE** -70.917037
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' & 1'-2' bgs.	Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Poorly-Graded Sand, Dry, SP, **(FILL)**	DP S-1	100	
5			5.0 ft – 6.0 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			6.5 ft – 4.5 Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick Fragments, Dry, SP-SM, **(FILL)**	DP S-2	100	
10			10.0 ft – 1.0 End of boring at 10.0 feet			
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BORING NUMBER F-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/03/2024 **DATE COMPLETED** 05/03/2024	**GROUND ELEVATION**	15.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623644 **LONGITUDE** -70.917057
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Boring located inside existing building. Analytical samples submitted from 1'-2' & 4'-5' bgs. Brick and rock fragments observed from 2 to 7' bgs.	0.5 ft Concrete 14.5 Brown, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
5				DP S-2	100	
			9.5 ft 5.5 End of boring at 9.5 feet			
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BORING NUMBER FF0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623341 **LONGITUDE** -70.917997
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**			
			1.0 ft — 9.0			
			Tan, Silty Sand, Little Gravel, Dry, SM, **(FILL)**	DP S-1	100	
			3.0 ft — 7.0			
			Brown, Poorly-Graded Sand with Clay and Gravel, Dry, SP-SC, **(FILL)**			
5			5.0 ft — 5.0			
			End of boring at 5.0 feet			
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BORING NUMBER FF-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623408 **LONGITUDE** -70.918017
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 0'-1', 1'-2', 3'-4', & 4'-5' bgs.	Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
			1.0 ft — Tan, Silty Sand, Dry, SM, **(FILL)** — 10.0			
			3.0 ft — Brown, Poorly-Graded Sand with Clay, Dry, SP-SC, **(FILL)** — 8.0			
			3.5 ft — Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** — 7.5			
5		Brick fragments at 4' bgs.	5.0 ft — End of boring at 5.0 feet — 6.0			
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BORING NUMBER FF-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623474 **LONGITUDE** -70.918038
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**			
			1.0 ft — 10.0			
			Tan, Silty Sand, Dry, SM, **(FILL)**			
			3.0 ft — 8.0	DP S-1	100	
			3.5 ft — 7.5			
			Brown, Poorly-Graded Sand with Clay, Dry, SP-SC, **(FILL)**			
			Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)**			
			5.0 ft — 6.0			
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER FF-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623541 **LONGITUDE** -70.918058
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1' to 4' bgs.	0.5 ft Asphalt 10.5 Tan, Silty Sand, Dry, SM, **(FILL)** 3.5 ft 7.5 4.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 7.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
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BORING NUMBER FF-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623675 **LONGITUDE** -70.918099
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.0 ft 7.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
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BORING NUMBER FF-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623809 **LONGITUDE** -70.918140
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-3.5' bgs.	0.5 ft Asphalt 9.5 Tan, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 3.0 ft 7.0 3.5 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 6.5 End of boring at 3.5 feet	DP S-1	100	
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Raynham, MA 02767

BORING NUMBER G0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623525 **LONGITUDE** -70.916927
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Tan, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.5 ft – 8.5			
			Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)**	DP S-1	100	
5				DP S-2	100	
			8.5 ft – 1.5 Brown, Peat, Moist, PT, **(ORGANICS)**			
10			10.0 ft – 0.0 End of boring at 10.0 feet			
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Raynham, MA 02767

BORING NUMBER G-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623592 **LONGITUDE** -70.916948
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted as composite and from 0'-1', 1'-2', 4'-5', & 9'-10' bgs.	Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Poorly-Graded Sand, Dry, SP, **(FILL)**	DP S-1	100	
5			5.0 ft – 6.0 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			6.5 ft – 4.5 Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick Fragments, Dry, SP-SM, **(FILL)**	DP S-2	100	
10			10.0 ft – 1.0 End of boring at 10.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER G-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/03/2024 **DATE COMPLETED** 05/03/2024	**GROUND ELEVATION**	15.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623659 **LONGITUDE** -70.916968
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Boring located inside existing building. Analytical samples submitted from 1'-2' & 4'-5' bgs.	0.5 ft Concrete 14.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
5				DP S-2	100	
			9.5 ft 5.5 End of boring at 9.5 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER G-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	15.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623726 **LONGITUDE** -70.916989
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Boring located inside existing building.	0.5 ft Concrete (14.5)			
			Tan, Silty Sand, Trace Gravel, Dry, SM, **(FILL)**			
		Analytical samples submitted from 0'-4' & 4'-8' bgs.	2.5 ft (12.5) Brown, Poorly-Graded Sand with Silt, Little Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
5				DP S-2	100	
			8.0 ft (7.0) End of boring at 8.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER G-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623860 **LONGITUDE** -70.917030
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Rock fragments at 3.5' bgs.	0.4 ft Asphalt 10.6 Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
5		Analytical samples submitted as composite and from 5'-6' & 9'-10' bgs.	4.3 ft 6.7 Brown, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-2	100	
10			10.0 ft 1.0 End of boring at 10.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER G-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623994 **LONGITUDE** -70.917071
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-4' bgs.	0.4 ft Asphalt 10.6 1.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)** 10.0 Tan to Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.0 ft 7.0 4.5 ft 6.5 End of boring at 4.5 feet	DP S-1	100	
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Raynham, MA 02767

BORING NUMBER GG0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623325 **LONGITUDE** -70.918086
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' bgs.	0.8 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.2 Tan, Silty Sand, Dry, SM, **(FILL)** 4.0 ft 6.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER GG-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623392 **LONGITUDE** -70.918106
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 1'-2' & 4'-5' bgs.	Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
			3.0 ft — 8.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**			
			5.0 ft — 6.0			
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER GG-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623459 **LONGITUDE** -70.918127
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Trace roots from 0'-1' bgs. Analytical samples submitted from 1'-2' & 4'-5' bgs.	Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
			4.0 ft — 7.0 Brown, Silty Sand with Gravel, Dry, SM, **(FILL)**			
5			5.0 ft — 6.0 End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER H0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623541 **LONGITUDE** -70.916838
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs.	Brown, Silty Sand, Trace Brick, Dry, SM, **(FILL)** 4.0 ft – 6.0	DP S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER H-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623608 **LONGITUDE** -70.916859
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' & 4'-5' bgs.	0.8 ft — Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** — 10.2			
			Tan, Poorly-Graded Sand, Dry, SP, **(FILL)**	DP S-1	100	
5			5.0 ft — 6.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**			
			6.5 ft — 4.5			
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick Fragments, Dry, SP-SM, **(FILL)**	DP S-2	100	
10			10.0 ft — 1.0			
			End of boring at 10.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER H-8.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624109 **LONGITUDE** -70.917013
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as a composite.	0.5 ft Asphalt 10.5 Brown to Tan, Poorly Graded Sand with Silt and Gravel, Dry, SM, **(FILL)** 4.5 ft 6.5 End of boring at 4.5 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER HH0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623310 **LONGITUDE** -70.918175
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' & 4'-5' bgs.	0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 5.0 ft 5.0	DP S-1	100	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER HH-0.5

CLIENT Foth Infrastructure & Environment, LLC
PROJECT NAME MassCEC Expansion
PROJECT NUMBER 332-344
PROJECT LOCATION New Bedford, MA
DATE STARTED 06/20/2024 **DATE COMPLETED** 06/20/2024
GROUND ELEVATION 10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR Geosearch, Inc.
LATITUDE 41.623523 **LONGITUDE** -70.916833
SAMPLING METHOD Direct Push
WATER LEVELS **AT END OF SOIL SAMPLING** N/A
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
CEC REP Dave Barboza **CHECKED BY** Tony Sousa, P.E.
NOTES Property 1 (18 Wright St. New Bedford, MA)

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Brown, Silty Sand, Trace Brick, Dry, SM, **(FILL)** 4.0 ft – 6.0	DP S-1	75	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER HH-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623377 **LONGITUDE** -70.918195
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as a composite.	Brown, Silty Sand, Dry, SM, **(FILL)**			
			1.5 ft — 9.5			
			Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
			4.0 ft — 7.0			
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER HH-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/30/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623510 **LONGITUDE** -70.918236
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as a composite.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan, Silty Sand, Dry, SM, **(FILL)** 5.0 ft – 6.0	DP S-1	100	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER HH-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/30/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623644 **LONGITUDE** -70.918277
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as a composite.	0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand, Dry, SM, **(FILL)** 4.0 ft 7.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER HH-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623778 **LONGITUDE** -70.918318
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as a composite.	0.5 ft Asphalt 9.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.0 ft 7.0 Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.0 ft 6.0 End of boring at 4.0 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER I0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623540 **LONGITUDE** -70.916744
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Tan, Silty Sand, Dry, SM, **(FILL)**			
			1.5 ft — 8.5			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
			4.0 ft — 6.0			
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER I-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623623 **LONGITUDE** -70.916770
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as a composite.	Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.0 ft – 7.0	DP S-1	100	
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER I-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/01/2024 **DATE COMPLETED** 05/01/2024	**GROUND ELEVATION**	15.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623757 **LONGITUDE** -70.916811
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Boring located inside existing building.	0.5 ft Concrete (14.5)			
			Tan, Silty Sand, Dry, SM, **(FILL)**			
		Analytical sample submitted as composite and from 4'-8' bgs.	2.5 ft (12.5) Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
5				DP S-2	100	
			8.0 ft (7.0) End of boring at 8.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER I-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623891 **LONGITUDE** -70.916852
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite.	0.5 ft Asphalt 10.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.5 ft 7.5 Tan to Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.3 ft 6.7 End of boring at 4.3 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER I-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	05/02/2024 **DATE COMPLETED** 05/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624024 **LONGITUDE** -70.916893
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite.	0.5 ft Asphalt 10.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.5 ft 7.5 Tan to Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.3 ft 6.7 End of boring at 4.3 feet	DP S-1	100	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER II0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623294 **LONGITUDE** -70.918264
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' bgs.	Tan, Silty Sand, Dry, SM, **(FILL)**			
			1.5 ft — 9.5			
			Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	100	
			4.0 ft — 7.0			
			End of boring at 4.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER II-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623261 **LONGITUDE** -70.918254
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Brick fragments at 0.75' bgs.	0.8 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.2			
			Tan to Brown, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
		Analytical sample submitted as composite and from 1'-2' & 4'-5' bgs.				
5			6.0 ft Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 4.0	DP S-2	100	
			8.0 ft End of boring at 8.0 feet 2.0			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER II-8.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623863 **LONGITUDE** -70.918438
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 04/29/2024 8.0 ft / Elev 2.0 ft
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite and from 5'-6' bgs.	0.5 ft Asphalt 9.5			
			Tan, Silty Sand, Dry, SM, **(FILL)**			
			2.0 ft 8.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-1	100	
			4.0 ft 6.0			
			Brown, Poorly-Graded Sand with Silt and Gravel, Few Organics, Dry, SP-SM, **(FILL)**			
5			5.5 ft 4.5			
			Brown, Peat, Moist, PT, **(ORGANICS)**			
			6.2 ft 3.8			
			Gray to Tan, Poorly-Graded Sand with Silt and Gravel, Moist to Wet, SP-SM	DP S-2	100	
10				DP S-3	100	
			11.3 ft -1.3			
			End of boring at 11.3 feet			
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BORING NUMBER J0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/29/2023 **DATE COMPLETED** 12/29/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623572 **LONGITUDE** -70.916660
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs.	Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 4.0 ft – 6.0	DP S-1	100	
			End of boring at 4.0 feet			
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BORING NUMBER JJ0

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623279 **LONGITUDE** -70.918353
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 1'-2' bgs.	Tan, Silty Sand, Dry, SM, **(FILL)** (1.0 ft – 10.0)			
			Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** (4.0 ft – 7.0)	DP S-1	100	
			End of boring at 4.0 feet			
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BORING NUMBER JJ-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/20/2024 **DATE COMPLETED** 06/20/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623242 **LONGITUDE** -70.918341
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Brick fragments at 0.75' bgs.	0.8 ft Light Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 10.2			
			Tan to Brown, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
		Analytical sample submitted from 1'-2' & 4'-5' bgs.				
5			6.0 ft 5.0			
			Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**	DP S-2	100	
			7.5 ft 3.5			
			End of boring at 7.5 feet			
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BORING NUMBER JJ/II-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623421 **LONGITUDE** -70.918349
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite.	0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5 Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 3.5 ft 7.5 End of boring at 3.5 feet	DP S-1	100	
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BORING NUMBER JJ/II-6

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	04/29/2024 **DATE COMPLETED** 04/29/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623688 **LONGITUDE** -70.918432
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted as composite.	0.5 ft Tan, Silty Sand, Trace Roots, Dry, SM, **(FILL)** 10.5 Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
		Trace Peat at 4.25'-4.5' bgs.	4.5 ft 6.5 End of boring at 4.5 feet			
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BORING NUMBER A0-5W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623430 **LONGITUDE** -70.917480
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	100	
5			End of boring at 5.0 feet			
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BORING NUMBER B0-5E

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623452 **LONGITUDE** -70.917355
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 0.8 ft – 9.2			
			Tan, Silty Sand, Dry, SM, **(FILL)** 4.5 ft – 5.5	DP S-1	100	
5			End of boring at 4.5 feet			
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BORING NUMBER B0-5W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623445 **LONGITUDE** -70.917391
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 0.8 ft – 9.2			
			Tan, Silty Sand, Dry, SM, **(FILL)** 4.5 ft – 5.5	DP S-1	100	
5			End of boring at 4.5 feet			
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BORING NUMBER B0-5N

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623462 **LONGITUDE** -70.917377
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.2			
			Tan, Silty Sand, Dry, SM, **(FILL)**	DP S-1	100	
			4.5 ft 6.5			
5			End of boring at 4.5 feet			
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BORING NUMBER B0-5S

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623435 **LONGITUDE** -70.917369
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Brown, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** 2.0 ft / 8.0			
			Tan, Silty Sand with Gravel, Trace Glass and Asphalt Debris, Dry, SM, **(FILL)**	DP S-1	100	
5		Sampler refusal at 6' bgs due to brick fragments in sampler tip.	6.0 ft / 4.0	DP S-2	100	
			End of boring at 6.0 feet			
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BORING NUMBER B0-10E

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623455 **LONGITUDE** -70.917337
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' & 2'-3' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 0.8 ft – 9.2			
			Tan, Silty Sand, Dry, SM, **(FILL)** 4.5 ft – 5.5	DP S-1	100	
5			End of boring at 4.5 feet			
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BORING NUMBER B0-10W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623442 **LONGITUDE** -70.917408
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' & 2'-3' bgs.	0.5 ft Brown, Silty Sand, Trace Roots, SM, **(TOPSOIL)** 9.5 Tan to Brown, Poorly-Graded Sand with Gravel, SP, **(FILL)**	DP S-1	100	
5		Sampler refusal at 6.5' bgs due to gravel in sampler tip.	6.5 ft 3.5	DP S-2	100	
			End of boring at 6.5 feet			
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BORING NUMBER B0-10N

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623475 **LONGITUDE** -70.917381
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES			**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 0.8 ft – 10.2			
			Tan, Silty Sand, Dry, SM, **(FILL)** 4.5 ft – 6.5	DP S-1	100	
5			End of boring at 4.5 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER B0-10S

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	06/21/2024 **DATE COMPLETED** 06/21/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623424 **LONGITUDE** -70.917365
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0			Brown, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** 2.0 ft / 8.0			
		Analytical sample submitted from 0'-1' & 2'-3' bgs.	Tan, Silty Sand with Gravel, Trace Glass/Asphalt Debris, Dry, SM, **(FILL)**	DP S-1	100	
5		Sampler refusal at 6.5' bgs due to brick fragments in sampler tip.	6.5 ft / 3.5	DP S-2	100	
			End of boring at 6.5 feet			
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Civil & Environmental Consultants, Inc.
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BORING NUMBER B0-15E

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623458 **LONGITUDE** -70.917319
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt, Trace Brick, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	60	
5			End of boring at 5.0 feet			
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BORING NUMBER B0-15W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623439 **LONGITUDE** -70.917426
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	80	
5			End of boring at 5.0 feet			
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BORING NUMBER B0-20E

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623461 **LONGITUDE** -70.917301
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	60	
5			End of boring at 5.0 feet			
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BORING NUMBER B0-20W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623436 **LONGITUDE** -70.917444
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-1' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	80	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

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31 Bellows Road
Raynham, MA 02767

BORING NUMBER B0-10S15E

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623434 **LONGITUDE** -70.917312
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' & 2'-3' bgs.	Dark Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	80	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

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Raynham, MA 02767

BORING NUMBER B0-10S15W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623414 **LONGITUDE** -70.917419
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' and 2'-3' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0			
			Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 5.0	DP S-1	60	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER B0-10N15E

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623485 **LONGITUDE** -70.917328
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' and 2'-3' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 6.0	DP S-1	80	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

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31 Bellows Road
Raynham, MA 02767

BORING NUMBER B0-10N15W

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623466 **LONGITUDE** -70.917434
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical samples submitted from 0'-1' & 2'-3' bgs.	Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 10.0			
			Tan to Brown, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** 5.0 ft – 6.0	DP S-1	80	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

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Rock Types

Rock Name	Characteristics	Symbol
Claystone	Clay sized particles that are consolidated, lacking fissility.	
Coal	Black and shiny, can break into cubes or conchoidally.	
Conglomerate	Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular.	
Limestone	Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils).	
Sandstone	Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse.	
Shale	Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature.	
Siltstone	Composed of silt, normally breaks as irregular chunks.	

Rock Quality Descriptions

Weathering

Completely Weathered: All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

Highly Weathered: More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

Moderately Weathered: Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

Slightly Weathered: Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

Fresh: No visible signs of rock material weathering.

RQD

Descriptor	%
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	>90

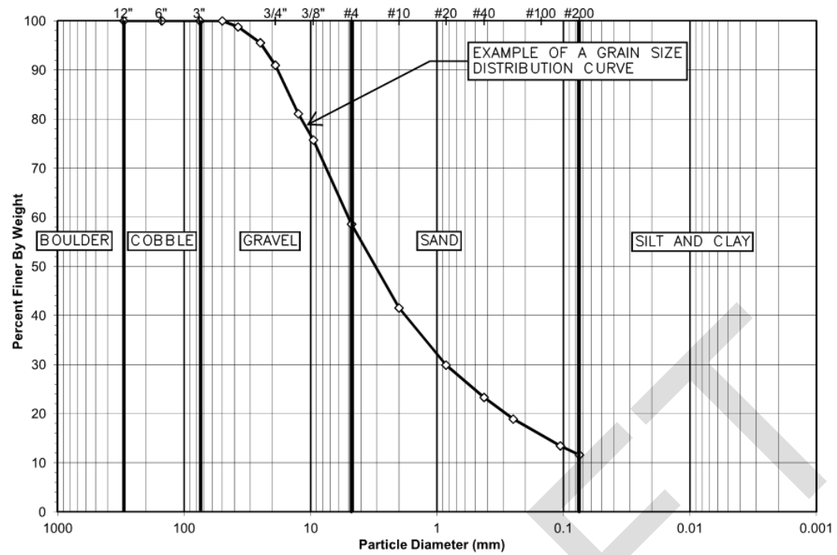
Brokenness

Descriptor	Fracture Spacing (in & ft)
Very Broken	<1 (<0.08)
Broken	1-3 (0.08-0.25)
Moderately Broken	3-6 (0.25-0.5)
Slightly Broken	>6 (>0.5)

Rock Hardness

Descriptor	Field Criterion	Relative Unconfined Compressive Strength
Very Hard	Difficult to break w/ Hammer	> 30,000 psi
Hard	Hand-held sample breaks w/ Hammer	8,000 to 30,000 psi
Medium Hard	Cannot scrape surface w/ knife	2,000 to 8,000 psi
Soft	Cutting or scraping w/ knife difficult	500 to 2,000 psi
Very Soft	Can be cut w/ knife	< 500 psi

Grain Size Distribution Curve



UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
Clean Gravels (Less than 5% fines)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
Gravels with fines (More than 12% fines)		
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
Clean Sands (Less than 5% fines)		
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
Sands with fines (More than 12% fines)		
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

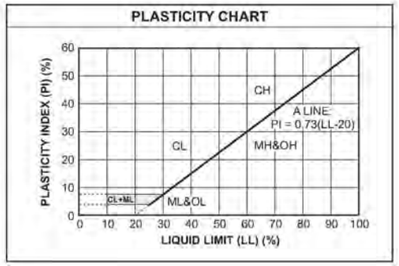
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



Glossary

Alluvial Soil or Alluvium: Soil deposited by water in a river, stream, floodplain, or delta.

Bedrock: Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

Colluvial Soil or Colluvium: Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

Fill: Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

Glacial Outwash: Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

Glacial Till: Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

N-Value: The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

Pocket Pen (PP): Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

Recovery %: Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

Refusal: The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

Residual Soil or Residuum: Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

Rock Quality Designation (RQD): The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

Shelby Tube: A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

Split Spoon Sampler: A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

Standard Penetration Test (SPT) ASTM D1586 : Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

Weathered Rock: Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

N-Value Rating

Fine-Grained Soils (Silt and Clay)

Consistency	Blows/ft	PP (tsf)
Very Soft	0-2	<0.25
Soft	3-4	0.25-0.5
Medium Stiff	5-8	0.5-1
Stiff	9-15	1-2
Very Stiff	16-32	2-4
Hard	>32	>4

Coarse-Grained Soils (Sand and Gravel)

Relative Density	Blows/ft
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

Unconsolidated Material

Term	Grain Size in mm (in)	Approximate Example Size
Clay and Silt	<.075	can't see grains to barely visible
Fine Sand	0.075-0.4	table salt to sugar
Med. Sand	0.4-2.0 (~<1/16)	openings in a window screen
Coarse Sand	2.0-4.75 (~1/16-1/8)	sidewalk salt
Gravel	4.75-75 (~1/8-3)	pea to tennis ball
Cobble	75-300 (3-12)	tennis ball to basketball
Boulder	>300 (>12)	larger than a basketball

Other Features – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

Term	%
Trace	< 5
Few	5-15
Some	15-45

Moisture Content

Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

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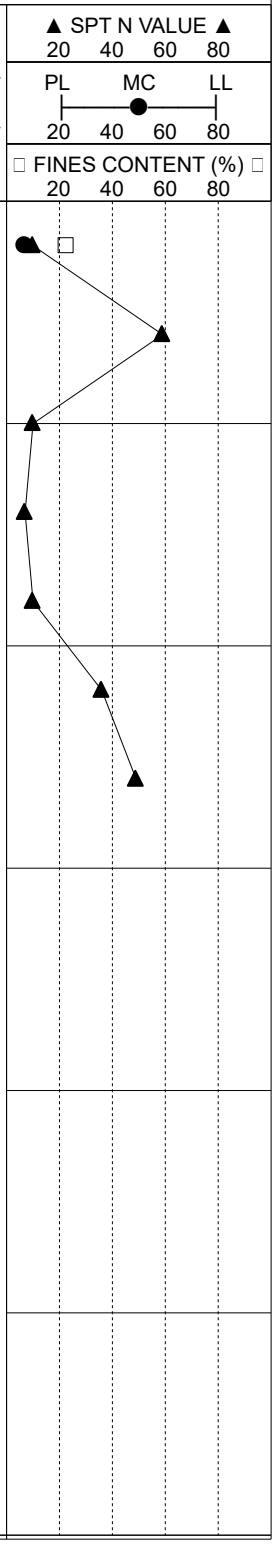
Definitions of Standard Terms and Symbols

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-2-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/13/2023 **DATE COMPLETED** 11/13/2023	**GROUND ELEVATION**	8.90 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622983 **LONGITUDE** -70.919441
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/13/2023 8.0 ft / Elev 0.9 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical sample submitted from 0'-6' bgs.	0.2 ft 3" Asphalt	8.6					
			Brown, SILTY SAND WITH GRAVEL, Trace Glass, Asphalt Debris, Dry, Medium Dense, SM, **(FILL)**		SS S-1	65	14-5-5-7 (10)		0.8
			2.5 ft	6.4					
			3.0 ft Gray, Buried Concrete	5.9	SS S-2	90	33-32-27-15 (59)		0.5
			3.2 ft Black, Buried Asphalt	5.6					
			Brown, Silty Sand with Gravel, Trace Glass, Brick, Asphalt Debris, Dry To Moist, Loose To Medium Dense, SM, **(FILL)**						
5					SS S-3	50	10-6-4-3 (10)		0.3
			7.0 ft	1.9					
			Dark Brown, Silty Sand, Trace Roots, Moist, Loose, SM, **(FILL)**		SS S-4	60	3-3-4-6 (7)		0.5
			8.0 ft	0.9					
			Dark Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)**		SS S-5	55	1-3-7-9 (10)		0.3
10			10.0 ft	-1.1					
			Light Brown, Silty Gravel with Sand, Wet, Dense, GM, **(TILL)**		SS S-6	60	9-17-19-20 (36)		0.3
			12.0 ft	-3.1					
			Brown, Silty Sand with Gravel, Wet, Dense, SM, **(TILL)**		SS S-7	--	18-21-28-50 (49)		0.4
			14.0 ft	-5.1					
			End of boring at 14.0 feet						
15									
20				-11					
25									
30				-21					



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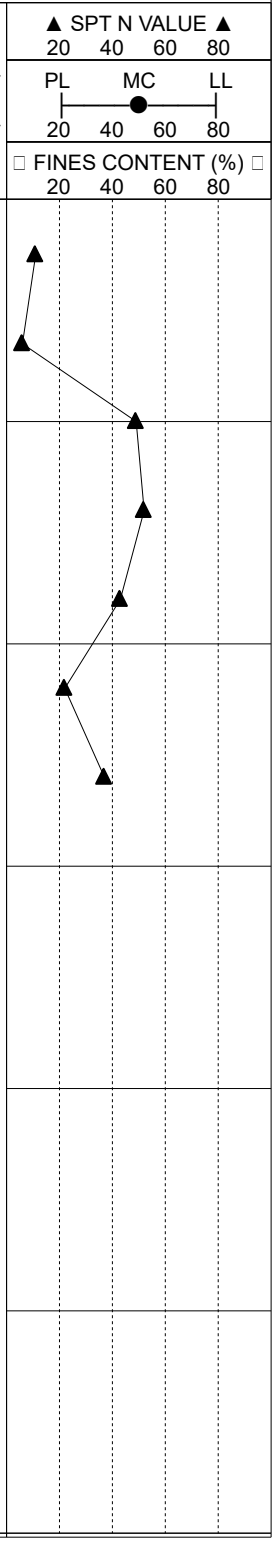
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-3-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/10/2023 **DATE COMPLETED** 11/10/2023	**GROUND ELEVATION**	8.30 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622826 **LONGITUDE** -70.919178
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/10/2023 6.0 ft / Elev 2.3 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical sample submitted from 0'-4' bgs.	0.2 ft 3" Asphalt; Brown, Silty Sand with Gravel, Trace Brick, Dry to Moist, Loose to Dense, SM, **(FILL)**	8.0	SS S-1	55	9-7-4-1 (11)		0.2
				SS S-2	60	2-2-4-13 (6)		0.1
5		6.0 ft ▽ Tan to Brown, Silty Gravel with Sand, Wet, Very Dense, GM, **(TILL)**	2.3	SS S-3	100	16-28-21-23 (49)		0.3
		8.0 ft Brown, Silty Sand with Gravel, Wet, Dense, SM, **(TILL)**	0.3	SS S-4	60	22-24-28-19 (52)		0.3
			-1	SS S-5	75	19-22-21-37 (43)		0.3
10	Augers grinding from 10-12' bgs.	10.0 ft Brown, Silty Sand with Gravel, Wet, Medium Dense to Dense, SM, **(TILL)**	-1.7	SS S-6	50	3-5-17-17 (22)		0.1
				SS S-7	75	22-18-19-34 (37)		0.2
		14.0 ft End of boring at 14.0 feet	-5.7					
15								
			-11					
20								
25								
			-21					
30								



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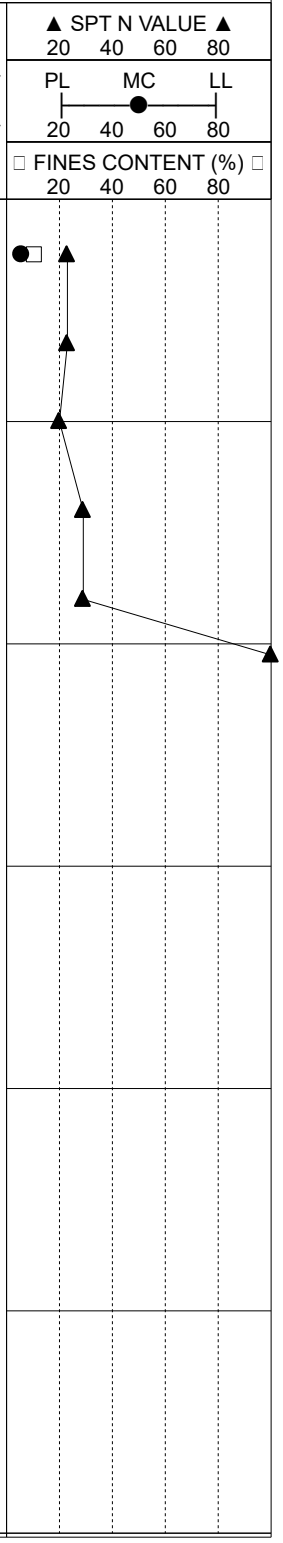
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-4-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/10/2023 **DATE COMPLETED** 11/10/2023	**GROUND ELEVATION**	6.70 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622690 **LONGITUDE** -70.919692
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/10/2023 6.0 ft / Elev 0.7 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical sample submitted from 0'-4' bgs.	Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace to Few Brick/ Asphalt/Misc. Debris, Dry, Medium Dense, SM, **(FILL)**		SS S-1	58	19-11-12-14 (23)		0.1
2.0 ft		Gray to Brown, Silty Sand with Gravel, Trace to Few Bricks/Asphalt/Misc. Debris, Dry to Moist, Medium Dense, SM, **(FILL)**	4.7	SS S-2	100	8-11-12-13 (23)		0.2
5				SS S-3	100	9-12-8-13 (20)		0.3
6.0 ft		Brown to Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)**	0.7	SS S-4	100	8-12-17-19 (29)		0.3
				SS S-5	42	5-11-18-30 (29)		0.1
10	Split spoon refusal at 10.5' bgs		-3	SS S-6	100	15-50/0'		0.1
10.5 ft		End of boring at 10.5 feet	-3.8					
15								
20			-13					
25								
30			-23					



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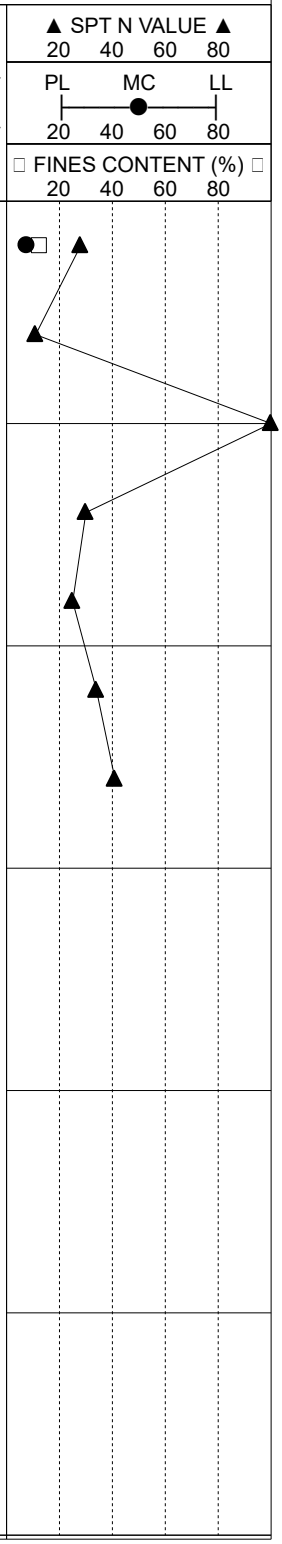
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-5-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/10/2023 **DATE COMPLETED** 11/10/2023	**GROUND ELEVATION**	8.20 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622868 **LONGITUDE** -70.919452
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/10/2023 6.0 ft / Elev 2.2 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	Analytical sample submitted from 0'-4' bgs.	Brown, SILTY SAND WITH GRAVEL, Trace Debris, Dry, Medium Dense, SM, **(FILL)**		SS S-1	75	21-14-14-9 (28)		0.5
2.0 ft		Dark Brown, Silty Sand with Gravel, Trace Debris, Dry, Medium Dense, SM, **(FILL)**	6.2	SS S-2	55	6-6-5-10 (11)		0.2
4.0 ft	Split spoon refusal on possible slab or boulder at 4' bgs. Augered through obstruction to 6' bgs.	No Recovery	4.2	SS S-3	--	50		
5								
6.0 ft ▽		Gray to Brown, Silty Sand with Gravel, Wet, Medium Dense to Dense, SM, **(TILL)**	2.2	SS S-4	75	17-15-15-12 (30)		0.2
			-1	SS S-5	100	6-10-15-12 (25)		0.2
10				SS S-6	50	8-17-17-17 (34)		0.2
13.5 ft	Split spoon refusal (spoon bouncing) at 13.5' bgs.	End of boring at 13.5 feet	-5.3	SS S-7	55	22-25-16 (41)		0.1
15								
			-11					
20								
25								
			-21					
30								



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Raynham, MA 02767

BORING NUMBER CEC-6-3

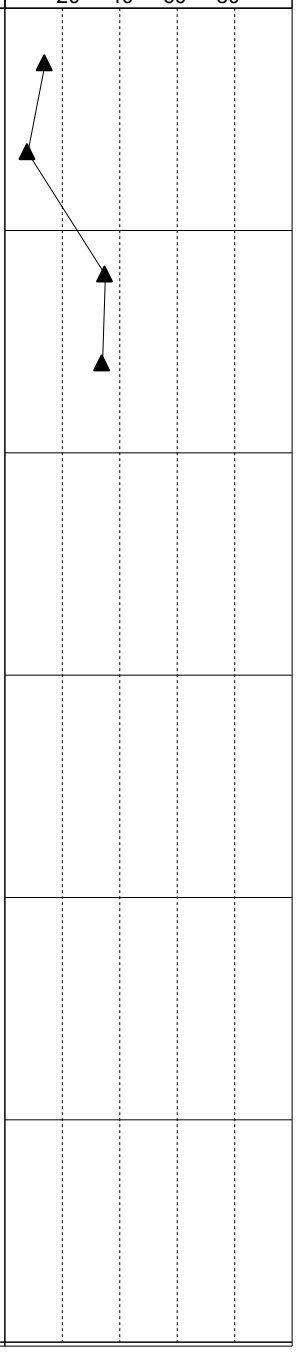
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/19/2024 **DATE COMPLETED** 09/19/2024	**GROUND ELEVATION**	8.50 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Soil Exploration	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	Wash Rotary	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 8.5 ft / Elev 0.0 ft
CEC REP	D Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** 8.5 ft / Elev 0.0 ft
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)
0		Analytical sample submitted from 0-4' & 5-7' bgs.	0.2 ft 3" Asphalt 8.2 Brown, Silty Sand with Gravel, Trace Brick, Cinders, Dry, Medium Dense, SM, **(FILL)**		SS S-1	70	8-8-6-5 (14)
					SS S-2	50	3-3-5-8 (8)
5			5.5 ft 3.0 Tan and Gray, Silty Sand with Gravel, Moist to Wet, Medium Dense, SM, **(TILL)**		SS S-3	83	17-18-17-17 (35)
			9.0 ft -0.5		SS S-4	88	16-14-20-19 (34)
10			End of boring at 9.0 feet	-1			
15							
20				-11			
25							
30				-21			

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



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BORING NUMBER CEC-7-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/19/2024 **DATE COMPLETED** 09/19/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Soil X Corp	**LATITUDE**	41.622973 **LONGITUDE** -70.919285
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-4' bgs.	0.2 ft Asphalt 8.8 Brown, Silty Sand with Gravel, Trace Brick, Cinder, Shells, Dry, SM, **(FILL)**	DP S-1	100	
			4.0 ft 5.0 Light Brown, Silty Sand with Gravel, Moist, SM, **(FILL)**			
5			6.5 ft 2.5 Tan to Gray, Silty Sand with Gravel, Moist, SM, **(FILL)**	DP S-2	100	
			8.5 ft 0.5 End of boring at 8.5 feet			
10						
15						
20						
25						
30						

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BORING NUMBER CEC-8-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/23/2024 **DATE COMPLETED** 09/23/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cement
SAMPLING CONTRACTOR	Soil Exploration	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 09/23/2024 7.5 ft / Elev 3.5 ft
CEC REP	Tony Sousa **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (350 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 2-4', 7-8', & 12-14.5'.	0.5 ft 6" Concrete Slab 10.5			
			Light Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**			0.1
			2.0 ft 9.0			
			Dark Brown to Black, Silty Sand with Gravel, Trace Cinders, Concrete, Dry to Wet, SM, **(FILL)**	DP S-1	50	0.0
						0.0
5						0.0
		Strong gasoline odor from 7 to 14.5' bgs.		DP S-2	68	0.9
						134.6
						127.8
10		Increased drilling difficulty at 10' bgs.	10.0 ft 1.0			211.8
			Gray, Silty Sand, Wet, SM, **(OUTWASH)**	DP S-3	95	22.6
			11.0 ft 0.0			
			Gray, Silty Sand with Gravel, Wet, SM, **(TILL)**			46.1
			12.0 ft -1.0			
			Gray, Poorly-Graded Sand with Silt and Gravel, Wet, SP-SM, **(TILL)**			100.7
		Probe refusal at 14.5' bgs.		DP S-4	100	97.9
			14.5 ft -3.5			
15			End of boring at 14.5 feet			
20						
25						
30						

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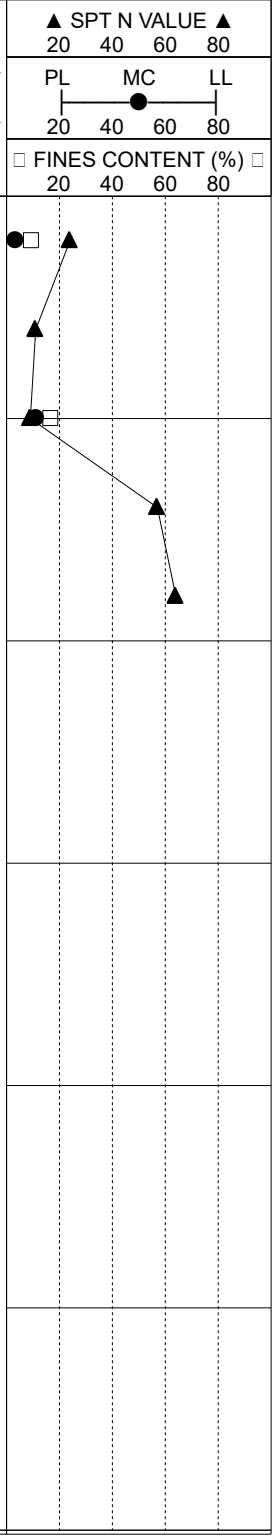
Raynham, MA 02767

BORING NUMBER CEC-1-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/13/2023 **DATE COMPLETED** 11/13/2023	**GROUND ELEVATION**	8.10 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622418 **LONGITUDE** -70.919612
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/13/2023 8.0 ft / Elev 0.1 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical sample submitted from 0'-4' bgs.	0.2 ft 3" Asphalt	7.8					
			Brown, POORLY GRADED GRAVEL WITH SILT AND SAND, Dry, Medium Dense, GP-GM, **(FILL)**		SS S-1	95	20-12-12-10 (24)		0.2
			2.0 ft Brown to Black, Silty Sand with Gravel, Trace Brick, Dry, Medium Dense, SM, **(FILL)**	6.1	SS S-2	90	10-7-4-5 (11)		0.4
			4.0 ft Dark Brown, SILTY SAND WITH GRAVEL, Trace Brick, Dry, Loose, SM, **(FILL)**	4.1	SS S-3	75	4-3-6-16 (9)		0.3
5			6.0 ft Gray, Silty Sand with Gravel, Moist, Very Dense, SM, **(TILL)**	2.1	SS S-4	75	26-30-27-37 (57)		0.2
			9.0 ft Light Brown, Silty Gravel with Sand, Wet, Very Dense, GM, **(TILL)**	-0.9	SS S-5	55	16-28-36-30 (64)		0.1
10			10.0 ft End of boring at 10.0 feet	-1.9					
15				-11					
20									
25				-21					
30									



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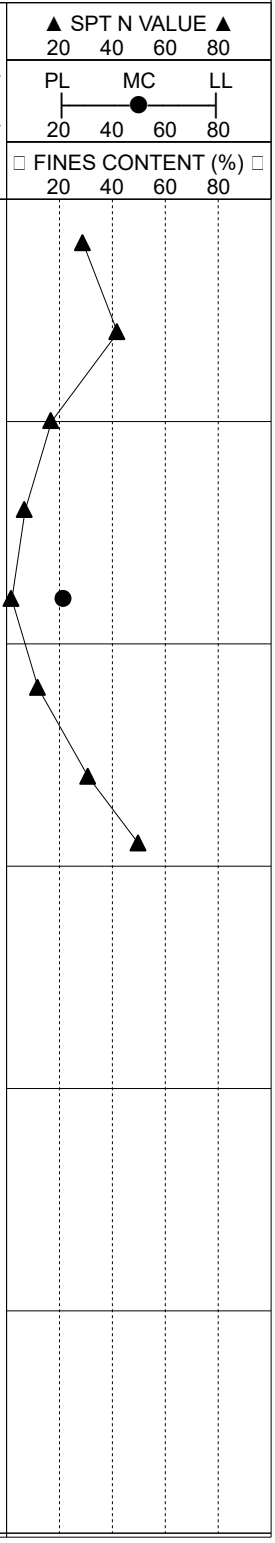
BORING NUMBER CEC-2-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/13/2023 **DATE COMPLETED** 11/13/2023	**GROUND ELEVATION**	8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622632 **LONGITUDE** -70.919198
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/13/2023 8.0 ft / Elev 0.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical sample submitted from 0'-4' bgs.	Brown, Silty Sand with Gravel, Trace Asphalt/Brick/Concrete Debris, Dry, Medium Dense to Dense, SM, **(FILL)**	8	SS S-1	55	16-15-14-12 (29)		1.3
					SS S-2	70	20-26-16-9 (42)		0.4
5					SS S-3	55	7-10-7-6 (17)		0.4
			7.0 ft — 1.0		SS S-4	65	8-4-3-3 (7)		0.8
			8.0 ft ▽ Dark Brown, Silty Sand with Gravel, Trace Roots, Moist, Loose, SM, **(FILL)** — 0.0						
			Dark Brown, Slightly Organic Silty Sand with Gravel, Trace Roots, Wet, Very Loose, SM, Organic Content 1.7%, **(OUTWASH)**		SS S-5	50	1-1-1-1 (2)		0.5
10			10.0 ft — -2.0	-2					
			Dark Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)**		SS S-6	55	4-5-7-5 (12)		0.6
			12.0 ft — -4.0						
			Light Brown, Silty Gravel with Sand, Wet, Dense to Very Dense, GM, **(TILL)**		SS S-7	65	10-18-13-27 (31)		1.2
		Split spoon refusal at 15' bgs	14.0 ft — -6.0						
15			15.0 ft — -7.0		SS S-8	100	18-50		1.2
			End of boring at 15.0 feet						
20				-12					
25									
30				-22					



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31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-5-4

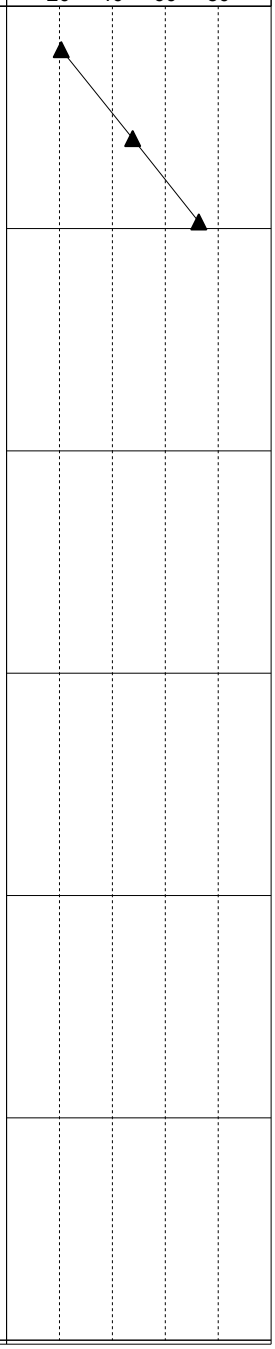
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/13/2023 **DATE COMPLETED** 11/13/2023	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.621744 **LONGITUDE** -70.919514
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** Not Encountered
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Analytical sample submitted from 0'-4' bgs.	Dark Brown, Silty Sand with Gravel, Trace Brick, Trace Roots, Dry, Medium Dense to Dense, SM, **(FILL)**	9	SS S-1	75	5-10-11-8 (21)		0.5
					SS S-2	85	7-16-32-35 (48)		0.4
			4.0 ft — Light Brown, Silty Sand with Gravel, Dry, Very Dense, SM, **(TILL)** — 5.0						
5		Split spoon refusal at 5.75' bgs	5.8 ft — End of boring at 5.8 feet	3.2	SS S-3	91	22-33-40-50 /0.3' (73)		0.2
10				-1					
15									
20				-11					
25									
30				-21					

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



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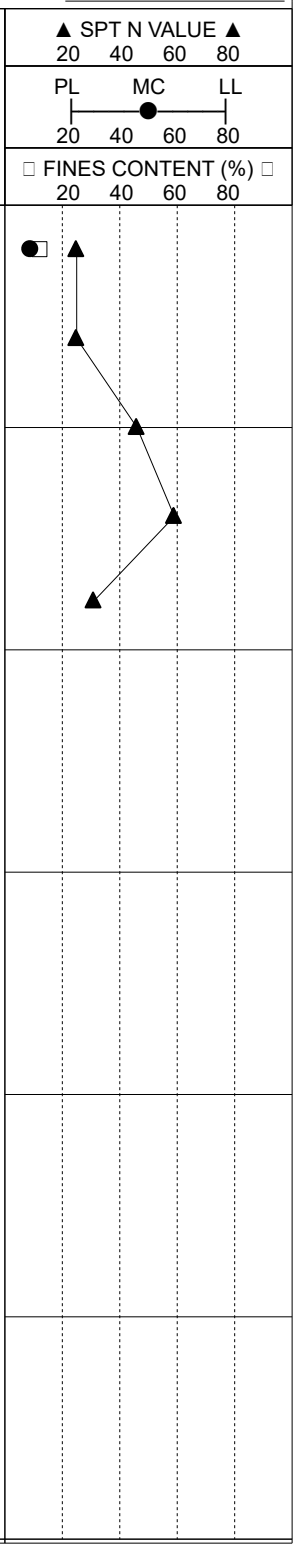
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-6-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/13/2023 **DATE COMPLETED** 11/13/2023	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.622043 **LONGITUDE** -70.919576
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** Not Encountered
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	PID (PPM)
0		Analytical sample submitted from depths 0'-4' bgs.	0.2 ft 3" Asphalt (8.8) Brown, SILTY SAND WITH GRAVEL, Trace Brick, Glass, Dry, Medium Dense, SM, **(FILL)**	9	SS S-1	55	18-14-11-10 (25)	0.1
			3.0 ft (6.0) Dark Brown, Silty Sand, Dry, Medium Dense To Very Dense, SM, **(FILL)**		SS S-2	80	13-12-13-25 (25)	0.4
5					SS S-3	75	5-19-27-25 (46)	0.2
					SS S-4	80	28-24-35-25 (59)	0.6
			8.0 ft (1.0) Light Brown, Silty Sand with Gravel, Moist, Dense, SM, **(TILL)**					
10		Split spoon refusal at 9.8' bgs.	9.8 ft (-0.8) End of boring at 9.8 feet	-1	SS S-5	83	9-14-17-50/0.3' (31)	0.5
15								
20				-11				
25								
30				-21				



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Raynham, MA 02767

BORING NUMBER CEC-7-4

CLIENT Foth Infrastructure & Environment, LLC
PROJECT NAME MassCEC Expansion
PROJECT NUMBER 332-344
PROJECT LOCATION New Bedford, MA
DATE STARTED 09/19/2024 **DATE COMPLETED** 09/19/2024
GROUND ELEVATION 9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR Soil Exploration
LATITUDE Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD Direct Push
WATER LEVELS AT END OF SOIL SAMPLING N/A; AT END OF CORING N/A; 24 HRS AFTER DRILLING N/A
CEC REP D Barboza **CHECKED BY** Tony Sousa, P.E.
NOTES Site 2 (362 S. Front St. New Bedford, MA)

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-4' & 5-10' bgs.	Dark Brown to Black, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	40	
5.0 ft / 4.0			Tan, Silty Sand with Gravel, Dry, SM, **(TILL)**	DP S-2	60	
10.0 ft / -1.0			End of boring at 10.0 feet			

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Raynham, MA 02767

BORING NUMBER CEC-8-4

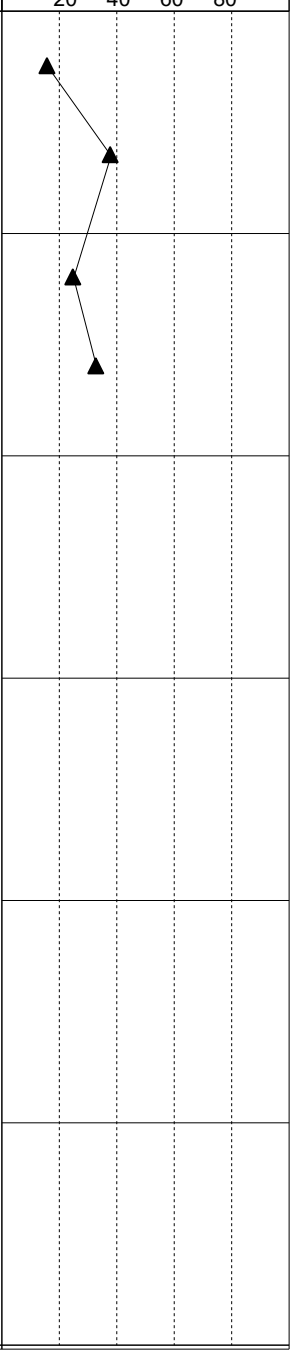
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/19/2024 **DATE COMPLETED** 09/19/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Soil Exploration	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	Wash Rotary	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 7.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)
0		Analytical sample submitted from 0'-4' bgs.	0.2 ft 3" Asphalt	9.8			
			Dark Gray, Silty Sand with Gravel, Trace Brick, Cinders, Dry, Medium Dense to Dense, SM, **(FILL)**	10	SS S-1	62	8-8-8-14 (16)
					SS S-2	75	24-24-14-9 (38)
5			5.0 ft Tan, Silty Sand with Gravel, Dry, Medium Dense, SM, **(OUTWASH)**	5.0	SS S-3	100	16-14-11-8 (25)
			7.0 ft Tan, Silty Sand, Wet, Dense, SM, **(OUTWASH)**	3.0			
			8.0 ft Gray to Tan, Silty Sand with Gravel, Wet, Dense, SM, **(TILL)**	2.0	SS S-4	100	8-11-22-26 (33)
			9.0 ft End of boring at 9.0 feet	1.0			
10				0			
15							
20				-10			
25							
30				-20			

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



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Raynham, MA 02767

BORING NUMBER CEC-9-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/19/2024 **DATE COMPLETED** 09/19/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Soil Exploration	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0			Brown, Silty Sand with Gravel, Dry, SM, **(TOPSOIL)**			
		Analytical sample submitted from 2'-6' & 6'-8' bgs.	2.0 ft — 8.0 Dark Brown to Black, Silty Sand with Gravel, Dry, SM, **(FILL)**	DP S-1	80	
5			6.0 ft — 4.0 Tan to Brown, Silty Sand with Gravel, Dry, SM, **(TILL)**	DP S-2	100	
		Sampler refusal at 8' bgs.	8.0 ft — 2.0 End of boring at 8.0 feet			
10						
15						
20						
25						
30						

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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER CEC-10-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/19/2024 **DATE COMPLETED** 09/19/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Soil Exploration	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Analytical sample submitted from 0'-5' bgs.	Dark Gray, Silty Sand with Gravel/Debris, Dry, SM, **(FILL)**			
			3.0 ft — 7.0	DP S-1	85	
			Tan, Silty Sand, Dry, SM, **(FILL)**			
5			5.0 ft — 5.0			
			Gray to Tan, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)**			
			7.0 ft — 3.0			
			Tan, Silty Sand with Gravel, Dry, SM, **(TILL)**	DP S-2	75	
10			10.0 ft — 0.0			
			End of boring at 10.0 feet			
15						
20						
25						
30						

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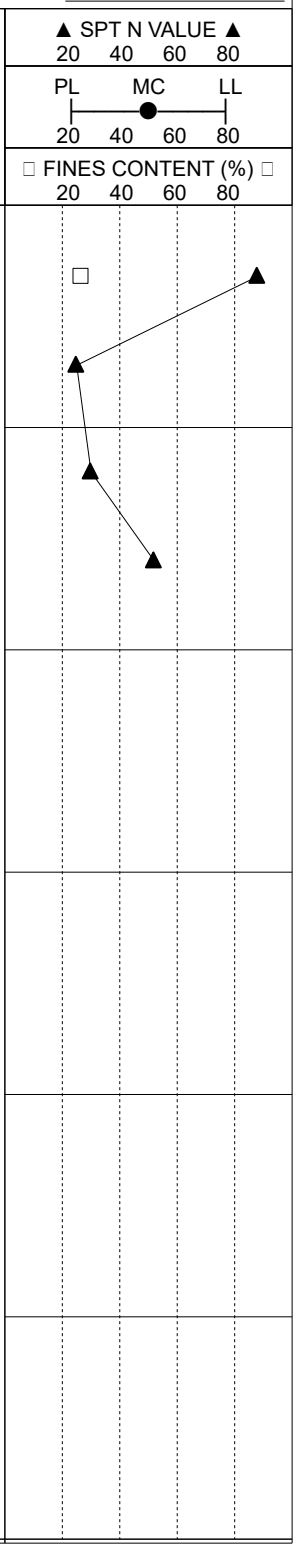
Raynham, MA 02767

BORING NUMBER CEC-11-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/18/2024 **DATE COMPLETED** 09/18/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cement
SAMPLING CONTRACTOR	Soil X Corp.	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	4-1/4-in Hollow Stem Auger	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)
0	0.5 ft	Gray, 5-1/4" Concrete Slab	9.5			
		Brown, SILTY SAND, Dry, Very Dense to Medium Dense, SM, **(FILL)**		SS S-1	95	30-46-42-17 (88)
				SS S-2	60	14-14-11-10 (25)
5	5.0 ft	Tan, Poorly-Graded Sand with Silt, Dry, Dense to Very Dense, SP-SM, **(OUTWASH)**	5.0	SS S-3	75	13-15-15-19 (30)
	8.0 ft	Brownish Tan, Silty Sand with Gravel, Moist, Very Dense, SM, **(TILL)**	2.0	SS S-4	75	17-25-27-25 (52)
	9.0 ft	End of boring at 9.0 feet	1.0			
10			0			
15						
20			-10			
25						
30			-20			



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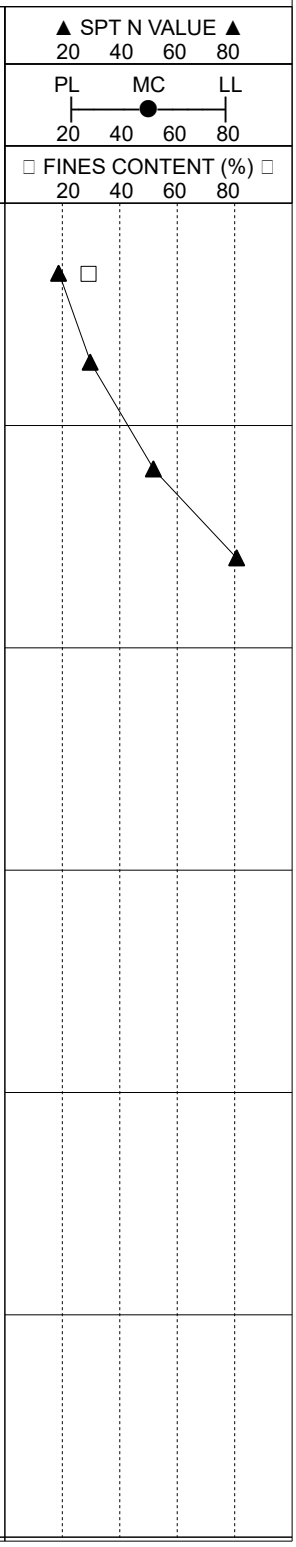
BORING NUMBER CEC-12-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/18/2024 **DATE COMPLETED** 09/18/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cement
SAMPLING CONTRACTOR	Soil X Corp.	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	4-1/4-in Hollow Stem Auger	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)
0	Gray, 6-5/8" Concrete Slab (0.6 ft)	10			
	Tan to Brown, SILTY SAND WITH GRAVEL, Dry, Medium Dense, SM, **(FILL)** (2.6 ft)	9.4	SS S-1	66	8-10-9-5 (19)
	Brown to Black, Silty Sand with Gravel, Trace Cinders, Dry, Dense, SM, **(FILL)** (5.0 ft)	7.4	SS S-2	80	9-14-16-7 (30)
5	Orange, Silty Sand, Dry, Very Dense, SM, **(OUTWASH)** (6.0 ft)	5.0	SS S-3	83	20-22-30-28 (52)
	Tan to Gray, Silty Sand with Gravel, Dry, Very Dense, SM, **(TILL)** (9.0 ft)	4.0	SS S-4	60	50-43-38-22 (81)
	End of boring at 9.0 feet	1.0			
10		0			
15					
20		-10			
25					
30		-20			



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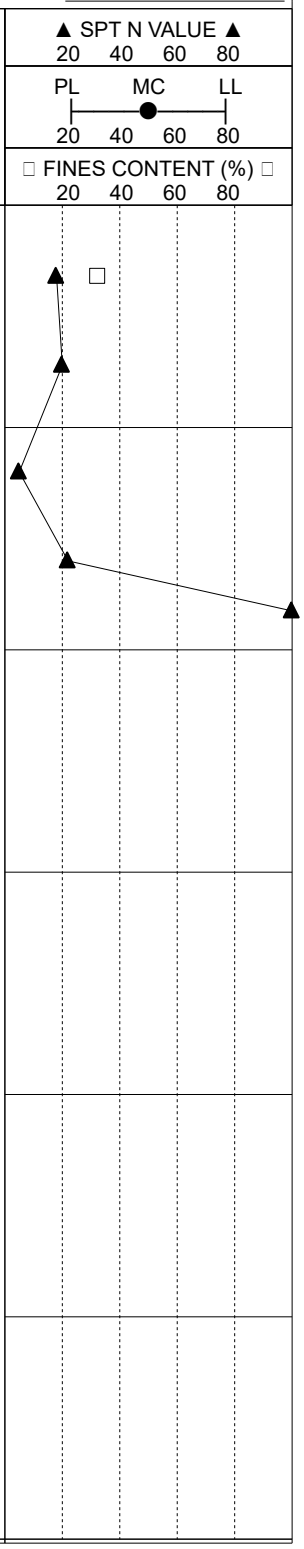
BORING NUMBER CEC-13-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/18/2024 **DATE COMPLETED** 09/18/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cement
SAMPLING CONTRACTOR	Soil X Corp.	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	4-1/4-in Hollow Stem Auger	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0			0.6 ft Gray, 5-3/4" Concrete Slab	10					
			Tan to Brown, SILTY SAND, Dry, Medium Dense, SM, **(FILL)**	9.4	SS S-1	80	11-9-9-6 (18)		
			2.6 ft Brown to Black, Silty Sand with Gravel, Trace Ash, Cinders, Dry, Medium Dense, SM, **(FILL)**	7.4	SS S-2	60	7-7-13-10 (20)		
5			5.0 ft Black, Silty Sand with Gravel, Dry, Loose, SM, **(FILL)**	5.0	SS S-3	50	8-3-2-2 (5)		
			7.5 ft Tan, Silty Sand with Gravel, Dry, Medium Dense to Very Dense, SM, **(TILL)**	2.5	SS S-4	60	1-10-12-16 (22)		
		Split Spoon Refusal at 9.2 ft bgs.	9.2 ft End of boring at 9.2 feet	0.8	SS S-5	80	50/0.3'		
10				0					
15									
20				-10					
25									
30				-20					



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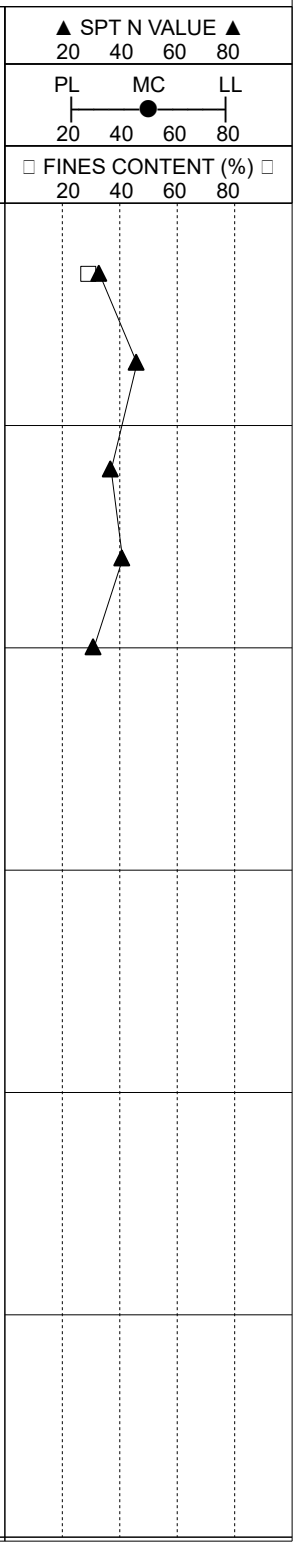
BORING NUMBER CEC-14-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/18/2024 **DATE COMPLETED** 09/18/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cement
SAMPLING CONTRACTOR	Soil X Corp.	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	4-1/4-in Hollow Stem Auger	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 9.0 ft / Elev 1.0 ft
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)
0		Analytical sample submitted from 0.6'-4.6' bgs.	0.4 ft Gray, 4-1/2" Concrete Slab	9.6			
			Dark Brown, SILTY SAND, Dry, Dense, SM, **(FILL)**		SS S-1	75	25-15-18-21 (33)
			2.6 ft	7.4			
			Black, Silty Sand with Gravel, Trace Ash, Dry, Dense, SM, **(FILL)**				
			3.6 ft	6.4	SS S-2	60	26-31-15-12 (46)
			Gray, Poorly Graded Sand with Silt and Gravel, Trace Brick, Dry, Dense, SP-SM, **(FILL)**				
5			5.0 ft	5.0			
			Orangish Tan, Silty Sand, Dry, Dense, SM, **(OUTWASH)**		SS S-3	75	17-16-21-18 (37)
			7.0 ft	3.0			
			Tan, Silty Sand with Gravel, Dry to Wet, Dense, SM, **(TILL)**		SS S-4	60	39-22-19-14 (41)
10				0	SS S-5	83	16-14-17-17 (31)
			11.0 ft	-1.0			
			End of boring at 11.0 feet				
15							
20				-10			
25							
30				-20			



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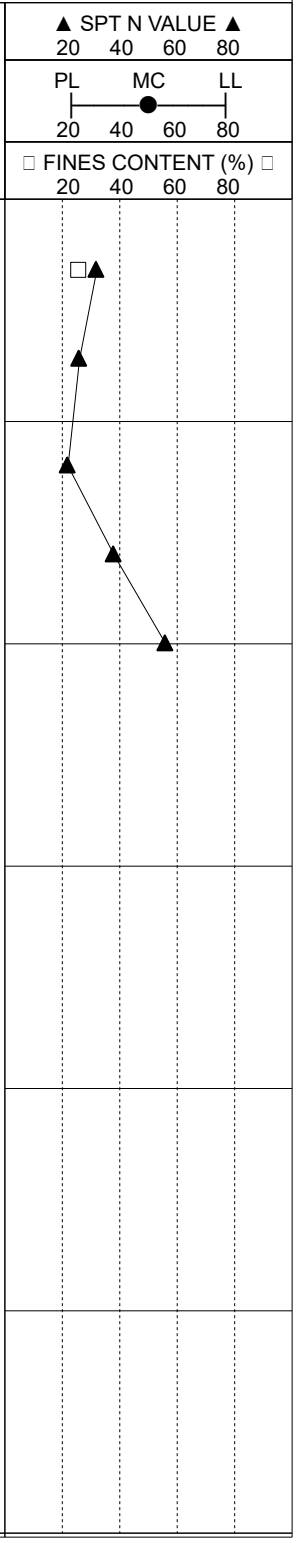
BORING NUMBER CEC-15-4

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	09/18/2024 **DATE COMPLETED** 09/18/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cement
SAMPLING CONTRACTOR	Soil X Corp.	**LATITUDE**	Not obtained - radio tower interference **LONGITUDE**
SAMPLING METHOD	4-1/4-in Hollow Stem Auger	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 10.0 ft / Elev 0.0 ft
CEC REP	Dave Barboza **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 2 (362 S. Front St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)
0		Analytical sample submitted from 0.6'-4.6' bgs.	0.6 ft Gray, 6-7/8" Concrete Slab	10 / 9.4			
			Dark Brown, SILTY SAND WITH GRAVEL, Dry, Dense, SM, **(FILL)**		SS S-1	60	16-17-15-10 (32)
			2.6 ft Dark Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)**	7.4	SS S-2	75	13-15-11-10 (26)
			4.6 ft Dark Brown, Silty Sand with Gravel, Trace Brick, Dry, Medium Dense, SM, **(FILL)**	5.4			
5			6.0 ft Orange, Silty Sand, Dry, Medium Dense, SM, **(OUTWASH)**	4.0	SS S-3	62	14-13-9-8 (22)
			7.0 ft Tan, Poorly-Graded Sand with Silt, Dry, Dense, SP-SM, **(OUTWASH)**	3.0	SS S-4	62	9-14-24-29 (38)
			9.0 ft Tan, Silty Sand, Moist, Very Dense, SM, **(OUTWASH)**	1.0			
10			10.0 ft Black to Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)**	0 / 0.0	SS S-5	100	29-28-28-34 (56)
			11.0 ft End of boring at 11.0 feet	-1.0			
15							
20				-10			
25							
30				-20			



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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER K-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623654 **LONGITUDE** -70.916591
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 10.6 Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			4.8 ft 5.0 ft Dark Gray, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 6.2 6.0 End of boring at 5.0 feet			0.0
10						
15						
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25						
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER K-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623788 **LONGITUDE** -70.916632
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 10.6 Brown to Dark Gray, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** 5.0 ft 6.0	DP S-1	90	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER K-4.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623888 **LONGITUDE** -70.916663
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 10.6 Brown to Dark Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft 6.0 End of boring at 5.0 feet	DP S-1	100	
5						
10						
15						
20						
25						
30						

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Raynham, MA 02767

BORING NUMBER L/M-4.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623911 **LONGITUDE** -70.916530
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 10.6 Tan to Brown to Gray, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** 5.0 ft 6.0 End of boring at 5.0 feet	DP S-1	80	
5						
10						
15						
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25						
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Civil & Environmental Consultants, Inc.
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BORING NUMBER L/M-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623677 **LONGITUDE** -70.916458
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 10.6 Tan to Brown, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** 5.0 ft 6.0	DP S-1	92	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER O-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623665 **LONGITUDE** -70.916220
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.6 Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 6.0	DP S-1	80	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER Q-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623696 **LONGITUDE** -70.916041
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.5 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.5			
			Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)**	DP S-1	100	
5			5.0 ft 6.0			
			End of boring at 5.0 feet			
10						
15						
20						
25						
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER Q-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624147 **LONGITUDE** -70.916180
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6			
			Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)**	DP S-1	80	
			3.5 ft 6.5 Gray to White, Poorly-Graded Gravel, GP, **(FILL)**			
5			4.8 ft 5.2 Dark Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)**	DP S-2	100	
10			10.0 ft 0.0 End of boring at 10.0 feet			
15						
20						
25						
30						

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Raynham, MA 02767

BORING NUMBER S-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623727 **LONGITUDE** -70.915863
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.6 Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 6.0 End of boring at 5.0 feet	DP S-1	100	
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DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER S-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624178 **LONGITUDE** -70.916002
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	90	
5			End of boring at 5.0 feet			
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Raynham, MA 02767

BORING NUMBER U-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623758 **LONGITUDE** -70.915685
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.5 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.5 Brown, Poorly-Graded Sand with Silt, Trace Glass, Dry, SP-SM, **(FILL)** 5.0 ft 6.0	DP S-1	100	
5			End of boring at 5.0 feet			
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DRAFT

Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER U-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL**
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624209 **LONGITUDE** -70.915824
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	90	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER W-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	11.00 ft **BACKFILL**
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623789 **LONGITUDE** -70.915507
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.5 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.5			
			Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)**	DP S-1	80	
			5.0 ft 6.0			
5			End of boring at 5.0 feet			
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DRAFT

Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER W-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/02/2024 **DATE COMPLETED** 07/02/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624240 **LONGITUDE** -70.915645
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	100	
5			End of boring at 5.0 feet			
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Raynham, MA 02767

BORING NUMBER Y-0.5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623914 **LONGITUDE** -70.915299
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	94	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER Y-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624003 **LONGITUDE** -70.915385
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	92	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER Y-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL**
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624137 **LONGITUDE** -70.915426
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	96	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER Y-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624271 **LONGITUDE** -70.915467
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs	0.4 ft Black, Asphalt 8.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 5.0 ft 4.0	DP S-1	80	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER A'-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623900 **LONGITUDE** -70.915166
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Gray, Poorly-Graded Gravel, GP, **(FILL)** 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	96	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER A'-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624034 **LONGITUDE** -70.915207
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	90	
5			End of boring at 5.0 feet			
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Raynham, MA 02767

BORING NUMBER A'-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624168 **LONGITUDE** -70.915248
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	94	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER A'-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624301 **LONGITUDE** -70.915289
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	98	
5			End of boring at 5.0 feet			
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DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER C'-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623931 **LONGITUDE** -70.914988
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	98	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
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Raynham, MA 02767

BORING NUMBER C'-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624065 **LONGITUDE** -70.915029
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	96	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER C'-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624199 **LONGITUDE** -70.915070
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 9.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 5.0	DP S-1	96	
5			End of boring at 5.0 feet			
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER C'-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624332 **LONGITUDE** -70.915111
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 8.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 4.0 End of boring at 5.0 feet	DP S-1	96	
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Civil & Environmental Consultants, Inc.
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BORING NUMBER E'-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623952 **LONGITUDE** -70.914862
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 8.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 4.0 End of boring at 5.0 feet	DP S-1	98	
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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER E'-3

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624096 **LONGITUDE** -70.914850
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 8.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 4.0	DP S-1	96	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER E'-5

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624236 **LONGITUDE** -70.914847
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 8.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 4.0	DP S-1	100	
5			End of boring at 5.0 feet			
10						
15						
20						
25						
30						

DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER E'-7

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	07/01/2024 **DATE COMPLETED** 07/01/2024	**GROUND ELEVATION**	9.00 ft **BACKFILL** with Cuttings
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624363 **LONGITUDE** -70.914933
SAMPLING METHOD	Direct Push	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	Cam Indeck **CHECKED BY** Tony Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Site 3 (4 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	PID (PPM)
0		Composite analytical sample submitted from 0'-5' bgs.	0.4 ft Black, Asphalt 8.6 Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft 4.0 End of boring at 5.0 feet	DP S-1	94	
5						
10						
15						
20						
25						
30						

DRAFT

ATTACHMENT 7: STORMWATER REPORT
(CIVIL & ENVIRONMENTAL CONSULTANTS, INC., APRIL 2025)

STORMWATER REPORT

54 WRIGHT STREET,
18 WRIGHT STREET, & 4 WRIGHT STREET

NEW BEDFORD MARINE COMMERCE TERMINAL
MASSACHUSETTS CLEAN ENERGY CENTER
NEW BEDFORD, MASSACHUSETTS

Prepared For:

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
15 CREEK ROAD
MARION, MA 02738

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
31 BELLOWS ROAD
RAYNHAM, MASSACHUSETTS, 02767

CEC Project 332-344

January 2025

Revised April 2025

TABLE OF CONTENTS

1.0 PROJECT NARRATIVE 1
1.1 Introduction 1
1.2 Existing Conditions 2
1.2.1 Topography 2
1.2.2 Geotechnical conditions and groundwater 3
1.2.3 Flood Zone 4
1.3 Proposed Project 4

2.0 STORMWATER MANAGEMENT SYSTEMS 6
2.1 Description of runoff controls 6
2.1.1 Wright Street 6
2.2 Construction Sequence Plan 7
2.2.1 Construction Sequence Plan 8

3.0 STORMWATER ANALYSIS 9
3.1 Method Of Analysis 9
3.2 Drainage Areas 9
3.3 Results of Analysis 12
3.3.1 Hydrology 13

4.0 STORMWATER CONTROL SYSTEM DESIGN CRITERIA 14
4.1 MassDEP Stormwater Management Policy 14
4.1.1 Stormwater Management Standards 14

TABLES

Table 3-1: Pre-Development Conditions 10
Table 3-2: Post-Development Conditions 11
Table 3-3: Project Stormwater Runoff Rates 12

FIGURES

Figure 1 – Site Location Map
Figure 2 – Aerial Site Plan
Figure 3 – FEMA Firmette
Figure 4 –HYD-EX Drainage Area Map - Existing Conditions
Figure 5 –HYD-PR Drainage Area Map - Proposed Conditions

APPENDICES

Appendix A – DEP Stormwater Checklist
Appendix B – Geotechnical Information
- NRCS Custom Soil Resource Report
- Geotechnical Borings
- Test Pit Logs
- Test Pit Soil Textural Analysis

Appendix C – Supporting Stormwater Calculations
- HydroCAD Drainage Analysis
- Water Quality Calculations
- Recharge Calculations
- TSS Removal Calculations
- Water Quality Unit Sizing Calculations
- Illicit Discharge Statement

Appendix D – Stormwater Management Operation & Maintenance Plan
- Operations and Maintenance Log
- Manufacturer's Operations and Maintenance Protocol

Appendix E – Construction Period Pollution Prevention & Erosion & Sediment Control Plan
- Construction BMP Maintenance Log

1.0 PROJECT NARRATIVE

1.1 INTRODUCTION

This report was prepared by Civil & Environmental Consultants, Inc. (CEC) for Foth Infrastructure & Environment, LLC (Foth), as retained by Massachusetts Clean Energy Center (MassCEC).

On behalf of Massachusetts Clean Energy Center (the "Applicant"), Civil & Environmental Consultants, Inc. (CEC) has prepared this stormwater report and analysis to demonstrate compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards and the City of New Bedford Stormwater Rules and Regulations, revised through June 2021 (Version 2). This Stormwater Management Report describes the proposed design as depicted on the Site Plans prepared by CEC, dated January 31, 2025.

The Applicant plans to redevelop 6.43-acres of commercial land located in New Bedford, Massachusetts, along Wright Street as identified as Assessor's Parcels 031-249, 031-263, 031-265, and a portion of 031-288 (the "Site"). The project includes the redevelopment of 54 Wright Street, 18 Wright Street, and 4 Wright Street of the New Bedford Marine Commerce Terminal for use by Massachusetts Clean Energy Center. The project includes the construction of approximately 6.43 acres of marine terminal, stormwater management, and site improvements (the "Project").

This Project is part of the overall MassCEC New Bedford Marine Commerce Terminal Phase 3 Terminal Expansion Project. The overall terminal expansion is anticipated to include:

- The demolition of the buildings at 18 Wright St, 54 Wright St, and 350 S. Front Street which is currently underway.
- Main terminal expansion improvements on 18 Wright Street, and 54 Wright Street.
- Demolition of existing buildings and terminal expansion on 4 Wright Street;
- Reconstruction of the Shuster bulkhead (includes relocating the 72" City of New Bedford stormwater outfall), and
- Site and building improvements on the South Front Street parcels.

This Stormwater Report includes the stormwater design for main terminal expansion portion of the project only (Site 1 & 3 on accompanying site plans). A separate Stormwater Report will be submitted for the South Front Street improvements (Site 2)

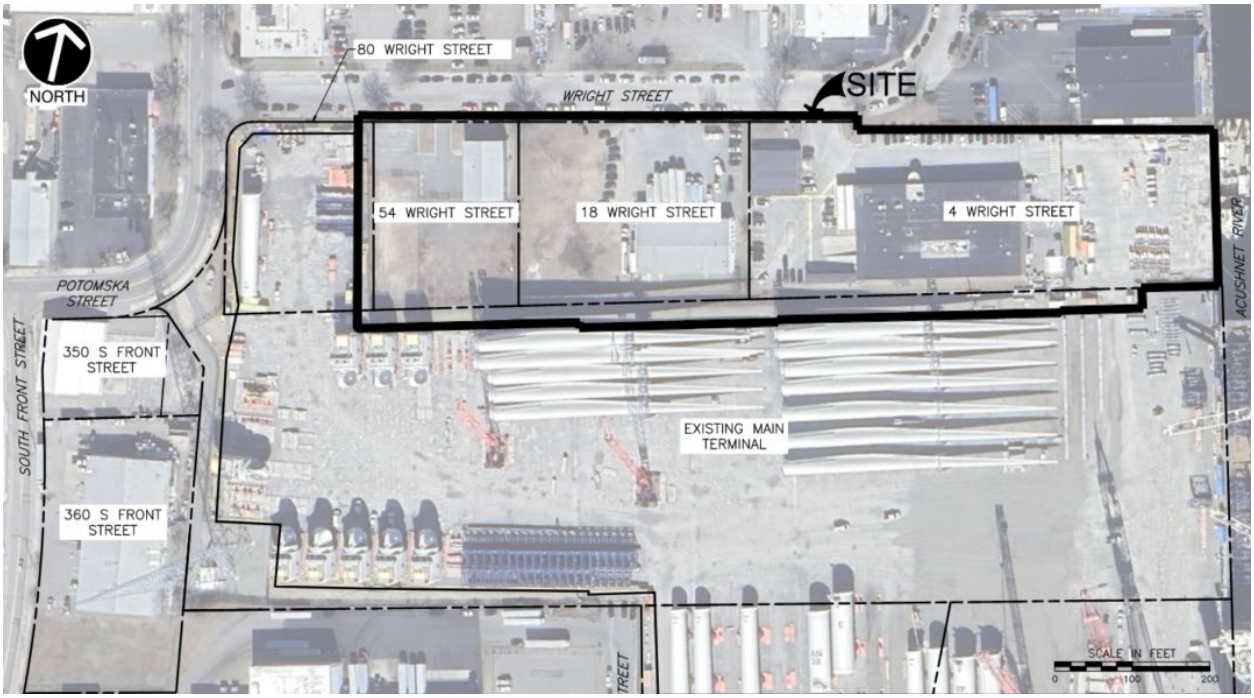


Figure 1: Existing Conditions

1.2 EXISTING CONDITIONS

The Site is located along the southern side of Wright Street, between Wright Street and the existing New Bedford Marine Commerce Terminal in New Bedford, Massachusetts. The properties in the project are located within the Waterfront Industrial zoning district. The Site is bounded to the North by Wright Street and North Wind Seafood, to the East by the Acushnet River, to the South by the New Bedford Marine Commerce Terminal, and to the West by Potomska Street. See Figure 1 for a site location map and Figure 2 for an aerial site plan.

Under existing conditions, approximately sixty-three (63) percent of the site is covered by impervious area consisting of existing buildings, existing dense graded gravel terminal area, concrete loading docks, and paved drives and parking areas. For the purposes of these calculations, the existing dense graded gravel terminal areas are being considered as impervious. The remainder of the site is covered by grassed areas that are in poor to fair condition.

1.2.1 Topography

Existing topography within the Site ranges from approximate elevation 8-ft Mean Lower Low Water (MLLW) at the existing bulkhead to an approximate elevation of 12.7-ft at a high point on the existing marine terminal. The project has limited existing stormwater drainage infrastructure that is comprised of on-site catch basins, drain manholes, perforated and solid pipes that connect to the City's storm drains in Wright Street. Most of the existing pavement area in the Project discharges into two (2) city storm drains. The first of these storm drains is a seventy-two (72) inch

reinforced concrete drainpipe that travels west to east through the site, and discharges into the Acushnet River, at the eastern portion of the site at 4 Wright Street. The second of these storm drains is a sixty-six (66) inch reinforced concrete drain pipe that travels northerly from Potomska Street, and then easterly through Wright Street, which also discharges into the Acushnet River, north of the Site. In addition, a portion of the stormwater runoff from 18 Wright Street, flows into two (2) onsite catch basins which connect to an existing twelve (12) inch reinforced concrete city sanitary sewer pipe in Wright Street.

1.2.2 Geotechnical Conditions and Groundwater

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the Site is classified as Urban Land (#602) and Udorthents (#651). Urban Land refers to land that has been excavated and filled, while Udorthents refers to land that has a soil parent material consisting of a mixture of glacial outwash and glacial till.

Four (4) soil observation test pits were performed by CEC on November 26th, 2024, one (1) on 54 Wright Street and three (3) on 18 Wright Street, all of which are in the area of the proposed infiltration systems. The soil observation test pits generally identified that the soil strata consisted of approximately eight (8) to twelve (12) feet of fill including topsoil, sand, rubble, and organic material underlain by silty/gravelly glacial outwash. Soil excavated from the test pits, at approximate elevations of the proposed infiltration systems, was sent to Thielsch Engineering for textural analyses. The textural analysis showed that soil taken from Test Pit #1 (54 Wright Street) and Test Pit #4 (18 Wright Street) at the approximate depths of the proposed infiltration systems was classified as sand per the USCS Soil Classification Methodology. The textural analysis showed that soil taken from Test Pit #2 and Test Pit #3 (18 Wright Street) at the approximate depths of the proposed infiltration systems, was classified as loamy sand per the USCS Soil Classification Methodology. Groundwater was observed at depths between ninety-six (96) and one hundred and forty-four (144) inches below existing ground surface. These groundwater depths are generally consistent with the Mean High Water level of the Acushnet River.

In addition to soil observation test pit exploration, CEC also performed a series of geotechnical borings in November 2022 which included drilling four (4) soil borings on the properties in the areas of the proposed infiltration systems. Soil taken from soil borings CEC-1-1, CEC-2-1, CEC-2-2, and CEC-3-2 at approximate depths of the proposed infiltration systems was analyzed and the soils were classified as sand and loamy sand per the USCS Soil Classification Methodology. Groundwater was observed in the borings; however, this data was not incorporated in the project's stormwater management design because soil borings do not provide an accurate determination for estimated seasonal high groundwater elevations.

Based on the review of the soils from the soil observation test pits, the soil textural analysis and the soil borings for the Site, it was determined that Hydrologic Soil Group (HSG) A best

represented the onsite soils and therefore was utilized in the hydrologic analysis. Hydrologic Group (A) criteria suggests that the soils have a high infiltration rate when thoroughly wet, a high rate of water transmission, and that the soils are well drained with a moderately coarse to coarse texture. For the hydrologic analysis for this Site, HSG A classification was utilized. The soil infiltration rate of 2.41 in/hr was conservatively utilized based on the Rawl's Rate for loamy sand in accordance with the Massachusetts Department of Environmental Protection Stormwater Handbook. Refer to Appendix B Geotechnical Information, of this report, for the NRCS Soil Information, soil observation test pit logs, textural analysis report, soil boring results and other geotechnical information.

1.2.3 Flood Zone

The majority of the Site is not located within any Special Flood Hazard areas as shown on the Federal Emergency Agency (FEMA) Flood Insurance Rate Map (FIRM) for the City of New Bedford, Map #25005C0481G, effective July 16, 2014. However, a portion of 4 Wright Street as well as the existing New Bedford Marine Commerce terminal is currently mapped as Zone AE (EL 6 Feet). This FEMA panel was most recently updated in 2014, and the New Bedford Marine Commerce terminal, directly adjacent to the Site, has since been redeveloped to raise the overall elevation above the 100-year flood plain. The MassCEC project team is evaluating the pursuit of a Letter of Map Revision for the marine terminal and the adjacent area confirming the correct flood elevation. All of that said, the proposed work, as described in this report, does not occur within any Special Flood Hazard areas.

1.3 PROPOSED PROJECT

The Project includes the demolition of existing site features including: three (3) existing commercial buildings, paved parking areas, paved and concrete walkways and sidewalks, fences, landscaping areas and subsurface utilities in order to construct approximately 6.43 acres of proposed dense graded gravel marine terminal, stormwater infrastructure, associated utilities, landscaping, and offsite roadway improvements.

The Project will include new stormwater management systems including water quality and quantity control structures designed to protect surface and groundwater resources and adjacent properties from potential stormwater impacts from the redevelopment of the Site. The proposed stormwater improvements will be designed in accordance with the Massachusetts Department of Environmental Protection Stormwater Management Standards and the City of New Bedford Stormwater Rules and Regulations.

In the proposed conditions, a majority of the site, although not actually impervious, is conservatively modeled as impervious cover for the purposes of designing the sites stormwater management systems. The "impervious areas" consist of the proposed dense graded gravel marine

terminal, other gravel areas, and off-site roadway improvements, while the remainder of the Site will consist of grassed landscaped areas. The overall stormwater drainage pattern within the Site will slope south to north towards Wright Street with the stormwater runoff being captured in a series of grassed swales within a proposed fifteen (15) to thirty-five (35) foot wide landscaped area. The stormwater runoff will be directed to one of six (6) water quality units before entering one of the three (3) the proposed subsurface infiltration systems. The proposed subsurface infiltration systems will consist of either prefabricated stormwater chambers or a crushed stone infiltration trench which will allow for stormwater runoff to be stored and infiltrated before entering the city of New Bedford municipal stormwater drainage system. The subsurface storage systems will discharge to the existing sixty-six (66) inch municipal storm drain in Wright Street by one (1) of two (2) proposed connections at the existing drain manholes in Wright Street. Furthermore, since the existing sixty-six (66) inch municipal drain is tidally influenced, backwater valves will be installed on the outlets of the proposed drainage systems to prevent the city drain from surcharging the infiltration system. Peak flow rates will be attenuated with outlet control structures to be constructed immediately downstream of the subsurface infiltration chambers, limiting post development peak flow rates to be as close to the pre-development peak flow rates as practicably feasible without negatively impacting the existing downstream storm drainage system. Refer to the Site Plans for additional design information including cross sections, details, and elevations of the proposed stormwater management systems.

2.0 STORMWATER MANAGEMENT SYSTEMS

2.1 DESCRIPTION OF RUNOFF CONTROLS

The proposed stormwater management improvements consist of components designed to manage stormwater runoff from the Site. These components attenuate runoff discharge peaks, minimize erosion, minimize the transport of sediments, improve water quality, and minimize impacts to downstream resource areas or existing downstream stormwater facilities.

The proposed stormwater management system implements a treatment train of the Best Management Practices designed to provide a minimum of ninety (90) percent of the annual average annual load of total suspended solids (TSS) in accordance with the Massachusetts Department of Environmental Protection Stormwater Management Standards and the City of New Bedford Stormwater Rules and Regulations. The proposed stormwater management system will use the following specific control measures:

2.1.1 Wright Street

- Grassed swales: The stormwater runoff from the proposed dense graded gravel areas will be collected in grassed swales that will provide pretreatment in combination with the water quality units described below.

- Nyloplast Yard Drains: The proposed Nyloplast yard drains will serve to collect the runoff from the grassed swales and direct it to the water quality units, described below, via a system of subsurface piping. The Nyloplast yard drains contain twenty-four (24) inch deep sumps to provide storage for the accumulation of solids and debris that may be transported into the swales. Nyloplast yard drains should be inspected and cleaned in accordance with the Operations and Maintenance (O&M) Plan included in Appendix D of this report.

- Proprietary water quality units (Stormceptor STC-900): Stormwater runoff will be directed to the Stormceptor water quality units from the Nyloplast yard drains via a system of storm drainpipes. The proposed Stormceptor water quality units will provide efficient removal of free oils, debris, and total suspended solids (TSS) prior to entry into the subsurface infiltration tanks or the stone infiltration trench. Although not the main objective of the water quality units, some removal of heavy metals and other nutrients is also achieved. Water quality units allow for the safe and effective removal of collected material and should be inspected and cleaned in accordance with the Operations and Maintenance (O&M) Plan included in Appendix D of this report.

The use of these water quality units for treatment of stormwater, prior to entry into the infiltration structures, is accepted as good engineering practice and is in accordance with sound professional standards. See Appendix C, of this report, for the NJCAT Technology Verification.

- Subsurface Infiltration Structures (Ferguson R-Tank) with Separator Row: The Separator Row will provide efficient removal of free oils, debris, and total suspended solids (TSS) as an added level of pretreatment of the stormwater runoff. The infiltration structures will provide an efficient means for infiltration of stormwater runoff after proper pre-treatment and treatment of the stormwater has occurred upstream of the structures, as described above. The structures and the separator rows allow for safe and easy removal of collected material and should be inspected and cleaned in accordance with the O&M Plan and per manufacturer's recommendations, both of which are included in Appendix D, of this report.

- Subsurface Stone Infiltration Trench: The stone infiltration trench will provide an efficient means for infiltration of stormwater runoff after proper pre-treatment and treatment of the stormwater has occurred upstream of the trench, as described above. The stone infiltration trench should be inspected and cleaned in accordance with the O&M Plan which is included in Appendix D, of this report.

- Outlet Control Structures: The outlet control structures will control the rate at which the stormwater runoff is discharged into the existing municipal stormwater management system from the infiltration systems. The outlet control structures should be inspected and cleaned in accordance with the Operations and Maintenance (O&M) Plan included in Appendix D of this report.

Stormwater recharge for the proposed redevelopment of the Site is provided through the infiltration of treated stormwater runoff from the dense graded gravel areas and the pavement areas via the Ferguson R-tank chambers or the stone infiltration trench, as described above, which are located beneath the landscaped areas.

2.2 CONSTRUCTION SEQUENCE PLAN

The purpose of the Construction Sequence Plan is to develop a working schedule for the implementation of the proposed stormwater management systems and associated improvements. Prior to initiating work, the erosion control and siltation control barriers will be installed along the limit of work, in the locations shown on the accompanying Site Plans. After the appropriate permits are obtained, the construction project will commence in the following sequence:

2.2.1 Construction Sequence Plan

1. Install necessary erosion control and siltation barriers as shown on the design drawings, including the vehicle construction exit and vehicle wash pad.
2. Perform demolition of existing pavement, building and landscape areas.
3. Cut and cap existing utility services as shown on the design drawings.
4. Perform excavation for soil remediation of environmentally unsuitable soils present onsite.
5. Remove and abandon existing on-site utilities as shown on the site plans.
6. Install proposed stormwater infrastructure components. It should be noted that discharge into the newly installed stormwater infrastructure components is not to be permitted until the site is fully developed. During construction, temporary stormwater measures and controls will be utilized.
7. Prepare subbase and install dense graded gravel (heavy lift) areas.
8. Install proposed final landscaping.
9. Upon approval from the Authorities Having Jurisdiction, remove erosion control and siltation barriers and measures.

The construction at 18 and 54 Wright Street is expected to start within the year 2025, however the construction at 4 Wright Street will be completed in a future phase. The stormwater management system infrastructure has been designed as two (2) separate, individual, stand-alone stormwater management systems to ensure that the best management practices can be constructed and maintained at 18 and 54 Wright Street before 4 Wright Street is constructed.

All construction stormwater water runoff, for 18 Wright Street, 54 Wright Street and 4 Wright Street, will be collected and treated in accordance with the Erosion and Sediment Control Plan included in Appendix E of this report. Permanent erosion and sedimentation measures will prevent the discharge of runoff into the municipal drainage system before the development of the site is completed.

3.0 STORMWATER ANALYSIS

3.1 METHOD OF ANALYSIS

A hydrologic analysis has been performed for the Site comparing existing conditions (pre-development) and post-development conditions using a software program developed by HydroCAD. This program analyzes site hydrology by the graphic peak discharge method documented in Technical Release No. 20 and Technical Release No. 55 published by the United States Department of Agriculture (USDA) Soil Conservation Service.

The following variables were developed for the contributing pre-development and post-development watersheds (drainage areas) in order to complete the analysis:

- **Rainfall Depth:** A hydrologic analysis was performed for the 24-hour 2-year, 10-year, 25-year, and 100-year, Type III storm events with rainfall depths of (3.40, 4.80, 5.60, and 7.00) inches respectively for each drainage area.

- **Runoff Curve Number (RCN):** The RCN is a hydrologic characteristic that contributes to the peak rate of runoff and volume from a given storm event. It is dependent upon soil conditions and land use. Generally, higher curve numbers are associated with less pervious soils and, hence, greater amounts of runoff. As previously noted in this report, based on the review of the NRCS Web Soil Survey, results of soil observation test pits, results of textural soil analysis and from the results of soil borings, Hydrologic Soil Group (HSG) A was used in determining RCNs for the existing onsite soils.

- **Time of Concentration (Tc):** The Tc is defined as the time it takes stormwater runoff to travel from the hydraulically most distant part of the watershed to the downstream point of interest. This parameter is dependent on the characteristics of the ground surface and condition of the travel path. Times of concentration were calculated for the various drainage areas using the HydroCAD program, with a minimum Tc of six (6) minutes used in accordance with the protocol outlined in Technical Release No. 55.

3.2 DRAINAGE AREAS

To perform the hydrologic analysis, the contributing drainage areas for pre-development and post-development conditions were delineated. The delineation of the drainage areas was determined by the topography depicted on the Existing Conditions Plan. Descriptions of the pre-development, existing conditions, and proposed conditions drainage areas are as follows:

- **Pre-Development:** The Site was evaluated for pre-development conditions prior to the commencement of the construction of the project. Available aerial imagery and

topographic information were used to identify the cover types and stormwater runoff drainage patterns. The Site is comprised of seven (7) pre-development drainage areas and the stormwater runoff was evaluated for one (1) of the three (3) design points: the existing combined twelve (12) inch reinforced concrete sanitary sewer pipe in Wright Street (Design Point #1), the sixty-six (66) inch reinforced concrete storm drain pipe in Potomska and Wright Street (Design Point #2), and the seventy-two (72) inch reinforced concrete storm drain pipe located within the site and in the marine terminal (Design Point #3). Refer to Figure 4 – HYD-EX Drainage Area Map - Existing Conditions for the locations of the pre-development conditions drainage areas. A summary of pre-development conditions drainage areas, curve numbers and time of concentrations is listed below:

Table 3-1: Pre-Development Conditions

PRE-DEVELOPMENT CONDITIONS				
Drainage Area	**Design Point**	**Area (ac.)**	**Curve Number**	**Time of Concentration (minutes)**
1A-EX	#1 (Existing 12" City Sewer)	0.391	96	6.0
2A-EX	#2 (Existing 66" City Storm Drain)	1.243	70	6.3
2B-EX		0.553	87	7.0
2C-EX		2.184	96	6.0
3A-EX	#3 (Existing 72" City Storm Drain)	0.105	45	10.7
3B-EX		1.405	55	6.0
3C-EX		0.551	65	6.0

- **Proposed Conditions:** The Site was evaluated under proposed conditions following the proposed construction of the current project. As proposed, the Site is comprised of sixteen (16) post-development drainage areas and was evaluated for two (2) Design Points. The existing combined twelve (12) inch reinforced concrete sanitary sewer pipe in Wright Street (Design Point #1), at 18 Wright Street will be removed and the sanitary sewer will no longer receive runoff from the Site. Stormwater runoff from drainage area 2A-PR including the sidewalks along Potomska and Wright Street will continue to drain to the existing sixty-six (66) inch reinforced concrete storm drain pipe in Potomska and Wright Street (Design Point #2). Stormwater runoff from the proposed dense graded gravel marine terminal areas will be collected and routed through grassed swales, nyloplast yard drains, water quality units, the subsurface infiltration structures and the subsurface stone infiltration trench prior to

discharging into Design Point #2. Stormwater runoff from drainage area 3A-PR will continue to drain to the seventy-two (72) inch reinforced concrete storm drain pipe located within the site and in the marine terminal (Design Point #3) with the same pattern as in the pre-development conditions. Refer to Figure 5 – HYD-PR Drainage Area Map - Proposed Conditions for the locations of the proposed conditions drainage areas. A summary of the proposed conditions drainage areas, curve numbers and time of concentrations is listed below:

Table 3-2: Post-Development Conditions

POST-DEVELOPMENT CONDITIONS				
Drainage Area	**Design Point**	**Area (ac.)**	**Curve Number**	**Time of Concentration (minutes)**
2A-PR	#2 (Existing 66" City Storm Drain)	0.119	98	6.0
2B-PR		0.178	91	6.0
2C-PR		0.958	94	6.0
2D-PR		0.376	93	6.0
2E-PR		0.282	91	6.0
2F-PR		0.075	83	6.0
2G-PR		0.072	80	6.0
2H-PR		0.451	92	6.0
2I-PR		0.682	91	6.0
2J-PR		1.111	94	6.0
2K-PR		0.370	90	6.0
2L-PR		0.360	90	6.0
2M-PR		0.440	91	6.0
2N-PR		0.821	93	6.0
3A-PR	#3 (Existing 72" City Storm Drain)	0.073	96	6.3
3B-PR	Open Water / Acushnet River	0.064	98	6.0

3.3 RESULTS OF ANALYSIS

A stormwater analysis was performed for the 24-hour 2-year, 10-year, 25-year, and 100-year storm events. Based on the calculations, it has been determined that there will not be an increase in stormwater runoff discharge rates off-site for the one (1) inch, 2-year, and 10-year storm events, after the proposed construction is complete and after the stormwater management system components, including the outlet control structures are in place. There will, however, be a slight increase in stormwater runoff discharge rates off-site for the 25-year and 100-year storm events, after the proposed construction is complete and after the stormwater management system components, including the outlet control structures are in place. Detailed calculations are attached in Appendix C of this report. Pre-development and post-development conditions were evaluated at each design point. A summary of the peak stormwater rates of runoff is provided in Table 3.3 Peak Runoff Rates, below.

As shown below in Table 3.3, post-development peak rates of runoff from the Site to design point 2 slightly exceed the pre-development peak rates of runoff in the 25-year and 100-year storm events. Supporting calculations are provided in Appendix C of this report.

Since the proposed stormwater management systems connect to the existing storm drain system in Wright Street and in the Marine Terminal, in such close proximity to the existing storm drain systems outfalls at the Acushnet River and since the storm drains do not connect to any pump stations, detention basins, surface features, resource areas or any other location with a finite storage capacity, the slightly increased peak flow rates for the 25-year and 100-year storm events should not have a negative impact to the downstream storm drain system. The properly treated stormwater discharge from the project's stormwater management system, essentially discharges directly to the Acushnet River, so the increased rate of runoff would have negligible impacts to such a large body of water. Additionally, the gravel terminal expansion area is conservatively modelled as impervious.

Table 3-3: Project Stormwater Runoff Rates

PEAK RUNOFF RATES (cfs)								
	2-Year		10-Year		25-Year		100-Year	
Design Point	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
1	1.2	0.0	1.8	0.0	2.1	0.0	2.6	0.0
2	9.3	5.0	14.5	12.8	17.5	19.8	22.9	37.4
3	0.5	0.2	2.0	0.3	3.1	0.4	5.2	0.5

3.3.1 Hydrology

The proposed stormwater management systems have been designed to convey storm events up to and including the 100-year storm event. Refer to Appendix C of this report, for supporting calculations.

4.0 STORMWATER CONTROL SYSTEM DESIGN CRITERIA

4.1 MASSDEP STORMWATER MANAGEMENT POLICY

Stormwater discharge from the proposed Project is subject to the Massachusetts DEP Stormwater Management Policy (the Policy). The Policy is designed "to protect the wetlands and waters of the Commonwealth from adverse impacts of storm water runoff." To accomplish this goal, the Policy establishes ten (10) performance standards to control stormwater quantity and quality. These standards establish the level of required controls that can be achieved with site planning, structural and non-structural controls, and other best management practices (BMPs). The Stormwater Checklist is provided in Appendix C of this report. Stormwater modeling methodology is discussed in detail in Section 3.0 of this report. Results of the stormwater modeling of the existing and proposed conditions are provided as Appendix C of this report.

4.1.1 Stormwater Management Standards

The following section documents compliance with the ten (10) MassDEP Stormwater Management Standards.

Standard 1
No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

The project is designed so that there are no new stormwater conveyances or outfalls that could discharge untreated stormwater into, or cause erosion to, wetlands or waters of the Commonwealth.

Standard 2
Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

The total post-development peak discharge rates of runoff slightly exceed pre-development peak discharge rates of runoff for the 25-year and 100-year storm events. Stormwater modeling methodology is discussed in detail in Section 3.0 of this report. The model output is provided in Appendix C of this report. Summaries of the model results are provided above in Table 3-3.

Since the proposed stormwater management systems connect to the existing storm drain system in Wright Street and in the Marine Terminal, in such close proximity to the existing storm drain systems outfalls at the Acushnet River and since the storm drains do not connect to any pump stations, detention basins, surface features, resource areas or any other location with a finite storage

capacity, the slightly increased peak flow rates for the 25-year and 100-year storm events should not have a negative impact to the downstream storm drain system. The properly treated stormwater discharge from the project's stormwater management system, essentially discharges directly to the Acushnet River, so the minor increased rate of runoff would have negligible impacts to such a large body of water.

Standard 3

Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site should approximate the annual recharge from the pre-development or existing site conditions, based on soil types.

In order to provide additional stormwater recharge beyond the Massachusetts Stormwater Standard requirements, consistent with New Bedford Stormwater Rules and Regulations to improve existing conditions, the Project has been designed to provide approximately 22,216 cubic feet of recharge through the proposed stormwater management systems, while only 22,035 cubic feet of recharge is required. Refer to Appendix C of this report for calculations and additional information.

Standard 4

For new development, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:

A. *Suitable nonstructural practices for source control and pollution prevention are implemented;*
B. *Stormwater management best practices (BMPs) are sized to capture the prescribed runoff volume; and*
C. *Stormwater management BMPs are maintained as designed.*

In accordance with New Bedford Stormwater Rules and Regulations, the project has been designed to remove a minimum of ninety (90) percent of the average annual load of TSS, where feasible. This is provided by utilizing initial pre-treatment of stormwater runoff with grassed swales and proprietary water quality units and also infiltrating one (1.0) inch of runoff from ground level impervious areas within the subsurface infiltration systems and subsurface infiltration trench. The stormwater management system also strives to remove 60% of phosphorus in compliance with New Bedford Stormwater Rules and Regulations by the implementation of the water quality units and the infiltration of the stormwater runoff.

The one (1) inch water quality volume for the proposed development is calculated to be 21,137 CF. The proposed infiltration chambers and stone infiltration trench will provide 22,216 CF of water quality treatment. Additionally, the proposed water quality units are each capable of providing a minimum of seventy-eight (78) percent TSS removal, thus providing the minimum

pre-treatment required. Supporting calculations and documentation can be found in Appendix C of this report.

A comprehensive Operations and Maintenance Plan (O&M) has been developed for the proposed stormwater management systems and is included in Appendix D of this report.

Standard 5

Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs. The use of infiltration practices without pre-treatment is prohibited.

The Site is not considered a land use with a higher potential pollutant load, and therefore this section does not apply to this project.

Standard 6

Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resources Waters (ORWs), shellfish beds, bathing beaches, cold water fisheries, and recharge areas for public water supplies.

The Site runoff discharges via a sixty-six (66) inch reinforced concrete drainpipe and a seventy-two (72) inch reinforced concrete drainpipe which ultimately discharge to the Acushnet River and ultimately to Buzzards Bay. The Acushnet River and Buzzards Bay contain shellfish beds. The Site has conservatively been designed to comply with this standard via the implementation of a combination of grassed swales, proprietary water quality units, and subsurface infiltration chambers and a subsurface infiltration trench. The stormwater drainage system has been designed to provide a minimum of ninety (90) percent TSS removal in compliance with the City of New Bedford Stormwater Rules and Regulations. The proposed water quality units provide a minimum of seventy-eight (78) percent TSS removal prior to discharge into the subsurface infiltration chambers and stone infiltration trench, exceeding the minimum forty-four (44) percent pre-treatment requirement.

Standard 7

Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. Where it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

Although the project involves redeveloping existing commercial properties, the Project has been designed to comply with the Stormwater Management Standards for New Development.

Standard 8
Erosion and sediment controls must be implemented to prevent impacts during construction, or land disturbance activities.

Erosion and sediment controls are integral to the project improvements. The plan includes straw bales, silt socks and/or silt fencing, which will be installed down-gradient of the proposed work area. Temporary stabilized construction exits, and truck washout areas will be constructed as well. Prior to, and during construction, the Site's Erosion and Sediment Control Plan will be followed by the site contractor to ensure that the erosion control measures function as designed. These measures will be utilized throughout construction to prevent erosion, control sediments, and stabilize exposed soils.

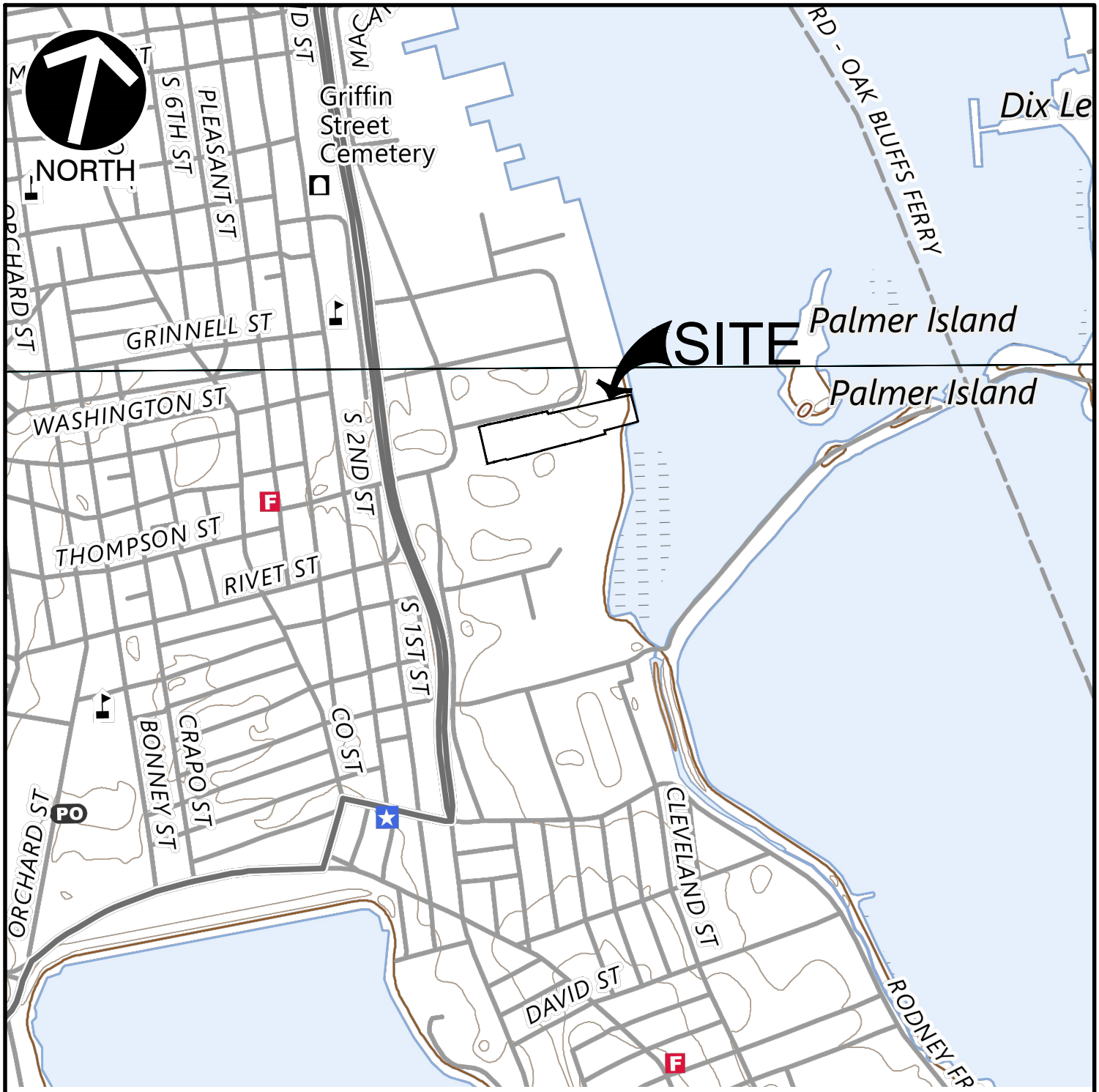
Standard 9
All stormwater management systems must have an operations and maintenance plan to ensure that systems function as designed.

A comprehensive Operations and Maintenance Plan (O&M) has been developed. The Manufacturer's O&M Procedures for the water quality unit and stormwater chambers are included in the O&M Plan for reference. The O&M is located in Appendix D of this report.

Standard 10
All illicit discharges to the stormwater management system are prohibited.

There are no known illicit discharges at the Site. If found, any illicit discharges will be eliminated, and the project will not be constructed with any illicit connections. An illicit discharge Statement is provided in Appendix C of this report.

FIGURES



REFERENCE

1. PROPERTY LINE INFORMATION IS BASED ON AN ON THE GROUND SURVEY PERFORMED BY CIVIL AND ENVIRONMENTAL CONSULTANTS IN FEBRUARY AND MARCH OF 2024
2. ORTHOGRAPHIC IMAGERY IS BASED ON GIS DATA PROVIDED BY THE UNITED STATES GEOLOGICAL SURVEY (USGS) NEW BEDFORD NORTH AND NEW BEDFORD SOUTH QUADRANGLES DOWNLOADED ON NOVEMBER 12, 2024

SCALE IN FEET

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Raynham, MA 02767

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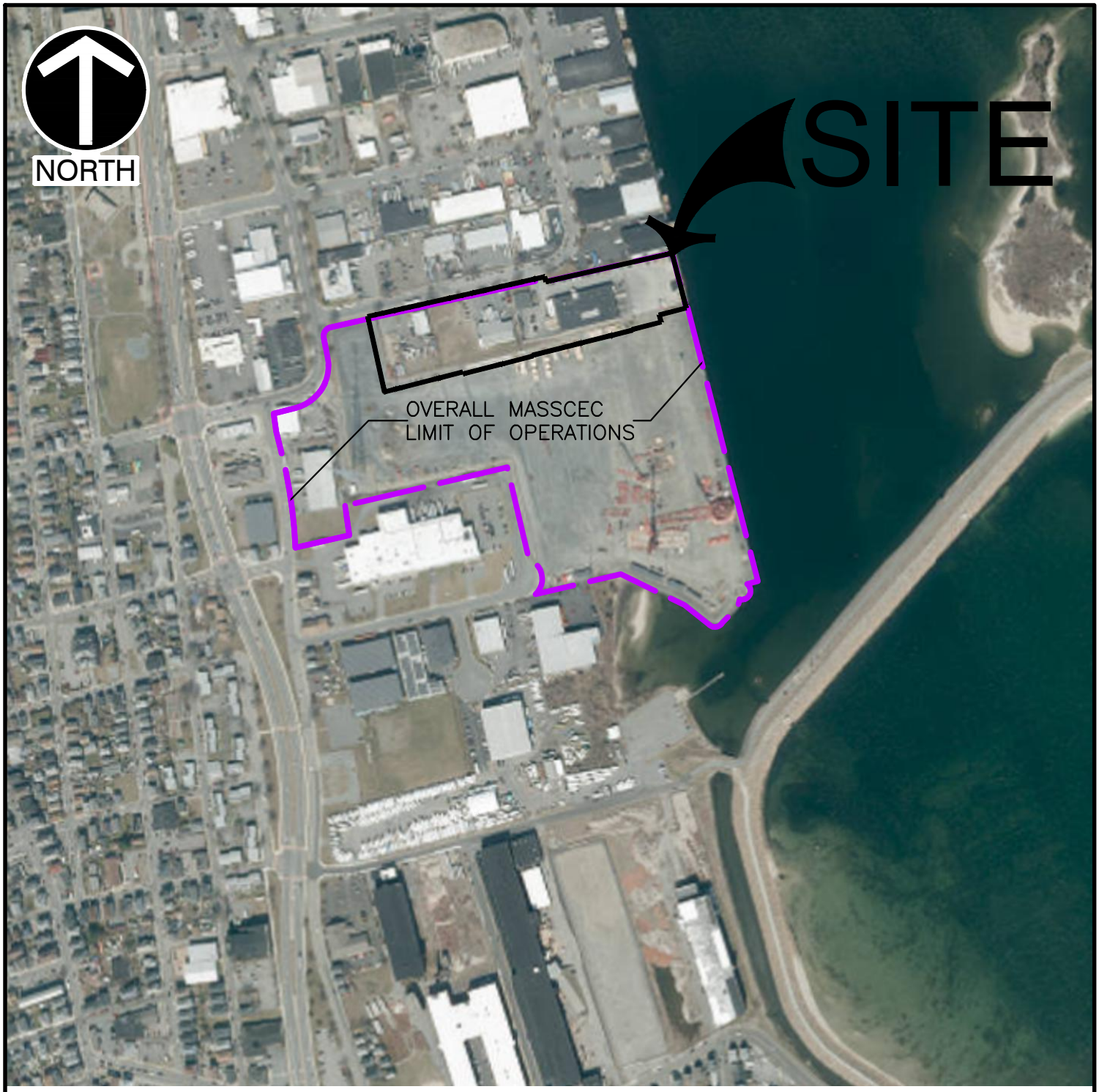
MASSACHUSETTS CLEAN ENERGY CENTER
NEW BEDFORD, MASSACHUSETTS

SITE LOCATION MAP

DRAWN BY:	ITB	CHECKED BY:	DSK	APPROVED BY:	BEP	FIGURE NO.:	1
DATE:	DECEMBER 2024	DWG SCALE:	1"=1000'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\CP01 - Concepts\5 - Overall\Stormwater report\332344-CP02-USGS Quads.dwg{LAYOUT2} LS:(2/5/2025 - iberl) - LP: 3/28/2025 7:56 AM



REFERENCE

1. PROPERTY LINE INFORMATION IS BASED ON AN ON THE GROUND SURVEY PERFORMED BY CIVIL AND ENVIRONMENTAL CONSULTANTS IN FEBRUARY AND MARCH OF 2024
2. AERIAL IMAGERY IS BASED ON GIS DATA PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASS GIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES

SCALE IN FEET

0 500 1000

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AERIAL SITE PLAN

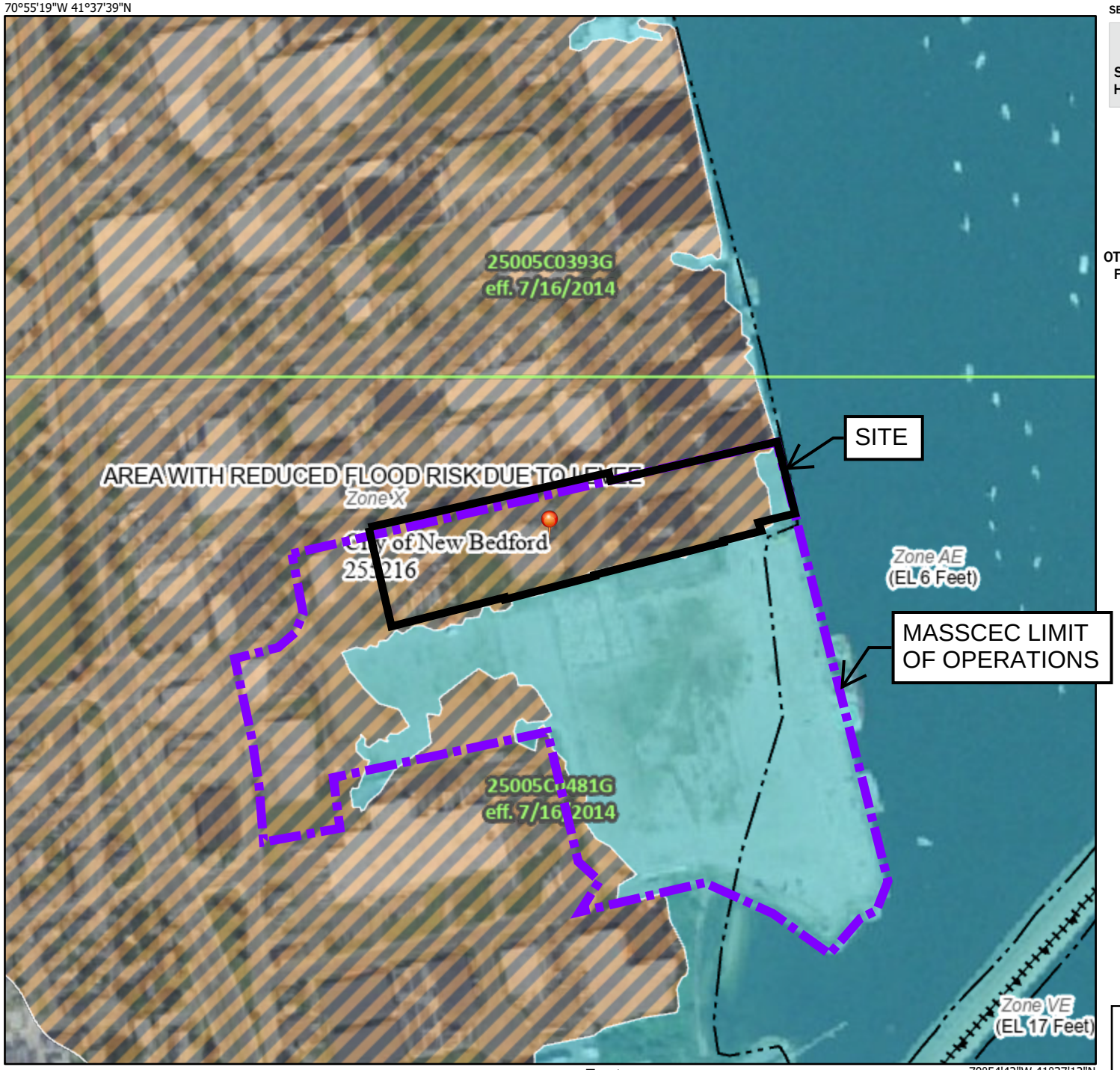
DRAWN BY:	ITB	CHECKED BY:	DSK	APPROVED BY:	BEP	FIGURE NO.:	2
DATE:	DECEMBER 2024	DWG SCALE:	1"=500'	PROJECT NO:	332-344		

\\cecinc.com\global\Projects\330-000\332-344\-CADD\Dwg\CP01 - Concepts\5 - Overall\Stormwater report\332344-CP01-Aerial.dwg{LAYOUT2} LS:(1/24/2025 - iberl) - LP: 2/5/2025 2:18 PM

National Flood Hazard Layer FIRMette

FEMA

70°55'19"W 41°37'39"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

70°54'42"W 41°37'12"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/7/2024 at 9:18 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

FIGURE 3 - FEMA FIRMETTE

NORTH

12" CITY SEWER

66" CITY STORM DRAIN

WRIGHT STREET DRAINAGE AREA = 280,164 SF

72" CITY STORM DRAIN

WRIGHT STREET

POTOMSKA STREET

S. FRONT STREET

BLACKMER STREET

ACUSHNET RIVER

1 2 3

1A-EX 2A-EX 2B-EX 2C-EX 3A-EX 3B-EX 3C-EX

A

PARCEL ID: 031 0264
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 14247, PG. 263

PARCEL NO. 1
LOT H-1
PLAN BK 102, PG. 37

PARCEL "A"
PLAN BK. 147, PG. 9

PARCEL ID: 031 0218 & 031 0237
N/F
CARLOS RAFAEL AND CONCEICAO RAFAEL
BOOK 5961, PG. 85

PARCEL ID: 031 0255
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 14929, PG. 65

PARCEL ID: 031 0249
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 14910, PG. 207

PARCEL NO. 1
PLAN BK 99, PG. 71

PARCEL ID: 031 0263
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 12222, PG. 204

BUILDING ±3,833 SQ. FT.

BUILDING ±25,853 SQ. FT.

BUILDING ±6,992 SQ. FT.

BUILDING ±20,060 SQ. FT.

PARCEL "B"
PLAN BK. 147, PG.

PARCEL ID: 031 0234
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 11982, PG. 152

PARCEL ID: 031 0288
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 10719, PG. 239

30' WIDE DRAINAGE EASEMENT
BOOK 1845 PG 50

PARCEL ID: 31-291
LOT 2
PLAN BK 11982, PG. 152

PARCEL ID: 031 0144
N/F
GREGORY G. WHITE 'TRS'
BOOK 14600, PG. 142

LOT 1
PLAN BK. 142, PG. 6

PARCEL ID: 025 A 0003
N/F
BLACKMER STREET REALTY LLC
BOOK 11376, PG. 320

PARCEL ID: 025 A 0001
N/F
BLACKMER STREET REALTY LLC
BOOK 11856, PG. 264

PARCEL ID: 025 A 0049
N/F
THE CITY OF NEW BEDFORD, MASSACHUSETTS
BOOK 12682, PG. 263

PARCEL ID: 025 A 0048
N/F
NEW BEDFORD REDEVELOPMENT AUTHORITY
BOOK 4272, PG. 209

LEGEND

1	EXISTING DESIGN POINT
A1	EXISTING SUBCATCHMENT AREA
P1	EXISTING POND/DETENTION AREA
A	SOIL MAP UNIT/HYDROLOGIC SOIL GROUP
	EXISTING SUBCATCHMENT BOUNDARY
	EXISTING SUBCATCHMENT BOUNDARY
	EXISTING TIME OF CONCENTRATION PATH
	EXISTING VEGETATED AREA
	EXISTING VEGETATED SWALE AREA
	EXISTING PAVED AREA
	EXISTING GRAVEL AREA
	EXISTING HEAVY LIFT GRAVEL AREA
	EXISTING ROOF AREA

SCALE IN FEET
0 60 120

REVISION RECORD

NO	DATE	DESCRIPTION

31 Bellows Road
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Ph: 774.501.2176
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Civil & Environmental Consultants, Inc.

MASSACHUSETTS CLEAN ENERGY CENTER
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

DRAINAGE AREA MAP
EXISTING CONDITIONS

DATE:	JANUARY 2025	DRAWN BY:	ITB
DWG SCALE:	1"=60'	CHECKED BY:	DSK
PROJECT NO:			332-344
APPROVED BY:			BEP

DRAWING NO.:
HYD-EX

\\cecinc.com\global\Projects\330-000\332-344\-CADD\Dwg\CP01 - Concepts\B-HydroCAD\332344-CV01-HYD-PRE.dwg\LAYOUT1\ LS:1/27/2025 - Wed\ - LP: 2/3/2025 10:11 AM

NORTH

WRIGHT STREET

POTOMSKA STREET

S. FRONT STREET

BLACKMER STREET

ACUSHNET RIVER

66" CITY STORM DRAIN

72" CITY STORM DRAIN

WRIGHT STREET DRAINAGE AREA = 280,164 SF

1P, 2P, 3P, 2A–PR, 2B–PR, 2C–PR, 2D–PR, 2E–PR, 2F–PR, 2G–PR, 2H–PR, 2I–PR, 2J–PR, 2K–PR, 2L–PR, 2M–PR, 2N–PR, 3A–PR, 3B–PR

1, 2, 3, A

PARCEL "A"
PLAN BK. 147, PG. 9

350 SOUTH FRONT STREET
0.58 ACRES
PARCEL ID: 031 0218 &
031 0237
N/F
CARLOS RAFAEL AND
CONCEICAO RAFAEL
BOOK 5961, PG. 85

PARCEL ID: 031 0264
N/F
MASSACHUSETTS CLEAN ENERGY
TECHNOLOGY CENTER
BOOK 14247, PG. 263

PARCEL NO. 1
LOT H-1
PLAN BK 102, PG. 37

54 WRIGHT STREET
1.0 ACRES
PARCEL ID: 031 0265
N/F
MASSACHUSETTS CLEAN ENERGY
TECHNOLOGY CENTER
BOOK 14929, PG. 65

PARCEL ID: 031 0234
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 11982, PG. 152

PARCEL ID: 031 0288
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BOOK 10719, PG. 239

PARCEL "B"
PLAN BK.
147, PG.

30' WIDE DRAINAGE EASEMENT
BOOK 1845 PG 50

BUILDING
±6,992 SQ. FT.

BUILDING
±20,060 SQ. FT.

PARCEL ID: 31–291
LOT 2
PLAN BK 11982, PG. 152

360 SOUTH FRONT STREET
1.57 ACRES
PARCEL ID: 031 0144
N/F
GREGORY C. WHITE "TRS"
BOOK 14600, PG. 142
LOT 1
PLAN BK. 142, PG. 6

PARCEL ID: 025 A 0003
N/F
BLACKMER STREET REALTY LLC
BOOK 11376, PG. 320

PARCEL ID: 025 A 0001
N/F
BLACKMER STREET REALTY LLC
BOOK 11856, PG. 264

PARCEL ID: 025 A 0049
N/F
THE CITY OF NEW BEDFORD, MASSACHUSETTS
BOOK 12682, PG. 263

PARCEL ID: 025 A 0048
N/F
NEW BEDFORD REDEVELOPMENT AUTHORITY
BOOK 4272, PG. 209

LEGEND

1	PROPOSED DESIGN POINT
A1	PROPOSED SUBCATCHMENT AREA
P1	PROPOSED POND/DETENTION AREA
A	SOIL MAP UNIT/HYDROLOGIC SOIL GROUP
	PROPOSED SUBCATCHMENT BOUNDARY
	PROPOSED TIME OF CONCENTRATION PATH
	PROPOSED OPEN WATER
	PROPOSED VEGETATED SWALE AREA
	PROPOSED PAVED AREA
	PROPOSED HEAVY LIFT GRAVEL AREA

SCALE IN FEET
0 60 120

REVISION RECORD

NO	DATE	DESCRIPTION

31 Bellows Road
Raynham, MA 02767
Ph: 774.501.2176
www.cecinc.com

Civil & Environmental Consultants, Inc.

MASSACHUSETTS CLEAN ENERGY CENTER
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

DRAINAGE AREA MAP
PROPOSED CONDITIONS

DATE:	JANUARY 2025	DRAWN BY:	ITB
DWG SCALE:	1"=60'	CHECKED BY:	DSK
PROJECT NO:			332-344
APPROVED BY:			BEP

DRAWING NO.:
HYD-PR

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APPENDIX A

DEP STORMWATER CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

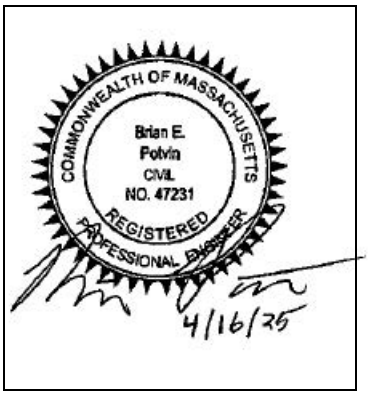
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



04/16/2025

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

APPENDIX B

GEOTECHNICAL INFORMATION

Soil Map—Bristol County, Massachusetts, Southern Part
(Soil Map)

Map Scale: 1:4,760 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 18, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2022—Jun 30, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
602	Urban land	47.2	42.4%
607	Water, saline	30.9	27.7%
608	Water, ocean	1.4	1.3%
651	Udorthents, smoothed	31.8	28.6%
Totals for Area of Interest		**111.3**	**100.0%**

Bristol County, Massachusetts, Southern Part

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: v5rw
Elevation: 0 to 3,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Setting

Parent material: Made land over loose sandy and gravelly glaciofluvial deposits and/or firm coarse-loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: variable
H2 - 6 to 60 inches: variable

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: Unranked

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 18, Aug 27, 2024

Bristol County, Massachusetts, Southern Part

602—Urban land

Map Unit Setting

National map unit symbol: v5ry
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

Minor Components

Udorthents

Percent of map unit: 15 percent
Hydric soil rating: Unranked

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 18, Aug 27, 2024

Bristol County, Massachusetts, Southern Part

608—Water, ocean

Map Unit Setting

National map unit symbol: v5x6
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Water, ocean: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 18, Aug 27, 2024

Bristol County, Massachusetts, Southern Part

607—Water, saline

Map Unit Setting

National map unit symbol: v5x5
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Water, saline: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Westbrook

Percent of map unit: 5 percent
Landform: Marshes
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 18, Aug 27, 2024

TEST BORING LOGS

Rock Types

Rock Name	Characteristics	Symbol
Claystone	Clay sized particles that are consolidated, lacking fissility.	
Coal	Black and shiny, can break into cubes or conchoidally.	
Conglomerate	Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular.	
Limestone	Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils).	
Sandstone	Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse.	
Shale	Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature.	
Siltstone	Composed of silt, normally breaks as irregular chunks.	

Rock Quality Descriptions

Weathering

Completely Weathered: All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

Highly Weathered: More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

Moderately Weathered: Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

Slightly Weathered: Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

Fresh: No visible signs of rock material weathering.

RQD

Descriptor	%
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	>90

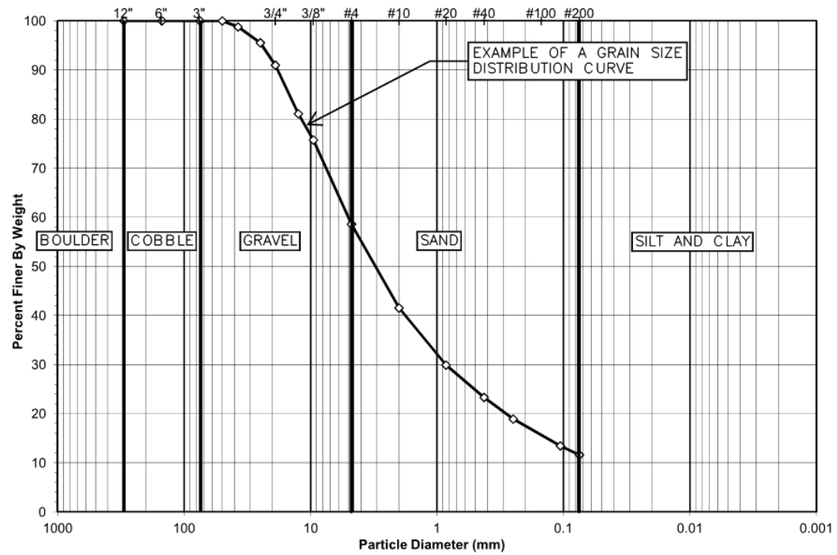
Brokenness

Descriptor	Fracture Spacing (in & ft)
Very Broken	<1 (<0.08)
Broken	1-3 (0.08-0.25)
Moderately Broken	3-6 (0.25-0.5)
Slightly Broken	>6 (>0.5)

Rock Hardness

Descriptor	Field Criterion	Relative Unconfined Compressive Strength
Very Hard	Difficult to break w/ Hammer	> 30,000 psi
Hard	Hand-held sample breaks w/ Hammer	8,000 to 30,000 psi
Medium Hard	Cannot scrape surface w/ knife	2,000 to 8,000 psi
Soft	Cutting or scraping w/ knife difficult	500 to 2,000 psi
Very Soft	Can be cut w/ knife	< 500 psi

Grain Size Distribution Curve



UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

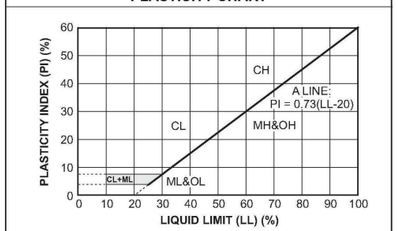
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



Glossary

Alluvial Soil or Alluvium: Soil deposited by water in a river, stream, floodplain, or delta.

Bedrock: Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

Colluvial Soil or Colluvium: Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

Fill: Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

Glacial Outwash: Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

Glacial Till: Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

N-Value: The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

Pocket Pen (PP): Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

Recovery %: Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

Refusal: The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

Residual Soil or Residuum: Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

Rock Quality Designation (RQD): The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

Shelby Tube: A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

Split Spoon Sampler: A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

Standard Penetration Test (SPT) ASTM D1586 : Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

Weathered Rock: Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

N-Value Rating

Fine-Grained Soils (Silt and Clay)

Consistency	Blows/ft	PP (tsf)
Very Soft	0-2	<0.25
Soft	3-4	0.25-0.5
Medium Stiff	5-8	0.5-1
Stiff	9-15	1-2
Very Stiff	16-32	2-4
Hard	>32	>4

Coarse-Grained Soils (Sand and Gravel)

Relative Density	Blows/ft
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

Unconsolidated Material

Term	Grain Size in mm (in)	Approximate Example Size
Clay and Silt	<.075	can't see grains to barely visible
Fine Sand	0.075-0.4	table salt to sugar
Med. Sand	0.4-2.0 (~<1/16)	openings in a window screen
Coarse Sand	2.0-4.75 (~1/16-1/8)	sidewalk salt
Gravel	4.75-75 (~1/8-3)	pea to tennis ball
Cobble	75-300 (3-12)	tennis ball to basketball
Boulder	>300 (>12)	larger than a basketball

Other Features – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

Term	%
Trace	< 5
Few	5-15
Some	15-45

Moisture Content

Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

Civil & Environmental Consultants, Inc.

Definitions of Standard Terms and Symbols

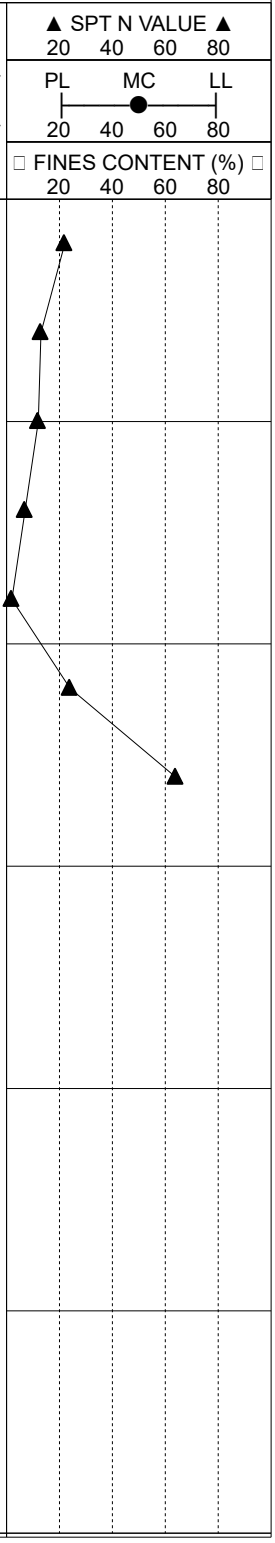
PROPERTY 1 (54 WRIGHT ST. NEW BEDFORD, MA)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-1-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623886 **LONGITUDE** -70.918409
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 7.5 ft / Elev 2.5 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon refusal at 14' bgs.	0.2 ft 3" Asphalt	9.8					
			Tan to Gray, Silty Sand, Trace Gravel, Medium Dense, SM, **(FILL)**		SS S-1	100	9-10-12-8 (22)		0.1
			2.0 ft Black to Brown, Slightly Organic Silty Sand, Trace Gravel, Coal, Dry, Medium Dense, Slightly Organic Odor, SM, **(FILL)**	8.0	SS S-2	75	4-5-8-9 (13)		1.4
			4.0 ft Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	6.0	SS S-3	50	7-8-4-6 (12)		0.6
5			6.0 ft Black, Slightly Organic Silt with Sand and Gravel, Trace Wood, Damp, Medium Stiff, Slightly Organic Odor, ML, **(FILL)**	4.0	SS S-4	12	5-3-4-2 (7)		0.7
			7.5 ft ▽ 8.0 ft Gray, Silty Sand, Few Cinders, Wet, Loose, SM, **(FILL)**	2.5 / 2.0					0.6
			9.5 ft Brown, Fibrous PEAT, Damp, Soft, PT, Organic Content 42.4%, **(Organics)**	0.5	SS S-5	88	WOH-WOH-2-2 (2)		0.3
10			11.0 ft Gray, Silty Sand with Gravel, Trace Roots/ Wood, Wet, Very Loose to Medium Dense, SM, **(OUTWASH)**	-1.0	SS S-6	80	3-7-17-17 (24)		0.2
			Brown, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)**		SS S-7	75	13-34-30-50 (64)		0.9
			14.0 ft End of boring at 14.0 feet	-4.0					0.8
15									
20									
25									
30									

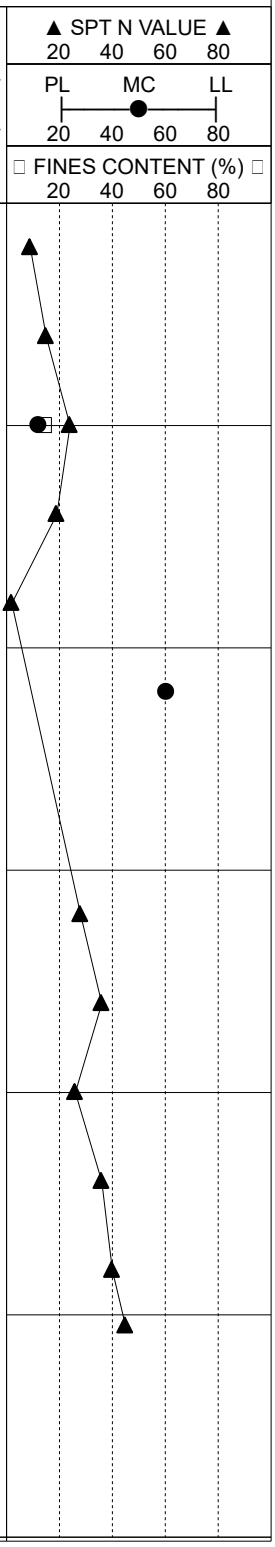


Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-2-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623973 **LONGITUDE** -70.917976
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 12.0 ft / Elev -1.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Tan, Silty Sand with Gravel, Dry, Loose, SM, **(FILL)**	11	SS S-1	75	3-3-6-6 (9)		0.1
2.0 ft		Light Brown, Silty Sand, Moist, Medium Dense, SM, **(FILL)**	9.0	SS S-2	100	4-5-10-12 (15)		0.2
5.0 ft		Dark Brown, SLIGHTLY ORGANIC SILTY SAND WITH GRAVEL, Trace Brick, Roots, Moist, Medium Dense, SM, Organic Content 2.1%, **(FILL)**	6.0	SS S-3	100	8-13-11-12 (24)		0.3
				SS S-4	90	10-11-8-9 (19)		0.3
8.0 ft		Tan, Silty Sand, Trace Gravel, Dry, Very Loose, SM, **(FILL)**	3.0					
8.8 ft		Dark Brown, Organic Silt with Sand, Trace Roots, Dry, Soft, OL, **(ORGANICS)**	2.2	SS S-5	65	2-1-1-2 (2)		0.3
10.0 ft		Black, Organic Sand with Silt, Moist, Very Soft, OL, Organic Content 9.7%, **(ORGANICS)**	1.0	SS S-6	100	--		0.1
12.0 ft		Dark Brown, Slightly Organic Silty Sand, Trace Roots, Moist, Loose, SM, **(ORGANICS)**	-1.0	SS S-7	100	--		0.6
14.0 ft		Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)**	-3.0	SS S-8	70	11-11-17-21 (28)		0.6
15.0 ft		Gray, Silty Sand with Gravel, Wet, Dense, SM, **(OUTWASH)**	-4.0	SS S-9	95	10-15-21-18 (36)		0.5
17.0 ft		Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)**	-6.0	SS S-10	60	12-14-12-15 (26)		0.2
19.0 ft		Gray, Silty Sand with Gravel, Wet, Dense, GM, **(TILL)**	-8.0	SS S-11	40	11-15-21-22 (36)		0.3
21.0 ft			-10.0	SS S-12	25	6-16-24-21 (40)		0.2
25.0 ft	Split Spoon Refusal at 25.5' bgs	No Recovery	-14.0	SS S-13	0	45 (45)		
25.5 ft		End of boring at 25.5 feet	-14.5					



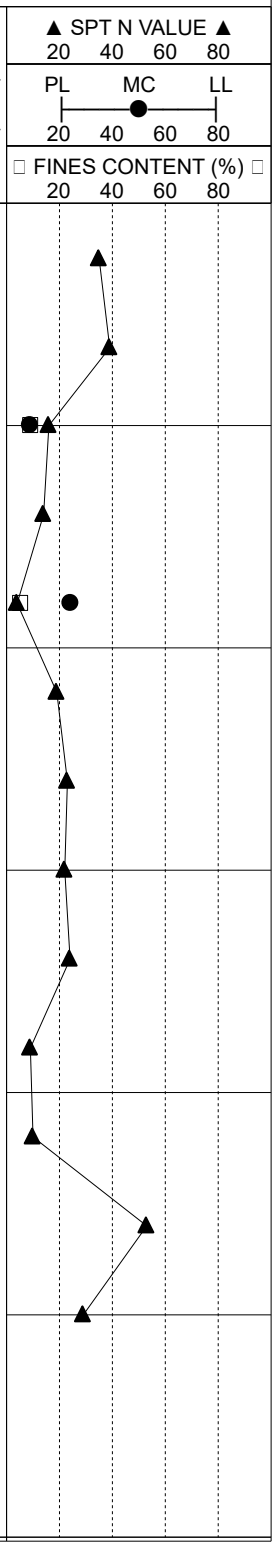
PROPERTY 2 (18 WRIGHT ST. NEW BEDFORD, MA)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-2-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	8.70 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624047 **LONGITUDE** -70.917329
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/06/2023 6.0 ft / Elev 2.7 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0.2 ft		3" Asphalt	8.4					
		Tan to Brown, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)**		SS S-1	60	11-13-22-17 (35)		0.3
2.2 ft		Brown to Black, Poorly-Graded Gravel / Asphalt with Sand and Silt, Dry, Dense, GP, **(FILL)**	6.4	SS S-2	750	27-26-13-10 (39)		1.2
3.8 ft / 4.0 ft		Tan, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)**	5.0 / 4.7	SS S-3	70	10-8-8-7 (16)		1.0
6.0 ft		Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Few Debris / Roots, Dry, Medium Dense, SP-SM, **(FILL)**	2.7	SS S-4	65	7-8-6-6 (14)		0.1
8.0 ft		Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense, SP-SM, **(FILL)**	0.7	SS S-5	45	3-2-2-4 (4)		1.3
10.0 ft		Gray, POORLY-GRADED SAND WITH SILT, Trace Shells, Wet, Loose, Slight Petroleum Odor, SP-SM, **(FILL)**	-1.3	SS S-6	70	5-5-14-16 (19)		1.9
11.0 ft		Black to Gray, Silty Sand with Gravel, Trace Shells, Wet, Medium Dense, Petroleum Odor, SM, **(FILL)**	-2.3	SS S-7	75	16-12-11-13 (23)		0.2
12.5 ft		Gray, Silty Gravel with Sand, Trace Shells, Wet, Medium Dense, GM, **(OUTWASH)**	-3.8	SS S-8	40	9-9-13-12 (22)		0.0
14.0 ft		Grayish Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)**	-5.3	SS S-9	55	7-12-12-11 (24)		0.2
16.0 ft		Tan, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(OUTWASH)**	-7.3	SS S-10	45	6-5-4-6 (9)		0.4
18.0 ft	Black, Slightly Organic Sand Seam at 18' bgs.	Tan, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-9.3	SS S-11	60	2-4-6-20 (10)		0.8
20.0 ft		Orange, Silty Sand with Gravel, Wet, Loose, SM, **(OUTWASH)**	-11.3	SS S-12	60	12-36-17-50 (53)		0.2
22.0 ft		Orange / Brown, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-13.3	SS S-13	45	11-12-17-17 (29)		0.5
26.0 ft		Orange / Brown, Silty Gravel with Sand, Wet, Medium Dense to Very Dense, GM, **(TILL)**	-17.3					
		End of boring at 26.0 feet						



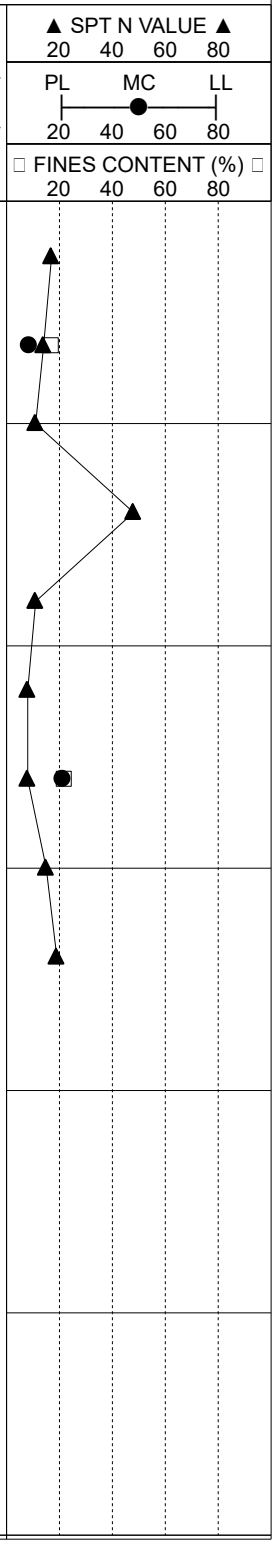
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-3-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	9.60 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624116 **LONGITUDE** -70.916931
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/06/2023 8.0 ft / Elev 1.6 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0.2 ft	3" Asphalt	9.4					
	Tan, Silty Sand, Dry, Medium Dense, SM, **(FILL)**		SS S-1	55	4-6-11-12 (17)		0.0
2.2 ft	Brown, SILTY SAND, FEW GRAVEL, Dry, Medium Dense, SM, **(FILL)**	7.4	SS S-2	50	5-8-6-6 (14)		1.0
4.2 ft	Brown to Dark Brown, Silty Sand with Gravel, Dry, Medium Dense to Dense, SM, **(FILL)**	5.4	SS S-3	50	7-5-6-22 (11)		0.0
			SS S-4	50	25-24-24-17 (48)		0.3
8.0 ft	Brown to Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense to Loose, SP-SM, **(OUTWASH)**	1.6	SS S-5	55	4-6-5-4 (11)		0.2
			SS S-6	55	3-4-4-4 (8)		0.9
12.0 ft	Gray, Slightly Organic SILTY SAND, FEW GRAVEL, Trace Shells, Wet, Loose, Slight Organic Odor, SM, Organic Content 1.1%, **(OUTWASH)**	-2.4	SS S-7	75	5-3-5-9 (8)		1.2
14.0 ft	Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(OUTWASH)**	-4.4	SS S-8	60	5-7-8-7 (15)		0.2
			SS S-9	75	7-10-9-7 (19)		0.3
18.0 ft	End of boring at 18.0 feet	-8.4					

REMARKS



PROJECT TITLE: MASSCEC PHASE III TERMINAL EXPANSION
PROJECT LOCATION: NEW BEDFORD MASSACHUSETTS
PROJECT NUMBER: 332-344

DATE: 11/26/24
PREPARED BY: ITB
CHECKED BY: BEP

Civil & Environmental Consultants, Inc.

OBSERVATION HOLE LOG (DRAINAGE TEST PITS)

TEST PIT # 1-54 WRIGHT GND. EL. 9.5'
DATE: 11-26-24 GW. EL. 1.5'
TEST BY: ITB
WITNESSED BY: EMW

DEPTH (IN)	ELEV (MLLW)	SOIL HORIZON	SOIL COLOR	SOIL TEXTURE	OTHER
0	9.5'				
		HTM	DARK BROWN	LOAMY SAND	TOPSOIL/ FILL
8"	8.8'				
		HTM	LIGHT TAN	LOAMY SAND	CLEAN SANDY FILL
32"	6.8'				
		HTM	GRAY, BROWN, BLACK	TBD	FILL (RUBBLE, GLASS,ETC)
96"	1.5'				
		HTM	DARK BROWN, BLACK	TBD	ORGANIC MATERIAL & PEAT
144"	-2.5'				
		C	GRAY	TBD	SILTY SAND
156"	-3.5'				

MOTTLING OBSERVED @ N/A
STANDING WATER OBSERVED @ 1.5'

OBSERVATION HOLE LOG (DRAINAGE TEST PITS)

TEST PIT # 2-18 WRIGHT GND. EL. 10.1'
DATE: 11-26-24 GW. EL. -1.9'
TEST BY: ITB
WITNESSED BY: EMW

DEPTH (IN)	ELEV (MLLW)	SOIL HORIZON	SOIL COLOR	SOIL TEXTURE	OTHER
0	10.1'				
		HTM	DARK BROWN	LOAMY SAND	TOPSOIL/ FILL
4"	9.8'				
		HTM	LIGHT TAN	LOAMY SAND	CLEAN SANDY FILL
52"	5.8'				
		HTM	DARK BROWN, BLACK	TBD	ORGANIC MATERIAL & PEAT
144"	-1.9'				
		C	GRAY	TBD	GRAVELLY SILTY SAND
150"	-2.4'				

MOTTLING OBSERVED @ N/A
STANDING WATER OBSERVED @ -1.9'

OBSERVATION HOLE LOG (DRAINAGE TEST PITS)

TEST PIT # 3-18 WRIGHT GND. EL. 10.9'
DATE: 11-26-24 GW. EL. 2.9'
TEST BY: ITB
WITNESSED BY: EMW

DEPTH (IN)	ELEV (MLLW)	SOIL HORIZON	SOIL COLOR	SOIL TEXTURE	OTHER
0	10.9'				
		HTM	DARK BROWN	TBD	TOPSOIL/ FILL
4"	10.6'				
		HTM	LIGHT TAN	LOAMY SAND	CLEAN SANDY FILL
44"	7.3'				
		HTM	DARK BROWN, BLACK	TBD	BRICK, WOOD, GLASS
96"	2.9'				
		C	GRAY	TBD	GRAVELLY SANDY OUTWASH
100"	2.6'				

MOTTLING OBSERVED @ N/A
STANDING WATER OBSERVED @ 2.9'

OBSERVATION HOLE LOG (DRAINAGE TEST PITS)

TEST PIT # 4-18 WRIGHT GND. EL. 11.1'
DATE: 11-26-24 GW. EL. 1.1'
TEST BY: ITB
WITNESSED BY: EMW

DEPTH (IN)	ELEV (MLLW)	SOIL HORIZON	SOIL COLOR	SOIL TEXTURE	OTHER
0	11.1'				
		HTM	BLACK	N/A	ASPHALT & GRAVEL
4"	10.8'				
		HTM	LIGHT TAN	LOAMY SAND	SANDY FILL W/ BRICKS
60"	6.1'				
		HTM	GRAY	TBD	SILTY FILL W/BRICKS, ROCKS
120"	1.1'				

MOTTLING OBSERVED @ N/A
STANDING WATER OBSERVED @ 1.1'

Thielsch DIVISION OF THE RISE GROUP	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 cts.thielsch.com *Let's Build a Solid Foundation*	Client Information: **Civil & Environmental Consultants, Inc.** **Raynham, MA** **774-501-2176** Project Contact: Israel Berl Collected By: EMW & ITB	Project Information: **MassCEC - Civil** **New Bedford, MA** Project Number: 332-344 Summary Page: 1 of 1 Report Date: 12.23.24

LABORATORY TESTING DATA SHEET, Report No.: 7424-M-177

Material Source	Sample ID	Depth (ft)	Laboratory No.	Identification Tests									Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Rcvd Moisture Content %	LL %	PL %	OD LL	Gravel %	Sand %	Fines %	Org. %	pH	g_d MAX (pcf) W_{opt} (%)	g_d MAX (pcf) W_{opt} (%) (Corr.)	Dry unit wt. (pcf)	Test Moisture Content %	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318			D6913			D2974	D4792	D1557								
54 Wright	CV-TP-01	-	24-S-5189					8.6	79.6	11.8											Dark Brown well-graded sand with silt // Sand
18 Wright	CV-TP-02A	8	24-S-5190					35.5	48.9	15.6											Dark Brown silty sand with gravel // Loamy Sand
18 Wright	CV-TP-02B	10	24-S-5191					22.9	63.0	14.1											Dark Brown silty sand with gravel // Loamy Sand
18 Wright	CV-TP-03	-	24-S-5192					27.1	58.2	14.7											Dark Brown silty sand with gravel // Loamy Sand
18 Wright	CV-TP-04	-	24-S-5193					19.1	73.7	7.2											Brown poorly graded sand with silt and gravel // Sand

Date Received: 12.12.24 Reviewed By: Date Reviewed: 12.23.24

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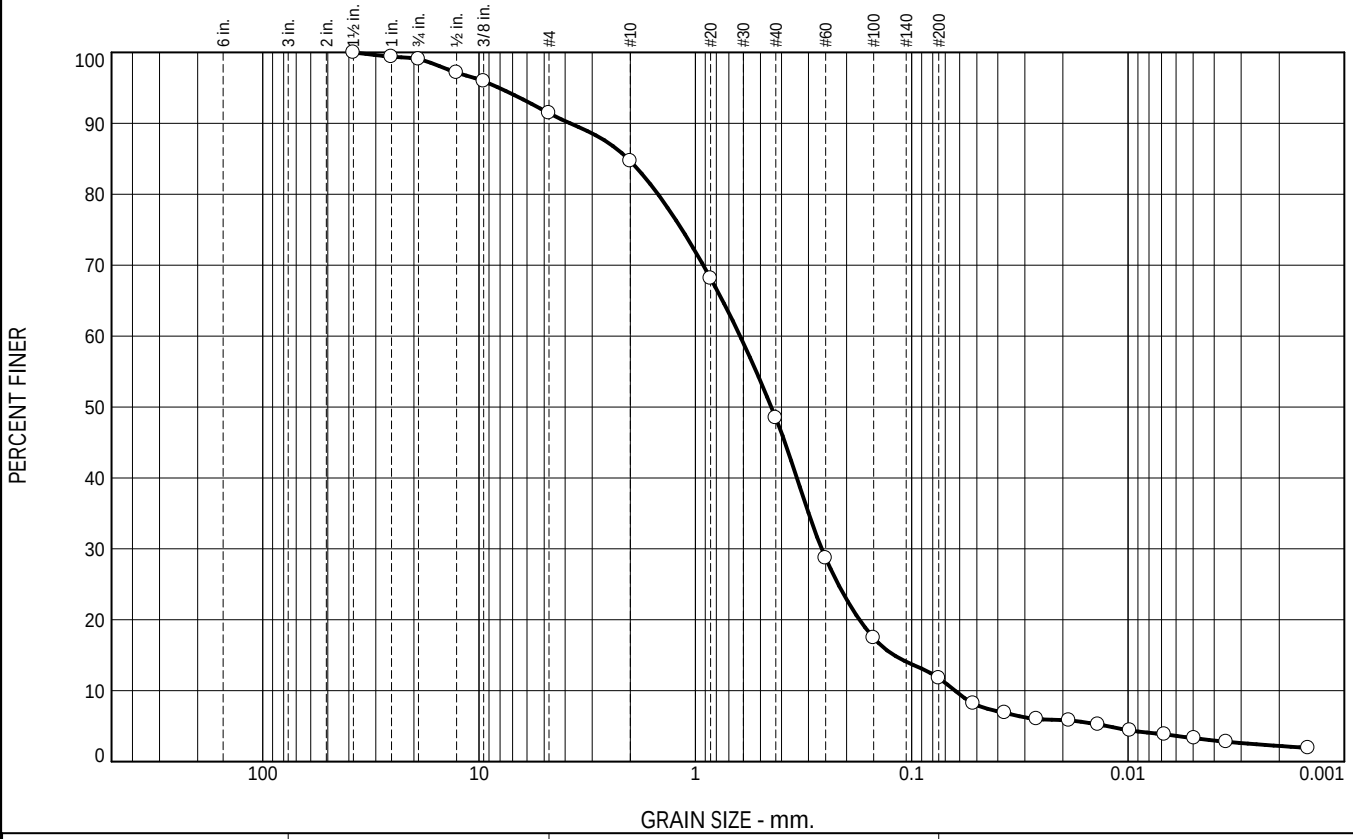
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.9	7.7	6.7	36.2	36.7	9.6	2.2

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	99.4		
3/4"	99.1		
1/2"	97.2		
3/8"	95.9		
#4	91.4		
#10	84.7		
#20	68.1		
#40	48.5		
#60	28.7		
#100	17.4		
#200	11.8		
0.0519 mm.	8.2		
0.0372 mm.	6.9		
0.0265 mm.	6.0		
0.0188 mm.	5.8		
0.0138 mm.	5.2		
0.0098 mm.	4.4		
0.0068 mm.	3.8		
0.0049 mm.	3.3		
0.0035 mm.	2.8		
0.0015 mm.	1.9		

* (no specification provided)

Soil Description

Dark Brown well-graded sand with silt // Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 3.7834 D_{85}= 2.0481 D_{60}= 0.6211
D_{50}= 0.4457 D_{30}= 0.2607 D_{15}= 0.1207
D_{10}= 0.0631 C_u= 9.85 C_c= 1.74

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Source of Sample: 54 Wright
Sample Number: CV-TP-01

Date: 12.19.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.
Project: MassCEC - Civil
New Bedford, MA
Project No: 332-344 Fig. 24-S-5189

Tested By: RKO/MCS / RB/AB Checked By: Andrew Vanasse

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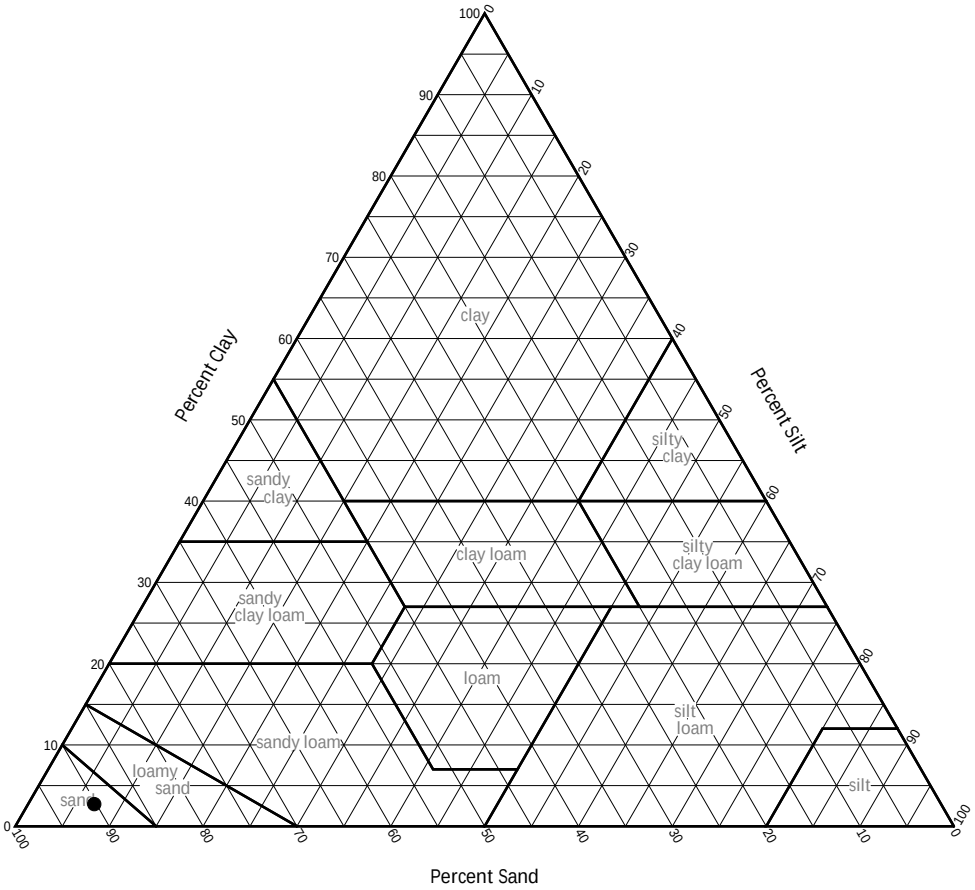
USDA Soil Classification



SOIL DATA

	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	54 Wright	CV-TP-01		90.2	7.2	2.6	Sand

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.

Project: MassCEC - Civil
New Bedford, MA

Project No.: 332-344

Fig. USDA-5189

Checked By: AV

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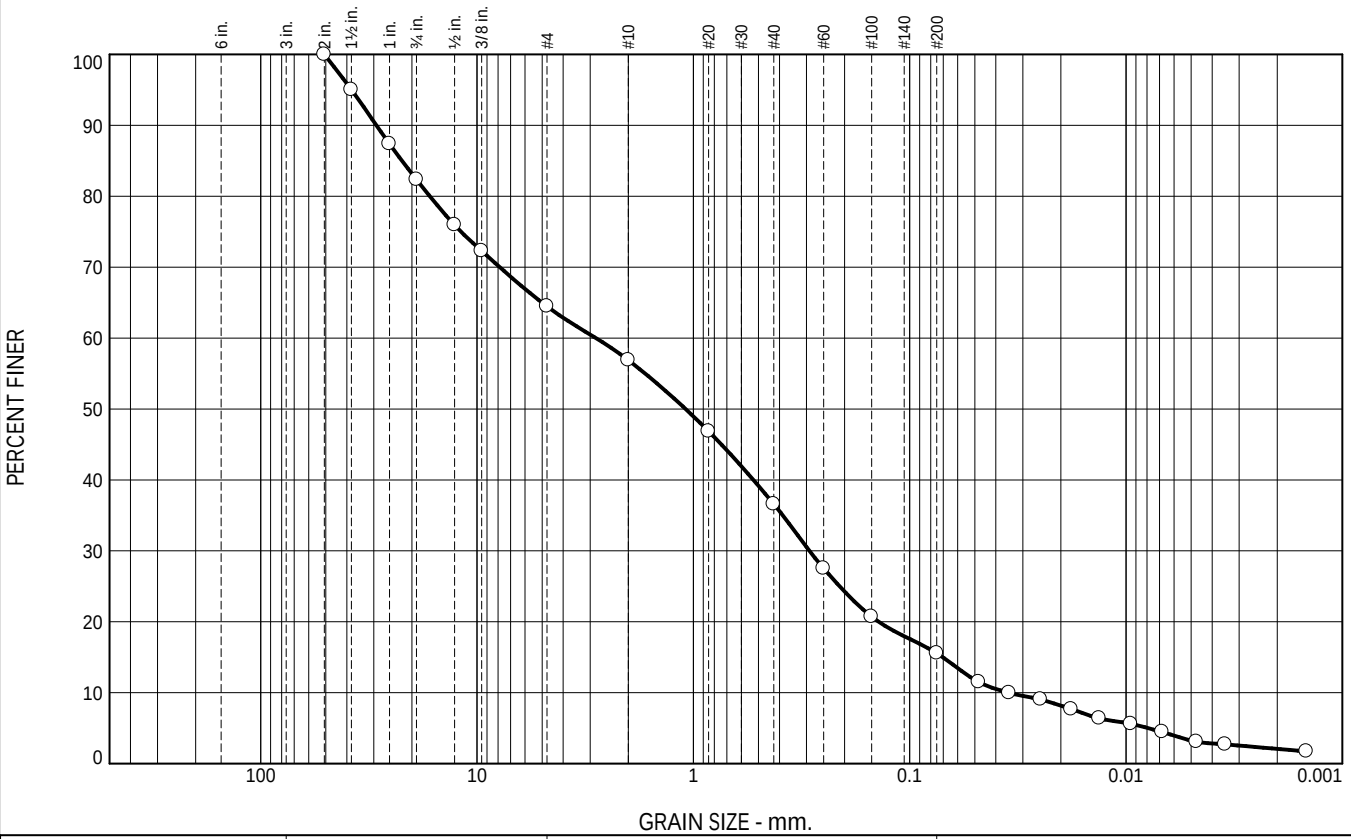
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.7	17.8	7.6	20.3	21.0	13.5	2.1

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	95.0		
1"	87.4		
3/4"	82.3		
1/2"	75.9		
3/8"	72.3		
#4	64.5		
#10	56.9		
#20	46.9		
#40	36.6		
#60	27.5		
#100	20.7		
#200	15.6		
0.0480 mm.	11.5		
0.0347 mm.	10.0		
0.0249 mm.	9.0		
0.0179 mm.	7.7		
0.0133 mm.	6.4		
0.0095 mm.	5.6		
0.0068 mm.	4.5		
0.0047 mm.	3.1		
0.0035 mm.	2.7		
0.0015 mm.	1.7		

* (no specification provided)

Soil Description

Dark Brown silty sand with gravel // Loamy Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 29.1771 D_{85}= 22.2255 D_{60}= 2.8230
D_{50}= 1.0864 D_{30}= 0.2909 D_{15}= 0.0704
D_{10}= 0.0350 C_u= 80.63 C_c= 0.86

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: 18 Wright Depth: 8'
Sample Number: CV-TP-02A

Date: 12.19.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.
Project: MassCEC - Civil
New Bedford, MA
Project No: 332-344 Fig. 24-S-5190

Tested By: RKO/MCS / RB/AB Checked By: Andrew Vanasse

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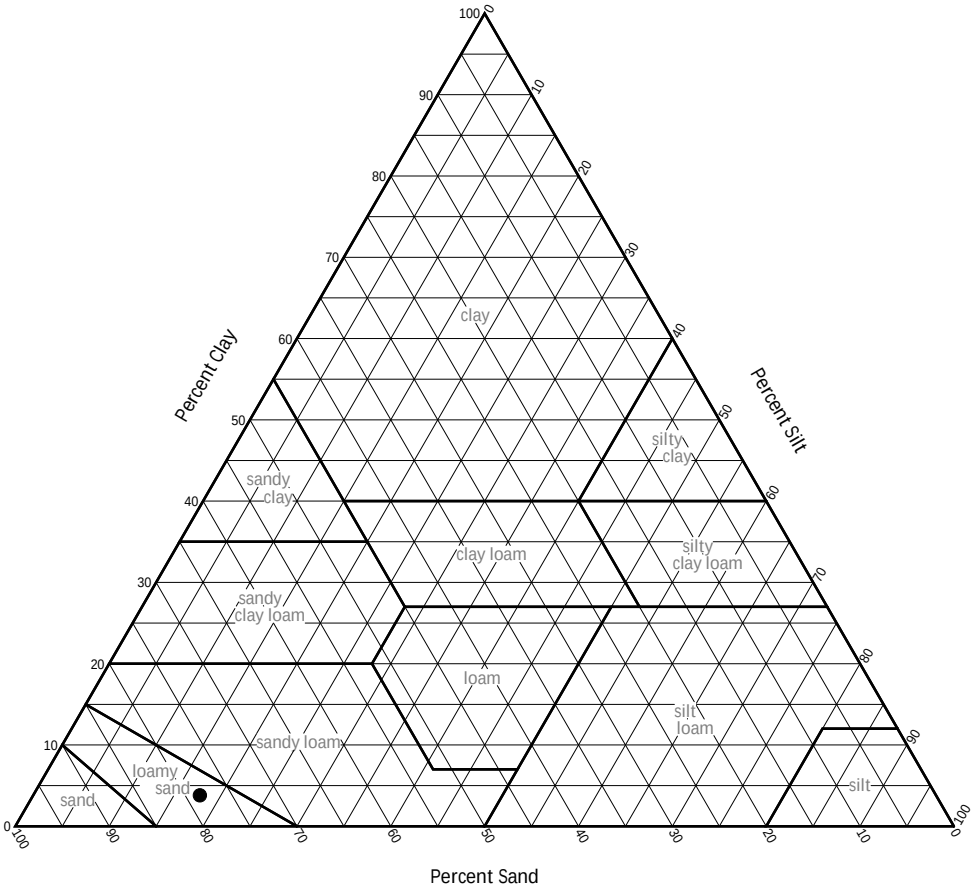
USDA Soil Classification



SOIL DATA

	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	18 Wright	CV-TP-02A	8'	78.4	17.9	3.7	Loamy sand

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.

Project: MassCEC - Civil
New Bedford, MA

Project No.: 332-344

Fig. USDA-5190

Checked By: AV

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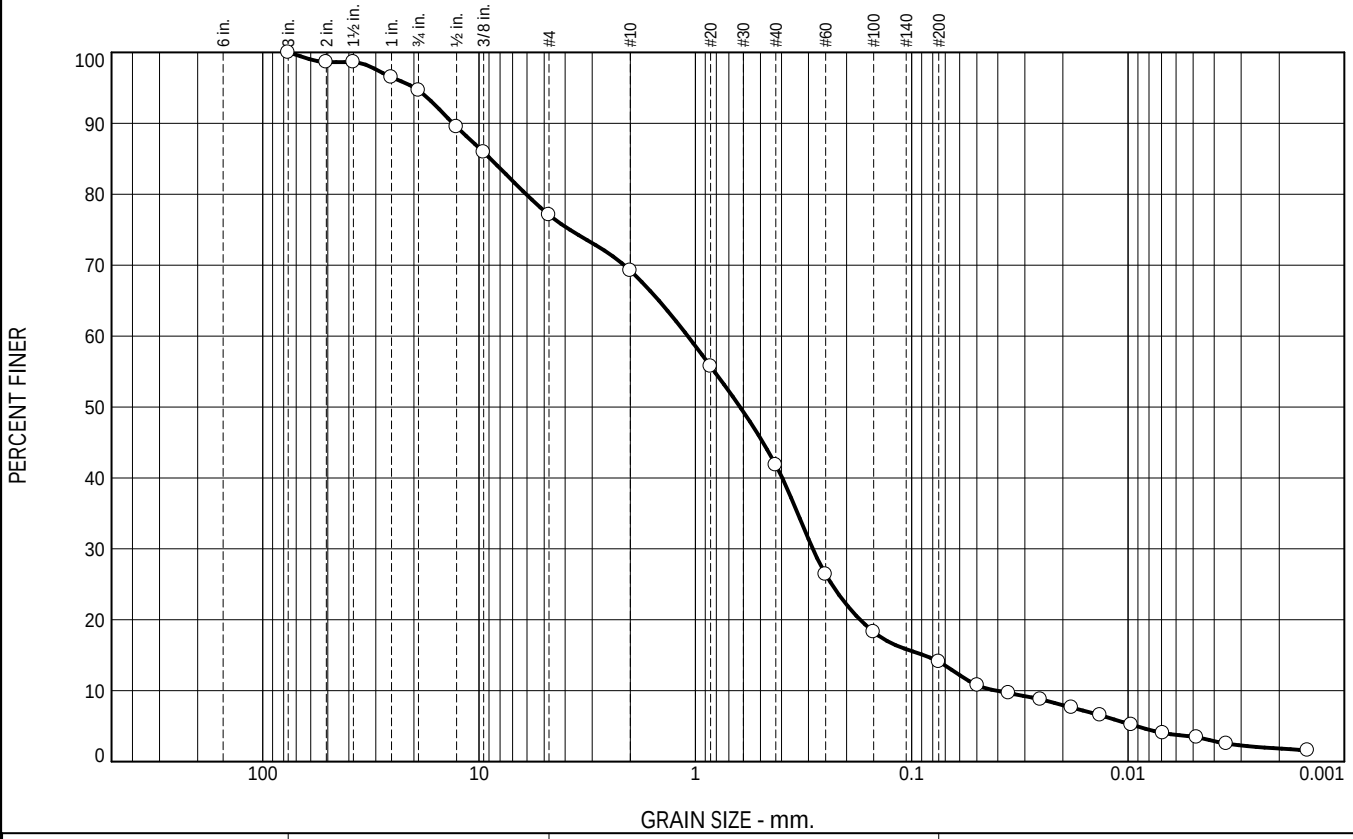
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.3	17.6	7.9	27.4	27.7	12.3	1.8

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100.0		
2"	98.6		
1 1/2"	98.6		
1"	96.5		
3/4"	94.7		
1/2"	89.5		
3/8"	85.9		
#4	77.1		
#10	69.2		
#20	55.7		
#40	41.8		
#60	26.4		
#100	18.3		
#200	14.1		
0.0497 mm.	10.7		
0.0356 mm.	9.7		
0.0254 mm.	8.8		
0.0182 mm.	7.6		
0.0135 mm.	6.5		
0.0097 mm.	5.2		
0.0069 mm.	4.0		
0.0048 mm.	3.4		
0.0035 mm.	2.5		
0.0015 mm.	1.6		

* (no specification provided)

Soil Description

Dark Brown silty sand with gravel // Loamy Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 13.1971 D_{85}= 8.8572 D_{60}= 1.0839
D_{50}= 0.6215 D_{30}= 0.2867 D_{15}= 0.0878
D_{10}= 0.0406 C_u= 26.71 C_c= 1.87

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: 18 Wright Depth: 10'
Sample Number: CV-TP-02B

Date: 12.19.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.
Project: MassCEC - Civil
New Bedford, MA
Project No: 332-344 Fig. 24-S-5191

Tested By: MCS / RB/SBR Checked By: Andrew Vanasse

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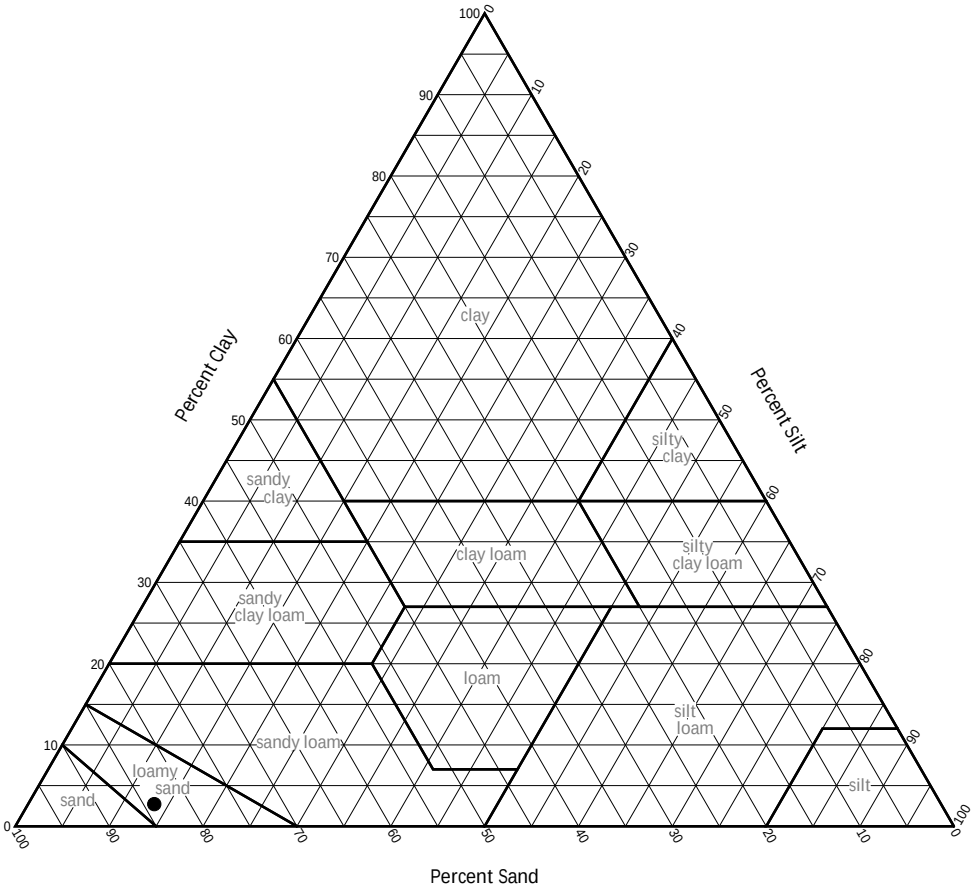
USDA Soil Classification



SOIL DATA

	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	18 Wright	CV-TP-02B	10'	83.8	13.6	2.6	Loamy sand

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.

Project: MassCEC - Civil
New Bedford, MA

Project No.: 332-344

Fig. USDA-5191

Checked By: AV

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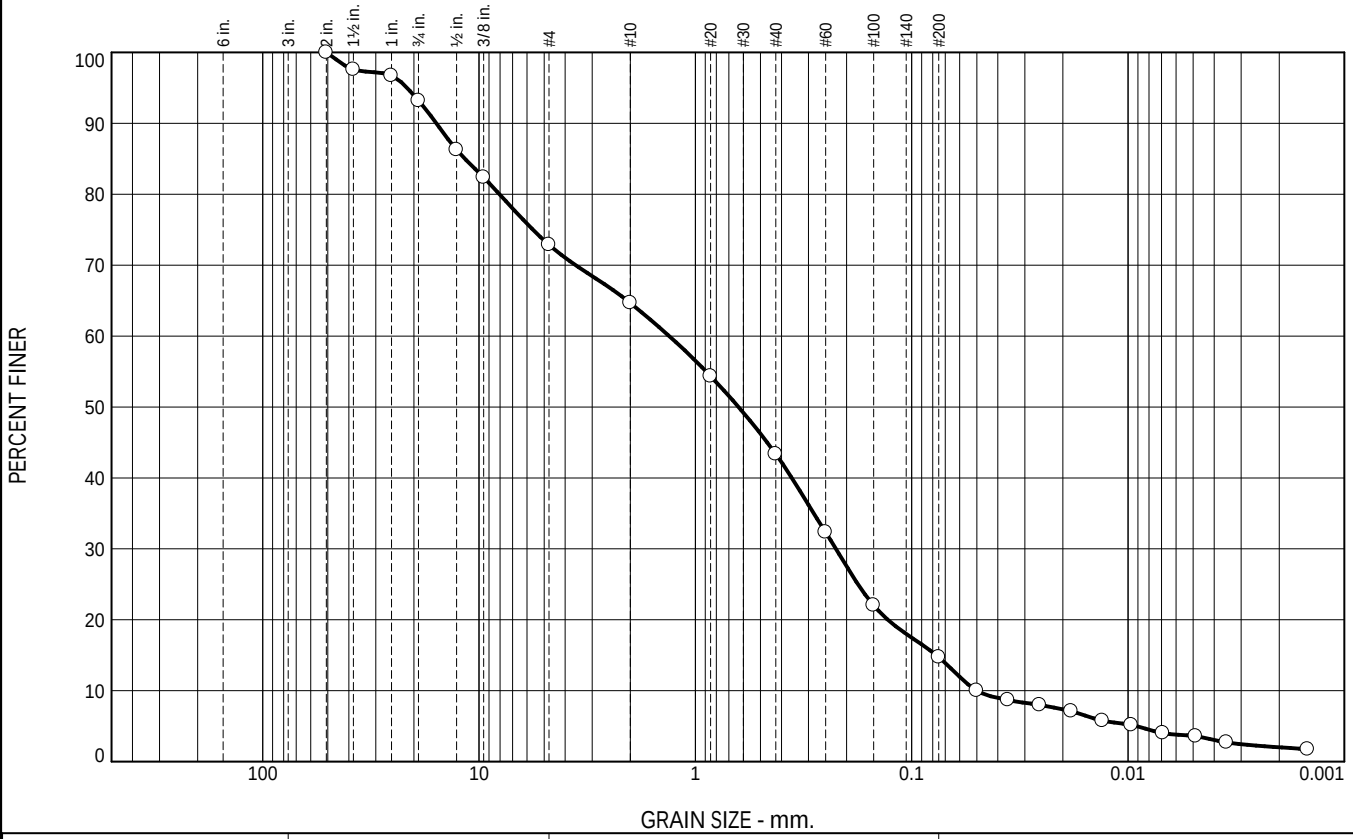
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.8	20.3	8.2	21.3	28.7	12.7	2.0

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	97.6		
1"	96.7		
3/4"	93.2		
1/2"	86.3		
3/8"	82.4		
#4	72.9		
#10	64.7		
#20	54.3		
#40	43.4		
#60	32.3		
#100	22.0		
#200	14.7		
0.0501 mm.	10.0		
0.0359 mm.	8.7		
0.0256 mm.	8.0		
0.0183 mm.	7.1		
0.0131 mm.	5.8		
0.0097 mm.	5.2		
0.0069 mm.	4.0		
0.0049 mm.	3.6		
0.0035 mm.	2.7		
0.0015 mm.	1.7		

* (no specification provided)

Soil Description

Dark Brown silty sand with gravel // Loamy Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 15.7511 D_{85}= 11.6197 D_{60}= 1.3207
D_{50}= 0.6316 D_{30}= 0.2240 D_{15}= 0.0770
D_{10}= 0.0499 C_u= 26.44 C_c= 0.76

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: 18 Wright
Sample Number: CV-TP-03

Date: 12.19.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.
Project: MassCEC - Civil
New Bedford, MA
Project No: 332-344 Fig. 24-S-5192

Tested By: MCS / RB/SBR Checked By: Andrew Vanasse

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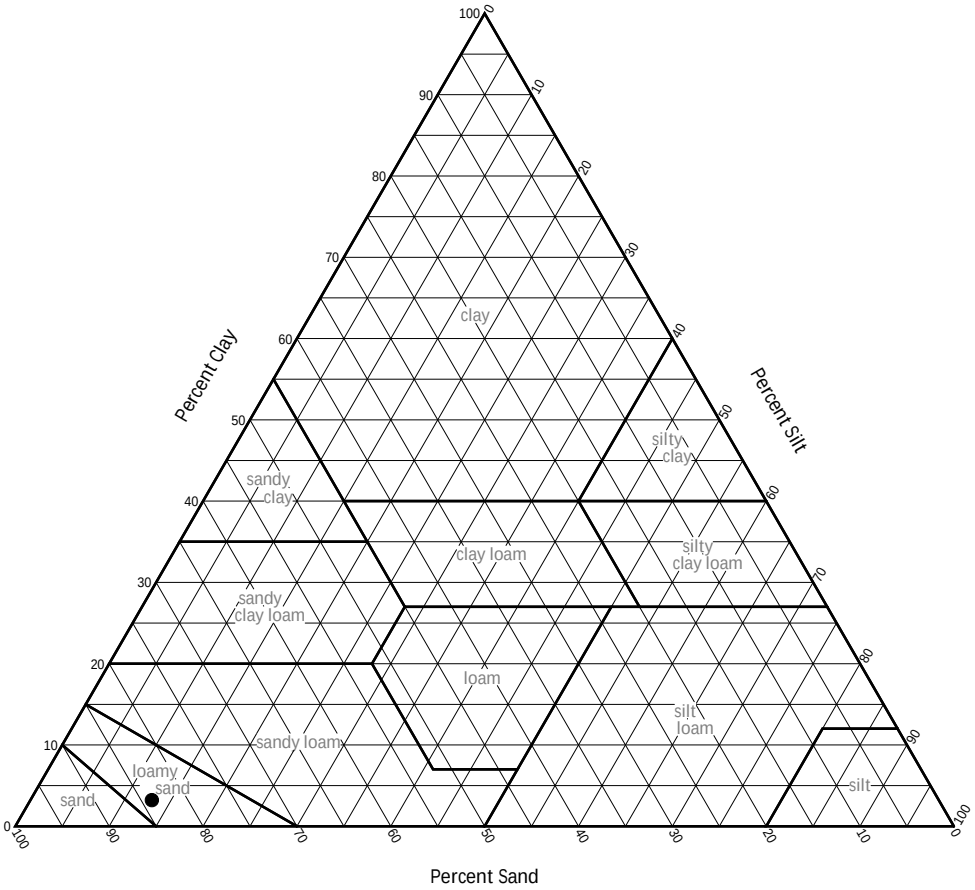
USDA Soil Classification



SOIL DATA

	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	18 Wright	CV-TP-03		83.8	13.1	3.1	Loamy sand

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.

Project: MassCEC - Civil
New Bedford, MA

Project No.: 332-344

Fig. USDA-5192

Checked By: AV

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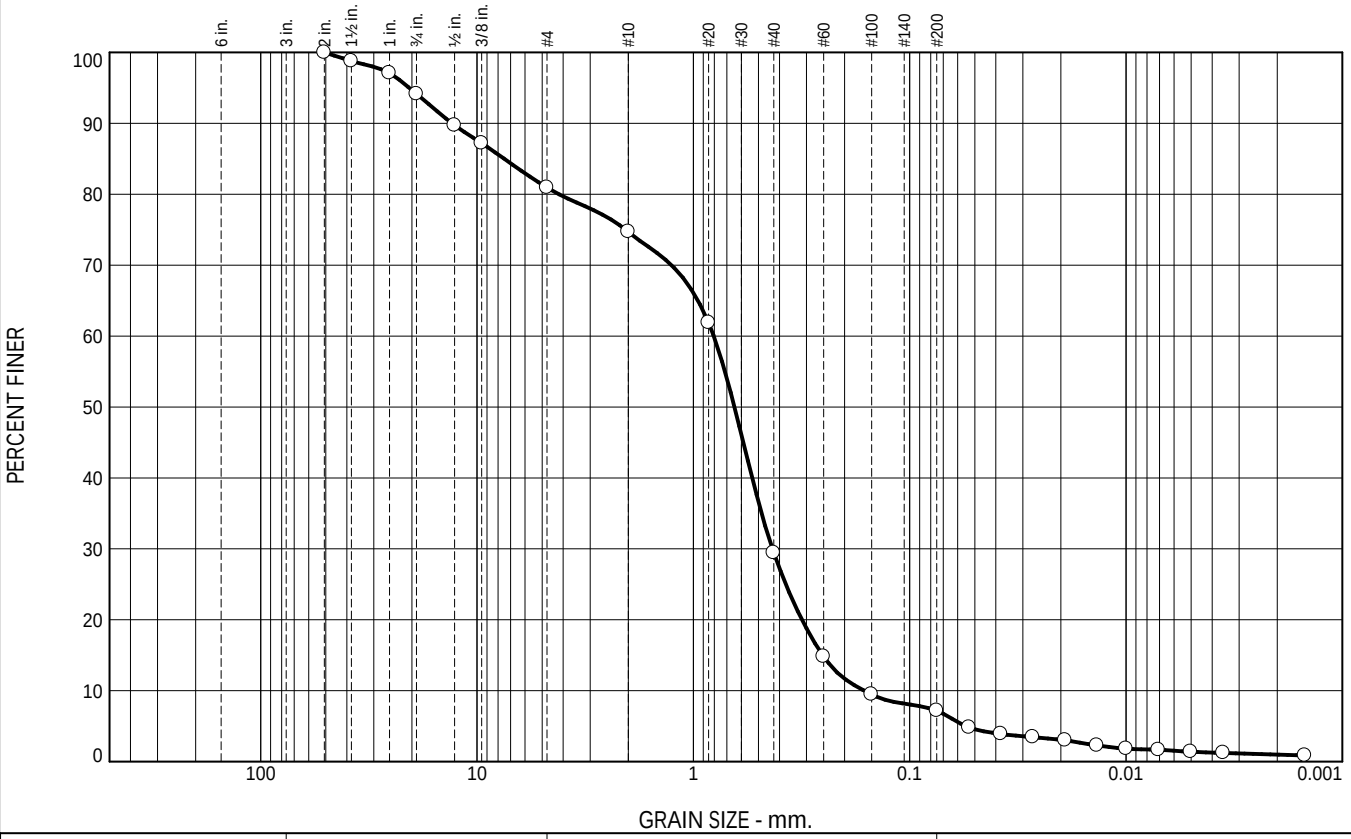
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.9	13.2	6.2	45.3	22.2	6.2	1.0

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	98.8		
1"	97.1		
3/4"	94.1		
1/2"	89.7		
3/8"	87.2		
#4	80.9		
#10	74.7		
#20	61.9		
#40	29.4		
#60	14.8		
#100	9.5		
#200	7.2		
0.0531 mm.	4.8		
0.0379 mm.	3.9		
0.0269 mm.	3.4		
0.0191 mm.	3.0		
0.0136 mm.	2.3		
0.0100 mm.	1.8		
0.0071 mm.	1.7		
0.0050 mm.	1.4		
0.0036 mm.	1.2		
0.0015 mm.	0.9		

* (no specification provided)

Soil Description

Brown poorly graded sand with silt and gravel // Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 13.0464 D_{85}= 7.4833 D_{60}= 0.8043
D_{50}= 0.6460 D_{30}= 0.4313 D_{15}= 0.2525
D_{10}= 0.1620 C_u= 4.97 C_c= 1.43

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Source of Sample: 18 Wright
Sample Number: CV-TP-04

Date: 12.19.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc.
Project: MassCEC - Civil
New Bedford, MA
Project No: 332-344 Fig. 24-S-5193

Tested By: MCS / RB/SBR Checked By: Andrew Vanasse

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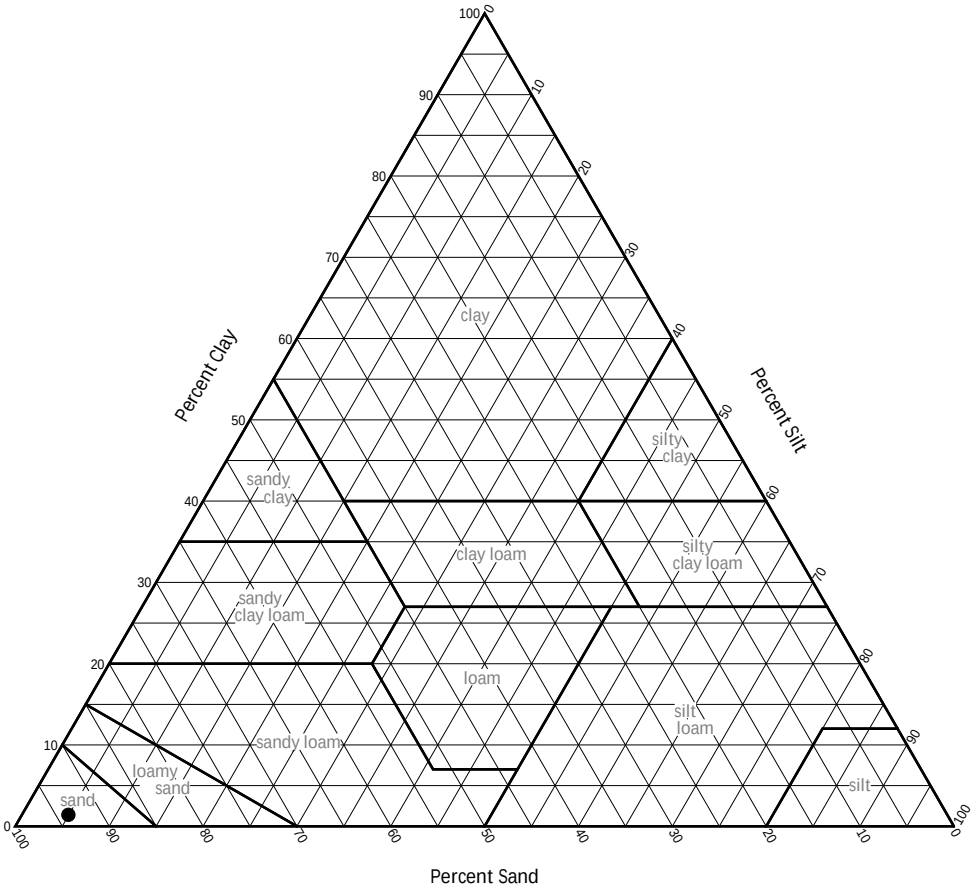
USDA Soil Classification



SOIL DATA

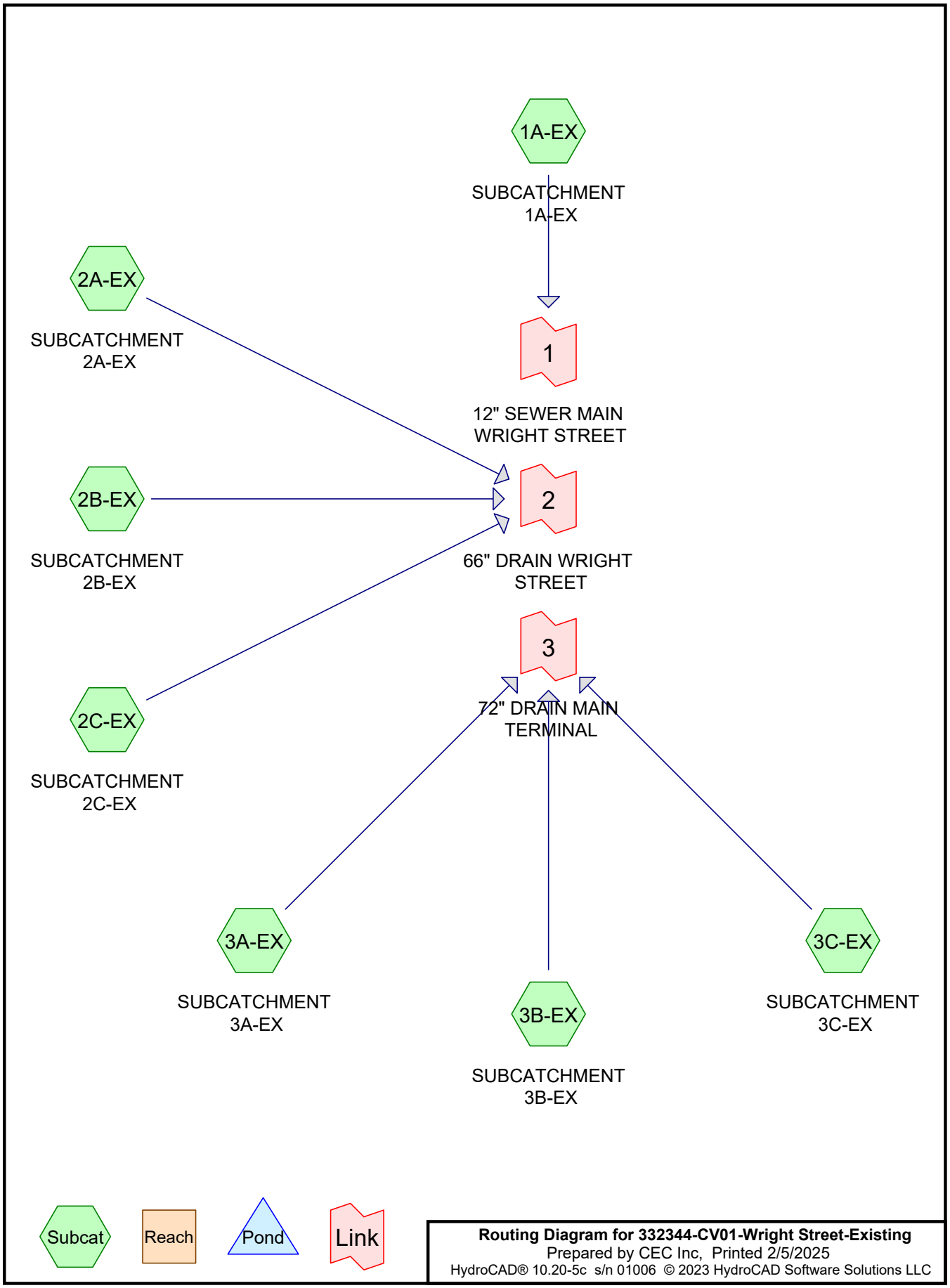
	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	18 Wright	CV-TP-04		93.6	5.1	1.3	Sand

Thielsch Engineering Inc. Cranston, RI	Client: Civil & Environmental Consultants, Inc. Project: MassCEC - Civil New Bedford, MA Project No.: 332-344 Fig. USDA-5193

Checked By: AV

APPENDIX C

SUPPORTING CALCULATIONS



Routing Diagram for 332344-CV01-Wright Street-Existing
Prepared by CEC Inc, Printed 2/5/2025
HydroCAD® 10.20-5c s/n 01006 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.40	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.80	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.60	2
4	100-Year	Type III 24-hr		Default	24.00	1	7.00	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.647	39	>75% Grass cover, Good, HSG A (1A-EX, 2A-EX, 2B-EX, 2C-EX, 3B-EX)
0.390	39	Grass swale >75% Grass cover, Good, HSG A (3A-EX, 3C-EX)
0.309	68	Grassed swale <50% Grass cover, Poor, HSG A (3B-EX)
0.031	96	Gravel surface, HSG A (2B-EX, 3B-EX)
0.033	68	Infiltration trench <50% Grass cover, Poor, HSG A (3A-EX, 3B-EX, 3C-EX)
3.118	98	Paved parking, HSG A (1A-EX, 2A-EX, 2B-EX, 2C-EX, 3B-EX, 3C-EX)
0.903	98	Roofs, HSG A (1A-EX, 2A-EX, 2C-EX, 3B-EX)
6.432	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
6.432	HSG A	1A-EX, 2A-EX, 2B-EX, 2C-EX, 3A-EX, 3B-EX, 3C-EX
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
6.432		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subc Numi
1.647	0.000	0.000	0.000	0.000	1.647	>75% Grass cover, Good	
0.390	0.000	0.000	0.000	0.000	0.390	Grass swale >75% Grass cover, Good	
0.309	0.000	0.000	0.000	0.000	0.309	Grassed swale <50% Grass cover, Poor	
0.031	0.000	0.000	0.000	0.000	0.031	Gravel surface	
0.033	0.000	0.000	0.000	0.000	0.033	Infiltration trench <50% Grass cover, Poor	
3.118	0.000	0.000	0.000	0.000	3.118	Paved parking	
0.903	0.000	0.000	0.000	0.000	0.903	Roofs	
6.432	**0.000**	**0.000**	**0.000**	**0.000**	**6.432**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A-EX: SUBCATCHMENT Runoff Area=17,024 sf 96.89% Impervious Runoff Depth>2.94"
Flow Length=321' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=1.22 cfs 0.096 af

Subcatchment2A-EX: SUBCATCHMENT Runoff Area=54,144 sf 53.11% Impervious Runoff Depth>0.95"
Flow Length=288' Tc=6.3 min CN=70 Runoff=1.23 cfs 0.098 af

Subcatchment2B-EX: SUBCATCHMENT Runoff Area=24,091 sf 77.14% Impervious Runoff Depth>2.09"
Flow Length=366' Slope=0.0100 '/' Tc=7.0 min CN=87 Runoff=1.29 cfs 0.096 af

Subcatchment2C-EX: SUBCATCHMENT Runoff Area=95,152 sf 96.08% Impervious Runoff Depth>2.94"
Flow Length=415' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=6.83 cfs 0.536 af

Subcatchment3A-EX: SUBCATCHMENT Runoff Area=4,568 sf 0.00% Impervious Runoff Depth>0.07"
Flow Length=1,505' Tc=10.7 min CN=45 Runoff=0.00 cfs 0.001 af

Subcatchment3B-EX: SUBCATCHMENT Runoff Area=61,203 sf 15.76% Impervious Runoff Depth>0.31"
Flow Length=1,225' Tc=6.0 min CN=55 Runoff=0.20 cfs 0.037 af

Subcatchment3C-EX: SUBCATCHMENT Runoff Area=23,981 sf 42.78% Impervious Runoff Depth>0.70"
Flow Length=1,214' Slope=0.0100 '/' Tc=6.0 min CN=65 Runoff=0.37 cfs 0.032 af

Link 1: 12" SEWER MAIN WRIGHT STREET Inflow=1.22 cfs 0.096 af
Primary=1.22 cfs 0.096 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=9.32 cfs 0.730 af
Primary=9.32 cfs 0.730 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=0.51 cfs 0.069 af
Primary=0.51 cfs 0.069 af

Total Runoff Area = 6.432 ac Runoff Volume = 0.895 af Average Runoff Depth = 1.67"
37.48% Pervious = 2.411 ac 62.52% Impervious = 4.021 ac

Summary for Subcatchment 1A-EX: SUBCATCHMENT 1A-EX

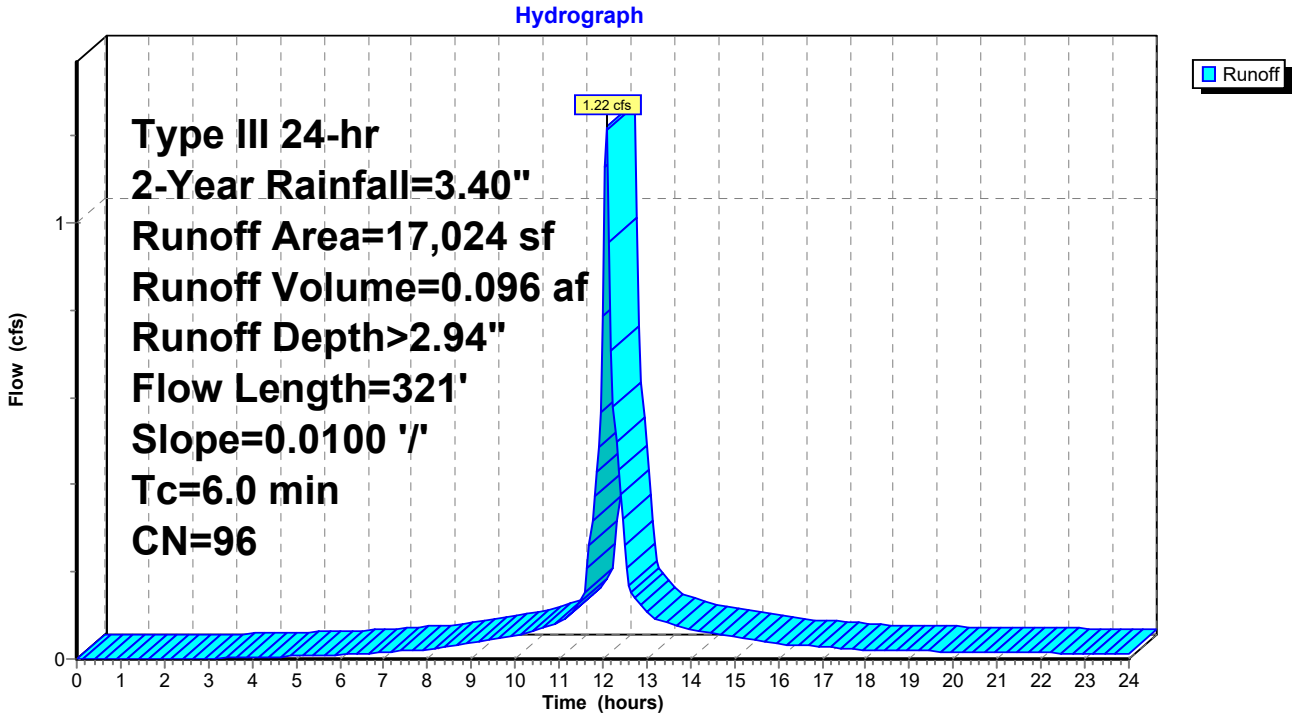
Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.096 af, Depth> 2.94"
Routed to Link 1 : 12" SEWER MAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
530	39	>75% Grass cover, Good, HSG A
11,090	98	Paved parking, HSG A
5,404	98	Roofs, HSG A
17,024	96	Weighted Average
530		3.11% Pervious Area
16,494		96.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Pavement to Catch Basin** Smooth surfaces n= 0.011 P2= 3.40"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Pavement to Catch Basin** Paved Kv= 20.3 fps
1.0	221	0.0100	3.54	1.39	**Pipe Channel, Combined Storm/Sewer pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
2.3	321	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1A-EX: SUBCATCHMENT 1A-EX



Summary for Subcatchment 2A-EX: SUBCATCHMENT 2A-EX

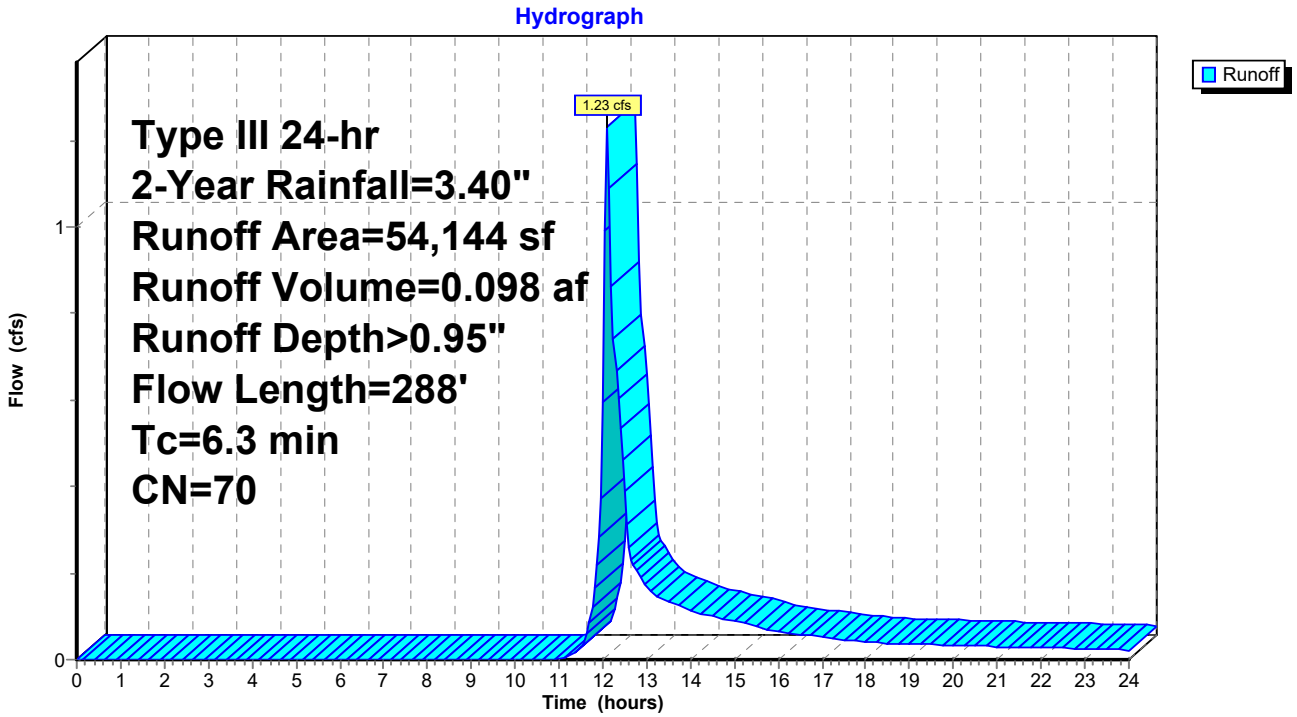
Runoff = 1.23 cfs @ 12.11 hrs, Volume= 0.098 af, Depth> 0.95"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
25,387	39	>75% Grass cover, Good, HSG A
24,930	98	Paved parking, HSG A
3,827	98	Roofs, HSG A
54,144	70	Weighted Average
25,387		46.89% Pervious Area
28,757		53.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0064	0.78		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.40"
1.0	101	0.0064	1.62		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.2	137	0.0060	0.54		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
6.3	288	Total			

Subcatchment 2A-EX: SUBCATCHMENT 2A-EX



Summary for Subcatchment 2B-EX: SUBCATCHMENT 2B-EX

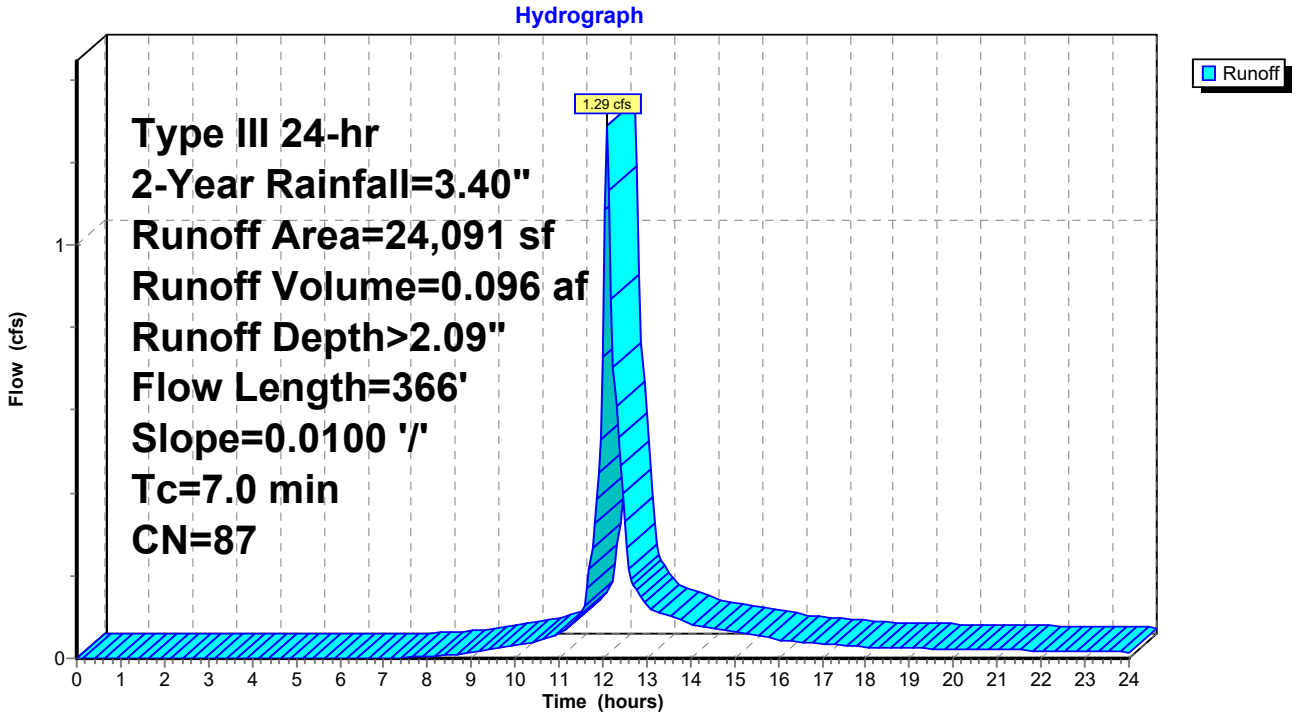
Runoff = 1.29 cfs @ 12.10 hrs, Volume= 0.096 af, Depth> 2.09"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
4,354	39	>75% Grass cover, Good, HSG A
18,584	98	Paved parking, HSG A
1,153	96	Gravel surface, HSG A
24,091	87	Weighted Average
5,507		22.86% Pervious Area
18,584		77.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	29	0.0100	0.10		**Sheet Flow, Grassed area** Grass: Short n= 0.150 P2= 3.40"
0.4	21	0.0100	0.79		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.2	148	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.7	168	0.0100	3.86	1.52	**Pipe Channel, Drain Pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
7.0	366	Total			

Subcatchment 2B-EX: SUBCATCHMENT 2B-EX



Summary for Subcatchment 2C-EX: SUBCATCHMENT 2C-EX

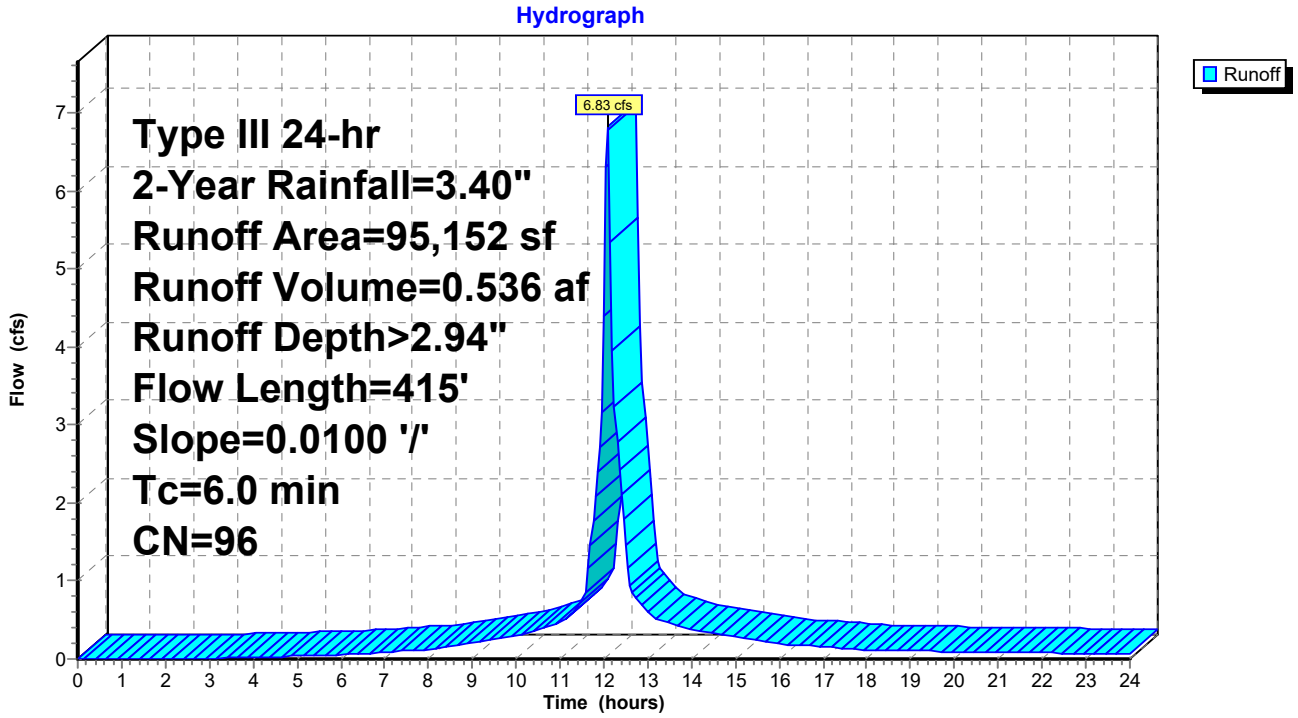
Runoff = 6.83 cfs @ 12.09 hrs, Volume= 0.536 af, Depth> 2.94"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
3,734	39	>75% Grass cover, Good, HSG A
65,565	98	Paved parking, HSG A
25,853	98	Roofs, HSG A
95,152	96	Weighted Average
3,734		3.92% Pervious Area
91,418		96.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.4	166	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.9	199	0.0100	3.86	1.52	**Pipe Channel, Drain pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
3.2	415	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-EX: SUBCATCHMENT 2C-EX



Summary for Subcatchment 3A-EX: SUBCATCHMENT 3A-EX

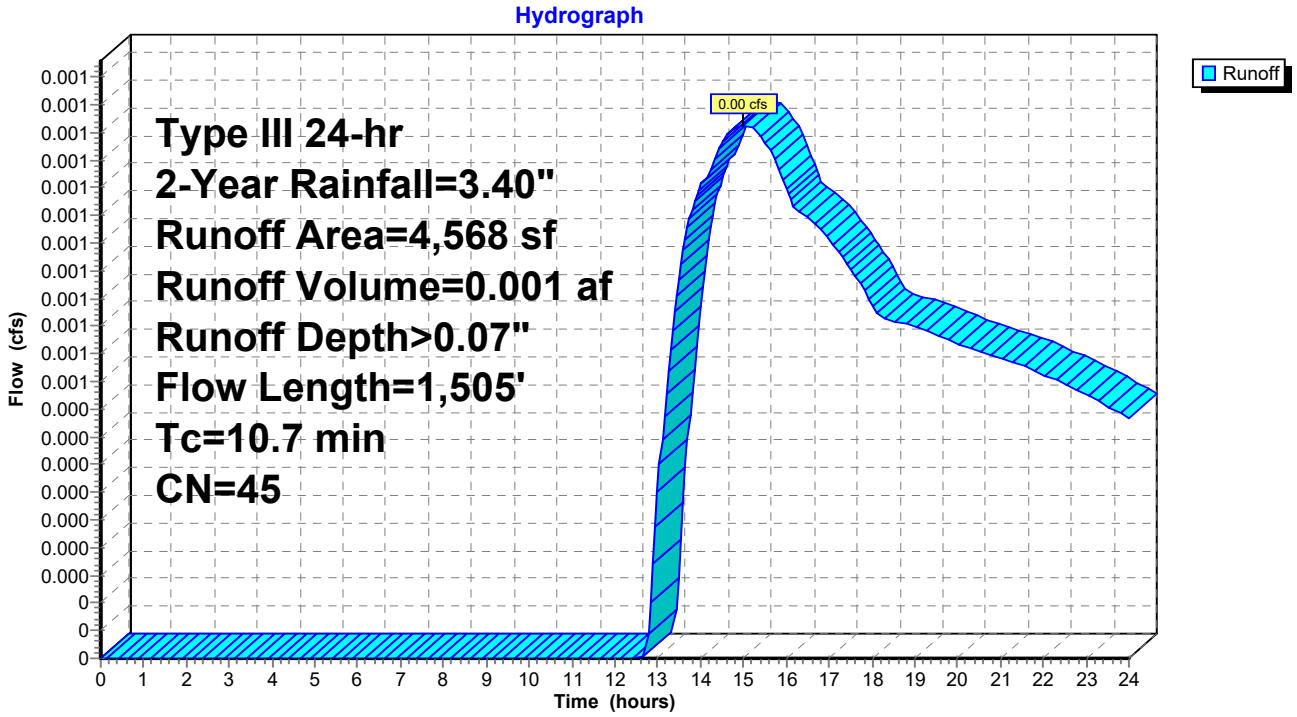
Runoff = 0.00 cfs @ 14.99 hrs, Volume= 0.001 af, Depth> 0.07"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	3,586	39	Grass swale >75% Grass cover, Good, HSG A
*	982	68	Infiltration trench <50% Grass cover, Poor, HSG A
	4,568	45	Weighted Average
	4,568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0055	0.22		**Sheet Flow, Heavy lift** Fallow n= 0.050 P2= 3.40"
1.8	128	0.0055	1.19		**Shallow Concentrated Flow, Heayv lift area** Unpaved Kv= 16.1 fps
4.0	628	0.0055	2.62	1.03	**Pipe Channel, CMP_Round 12"** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
1.1	699	0.0050	10.59	299.47	**Pipe Channel, RCP_Round 72"** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
10.7	1,505	Total			

Subcatchment 3A-EX: SUBCATCHMENT 3A-EX



Summary for Subcatchment 3B-EX: SUBCATCHMENT 3B-EX

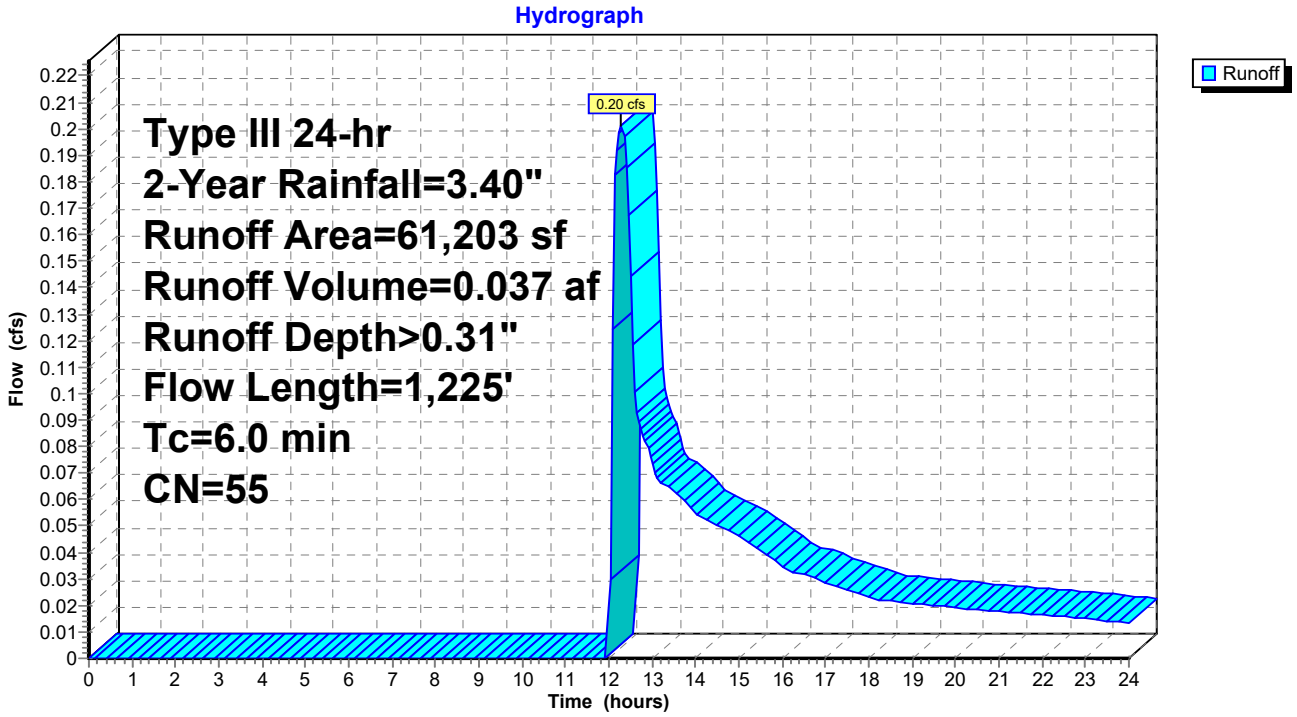
Runoff = 0.20 cfs @ 12.29 hrs, Volume= 0.037 af, Depth> 0.31"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
	37,725	39	>75% Grass cover, Good, HSG A
*	13,473	68	Grassed swale <50% Grass cover, Poor, HSG A
	5,375	98	Paved parking, HSG A
	4,268	98	Roofs, HSG A
*	162	68	Infiltration trench <50% Grass cover, Poor, HSG A
	200	96	Gravel surface, HSG A
	61,203	55	Weighted Average
	51,560		84.24% Pervious Area
	9,643		15.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0070	0.81		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
0.1	13	0.0070	1.70		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
2.3	91	0.0090	0.66		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
1.8	372	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.0	1,225	Total			

Subcatchment 3B-EX: SUBCATCHMENT 3B-EX



Summary for Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

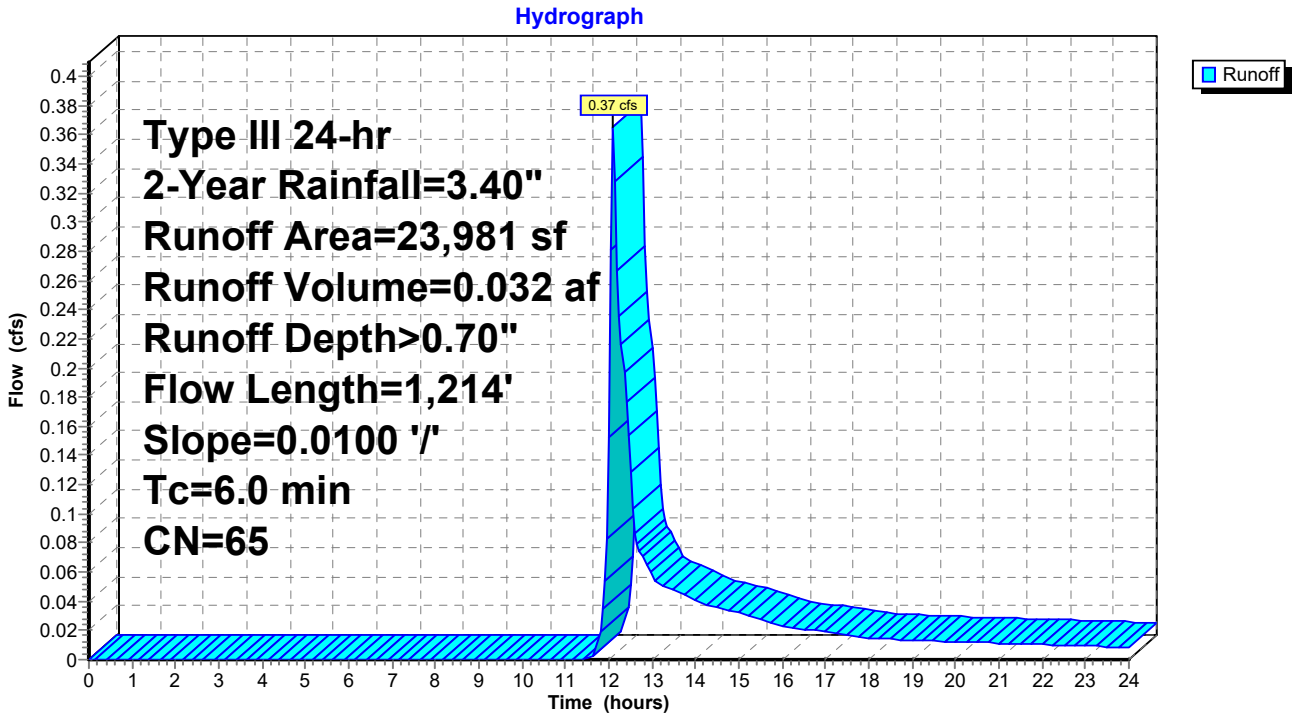
Runoff = 0.37 cfs @ 12.11 hrs, Volume= 0.032 af, Depth> 0.70"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	13,420	39	Grass swale >75% Grass cover, Good, HSG A
*	301	68	Infiltration trench <50% Grass cover, Poor, HSG A
	10,260	98	Paved parking, HSG A
	23,981	65	Weighted Average
	13,721		57.22% Pervious Area
	10,260		42.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	515	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
3.2	1,214	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

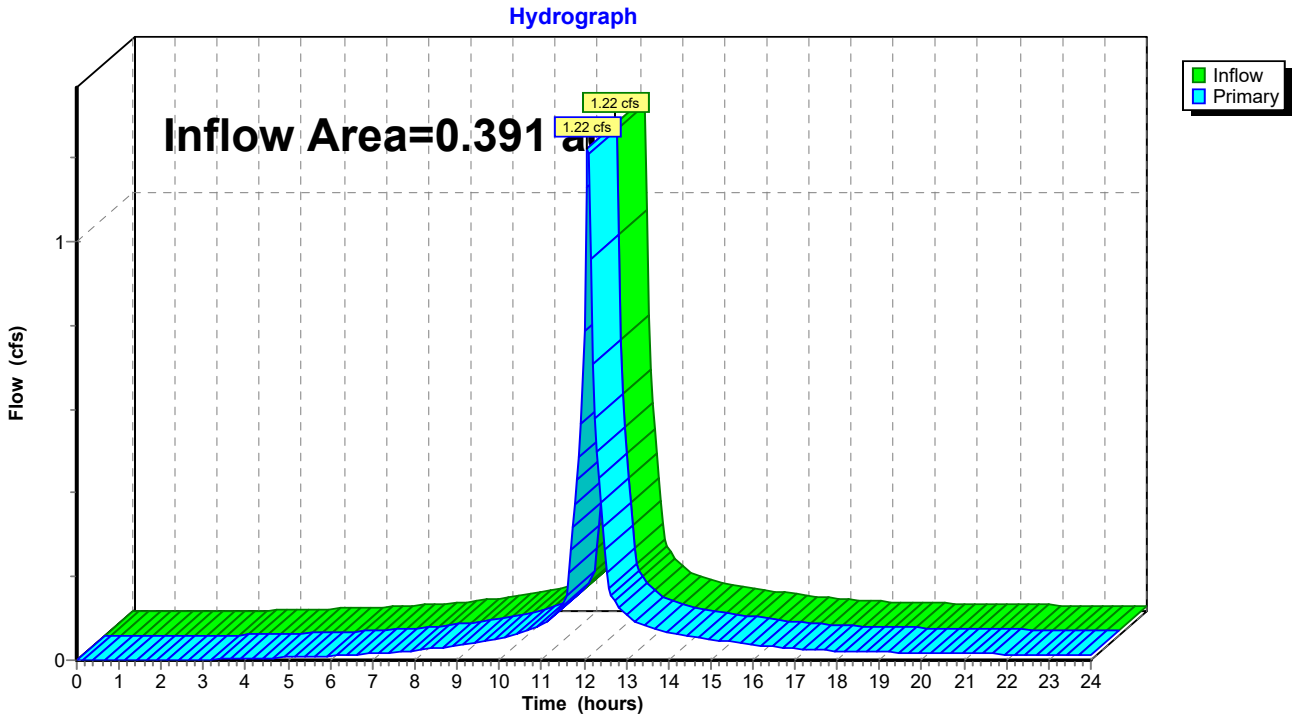


Summary for Link 1: 12" SEWER MAIN WRIGHT STREET

Inflow Area = 0.391 ac, 96.89% Impervious, Inflow Depth > 2.94" for 2-Year event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.096 af
Primary = 1.22 cfs @ 12.09 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 1: 12" SEWER MAIN WRIGHT STREET

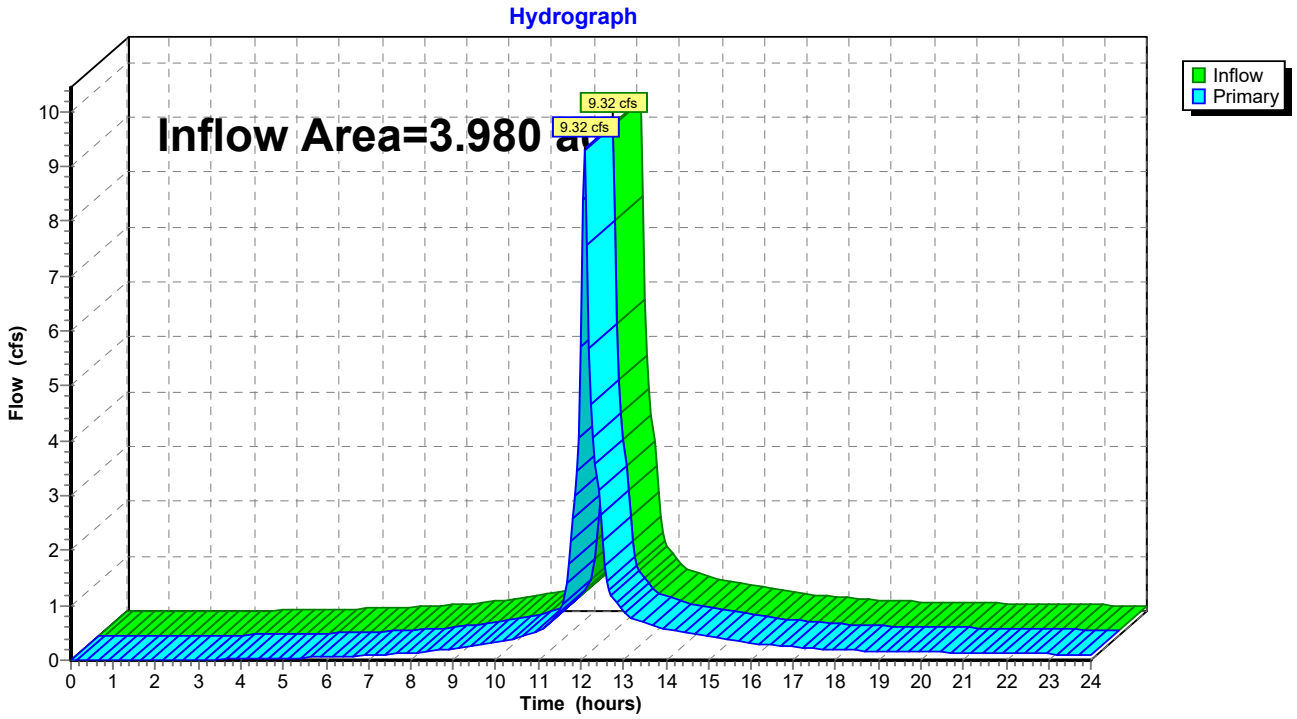


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 3.980 ac, 80.03% Impervious, Inflow Depth > 2.20" for 2-Year event
Inflow = 9.32 cfs @ 12.09 hrs, Volume= 0.730 af
Primary = 9.32 cfs @ 12.09 hrs, Volume= 0.730 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

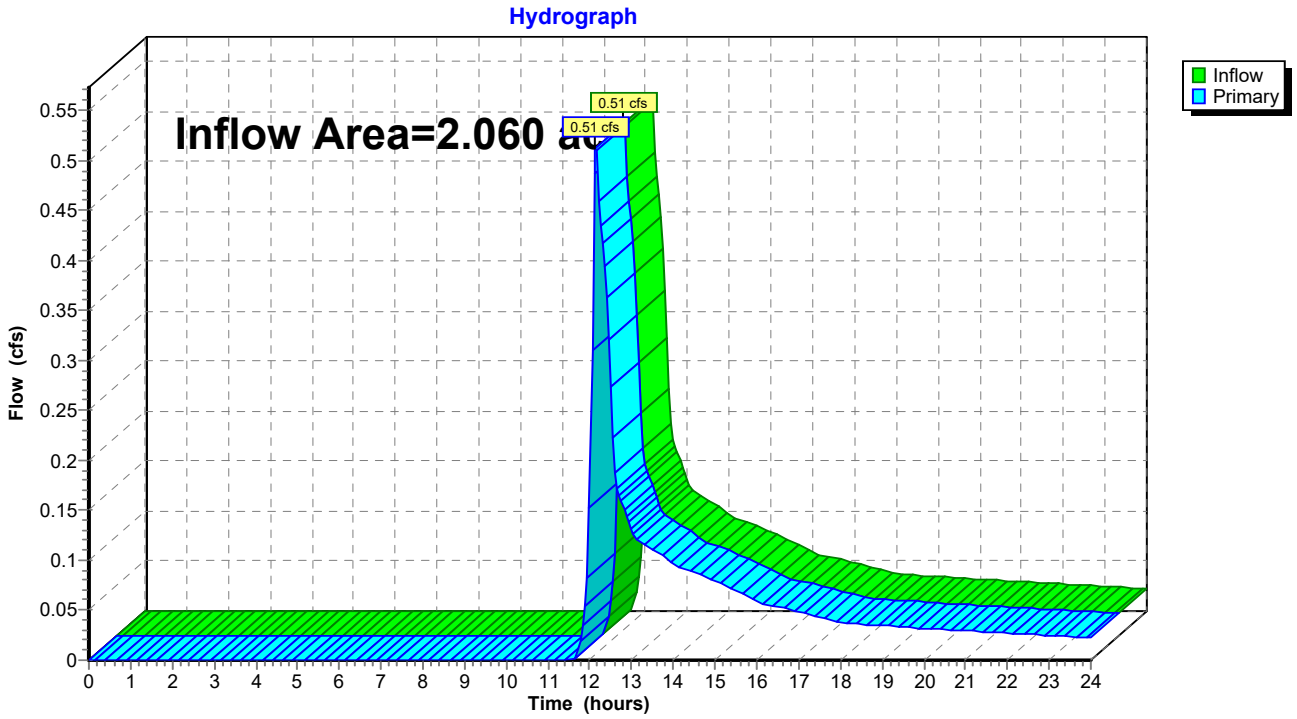


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 2.060 ac, 22.18% Impervious, Inflow Depth > 0.40" for 2-Year event
Inflow = 0.51 cfs @ 12.14 hrs, Volume= 0.069 af
Primary = 0.51 cfs @ 12.14 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A-EX: SUBCATCHMENT Runoff Area=17,024 sf 96.89% Impervious Runoff Depth>4.33"
Flow Length=321' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=1.76 cfs 0.141 af

Subcatchment2A-EX: SUBCATCHMENT Runoff Area=54,144 sf 53.11% Impervious Runoff Depth>1.89"
Flow Length=288' Tc=6.3 min CN=70 Runoff=2.63 cfs 0.195 af

Subcatchment2B-EX: SUBCATCHMENT Runoff Area=24,091 sf 77.14% Impervious Runoff Depth>3.38"
Flow Length=366' Slope=0.0100 '/' Tc=7.0 min CN=87 Runoff=2.06 cfs 0.156 af

Subcatchment2C-EX: SUBCATCHMENT Runoff Area=95,152 sf 96.08% Impervious Runoff Depth>4.33"
Flow Length=415' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=9.84 cfs 0.788 af

Subcatchment3A-EX: SUBCATCHMENT Runoff Area=4,568 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=1,505' Tc=10.7 min CN=45 Runoff=0.02 cfs 0.003 af

Subcatchment3B-EX: SUBCATCHMENT Runoff Area=61,203 sf 15.76% Impervious Runoff Depth>0.88"
Flow Length=1,225' Tc=6.0 min CN=55 Runoff=1.11 cfs 0.103 af

Subcatchment3C-EX: SUBCATCHMENT Runoff Area=23,981 sf 42.78% Impervious Runoff Depth>1.52"
Flow Length=1,214' Slope=0.0100 '/' Tc=6.0 min CN=65 Runoff=0.91 cfs 0.070 af

Link 1: 12" SEWER MAIN WRIGHT STREET Inflow=1.76 cfs 0.141 af
Primary=1.76 cfs 0.141 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=14.48 cfs 1.139 af
Primary=14.48 cfs 1.139 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=2.02 cfs 0.176 af
Primary=2.02 cfs 0.176 af

Total Runoff Area = 6.432 ac Runoff Volume = 1.457 af Average Runoff Depth = 2.72"
37.48% Pervious = 2.411 ac 62.52% Impervious = 4.021 ac

Summary for Subcatchment 1A-EX: SUBCATCHMENT 1A-EX

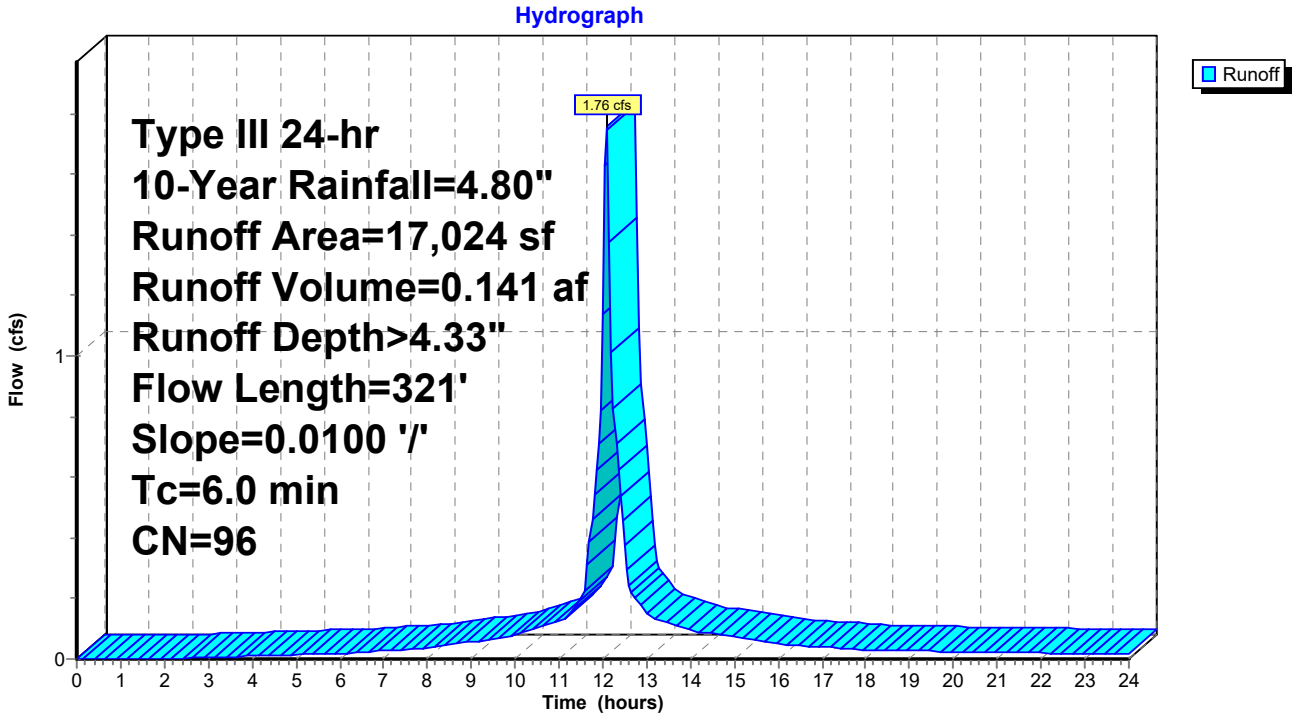
Runoff = 1.76 cfs @ 12.09 hrs, Volume= 0.141 af, Depth> 4.33"
Routed to Link 1 : 12" SEWER MAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
530	39	>75% Grass cover, Good, HSG A
11,090	98	Paved parking, HSG A
5,404	98	Roofs, HSG A
17,024	96	Weighted Average
530		3.11% Pervious Area
16,494		96.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Pavement to Catch Basin** Smooth surfaces n= 0.011 P2= 3.40"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Pavement to Catch Basin** Paved Kv= 20.3 fps
1.0	221	0.0100	3.54	1.39	**Pipe Channel, Combined Storm/Sewer pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
2.3	321	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1A-EX: SUBCATCHMENT 1A-EX



Summary for Subcatchment 2A-EX: SUBCATCHMENT 2A-EX

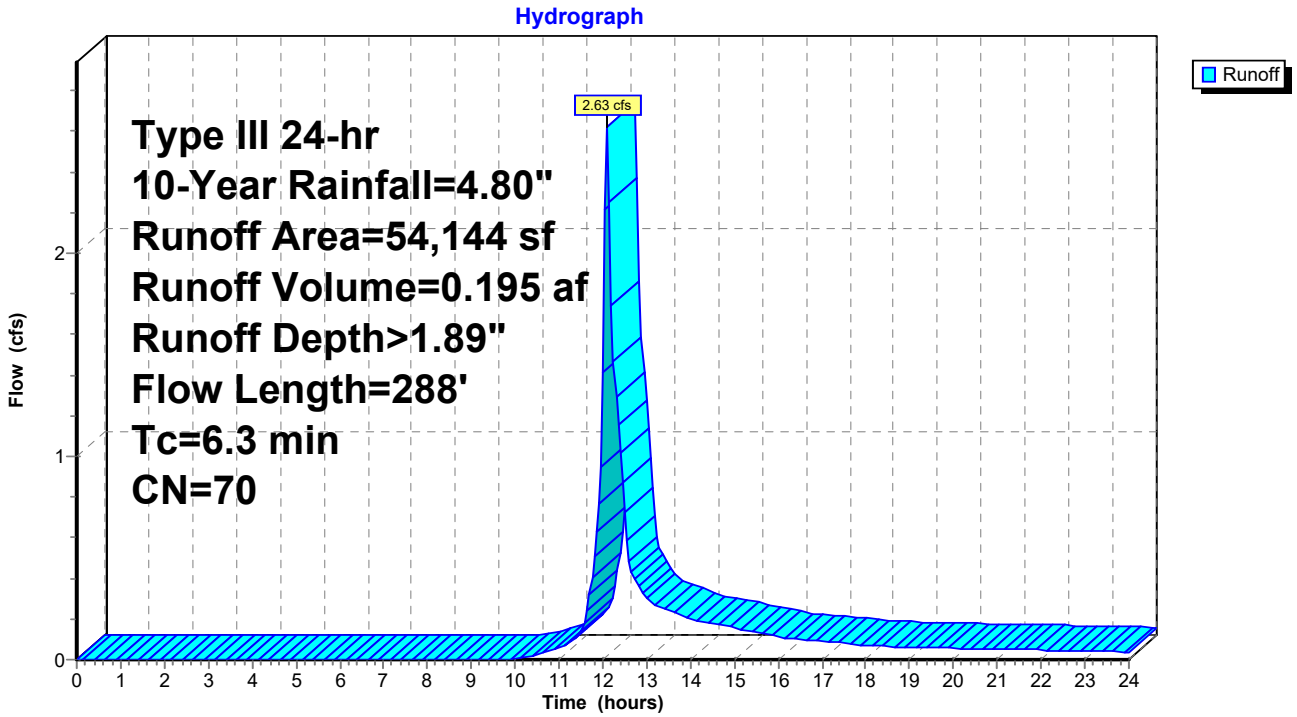
Runoff = 2.63 cfs @ 12.10 hrs, Volume= 0.195 af, Depth> 1.89"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
25,387	39	>75% Grass cover, Good, HSG A
24,930	98	Paved parking, HSG A
3,827	98	Roofs, HSG A
54,144	70	Weighted Average
25,387		46.89% Pervious Area
28,757		53.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0064	0.78		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.40"
1.0	101	0.0064	1.62		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.2	137	0.0060	0.54		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
6.3	288	Total			

Subcatchment 2A-EX: SUBCATCHMENT 2A-EX



Summary for Subcatchment 2B-EX: SUBCATCHMENT 2B-EX

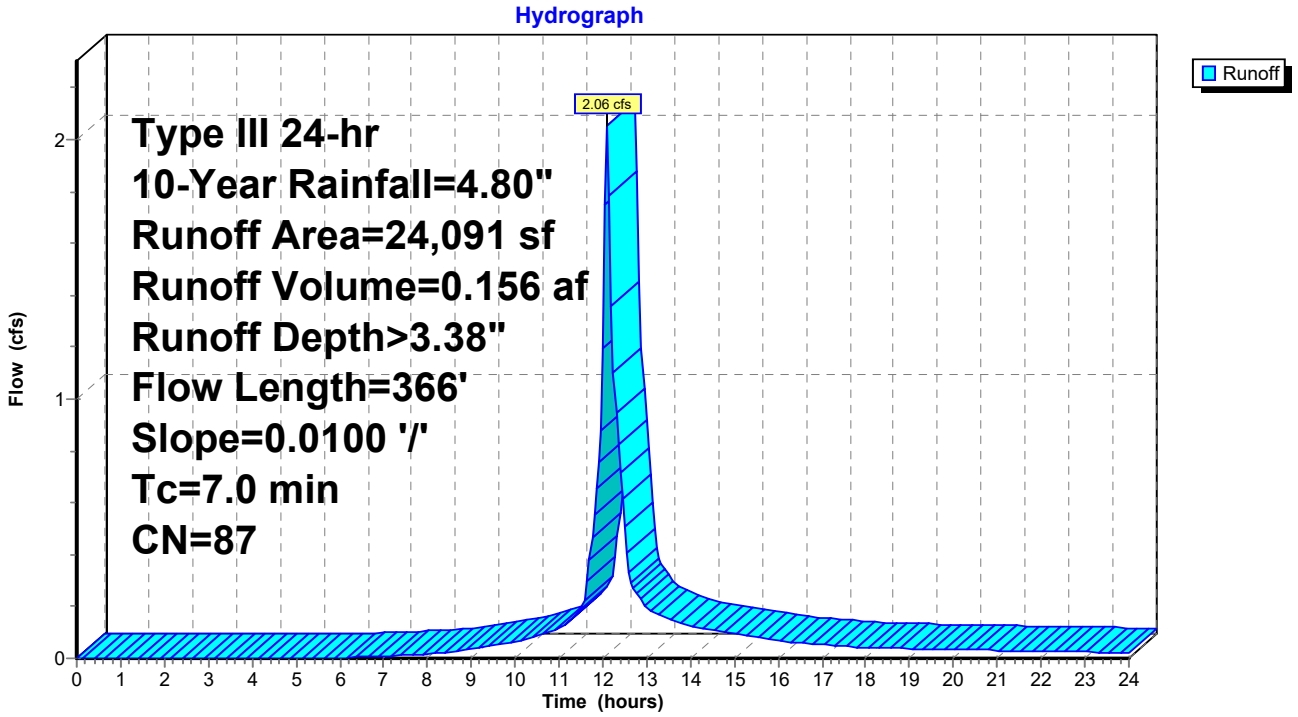
Runoff = 2.06 cfs @ 12.10 hrs, Volume= 0.156 af, Depth> 3.38"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
4,354	39	>75% Grass cover, Good, HSG A
18,584	98	Paved parking, HSG A
1,153	96	Gravel surface, HSG A
24,091	87	Weighted Average
5,507		22.86% Pervious Area
18,584		77.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	29	0.0100	0.10		**Sheet Flow, Grassed area** Grass: Short n= 0.150 P2= 3.40"
0.4	21	0.0100	0.79		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.2	148	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.7	168	0.0100	3.86	1.52	**Pipe Channel, Drain Pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
7.0	366	Total			

Subcatchment 2B-EX: SUBCATCHMENT 2B-EX



Summary for Subcatchment 2C-EX: SUBCATCHMENT 2C-EX

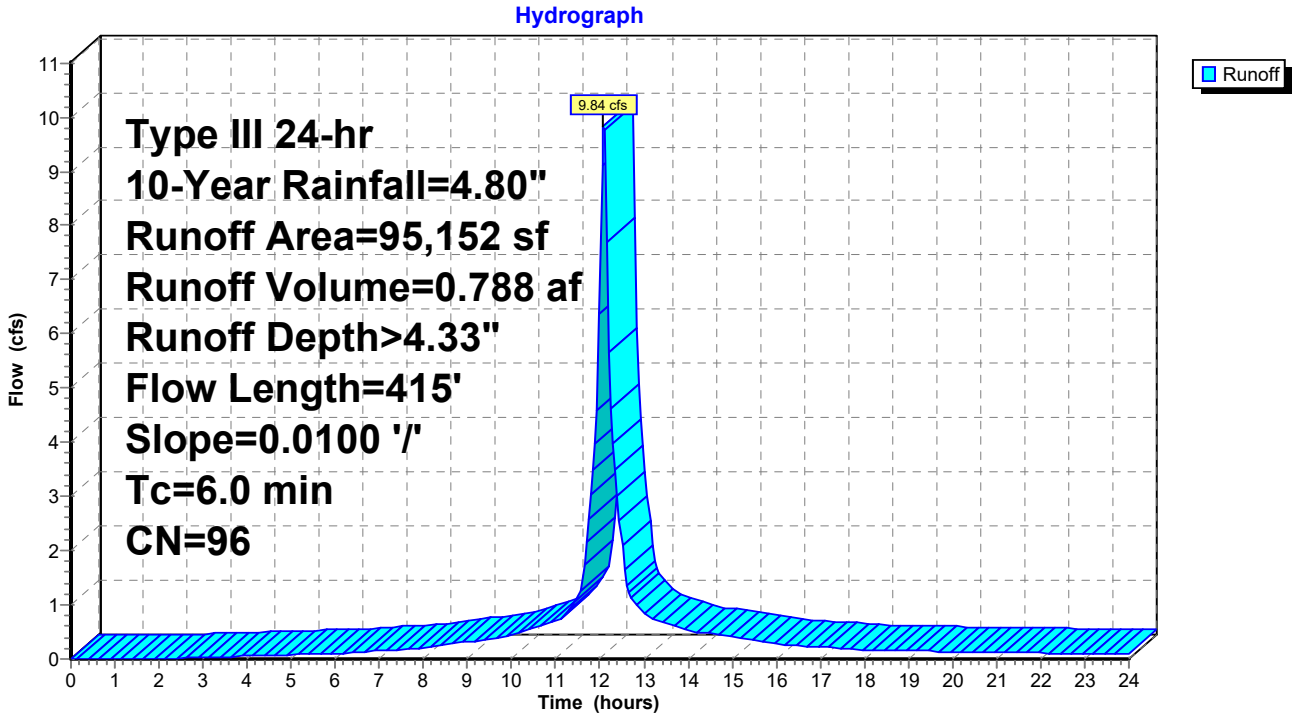
Runoff = 9.84 cfs @ 12.09 hrs, Volume= 0.788 af, Depth> 4.33"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
3,734	39	>75% Grass cover, Good, HSG A
65,565	98	Paved parking, HSG A
25,853	98	Roofs, HSG A
95,152	96	Weighted Average
3,734		3.92% Pervious Area
91,418		96.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.4	166	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.9	199	0.0100	3.86	1.52	**Pipe Channel, Drain pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
3.2	415	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-EX: SUBCATCHMENT 2C-EX



Summary for Subcatchment 3A-EX: SUBCATCHMENT 3A-EX

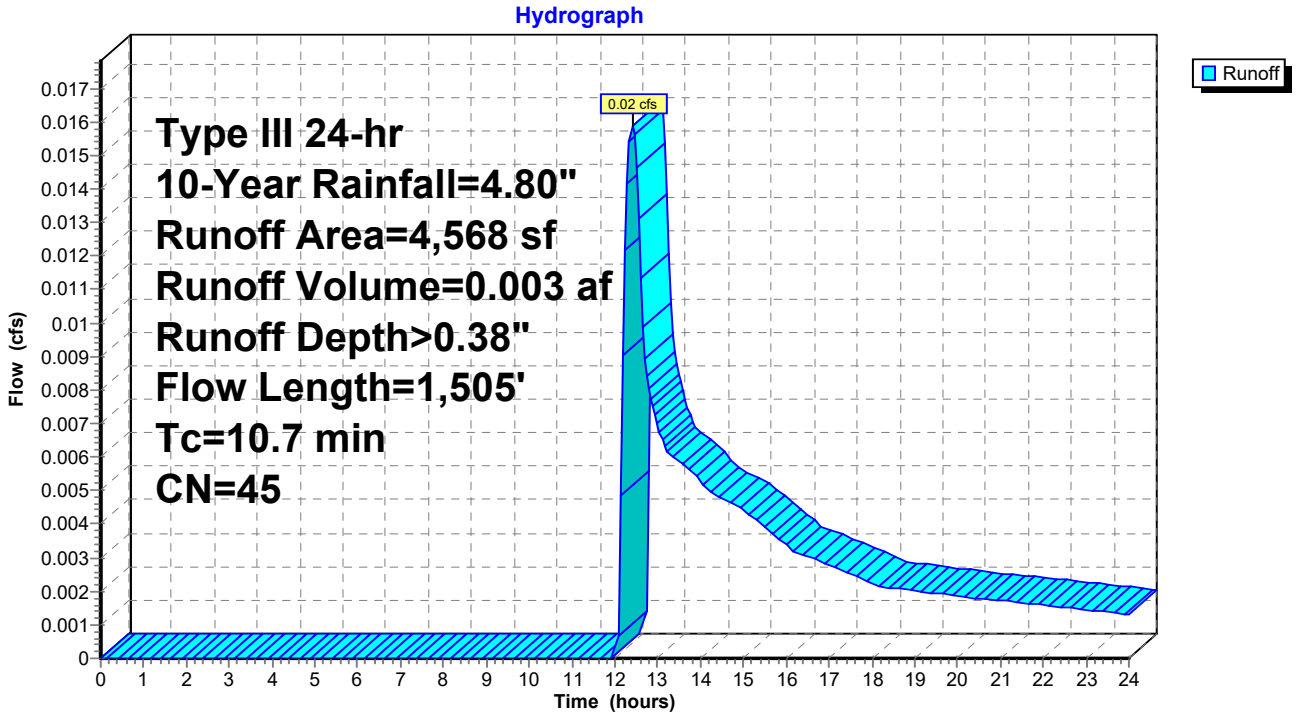
Runoff = 0.02 cfs @ 12.41 hrs, Volume= 0.003 af, Depth> 0.38"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	3,586	39	Grass swale >75% Grass cover, Good, HSG A
*	982	68	Infiltration trench <50% Grass cover, Poor, HSG A
	4,568	45	Weighted Average
	4,568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0055	0.22		**Sheet Flow, Heavy lift** Fallow n= 0.050 P2= 3.40"
1.8	128	0.0055	1.19		**Shallow Concentrated Flow, Heayv lift area** Unpaved Kv= 16.1 fps
4.0	628	0.0055	2.62	1.03	**Pipe Channel, CMP_Round 12"** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
1.1	699	0.0050	10.59	299.47	**Pipe Channel, RCP_Round 72"** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
10.7	1,505	Total			

Subcatchment 3A-EX: SUBCATCHMENT 3A-EX



Summary for Subcatchment 3B-EX: SUBCATCHMENT 3B-EX

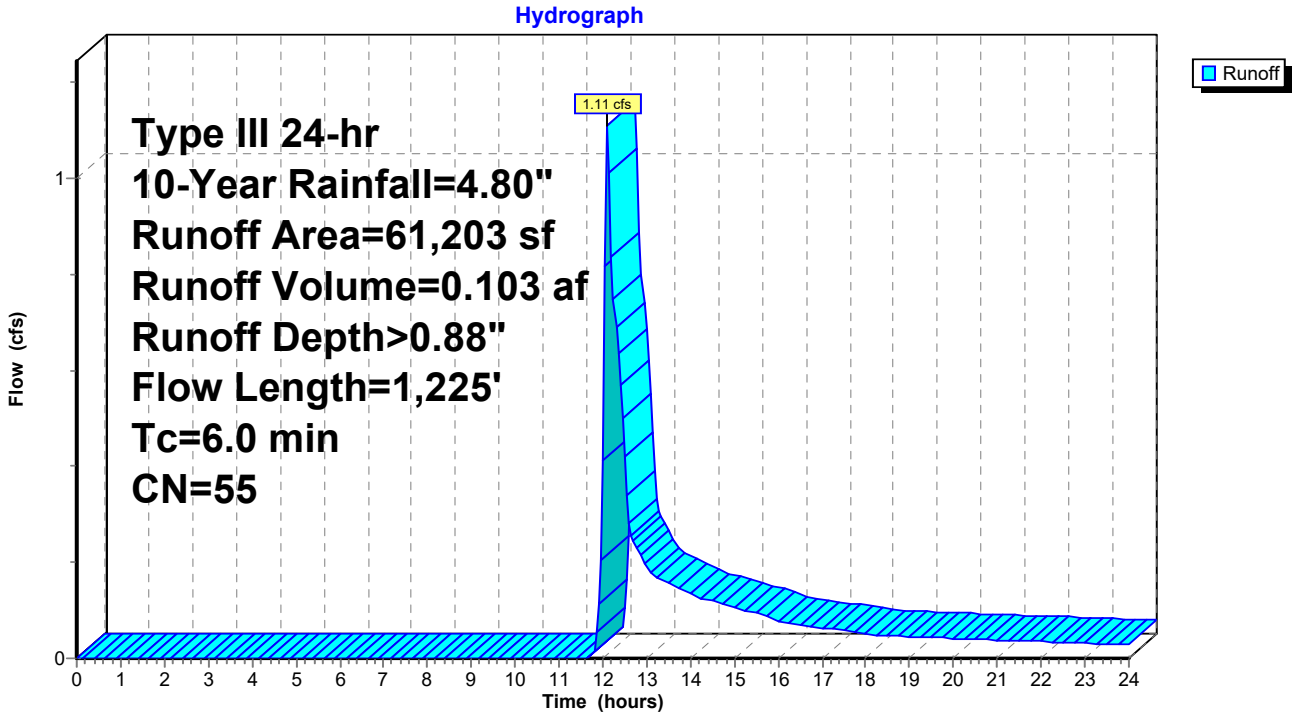
Runoff = 1.11 cfs @ 12.11 hrs, Volume= 0.103 af, Depth> 0.88"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
	37,725	39	>75% Grass cover, Good, HSG A
*	13,473	68	Grassed swale <50% Grass cover, Poor, HSG A
	5,375	98	Paved parking, HSG A
	4,268	98	Roofs, HSG A
*	162	68	Infiltration trench <50% Grass cover, Poor, HSG A
	200	96	Gravel surface, HSG A
	61,203	55	Weighted Average
	51,560		84.24% Pervious Area
	9,643		15.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0070	0.81		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
0.1	13	0.0070	1.70		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
2.3	91	0.0090	0.66		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
1.8	372	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.0	1,225	Total			

Subcatchment 3B-EX: SUBCATCHMENT 3B-EX



Summary for Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

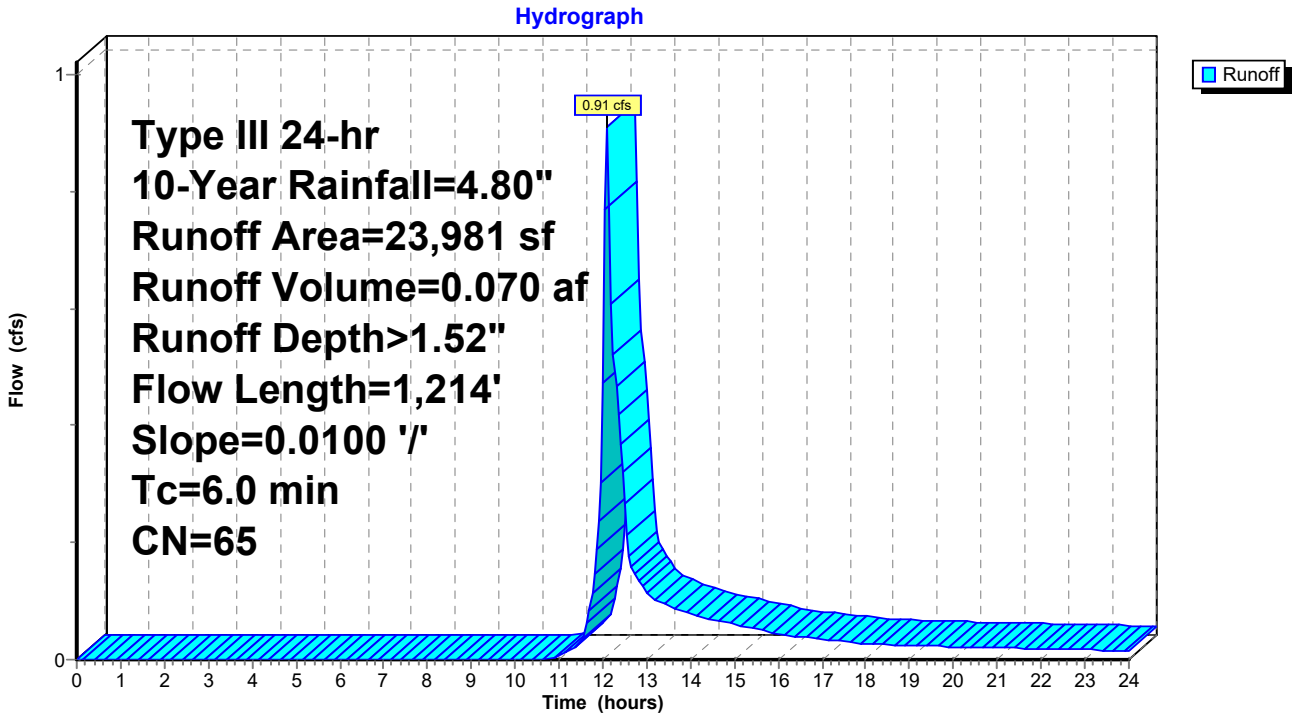
Runoff = 0.91 cfs @ 12.10 hrs, Volume= 0.070 af, Depth> 1.52"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	13,420	39	Grass swale >75% Grass cover, Good, HSG A
*	301	68	Infiltration trench <50% Grass cover, Poor, HSG A
	10,260	98	Paved parking, HSG A
	23,981	65	Weighted Average
	13,721		57.22% Pervious Area
	10,260		42.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	515	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
3.2	1,214	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

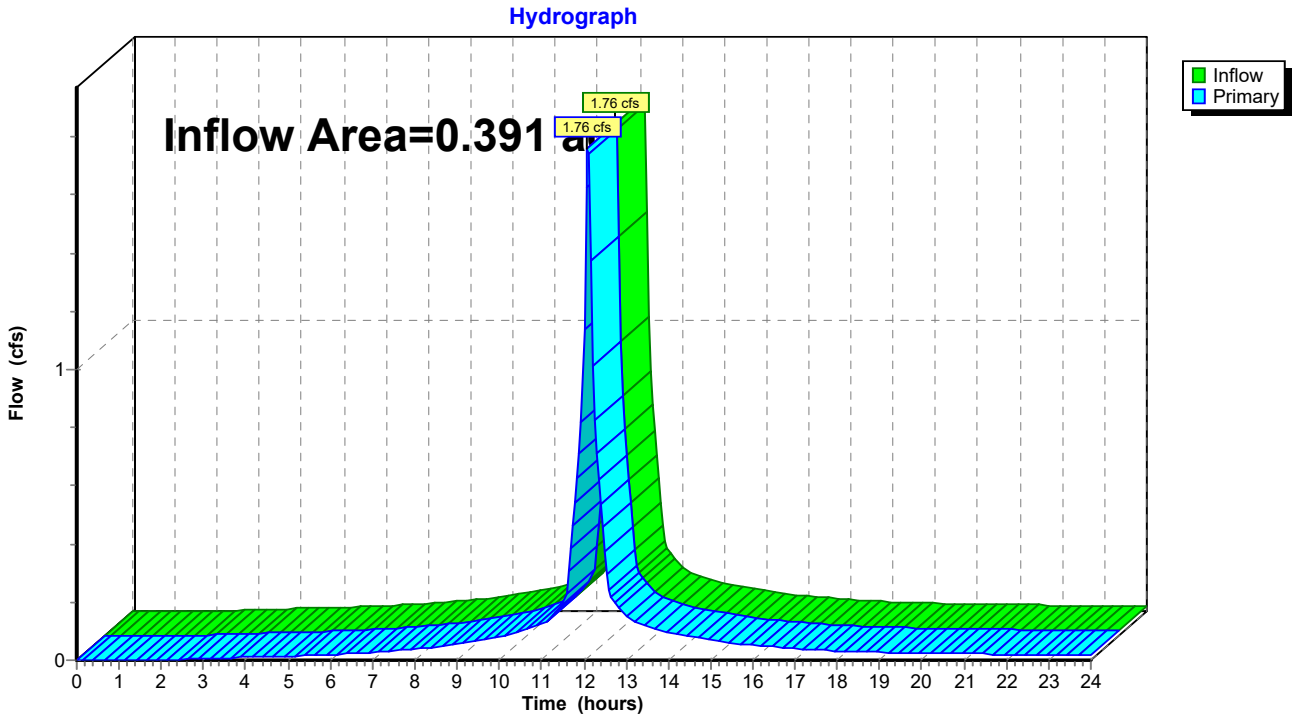


Summary for Link 1: 12" SEWER MAIN WRIGHT STREET

Inflow Area = 0.391 ac, 96.89% Impervious, Inflow Depth > 4.33" for 10-Year event
Inflow = 1.76 cfs @ 12.09 hrs, Volume= 0.141 af
Primary = 1.76 cfs @ 12.09 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 1: 12" SEWER MAIN WRIGHT STREET

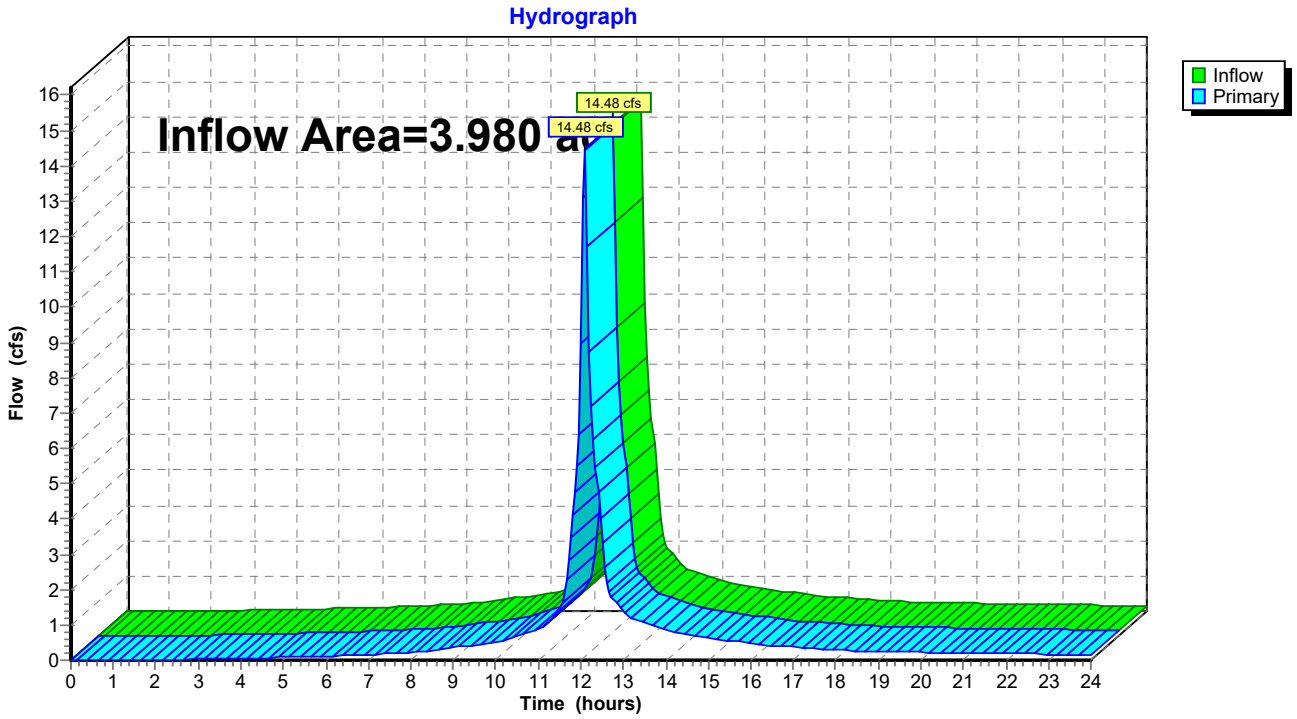


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 3.980 ac, 80.03% Impervious, Inflow Depth > 3.44" for 10-Year event
Inflow = 14.48 cfs @ 12.09 hrs, Volume= 1.139 af
Primary = 14.48 cfs @ 12.09 hrs, Volume= 1.139 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

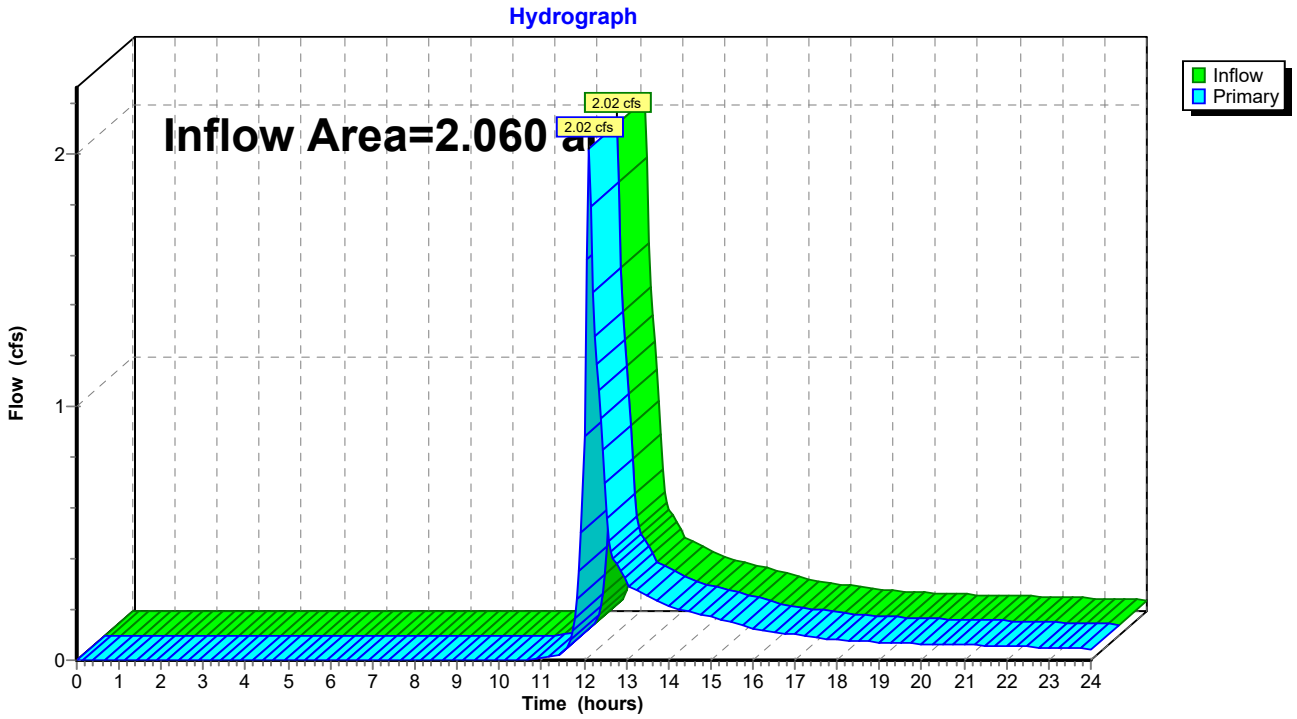


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 2.060 ac, 22.18% Impervious, Inflow Depth > 1.03" for 10-Year event
Inflow = 2.02 cfs @ 12.11 hrs, Volume= 0.176 af
Primary = 2.02 cfs @ 12.11 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A-EX: SUBCATCHMENT Runoff Area=17,024 sf 96.89% Impervious Runoff Depth>5.13"
Flow Length=321' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=2.07 cfs 0.167 af

Subcatchment2A-EX: SUBCATCHMENT Runoff Area=54,144 sf 53.11% Impervious Runoff Depth>2.49"
Flow Length=288' Tc=6.3 min CN=70 Runoff=3.51 cfs 0.258 af

Subcatchment2B-EX: SUBCATCHMENT Runoff Area=24,091 sf 77.14% Impervious Runoff Depth>4.13"
Flow Length=366' Slope=0.0100 '/' Tc=7.0 min CN=87 Runoff=2.49 cfs 0.190 af

Subcatchment2C-EX: SUBCATCHMENT Runoff Area=95,152 sf 96.08% Impervious Runoff Depth>5.13"
Flow Length=415' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=11.55 cfs 0.933 af

Subcatchment3A-EX: SUBCATCHMENT Runoff Area=4,568 sf 0.00% Impervious Runoff Depth>0.65"
Flow Length=1,505' Tc=10.7 min CN=45 Runoff=0.04 cfs 0.006 af

Subcatchment3B-EX: SUBCATCHMENT Runoff Area=61,203 sf 15.76% Impervious Runoff Depth>1.29"
Flow Length=1,225' Tc=6.0 min CN=55 Runoff=1.81 cfs 0.151 af

Subcatchment3C-EX: SUBCATCHMENT Runoff Area=23,981 sf 42.78% Impervious Runoff Depth>2.06"
Flow Length=1,214' Slope=0.0100 '/' Tc=6.0 min CN=65 Runoff=1.27 cfs 0.095 af

Link 1: 12" SEWER MAIN WRIGHT STREET Inflow=2.07 cfs 0.167 af
Primary=2.07 cfs 0.167 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=17.51 cfs 1.381 af
Primary=17.51 cfs 1.381 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=3.09 cfs 0.252 af
Primary=3.09 cfs 0.252 af

Total Runoff Area = 6.432 ac Runoff Volume = 1.800 af Average Runoff Depth = 3.36"
37.48% Pervious = 2.411 ac 62.52% Impervious = 4.021 ac

Summary for Subcatchment 1A-EX: SUBCATCHMENT 1A-EX

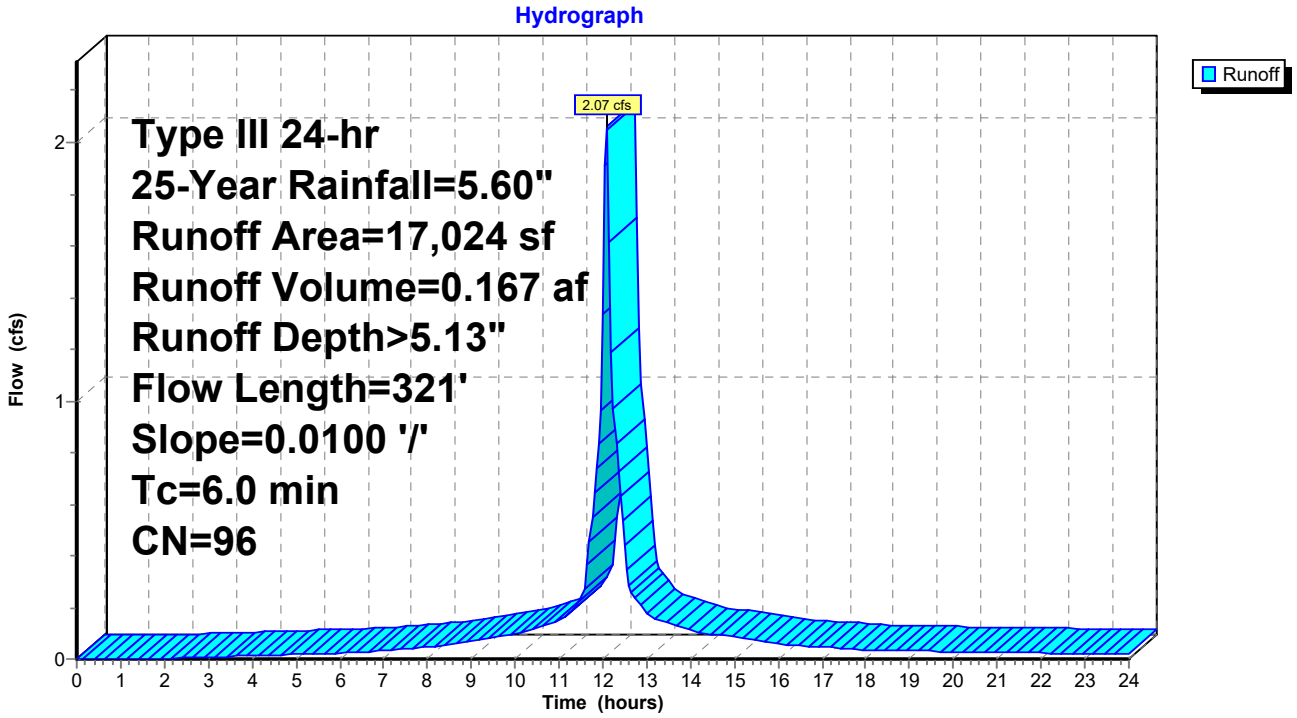
Runoff = 2.07 cfs @ 12.09 hrs, Volume= 0.167 af, Depth> 5.13"
Routed to Link 1 : 12" SEWER MAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
530	39	>75% Grass cover, Good, HSG A
11,090	98	Paved parking, HSG A
5,404	98	Roofs, HSG A
17,024	96	Weighted Average
530		3.11% Pervious Area
16,494		96.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Pavement to Catch Basin** Smooth surfaces n= 0.011 P2= 3.40"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Pavement to Catch Basin** Paved Kv= 20.3 fps
1.0	221	0.0100	3.54	1.39	**Pipe Channel, Combined Storm/Sewer pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
2.3	321	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1A-EX: SUBCATCHMENT 1A-EX



Summary for Subcatchment 2A-EX: SUBCATCHMENT 2A-EX

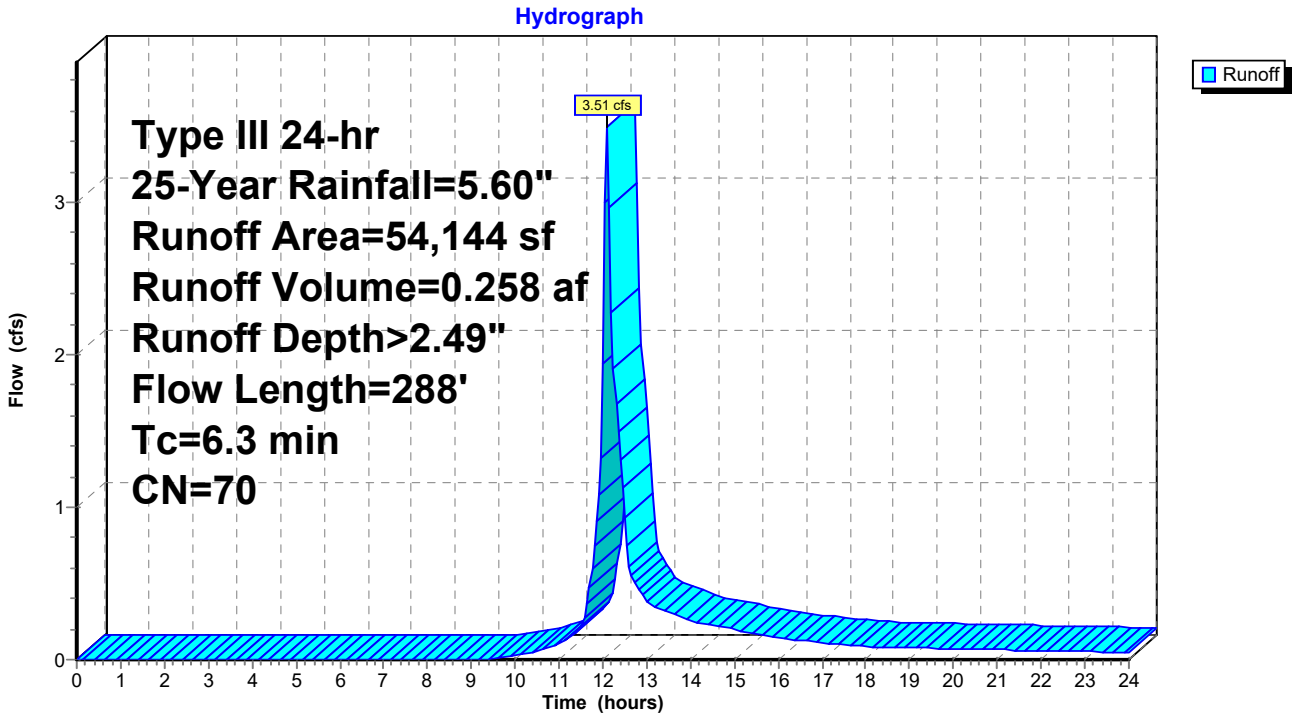
Runoff = 3.51 cfs @ 12.10 hrs, Volume= 0.258 af, Depth> 2.49"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
25,387	39	>75% Grass cover, Good, HSG A
24,930	98	Paved parking, HSG A
3,827	98	Roofs, HSG A
54,144	70	Weighted Average
25,387		46.89% Pervious Area
28,757		53.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0064	0.78		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.40"
1.0	101	0.0064	1.62		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.2	137	0.0060	0.54		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
6.3	288	Total			

Subcatchment 2A-EX: SUBCATCHMENT 2A-EX



Summary for Subcatchment 2B-EX: SUBCATCHMENT 2B-EX

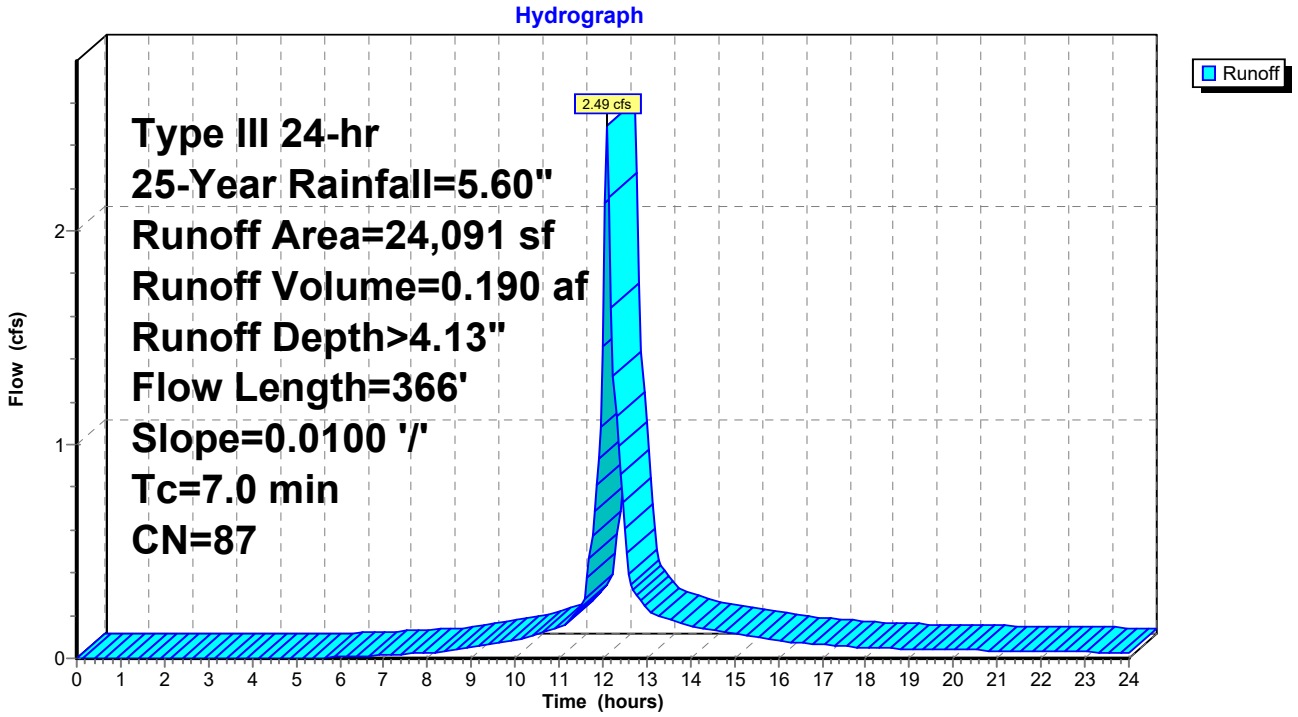
Runoff = 2.49 cfs @ 12.10 hrs, Volume= 0.190 af, Depth> 4.13"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
4,354	39	>75% Grass cover, Good, HSG A
18,584	98	Paved parking, HSG A
1,153	96	Gravel surface, HSG A
24,091	87	Weighted Average
5,507		22.86% Pervious Area
18,584		77.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	29	0.0100	0.10		**Sheet Flow, Grassed area** Grass: Short n= 0.150 P2= 3.40"
0.4	21	0.0100	0.79		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.2	148	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.7	168	0.0100	3.86	1.52	**Pipe Channel, Drain Pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
7.0	366	Total			

Subcatchment 2B-EX: SUBCATCHMENT 2B-EX



Summary for Subcatchment 2C-EX: SUBCATCHMENT 2C-EX

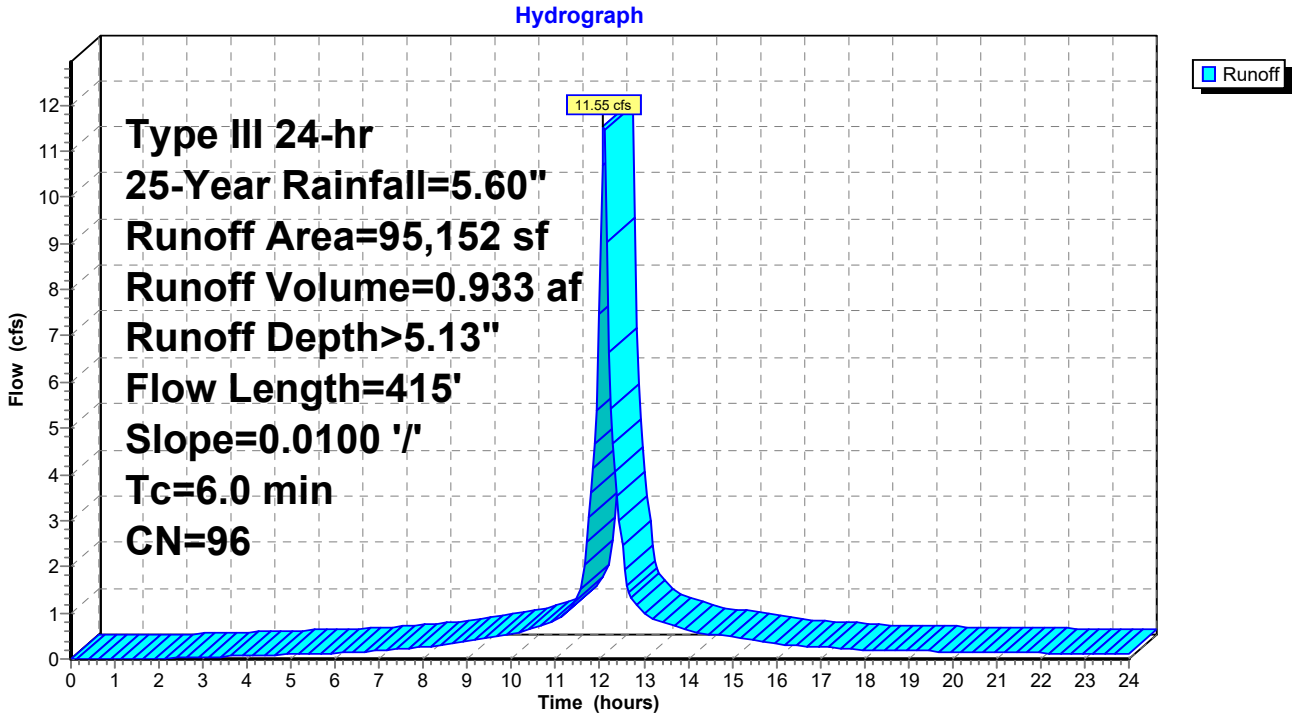
Runoff = 11.55 cfs @ 12.09 hrs, Volume= 0.933 af, Depth> 5.13"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
3,734	39	>75% Grass cover, Good, HSG A
65,565	98	Paved parking, HSG A
25,853	98	Roofs, HSG A
95,152	96	Weighted Average
3,734		3.92% Pervious Area
91,418		96.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.4	166	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.9	199	0.0100	3.86	1.52	**Pipe Channel, Drain pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
3.2	415	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-EX: SUBCATCHMENT 2C-EX



Summary for Subcatchment 3A-EX: SUBCATCHMENT 3A-EX

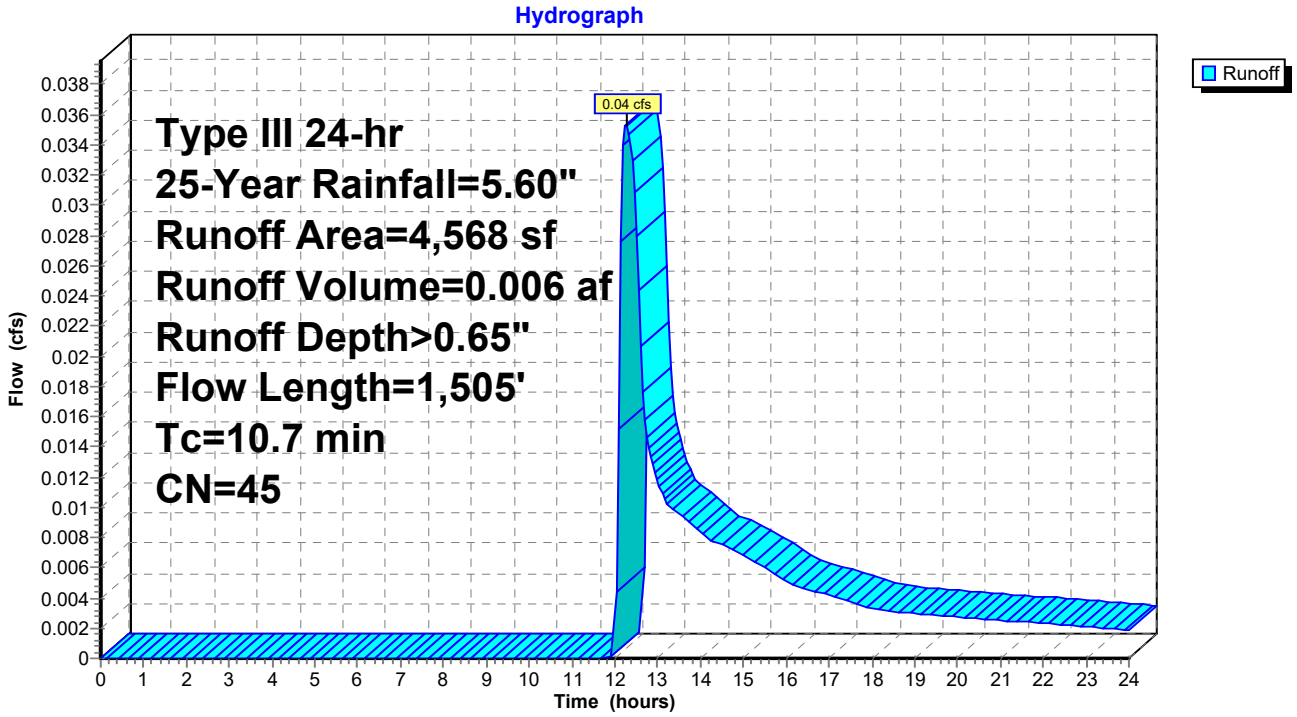
Runoff = 0.04 cfs @ 12.27 hrs, Volume= 0.006 af, Depth> 0.65"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	3,586	39	Grass swale >75% Grass cover, Good, HSG A
*	982	68	Infiltration trench <50% Grass cover, Poor, HSG A
	4,568	45	Weighted Average
	4,568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0055	0.22		**Sheet Flow, Heavy lift** Fallow n= 0.050 P2= 3.40"
1.8	128	0.0055	1.19		**Shallow Concentrated Flow, Heayv lift area** Unpaved Kv= 16.1 fps
4.0	628	0.0055	2.62	1.03	**Pipe Channel, CMP_Round 12"** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
1.1	699	0.0050	10.59	299.47	**Pipe Channel, RCP_Round 72"** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
10.7	1,505	Total			

Subcatchment 3A-EX: SUBCATCHMENT 3A-EX



Summary for Subcatchment 3B-EX: SUBCATCHMENT 3B-EX

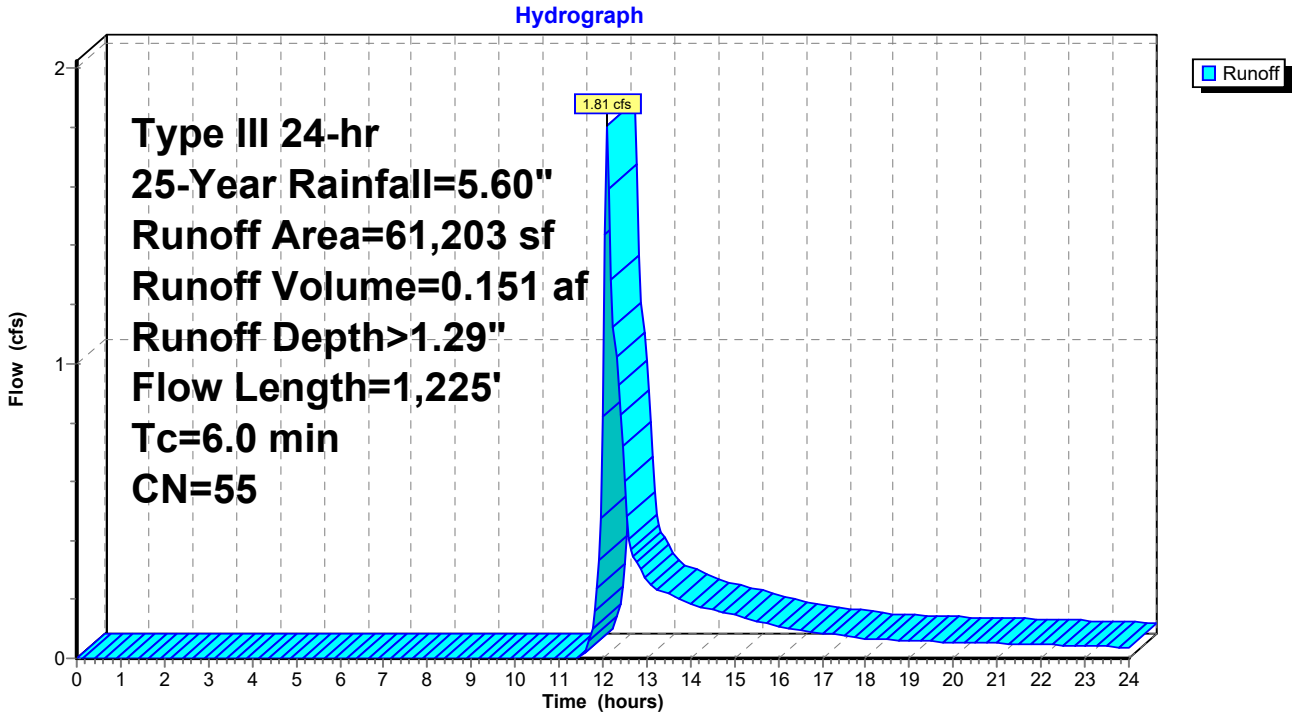
Runoff = 1.81 cfs @ 12.11 hrs, Volume= 0.151 af, Depth> 1.29"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
	37,725	39	>75% Grass cover, Good, HSG A
*	13,473	68	Grassed swale <50% Grass cover, Poor, HSG A
	5,375	98	Paved parking, HSG A
	4,268	98	Roofs, HSG A
*	162	68	Infiltration trench <50% Grass cover, Poor, HSG A
	200	96	Gravel surface, HSG A
	61,203	55	Weighted Average
	51,560		84.24% Pervious Area
	9,643		15.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0070	0.81		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
0.1	13	0.0070	1.70		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
2.3	91	0.0090	0.66		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
1.8	372	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.0	1,225	Total			

Subcatchment 3B-EX: SUBCATCHMENT 3B-EX



Summary for Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

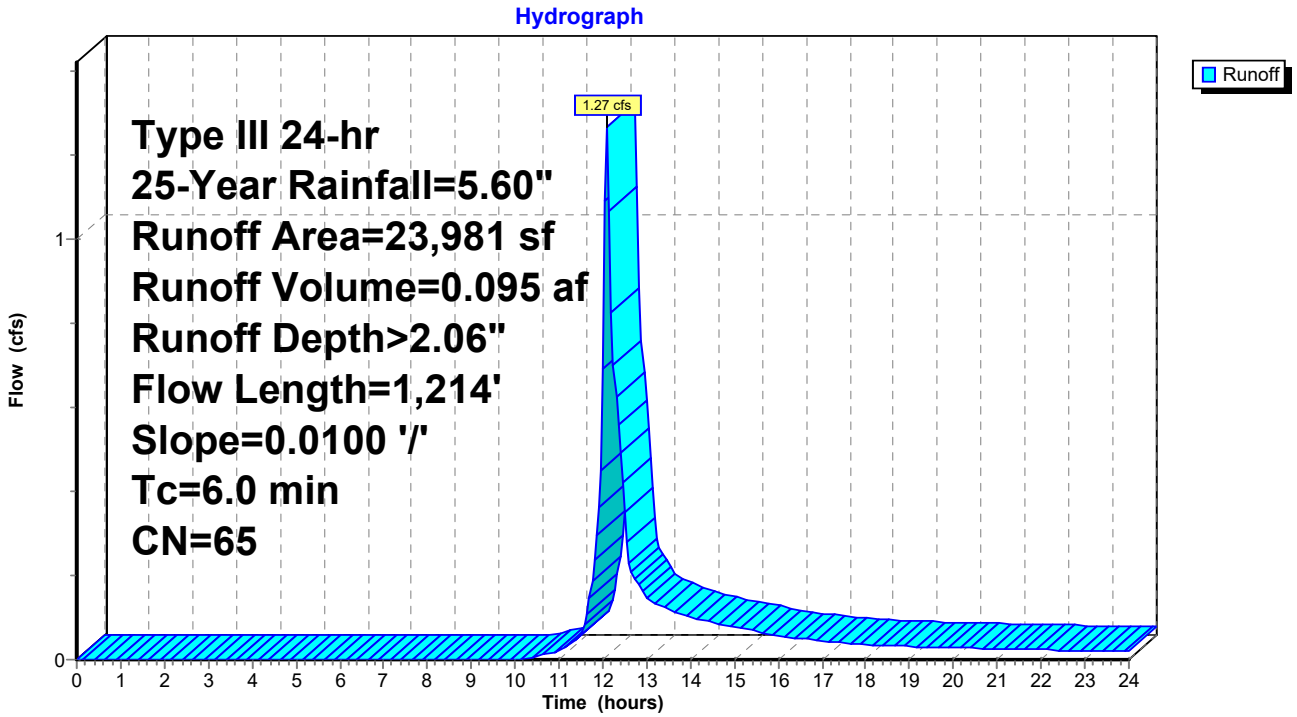
Runoff = 1.27 cfs @ 12.10 hrs, Volume= 0.095 af, Depth> 2.06"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	13,420	39	Grass swale >75% Grass cover, Good, HSG A
*	301	68	Infiltration trench <50% Grass cover, Poor, HSG A
	10,260	98	Paved parking, HSG A
	23,981	65	Weighted Average
	13,721		57.22% Pervious Area
	10,260		42.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	515	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
3.2	1,214	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

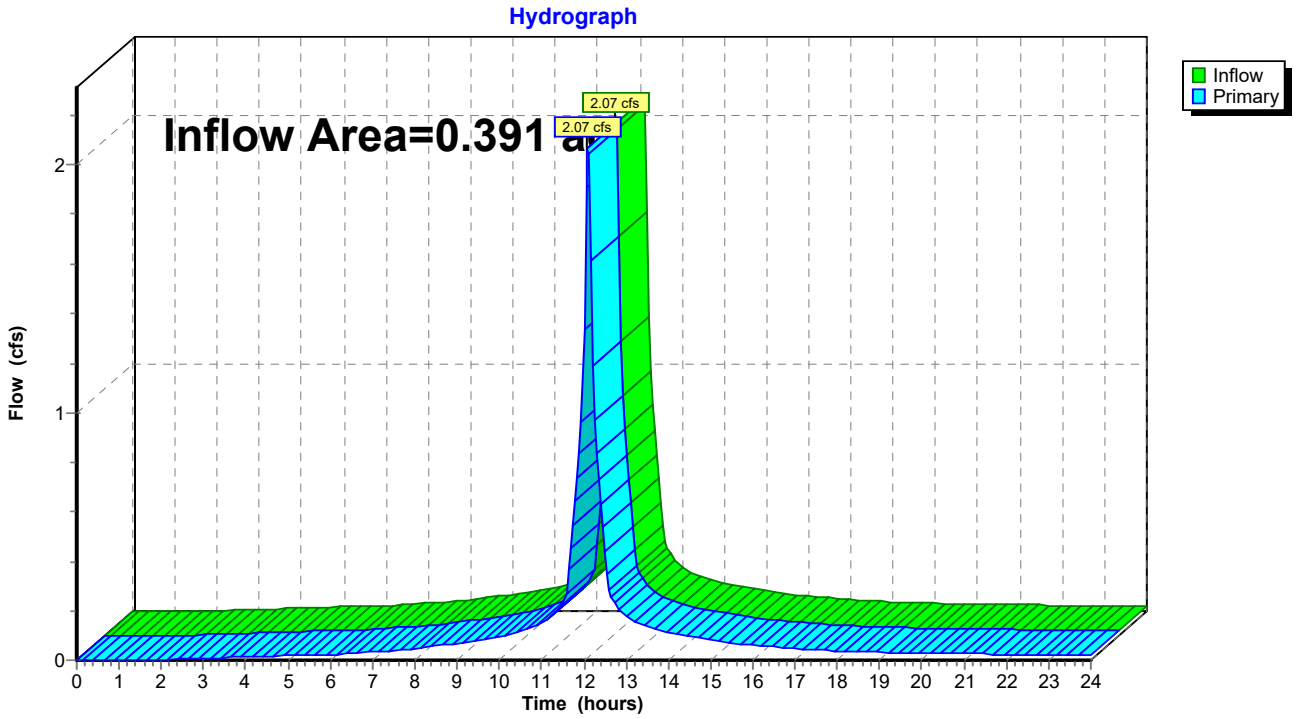


Summary for Link 1: 12" SEWER MAIN WRIGHT STREET

Inflow Area = 0.391 ac, 96.89% Impervious, Inflow Depth > 5.13" for 25-Year event
Inflow = 2.07 cfs @ 12.09 hrs, Volume= 0.167 af
Primary = 2.07 cfs @ 12.09 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 1: 12" SEWER MAIN WRIGHT STREET

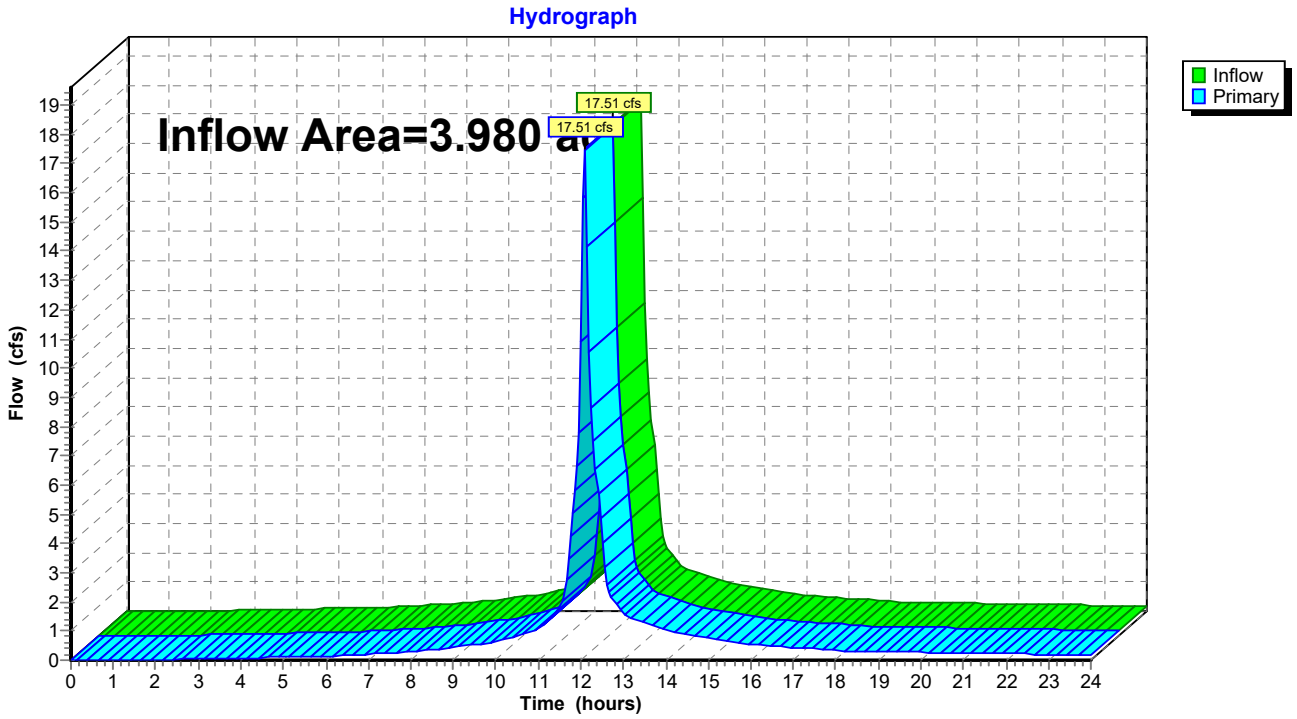


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 3.980 ac, 80.03% Impervious, Inflow Depth > 4.16" for 25-Year event
Inflow = 17.51 cfs @ 12.09 hrs, Volume= 1.381 af
Primary = 17.51 cfs @ 12.09 hrs, Volume= 1.381 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

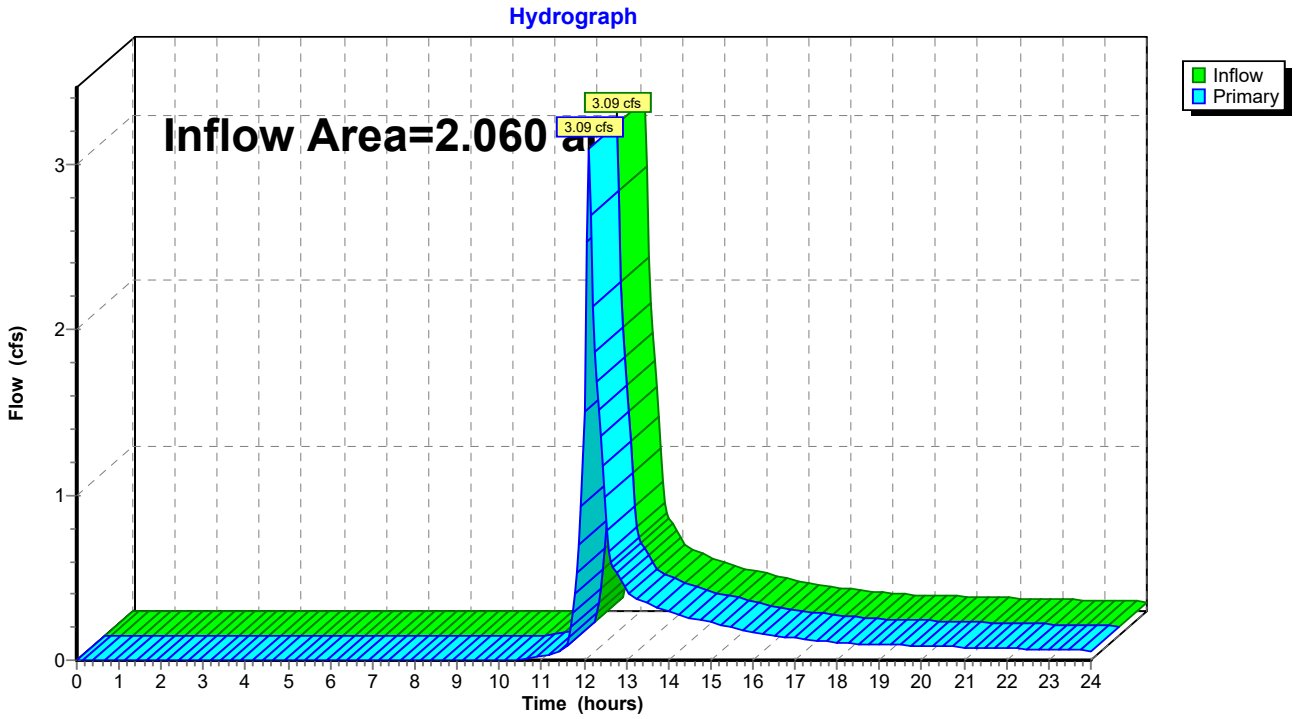


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 2.060 ac, 22.18% Impervious, Inflow Depth > 1.46" for 25-Year event
Inflow = 3.09 cfs @ 12.10 hrs, Volume= 0.252 af
Primary = 3.09 cfs @ 12.10 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A-EX: SUBCATCHMENT Runoff Area=17,024 sf 96.89% Impervious Runoff Depth>6.52"
Flow Length=321' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=2.60 cfs 0.212 af

Subcatchment2A-EX: SUBCATCHMENT Runoff Area=54,144 sf 53.11% Impervious Runoff Depth>3.61"
Flow Length=288' Tc=6.3 min CN=70 Runoff=5.13 cfs 0.374 af

Subcatchment2B-EX: SUBCATCHMENT Runoff Area=24,091 sf 77.14% Impervious Runoff Depth>5.47"
Flow Length=366' Slope=0.0100 '/' Tc=7.0 min CN=87 Runoff=3.26 cfs 0.252 af

Subcatchment2C-EX: SUBCATCHMENT Runoff Area=95,152 sf 96.08% Impervious Runoff Depth>6.52"
Flow Length=415' Slope=0.0100 '/' Tc=6.0 min CN=96 Runoff=14.52 cfs 1.187 af

Subcatchment3A-EX: SUBCATCHMENT Runoff Area=4,568 sf 0.00% Impervious Runoff Depth>1.23"
Flow Length=1,505' Tc=10.7 min CN=45 Runoff=0.10 cfs 0.011 af

Subcatchment3B-EX: SUBCATCHMENT Runoff Area=61,203 sf 15.76% Impervious Runoff Depth>2.12"
Flow Length=1,225' Tc=6.0 min CN=55 Runoff=3.22 cfs 0.248 af

Subcatchment3C-EX: SUBCATCHMENT Runoff Area=23,981 sf 42.78% Impervious Runoff Depth>3.10"
Flow Length=1,214' Slope=0.0100 '/' Tc=6.0 min CN=65 Runoff=1.95 cfs 0.142 af

Link 1: 12" SEWER MAIN WRIGHT STREET Inflow=2.60 cfs 0.212 af
Primary=2.60 cfs 0.212 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=22.86 cfs 1.814 af
Primary=22.86 cfs 1.814 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=5.23 cfs 0.401 af
Primary=5.23 cfs 0.401 af

Total Runoff Area = 6.432 ac Runoff Volume = 2.427 af Average Runoff Depth = 4.53"
37.48% Pervious = 2.411 ac 62.52% Impervious = 4.021 ac

Summary for Subcatchment 1A-EX: SUBCATCHMENT 1A-EX

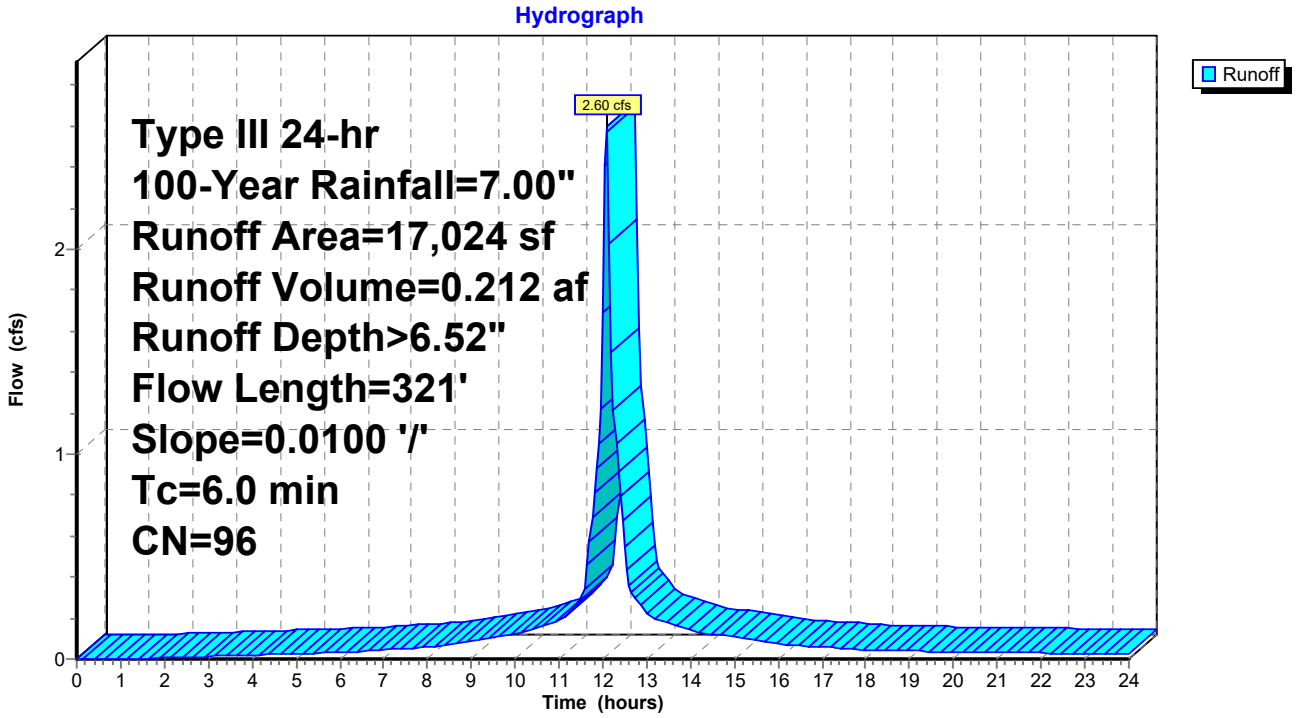
Runoff = 2.60 cfs @ 12.09 hrs, Volume= 0.212 af, Depth> 6.52"
Routed to Link 1 : 12" SEWER MAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
530	39	>75% Grass cover, Good, HSG A
11,090	98	Paved parking, HSG A
5,404	98	Roofs, HSG A
17,024	96	Weighted Average
530		3.11% Pervious Area
16,494		96.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Pavement to Catch Basin** Smooth surfaces n= 0.011 P2= 3.40"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Pavement to Catch Basin** Paved Kv= 20.3 fps
1.0	221	0.0100	3.54	1.39	**Pipe Channel, Combined Storm/Sewer pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
2.3	321	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1A-EX: SUBCATCHMENT 1A-EX



Summary for Subcatchment 2A-EX: SUBCATCHMENT 2A-EX

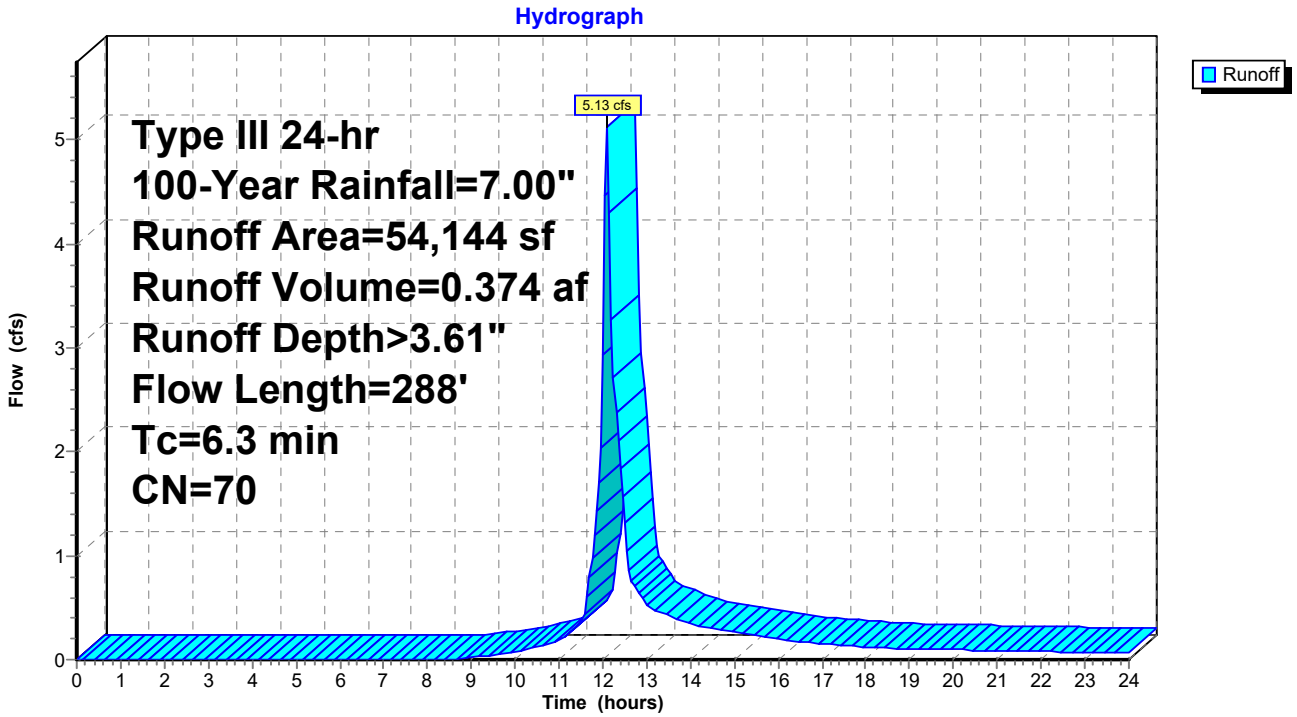
Runoff = 5.13 cfs @ 12.10 hrs, Volume= 0.374 af, Depth> 3.61"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
25,387	39	>75% Grass cover, Good, HSG A
24,930	98	Paved parking, HSG A
3,827	98	Roofs, HSG A
54,144	70	Weighted Average
25,387		46.89% Pervious Area
28,757		53.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0064	0.78		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.40"
1.0	101	0.0064	1.62		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.2	137	0.0060	0.54		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
6.3	288	Total			

Subcatchment 2A-EX: SUBCATCHMENT 2A-EX



Summary for Subcatchment 2B-EX: SUBCATCHMENT 2B-EX

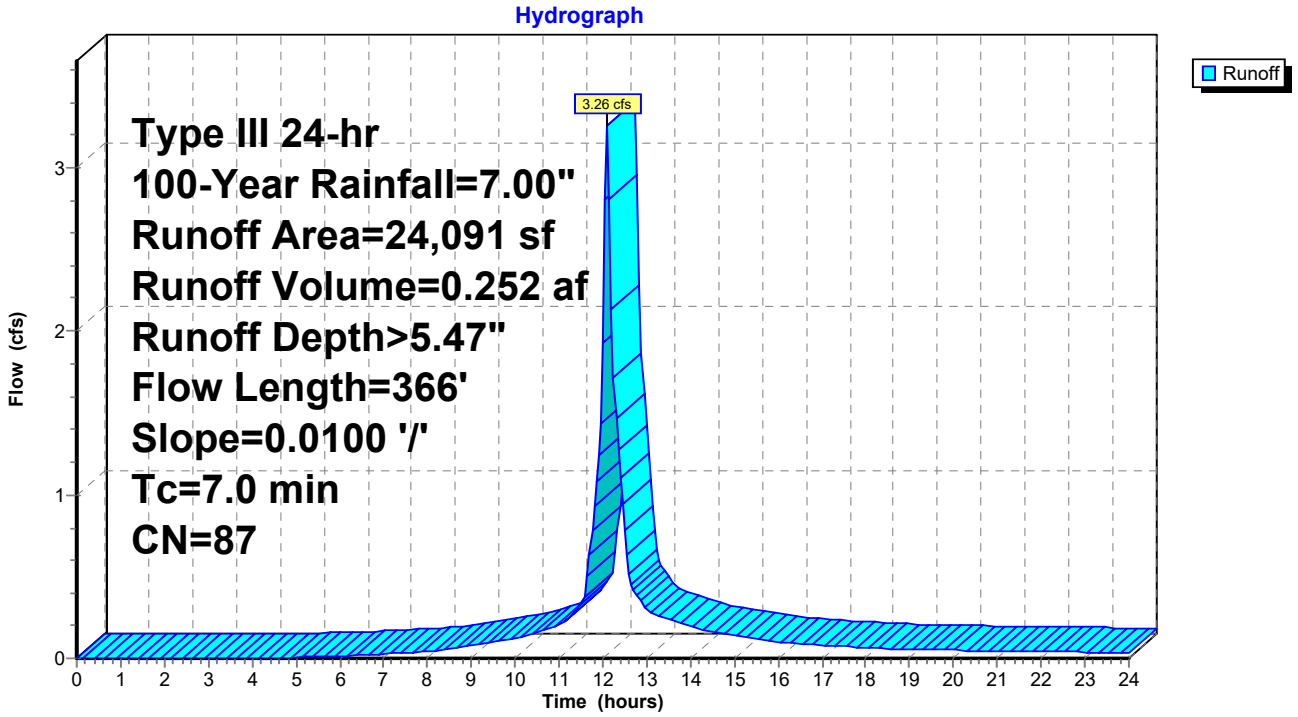
Runoff = 3.26 cfs @ 12.10 hrs, Volume= 0.252 af, Depth> 5.47"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
4,354	39	>75% Grass cover, Good, HSG A
18,584	98	Paved parking, HSG A
1,153	96	Gravel surface, HSG A
24,091	87	Weighted Average
5,507		22.86% Pervious Area
18,584		77.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	29	0.0100	0.10		**Sheet Flow, Grassed area** Grass: Short n= 0.150 P2= 3.40"
0.4	21	0.0100	0.79		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.2	148	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.7	168	0.0100	3.86	1.52	**Pipe Channel, Drain Pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
7.0	366	Total			

Subcatchment 2B-EX: SUBCATCHMENT 2B-EX



Summary for Subcatchment 2C-EX: SUBCATCHMENT 2C-EX

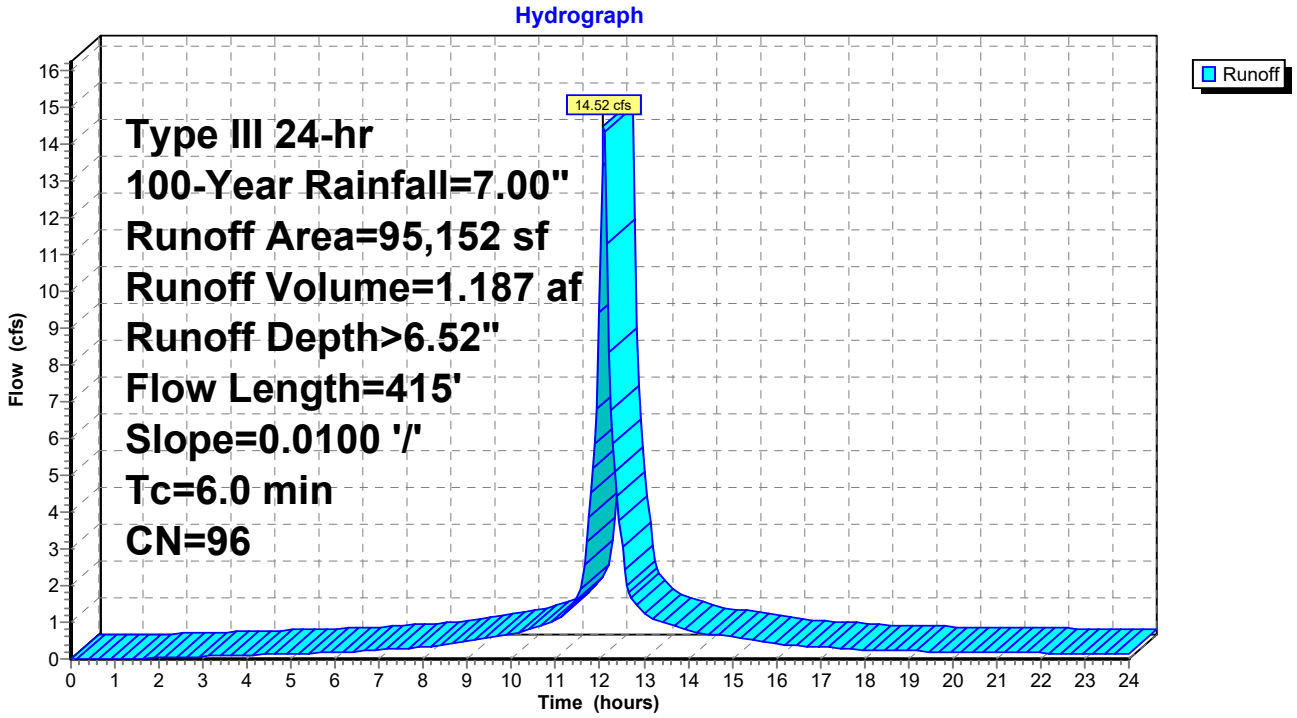
Runoff = 14.52 cfs @ 12.09 hrs, Volume= 1.187 af, Depth> 6.52"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
3,734	39	>75% Grass cover, Good, HSG A
65,565	98	Paved parking, HSG A
25,853	98	Roofs, HSG A
95,152	96	Weighted Average
3,734		3.92% Pervious Area
91,418		96.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
1.4	166	0.0100	2.03		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
0.9	199	0.0100	3.86	1.52	**Pipe Channel, Drain pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.011 Concrete pipe, straight & clean
3.2	415	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-EX: SUBCATCHMENT 2C-EX



Summary for Subcatchment 3A-EX: SUBCATCHMENT 3A-EX

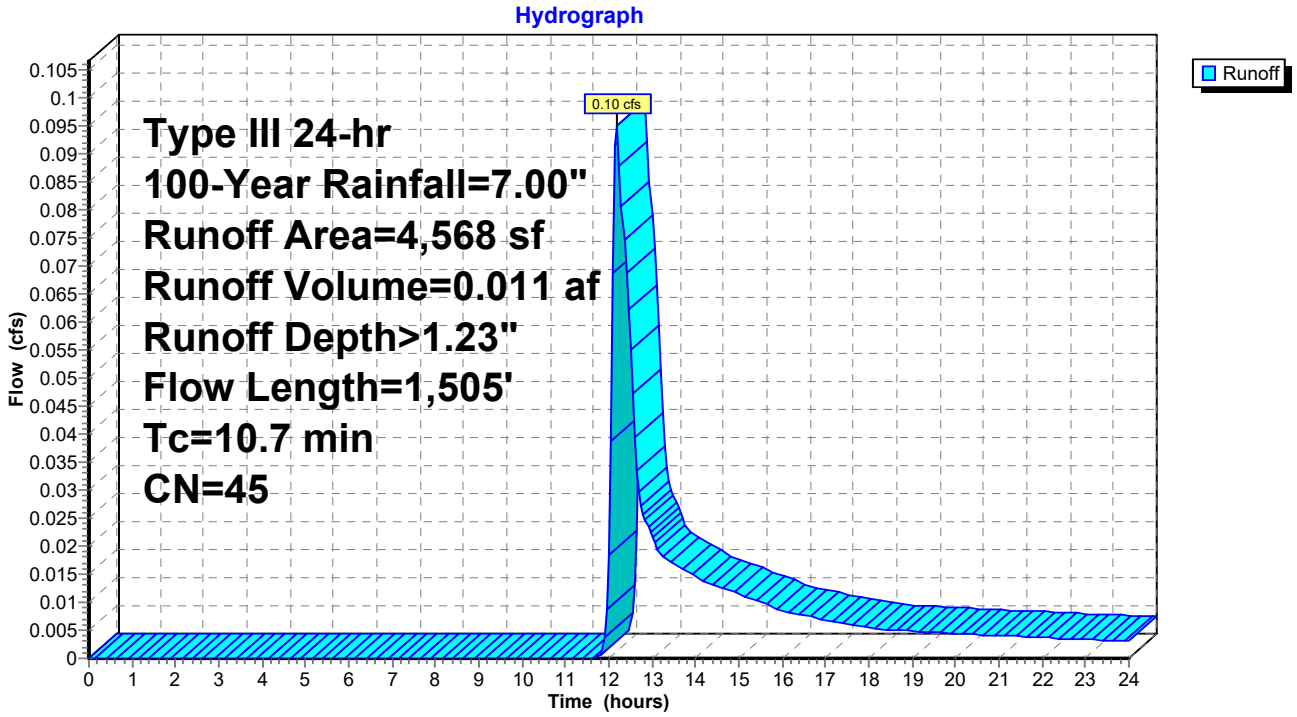
Runoff = 0.10 cfs @ 12.19 hrs, Volume= 0.011 af, Depth> 1.23"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	3,586	39	Grass swale >75% Grass cover, Good, HSG A
*	982	68	Infiltration trench <50% Grass cover, Poor, HSG A
	4,568	45	Weighted Average
	4,568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0055	0.22		**Sheet Flow, Heavy lift** Fallow n= 0.050 P2= 3.40"
1.8	128	0.0055	1.19		**Shallow Concentrated Flow, Heayv lift area** Unpaved Kv= 16.1 fps
4.0	628	0.0055	2.62	1.03	**Pipe Channel, CMP_Round 12"** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
1.1	699	0.0050	10.59	299.47	**Pipe Channel, RCP_Round 72"** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
10.7	1,505	Total			

Subcatchment 3A-EX: SUBCATCHMENT 3A-EX



Summary for Subcatchment 3B-EX: SUBCATCHMENT 3B-EX

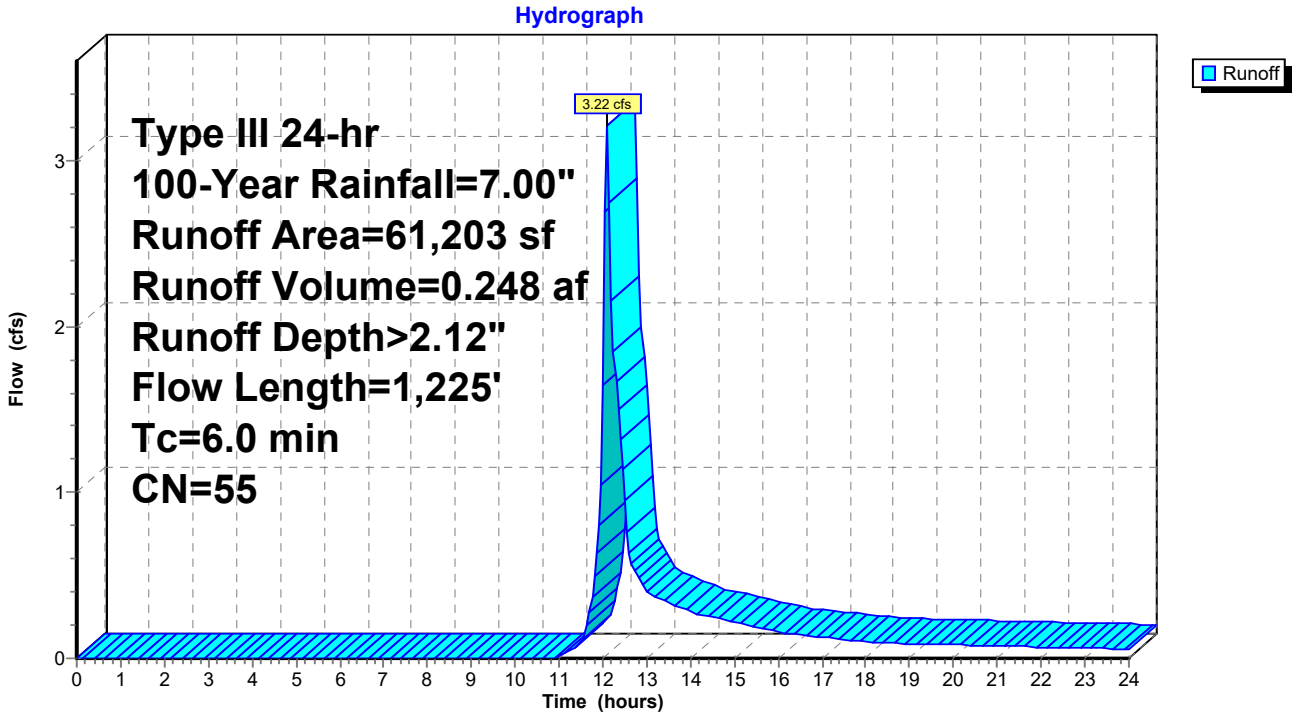
Runoff = 3.22 cfs @ 12.10 hrs, Volume= 0.248 af, Depth> 2.12"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
	37,725	39	>75% Grass cover, Good, HSG A
*	13,473	68	Grassed swale <50% Grass cover, Poor, HSG A
	5,375	98	Paved parking, HSG A
	4,268	98	Roofs, HSG A
*	162	68	Infiltration trench <50% Grass cover, Poor, HSG A
	200	96	Gravel surface, HSG A
	61,203	55	Weighted Average
	51,560		84.24% Pervious Area
	9,643		15.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0070	0.81		**Sheet Flow, Paved area** Smooth surfaces n= 0.011 P2= 3.40"
0.1	13	0.0070	1.70		**Shallow Concentrated Flow, Paved area** Paved Kv= 20.3 fps
2.3	91	0.0090	0.66		**Shallow Concentrated Flow, Grassed area** Short Grass Pasture Kv= 7.0 fps
1.8	372	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.0	1,225	Total			

Subcatchment 3B-EX: SUBCATCHMENT 3B-EX



Summary for Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

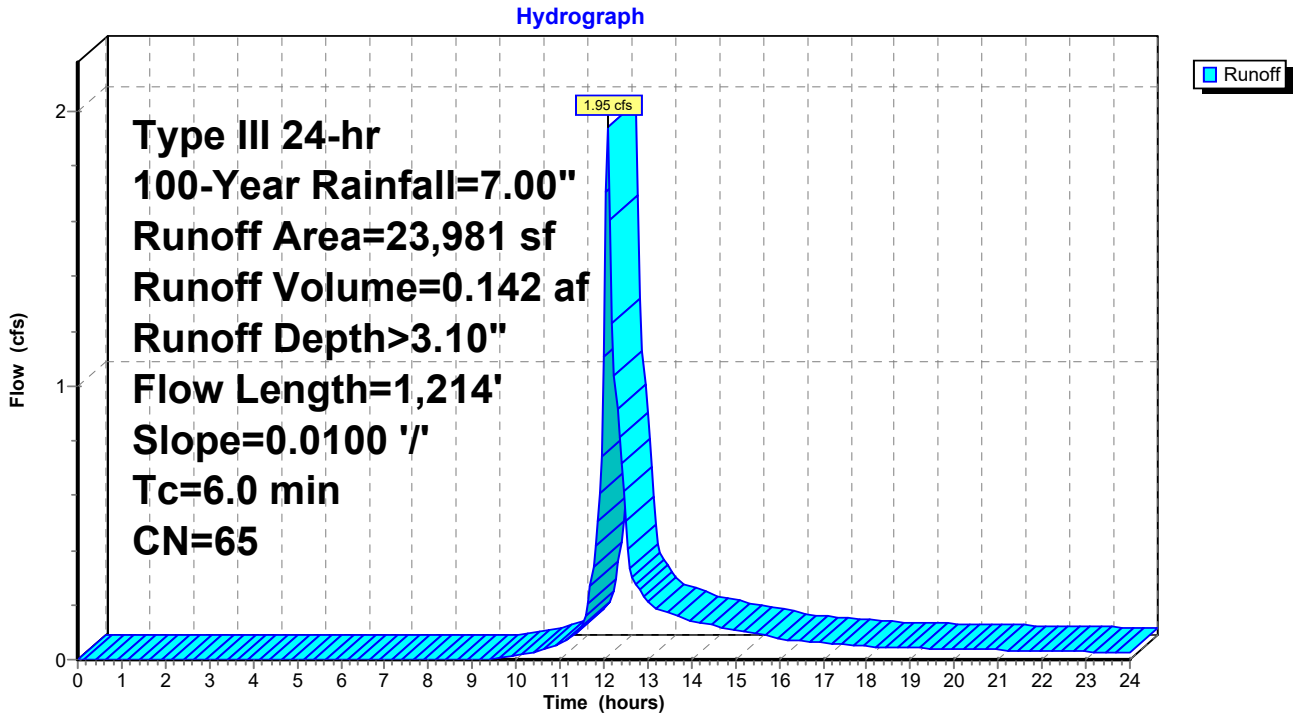
Runoff = 1.95 cfs @ 12.10 hrs, Volume= 0.142 af, Depth> 3.10"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	13,420	39	Grass swale >75% Grass cover, Good, HSG A
*	301	68	Infiltration trench <50% Grass cover, Poor, HSG A
	10,260	98	Paved parking, HSG A
	23,981	65	Weighted Average
	13,721		57.22% Pervious Area
	10,260		42.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	515	0.0100	3.54	1.39	**Pipe Channel, Infiltration trench collector pipe** 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.012 Corrugated PP, smooth interior
0.8	699	0.0100	14.98	423.51	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
3.2	1,214	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3C-EX: SUBCATCHMENT 3C-EX

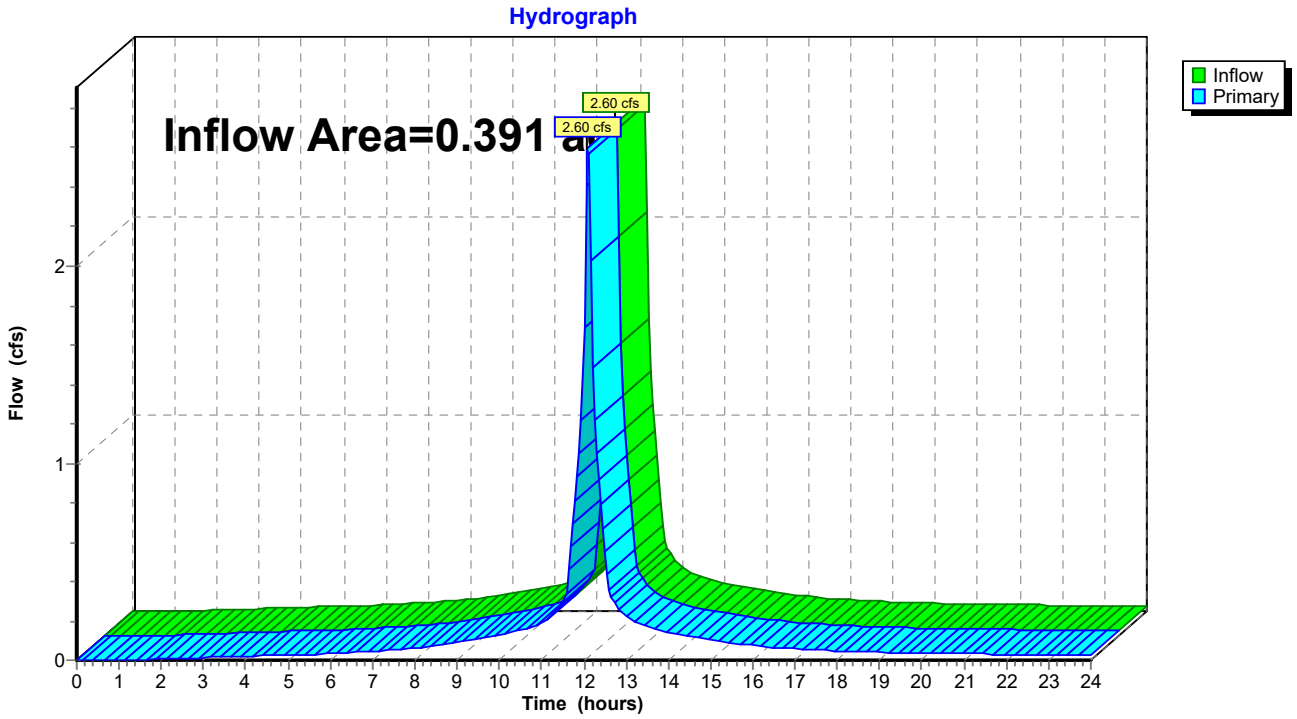


Summary for Link 1: 12" SEWER MAIN WRIGHT STREET

Inflow Area = 0.391 ac, 96.89% Impervious, Inflow Depth > 6.52" for 100-Year event
Inflow = 2.60 cfs @ 12.09 hrs, Volume= 0.212 af
Primary = 2.60 cfs @ 12.09 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 1: 12" SEWER MAIN WRIGHT STREET

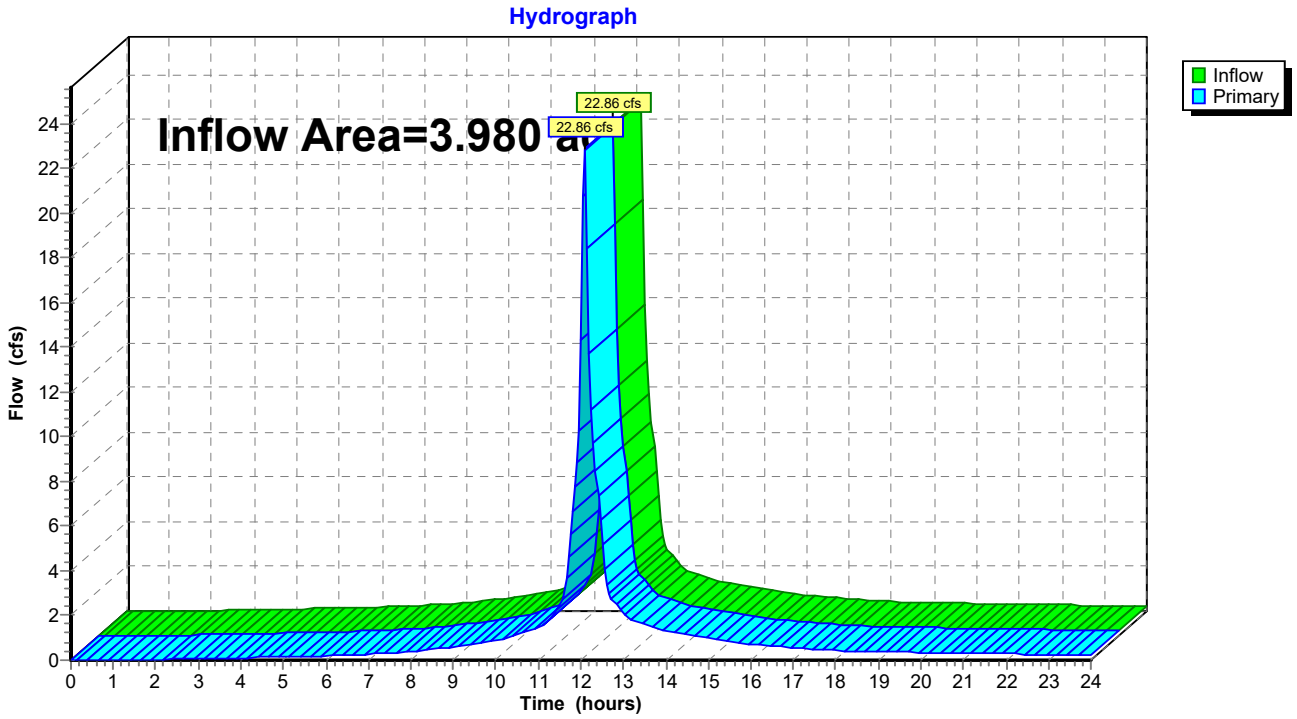


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 3.980 ac, 80.03% Impervious, Inflow Depth > 5.47" for 100-Year event
Inflow = 22.86 cfs @ 12.09 hrs, Volume= 1.814 af
Primary = 22.86 cfs @ 12.09 hrs, Volume= 1.814 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

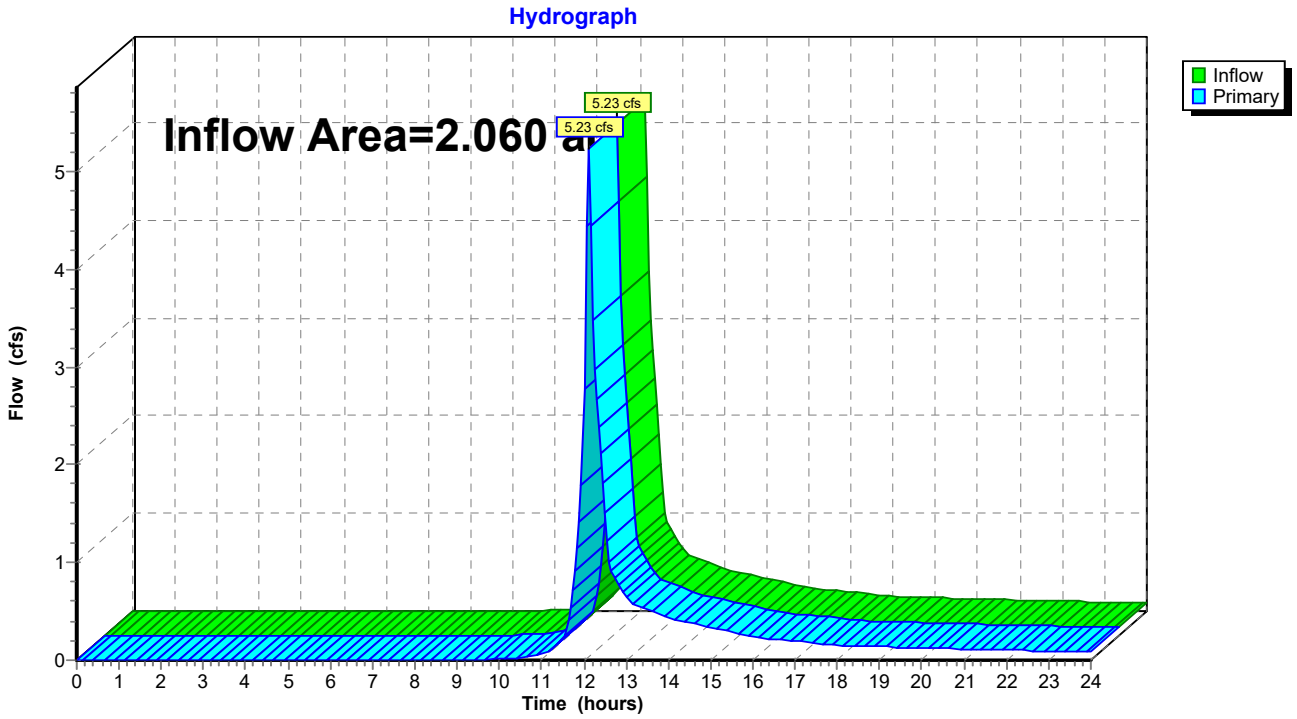


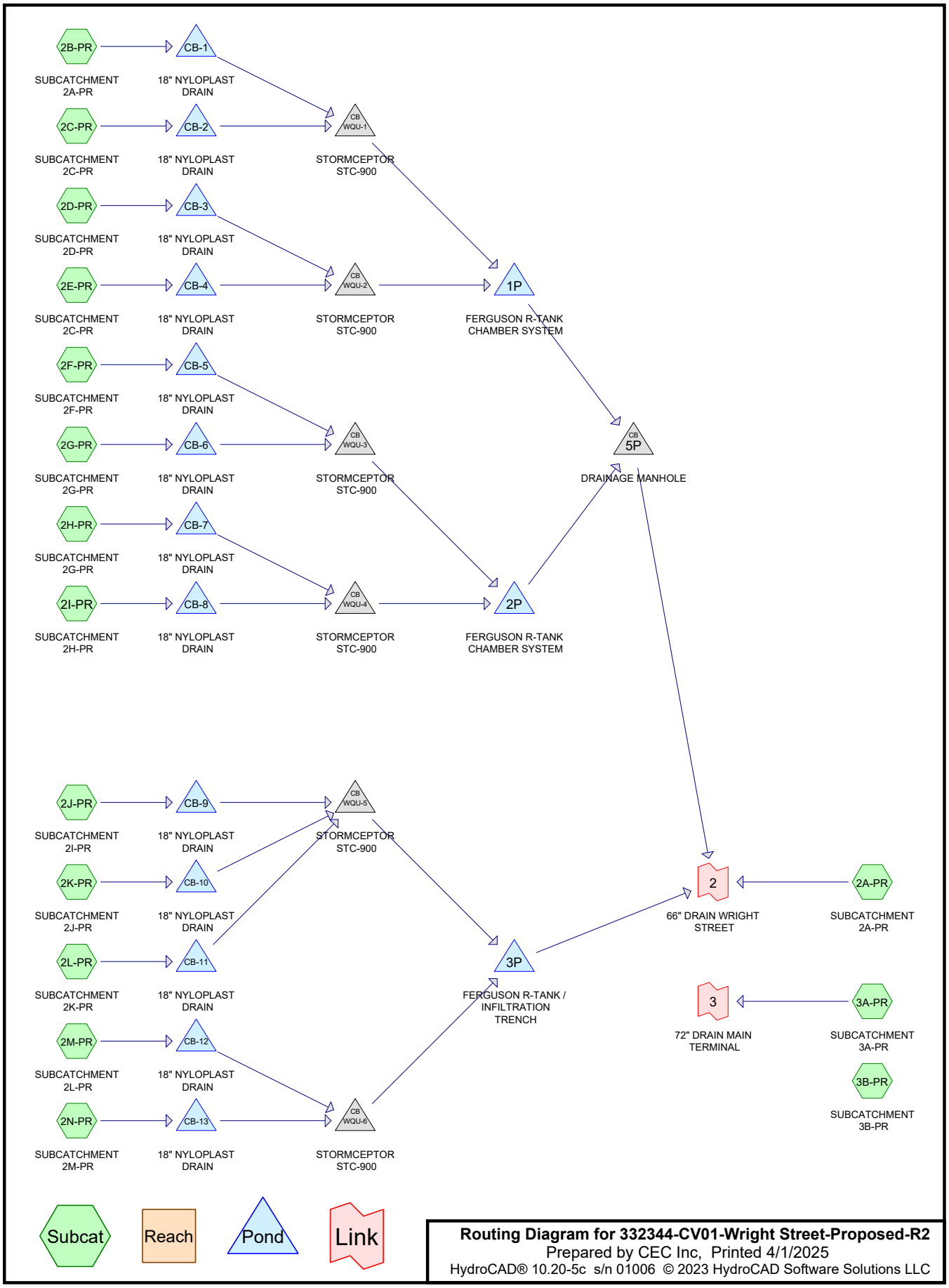
Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 2.060 ac, 22.18% Impervious, Inflow Depth > 2.34" for 100-Year event
Inflow = 5.23 cfs @ 12.10 hrs, Volume= 0.401 af
Primary = 5.23 cfs @ 12.10 hrs, Volume= 0.401 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL





Routing Diagram for 332344-CV01-Wright Street-Proposed-R2
Prepared by CEC Inc, Printed 4/1/2025
HydroCAD® 10.20-5c s/n 01006 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.40	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.80	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.60	2
4	100-Year	Type III 24-hr		Default	24.00	1	7.00	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.046	39	15' Landscaped area >75% Grass cover, Good, HSG A (2N-PR)
5.758	96	Heavy lift Gravel surface, HSG A (2B-PR, 2C-PR, 2D-PR, 2E-PR, 2F-PR, 2G-PR, 2H-PR, 2I-PR, 2J-PR, 2K-PR, 2L-PR, 2M-PR, 2N-PR, 3A-PR)
0.380	39	Landscaped area >75% Grass cover, Good, HSG A (2B-PR, 2C-PR, 2D-PR, 2E-PR, 2F-PR, 2G-PR, 2H-PR, 2I-PR, 2J-PR, 2K-PR, 2L-PR, 2M-PR)
0.184	98	Paved parking, HSG A (2A-PR, 2J-PR)
0.064	98	Water Surface, HSG A (3B-PR)
6.432	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
6.432	HSG A	2A-PR, 2B-PR, 2C-PR, 2D-PR, 2E-PR, 2F-PR, 2G-PR, 2H-PR, 2I-PR, 2J-PR, 2K-PR, 2L-PR, 2M-PR, 2N-PR, 3A-PR, 3B-PR
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
6.432		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover
0.046	0.000	0.000	0.000	0.000	0.046	15' Landscaped area >75% Grass cover, Good
5.758	0.000	0.000	0.000	0.000	5.758	Heavy lift Gravel surface
0.380	0.000	0.000	0.000	0.000	0.380	Landscaped area >75% Grass cover, Good
0.184	0.000	0.000	0.000	0.000	0.184	Paved parking
0.064	0.000	0.000	0.000	0.000	0.064	Water Surface
6.432	**0.000**	**0.000**	**0.000**	**0.000**	**6.432**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2A-PR: SUBCATCHMENT Runoff Area=5,164 sf 100.00% Impervious Runoff Depth>3.16"
Tc=6.0 min CN=98 Runoff=0.4 cfs 0.03 af

Subcatchment2B-PR: SUBCATCHMENT Runoff Area=7,746 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=320' Tc=6.0 min CN=91 Runoff=0.5 cfs 0.04 af

Subcatchment2C-PR: SUBCATCHMENT Runoff Area=41,736 sf 0.00% Impervious Runoff Depth>2.74"
Flow Length=378' Tc=6.0 min CN=94 Runoff=2.9 cfs 0.22 af

Subcatchment2D-PR: SUBCATCHMENT Runoff Area=16,382 sf 0.00% Impervious Runoff Depth>2.64"
Flow Length=380' Tc=6.0 min CN=93 Runoff=1.1 cfs 0.08 af

Subcatchment2E-PR: SUBCATCHMENT Runoff Area=12,269 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=161' Tc=6.0 min CN=91 Runoff=0.8 cfs 0.06 af

Subcatchment2F-PR: SUBCATCHMENT Runoff Area=3,277 sf 0.00% Impervious Runoff Depth>1.77"
Flow Length=137' Tc=6.0 min CN=83 Runoff=0.2 cfs 0.01 af

Subcatchment2G-PR: SUBCATCHMENT Runoff Area=3,117 sf 0.00% Impervious Runoff Depth>1.56"
Flow Length=258' Tc=6.0 min CN=80 Runoff=0.1 cfs 0.01 af

Subcatchment2H-PR: SUBCATCHMENT Runoff Area=19,639 sf 0.00% Impervious Runoff Depth>2.54"
Flow Length=320' Tc=6.0 min CN=92 Runoff=1.3 cfs 0.10 af

Subcatchment2I-PR: SUBCATCHMENT Runoff Area=29,698 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=385' Tc=6.0 min CN=91 Runoff=1.9 cfs 0.14 af

Subcatchment2J-PR: SUBCATCHMENT Runoff Area=48,397 sf 5.88% Impervious Runoff Depth>2.74"
Flow Length=340' Tc=6.0 min CN=94 Runoff=3.3 cfs 0.25 af

Subcatchment2K-PR: SUBCATCHMENT Runoff Area=16,131 sf 0.00% Impervious Runoff Depth>2.35"
Flow Length=340' Tc=6.0 min CN=90 Runoff=1.0 cfs 0.07 af

Subcatchment2L-PR: SUBCATCHMENT Runoff Area=15,693 sf 0.00% Impervious Runoff Depth>2.35"
Flow Length=340' Tc=6.0 min CN=90 Runoff=1.0 cfs 0.07 af

Subcatchment2M-PR: SUBCATCHMENT Runoff Area=19,164 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=275' Tc=6.0 min CN=91 Runoff=1.2 cfs 0.09 af

Subcatchment2N-PR: SUBCATCHMENT Runoff Area=35,765 sf 0.00% Impervious Runoff Depth>2.64"
Flow Length=370' Tc=6.0 min CN=93 Runoff=2.4 cfs 0.18 af

Subcatchment3A-PR: SUBCATCHMENT Runoff Area=3,190 sf 0.00% Impervious Runoff Depth>2.94"
Flow Length=1,325' Tc=6.3 min CN=96 Runoff=0.2 cfs 0.02 af

Subcatchment3B-PR: SUBCATCHMENT Runoff Area=2,795 sf 100.00% Impervious Runoff Depth>3.16"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Pond 1P: FERGUSON R-TANK CHAMBER Peak Elev=7.44' Storage=0.12 af Inflow=5.2 cfs 0.39 af
Discarded=0.1 cfs 0.17 af Primary=3.9 cfs 0.15 af Outflow=4.0 cfs 0.32 af

Pond 2P: FERGUSON R-TANK CHAMBER Peak Elev=7.23' Storage=0.08 af Inflow=3.4 cfs 0.25 af
Discarded=0.1 cfs 0.15 af Primary=1.6 cfs 0.07 af Outflow=1.7 cfs 0.23 af

Pond 3P: FERGUSON R-TANK / INFILTRATION Peak Elev=6.11' Storage=0.27 af Inflow=8.9 cfs 0.67 af
Discarded=0.5 cfs 0.61 af Primary=0.6 cfs 0.06 af Outflow=1.2 cfs 0.67 af

Pond 5P: DRAINAGE MANHOLE Peak Elev=6.29' Inflow=4.8 cfs 0.22 af
30.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=4.8 cfs 0.22 af

Pond CB-1: 18" NYLOPLAST DRAIN Peak Elev=9.03' Storage=0 cf Inflow=0.5 cfs 0.04 af
Outflow=0.5 cfs 0.04 af

Pond CB-10: 18" NYLOPLAST DRAIN Peak Elev=7.89' Storage=2 cf Inflow=1.0 cfs 0.07 af
Outflow=1.0 cfs 0.07 af

Pond CB-11: 18" NYLOPLAST DRAIN Peak Elev=7.85' Storage=2 cf Inflow=1.0 cfs 0.07 af
Outflow=1.0 cfs 0.07 af

Pond CB-12: 18" NYLOPLAST DRAIN Peak Elev=7.88' Storage=3 cf Inflow=1.2 cfs 0.09 af
Outflow=1.2 cfs 0.09 af

Pond CB-13: 18" NYLOPLAST DRAIN Peak Elev=7.90' Storage=17 cf Inflow=2.4 cfs 0.18 af
Outflow=2.4 cfs 0.18 af

Pond CB-2: 18" NYLOPLAST DRAIN Peak Elev=8.89' Storage=16 cf Inflow=2.9 cfs 0.22 af
Outflow=2.8 cfs 0.22 af

Pond CB-3: 18" NYLOPLAST DRAIN Peak Elev=8.77' Storage=0.00 af Inflow=1.1 cfs 0.08 af
Outflow=1.1 cfs 0.08 af

Pond CB-4: 18" NYLOPLAST DRAIN Peak Elev=8.97' Storage=1 cf Inflow=0.8 cfs 0.06 af
Outflow=0.8 cfs 0.06 af

Pond CB-5: 18" NYLOPLAST DRAIN Peak Elev=9.03' Storage=0 cf Inflow=0.2 cfs 0.01 af
Outflow=0.2 cfs 0.01 af

Pond CB-6: 18" NYLOPLAST DRAIN Peak Elev=8.91' Storage=0 cf Inflow=0.1 cfs 0.01 af
Outflow=0.1 cfs 0.01 af

Pond CB-7: 18" NYLOPLAST DRAIN Peak Elev=8.67' Storage=4 cf Inflow=1.3 cfs 0.10 af
Outflow=1.3 cfs 0.10 af

Pond CB-8: 18" NYLOPLAST DRAIN Peak Elev=8.58' Storage=9 cf Inflow=1.9 cfs 0.14 af
Outflow=1.9 cfs 0.14 af

Pond CB-9: 18" NYLOPLAST DRAIN Peak Elev=7.97' Storage=7 cf Inflow=3.3 cfs 0.25 af
Outflow=3.3 cfs 0.25 af

Pond WQU-1: STORMCEPTORSTC-900 Peak Elev=7.44' Inflow=3.3 cfs 0.25 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=3.3 cfs 0.25 af

Pond WQU-2: STORMCEPTORSTC-900 Peak Elev=7.09' Inflow=1.9 cfs 0.14 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=1.9 cfs 0.14 af

Pond WQU-3: STORMCEPTORSTC-900 Peak Elev=6.74' Inflow=0.3 cfs 0.02 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=0.3 cfs 0.02 af

Pond WQU-4: STORMCEPTORSTC-900 Peak Elev=7.19' Inflow=3.2 cfs 0.23 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=3.2 cfs 0.23 af

Pond WQU-5: STORMCEPTORSTC-900 Peak Elev=6.50' Inflow=5.3 cfs 0.40 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=5.3 cfs 0.40 af

Pond WQU-6: STORMCEPTORSTC-900 Peak Elev=6.25' Inflow=3.6 cfs 0.27 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=3.6 cfs 0.27 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=5.0 cfs 0.31 af
Primary=5.0 cfs 0.31 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=0.2 cfs 0.02 af
Primary=0.2 cfs 0.02 af

Total Runoff Area = 6.432 ac Runoff Volume = 1.38 af Average Runoff Depth = 2.58"
96.14% Pervious = 6.184 ac 3.86% Impervious = 0.248 ac

Summary for Subcatchment 2A-PR: SUBCATCHMENT 2A-PR

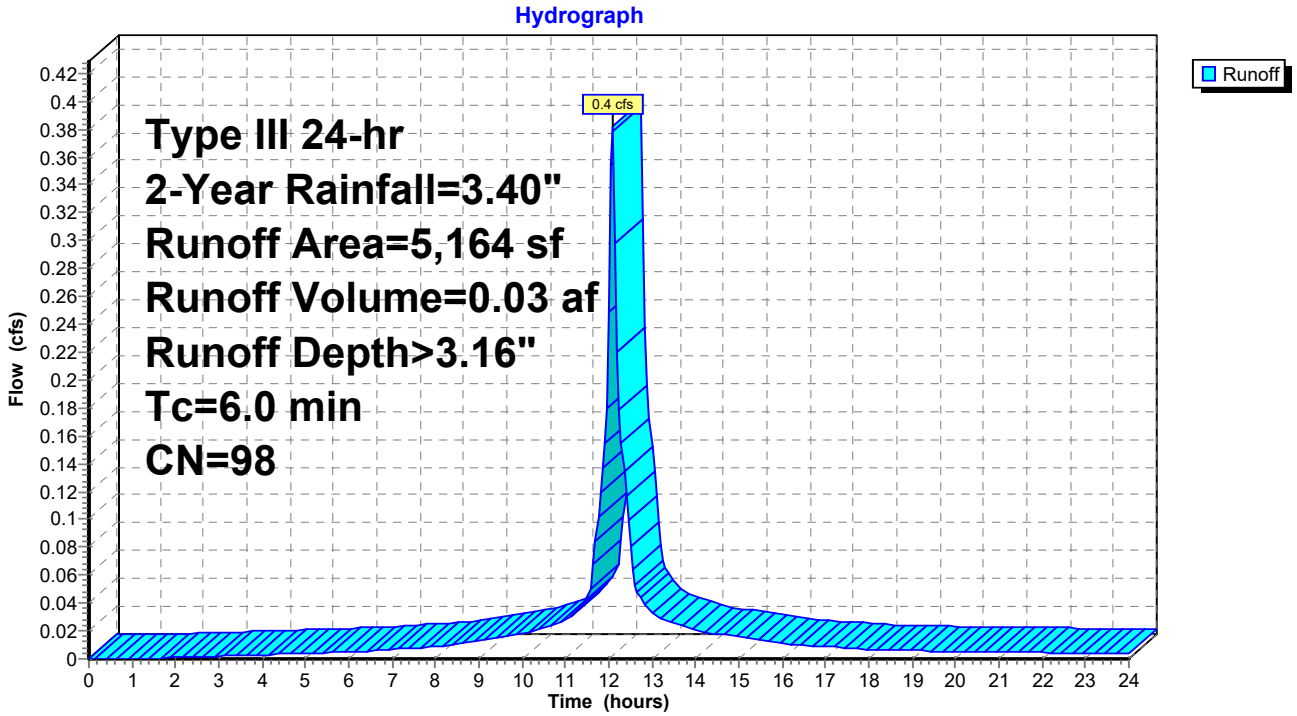
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 3.16"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
5,164	98	Paved parking, HSG A
5,164		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 2A-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2B-PR: SUBCATCHMENT 2A-PR

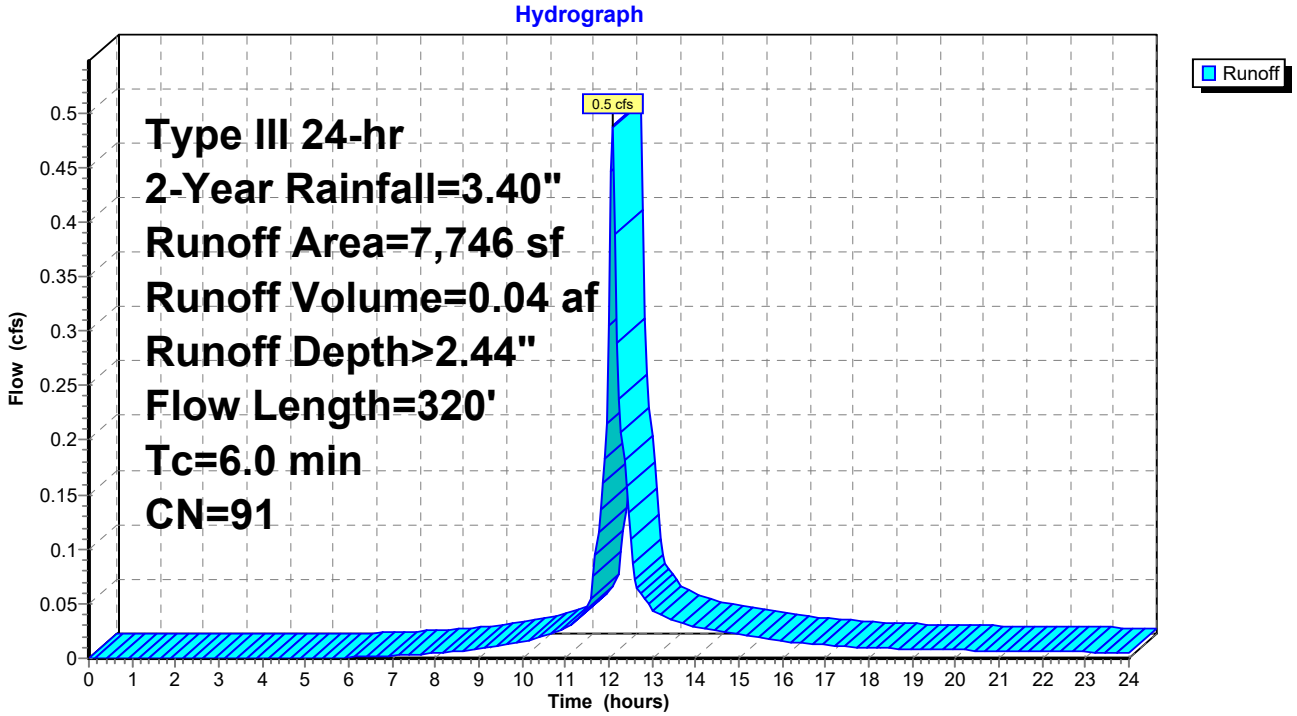
Runoff = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af, Depth> 2.44"
Routed to Pond CB-1 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	693	39	Landscaped area >75% Grass cover, Good, HSG A
*	7,053	96	Heavy lift Gravel surface, HSG A
	7,746	91	Weighted Average
	7,746		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	260	0.0053	1.17		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	60	0.0100	3.53	17.63	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
4.0	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2B-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2C-PR: SUBCATCHMENT 2C-PR

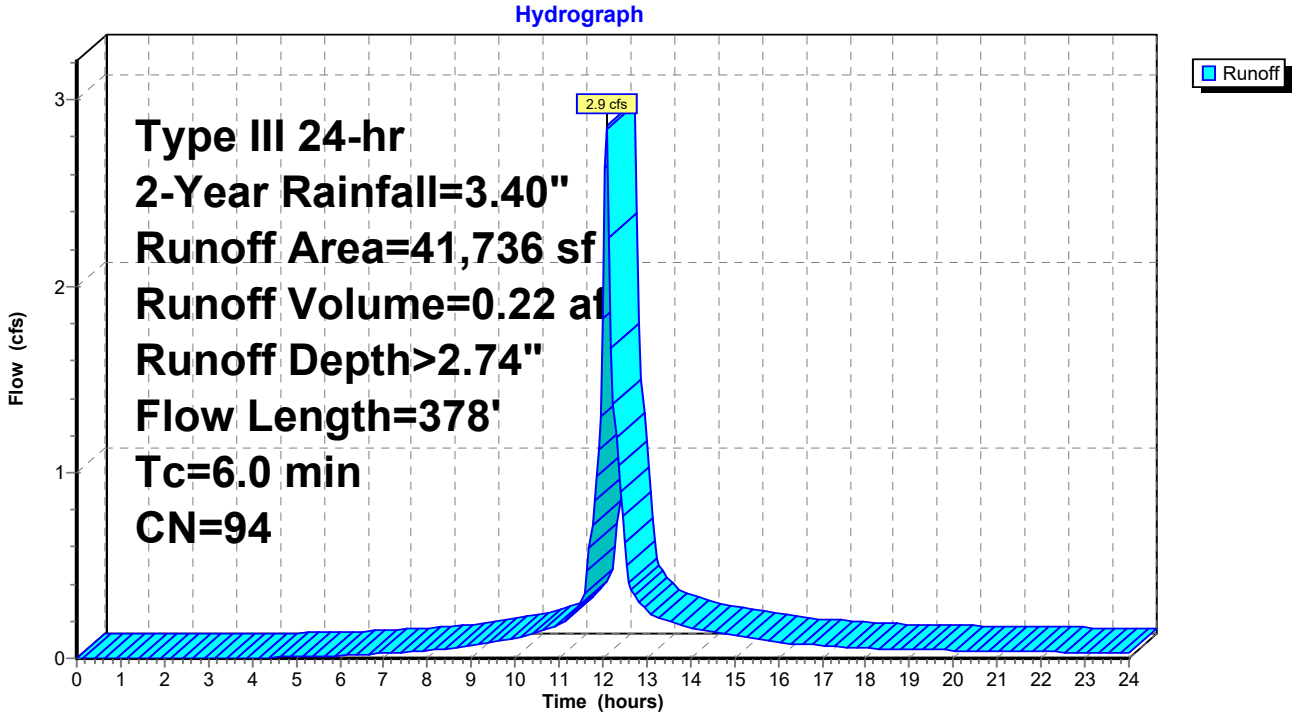
Runoff = 2.9 cfs @ 12.09 hrs, Volume= 0.22 af, Depth> 2.74"
Routed to Pond CB-2 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,298	39	Landscaped area >75% Grass cover, Good, HSG A
*	40,438	96	Heavy lift Gravel surface, HSG A
	41,736	94	Weighted Average
	41,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	328	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
5.1	378	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2D-PR: SUBCATCHMENT 2D-PR

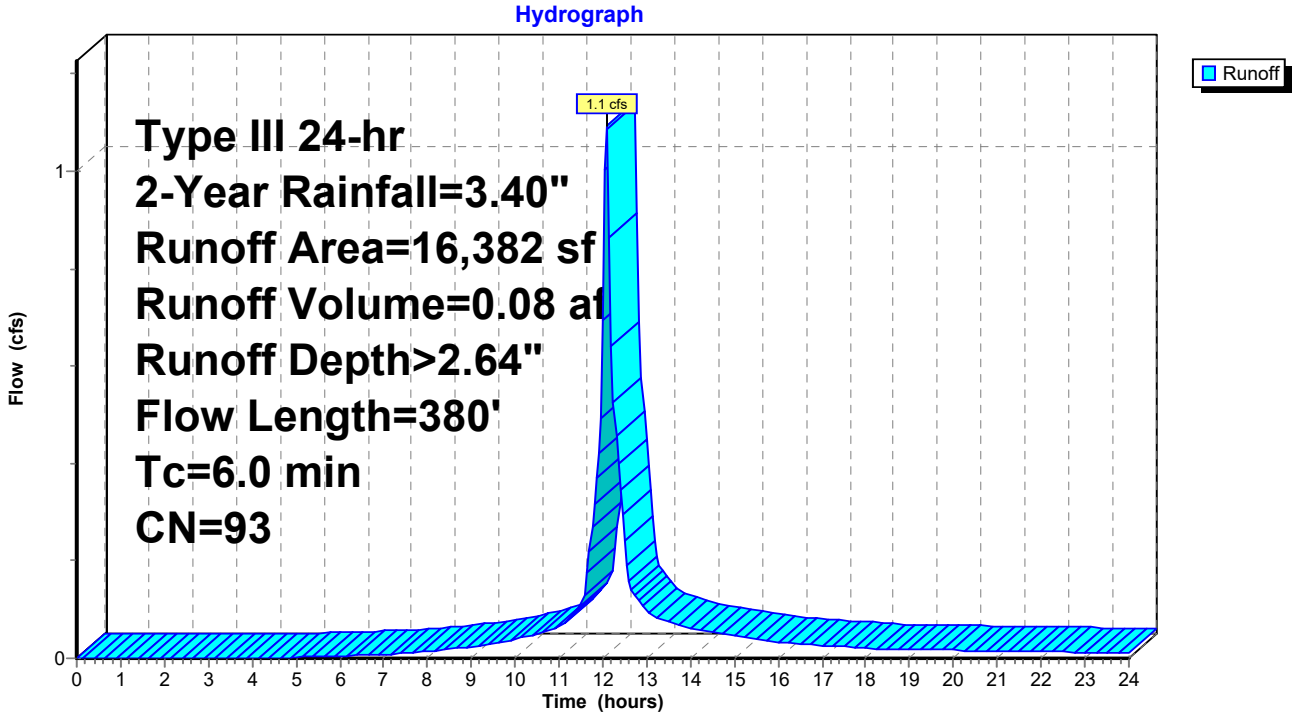
Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af, Depth> 2.64"
Routed to Pond CB-3 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	962	39	Landscaped area >75% Grass cover, Good, HSG A
*	15,420	96	Heavy lift Gravel surface, HSG A
	16,382	93	Weighted Average
	16,382		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	335	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.8	380	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2D-PR: SUBCATCHMENT 2D-PR



Summary for Subcatchment 2E-PR: SUBCATCHMENT 2C-PR

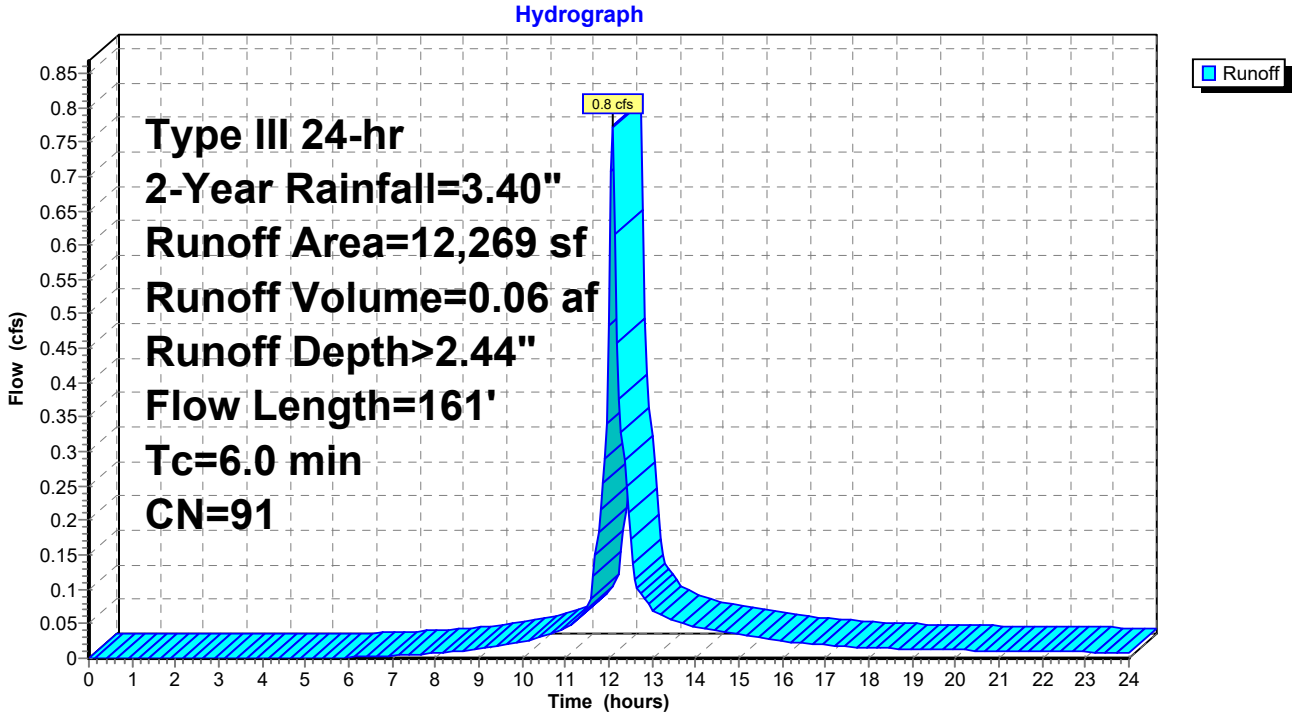
Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af, Depth> 2.44"
Routed to Pond CB-4 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,043	39	Landscaped area >75% Grass cover, Good, HSG A
*	11,226	96	Heavy lift Gravel surface, HSG A
	12,269	91	Weighted Average
	12,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	116	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.8	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2E-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2F-PR: SUBCATCHMENT 2F-PR

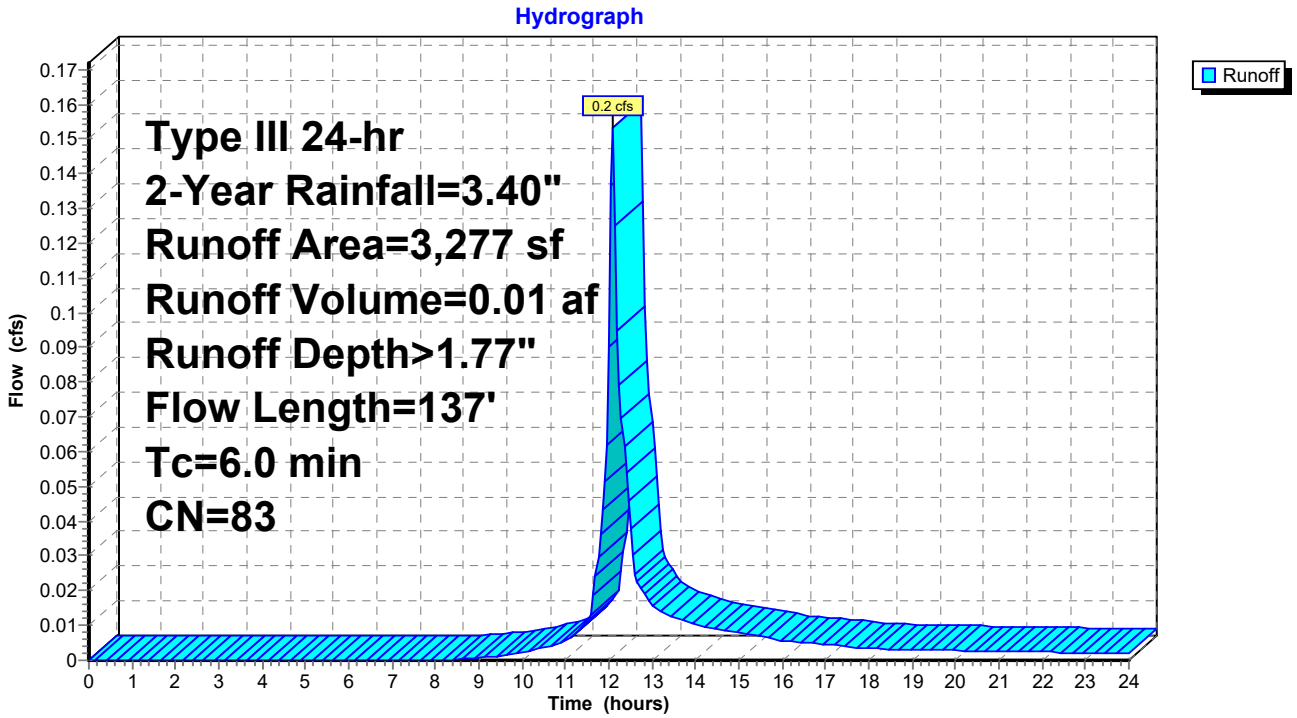
Runoff = 0.2 cfs @ 12.09 hrs, Volume= 0.01 af, Depth> 1.77"
Routed to Pond CB-5 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	751	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,526	96	Heavy lift Gravel surface, HSG A
	3,277	83	Weighted Average
	3,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	37	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.6	137	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2F-PR: SUBCATCHMENT 2F-PR



Summary for Subcatchment 2G-PR: SUBCATCHMENT 2G-PR

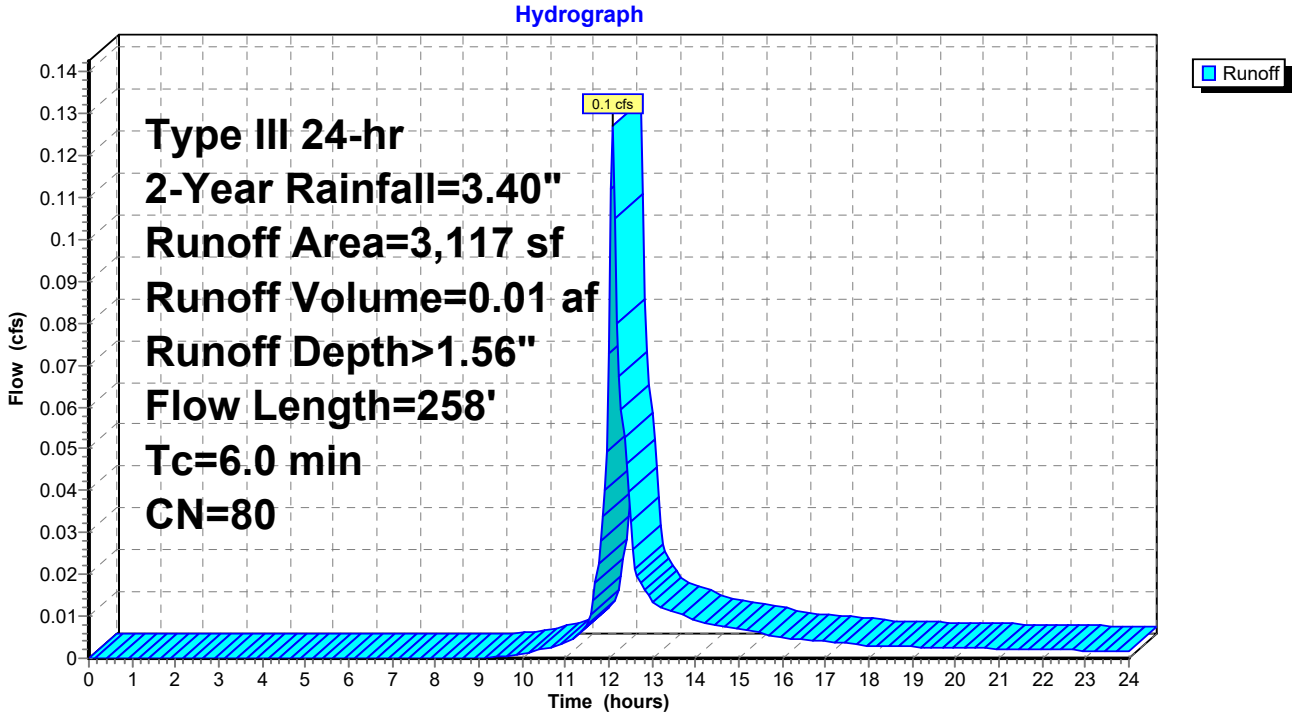
Runoff = 0.1 cfs @ 12.10 hrs, Volume= 0.01 af, Depth> 1.56"
Routed to Pond CB-6 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	902	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,215	96	Heavy lift Gravel surface, HSG A
	3,117	80	Weighted Average
	3,117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	208	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
3.3	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2G-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2H-PR: SUBCATCHMENT 2G-PR

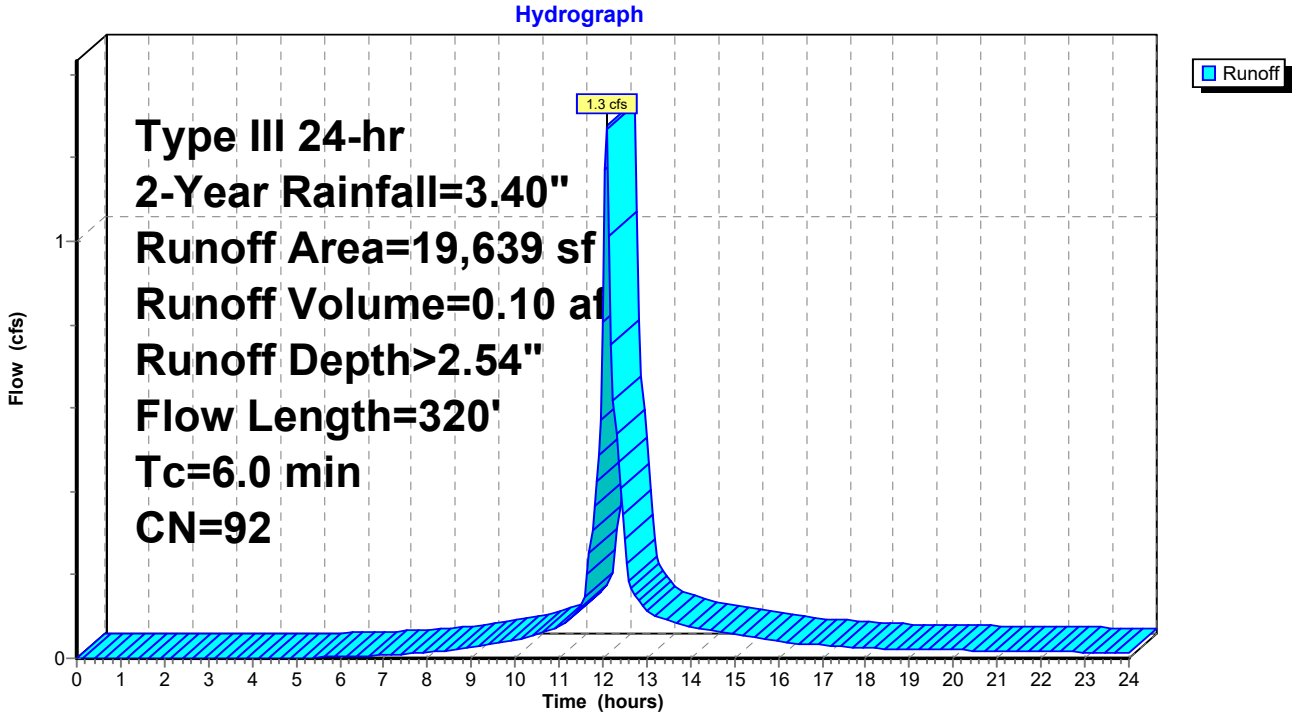
Runoff = 1.3 cfs @ 12.09 hrs, Volume= 0.10 af, Depth> 2.54"
Routed to Pond CB-7 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,347	39	Landscaped area >75% Grass cover, Good, HSG A
*	18,292	96	Heavy lift Gravel surface, HSG A
	19,639	92	Weighted Average
	19,639		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	270	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.3	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2H-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2I-PR: SUBCATCHMENT 2H-PR

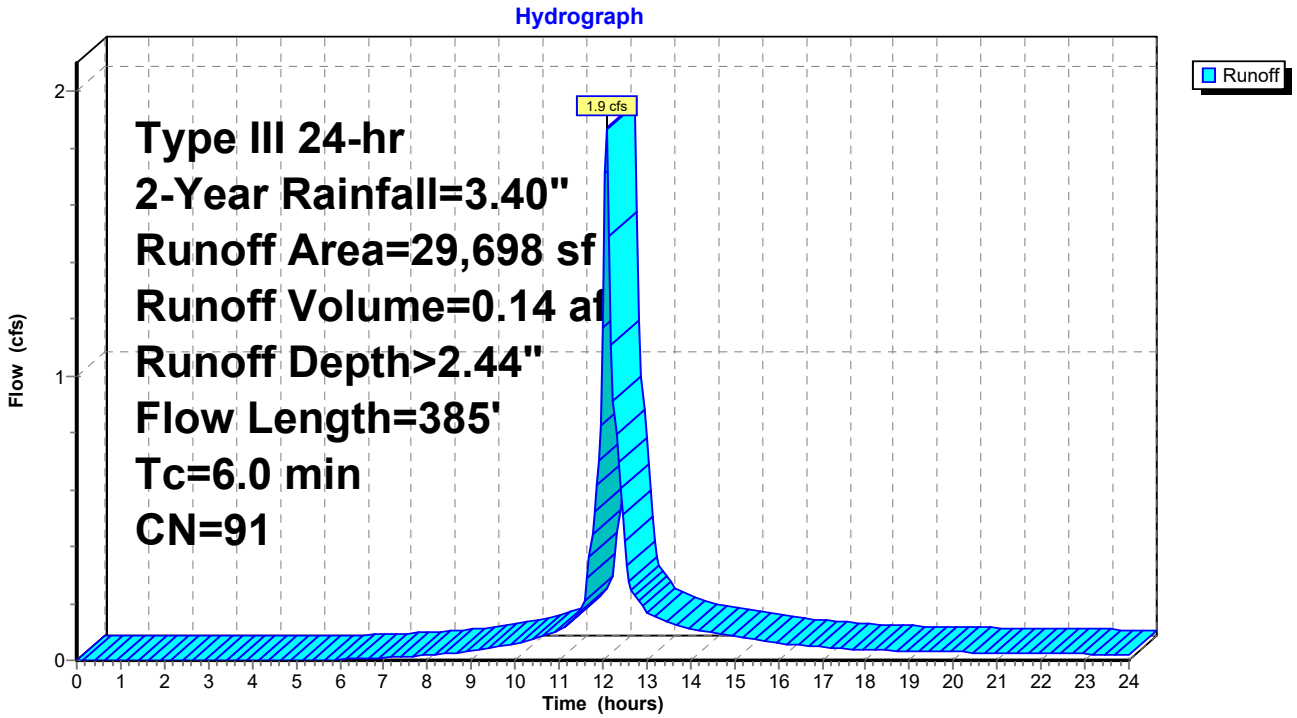
Runoff = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af, Depth> 2.44"
Routed to Pond CB-8 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	2,542	39	Landscaped area >75% Grass cover, Good, HSG A
*	27,156	96	Heavy lift Gravel surface, HSG A
	29,698	91	Weighted Average
	29,698		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	335	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.6	385	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2I-PR: SUBCATCHMENT 2H-PR



Summary for Subcatchment 2J-PR: SUBCATCHMENT 2I-PR

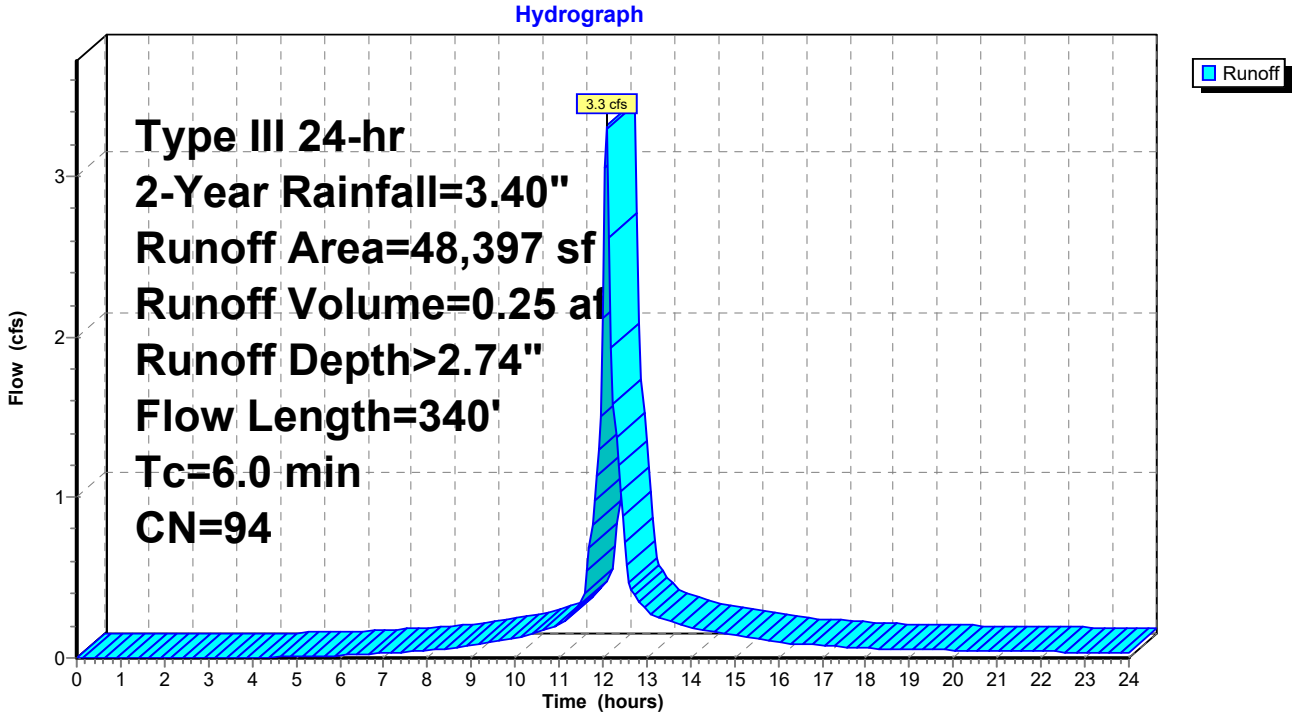
Runoff = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af, Depth> 2.74"
Routed to Pond CB-9 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	2,106	39	Landscaped area >75% Grass cover, Good, HSG A
*	43,443	96	Heavy lift Gravel surface, HSG A
	2,848	98	Paved parking, HSG A
	48,397	94	Weighted Average
	45,549		94.12% Pervious Area
	2,848		5.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2J-PR: SUBCATCHMENT 2I-PR



Summary for Subcatchment 2K-PR: SUBCATCHMENT 2J-PR

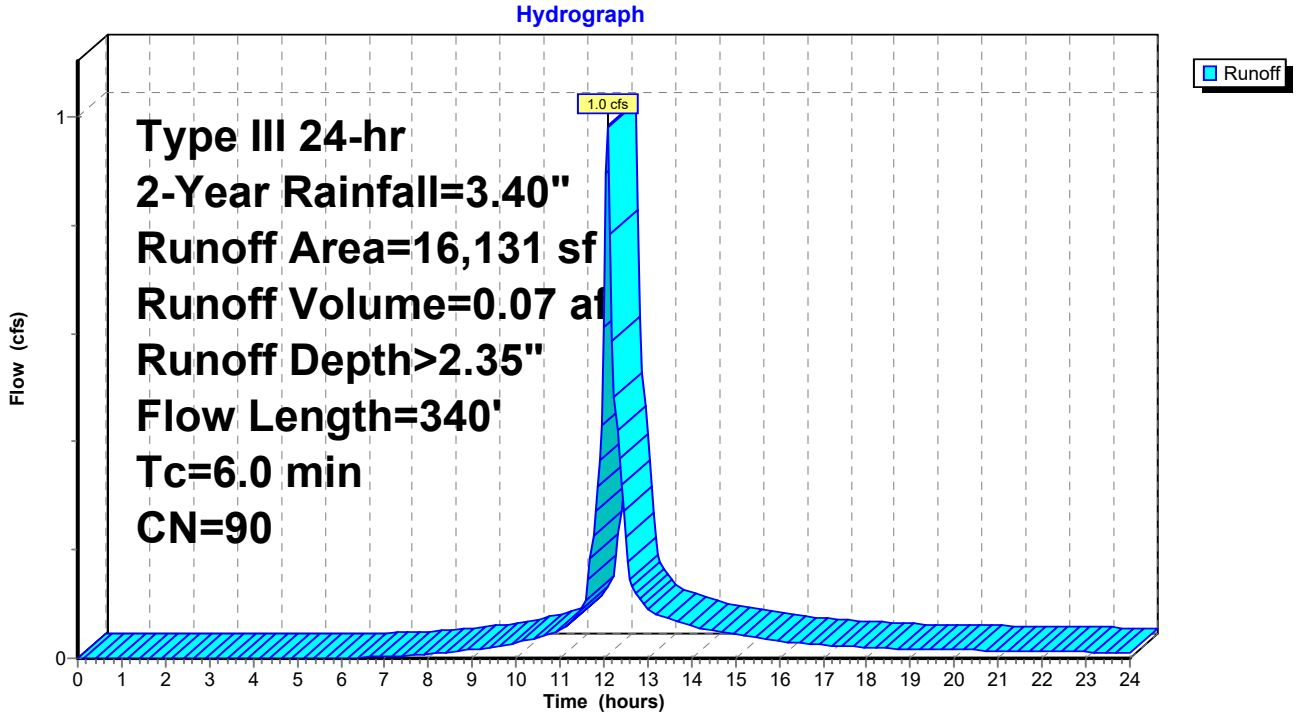
Runoff = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af, Depth> 2.35"
Routed to Pond CB-10 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,634	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,497	96	Heavy lift Gravel surface, HSG A
	16,131	90	Weighted Average
	16,131		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2K-PR: SUBCATCHMENT 2J-PR



Summary for Subcatchment 2L-PR: SUBCATCHMENT 2K-PR

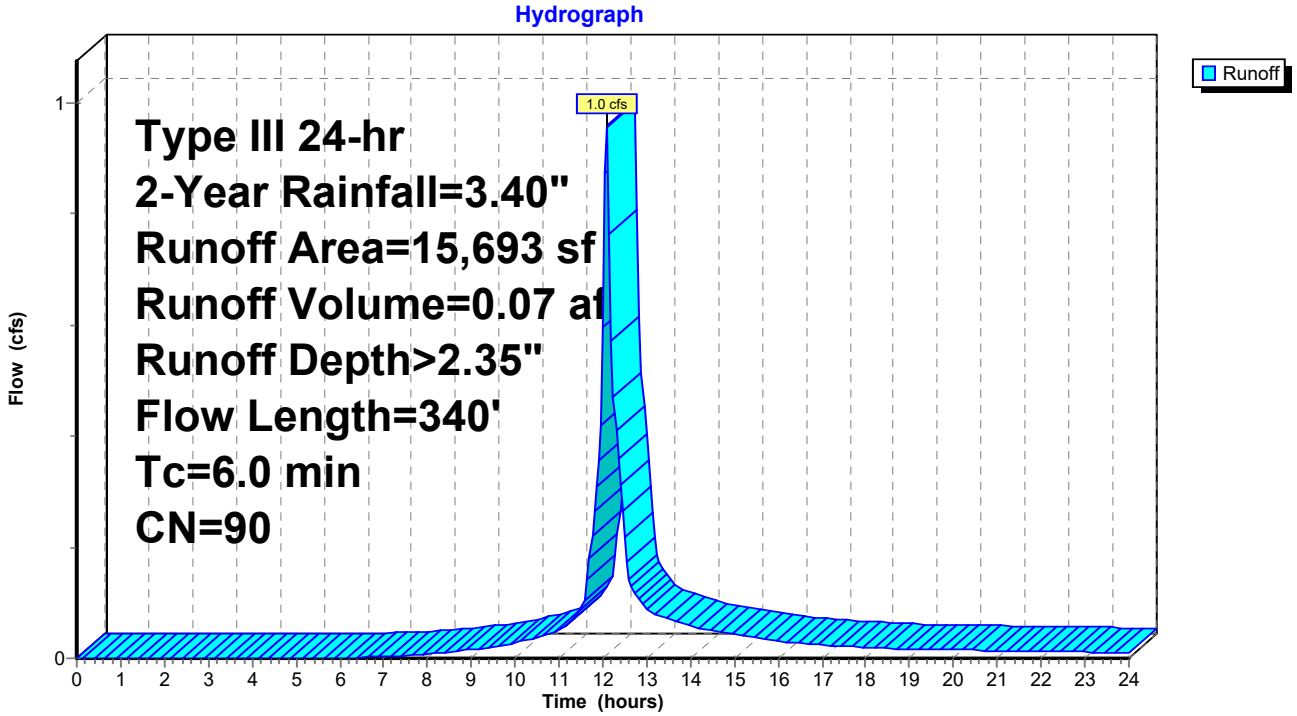
Runoff = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af, Depth> 2.35"
Routed to Pond CB-11 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,630	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,063	96	Heavy lift Gravel surface, HSG A
	15,693	90	Weighted Average
	15,693		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2L-PR: SUBCATCHMENT 2K-PR



Summary for Subcatchment 2M-PR: SUBCATCHMENT 2L-PR

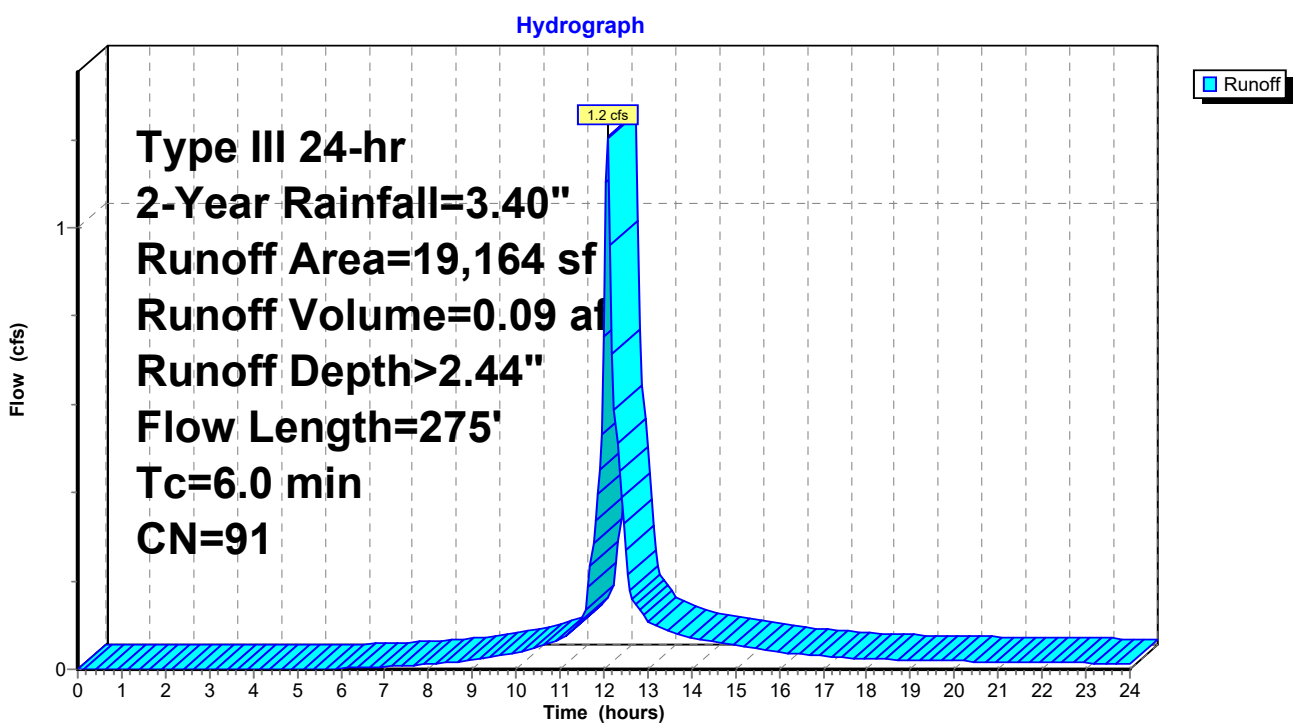
Runoff = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af, Depth> 2.44"
Routed to Pond CB-12 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,629	39	Landscaped area >75% Grass cover, Good, HSG A
*	17,535	96	Heavy lift Gravel surface, HSG A
	19,164	91	Weighted Average
	19,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	225	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.0	275	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2M-PR: SUBCATCHMENT 2L-PR



Summary for Subcatchment 2N-PR: SUBCATCHMENT 2M-PR

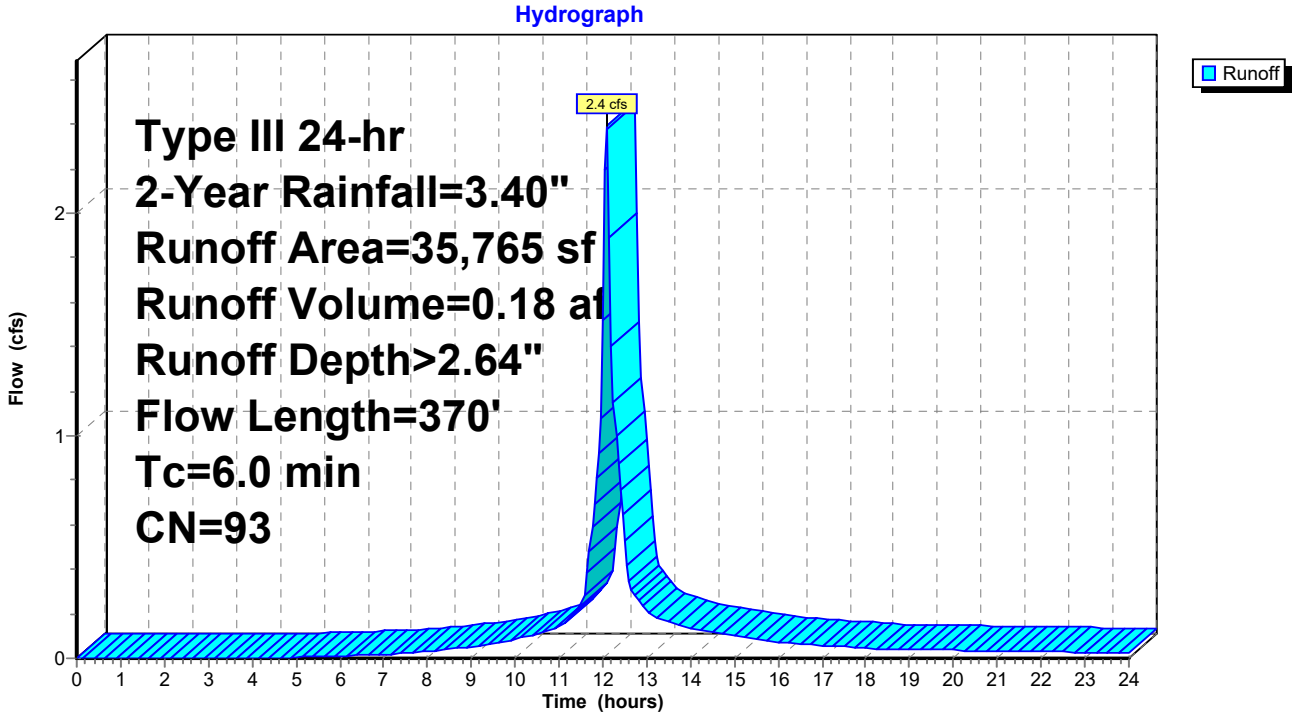
Runoff = 2.4 cfs @ 12.09 hrs, Volume= 0.18 af, Depth> 2.64"
Routed to Pond CB-13 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	2,016	39	15' Landscaped area >75% Grass cover, Good, HSG A
*	33,749	96	Heavy lift Gravel surface, HSG A
	35,765	93	Weighted Average
	35,765		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	320	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.4	370	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2N-PR: SUBCATCHMENT 2M-PR



Summary for Subcatchment 3A-PR: SUBCATCHMENT 3A-PR

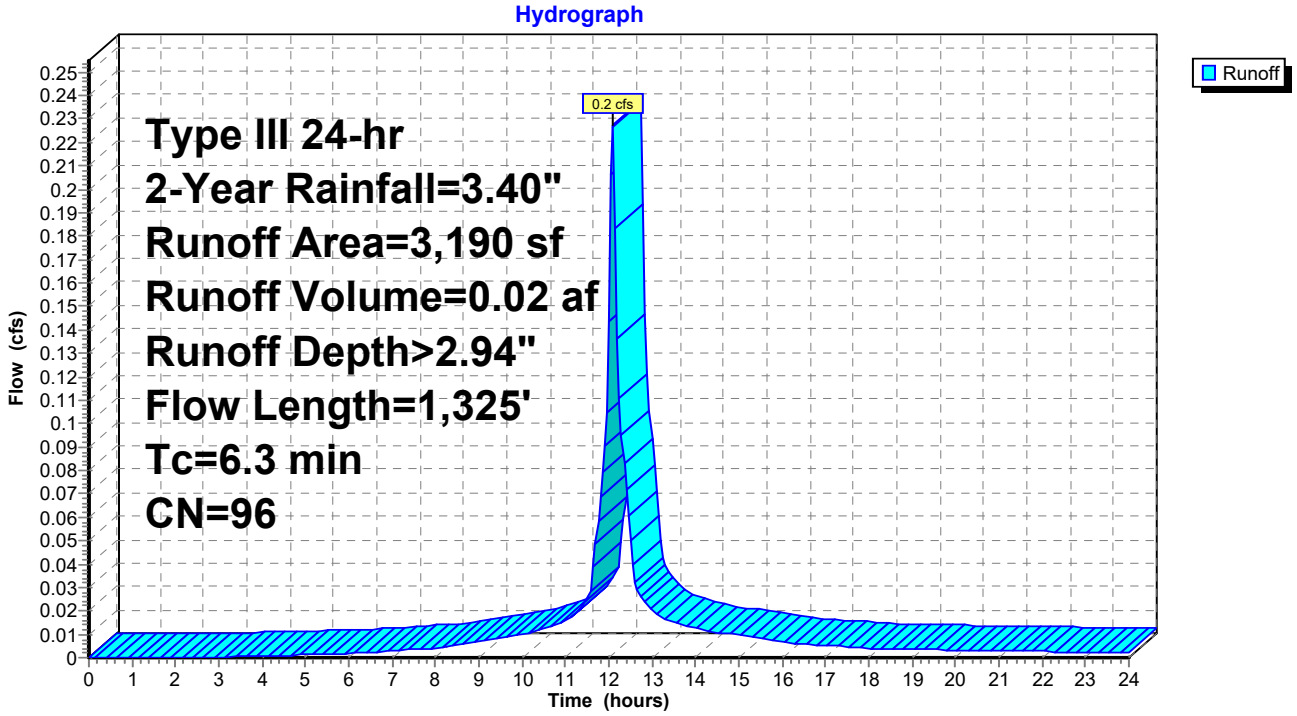
Runoff = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 2.94"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	3,190	96	Heavy lift Gravel surface, HSG A
	3,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	50	0.0050	0.54		**Sheet Flow, Gravel surface** Smooth surfaces n= 0.011 P2= 2.00"
3.5	740	0.0050	3.47	2.73	**Pipe Channel, Infiltration trench** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
1.3	535	0.0020	6.70	189.40	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.3	1,325	Total			

Subcatchment 3A-PR: SUBCATCHMENT 3A-PR



Summary for Subcatchment 3B-PR: SUBCATCHMENT 3B-PR

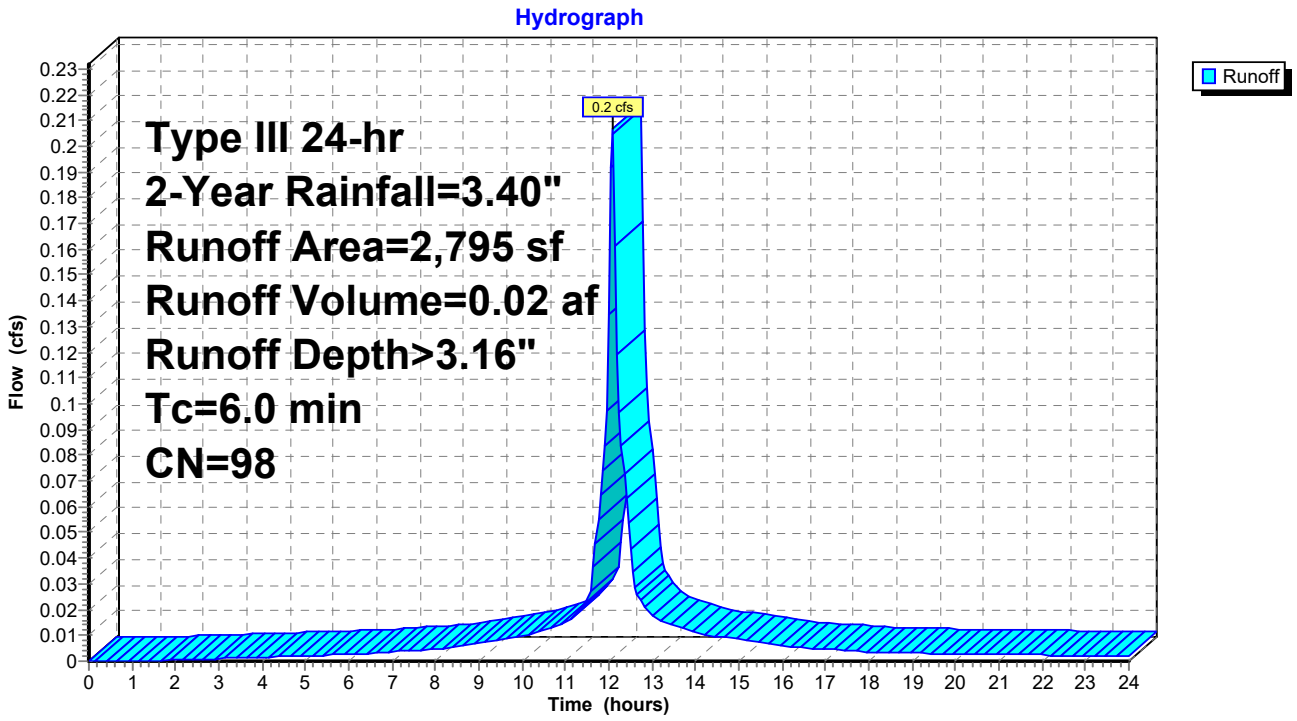
Runoff = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
2,795	98	Water Surface, HSG A
2,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3B-PR: SUBCATCHMENT 3B-PR



Summary for Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.794 ac, 0.00% Impervious, Inflow Depth > 2.64" for 2-Year event
Inflow = 5.2 cfs @ 12.09 hrs, Volume= 0.39 af
Outflow = 4.0 cfs @ 12.17 hrs, Volume= 0.32 af, Atten= 23%, Lag= 4.8 min
Discarded = 0.1 cfs @ 9.25 hrs, Volume= 0.17 af
Primary = 3.9 cfs @ 12.17 hrs, Volume= 0.15 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.44' @ 12.17 hrs Surf.Area= 0.052 ac Storage= 0.12 af

Plug-Flow detention time= 148.3 min calculated for 0.32 af (80% of inflow)
Center-of-Mass det. time= 75.2 min (864.7 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	3.50'	0.06 af	**11.25'W x 201.05'L x 4.07'H Field A** 0.21 af Overall - 0.07 af Embedded = 0.14 af x 40.0% Voids
#2A	3.75'	0.06 af	**Ferguson R-Tank HD 2** x 336 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 336 Chambers in 4 Rows
		0.12 af	Total Available Storage

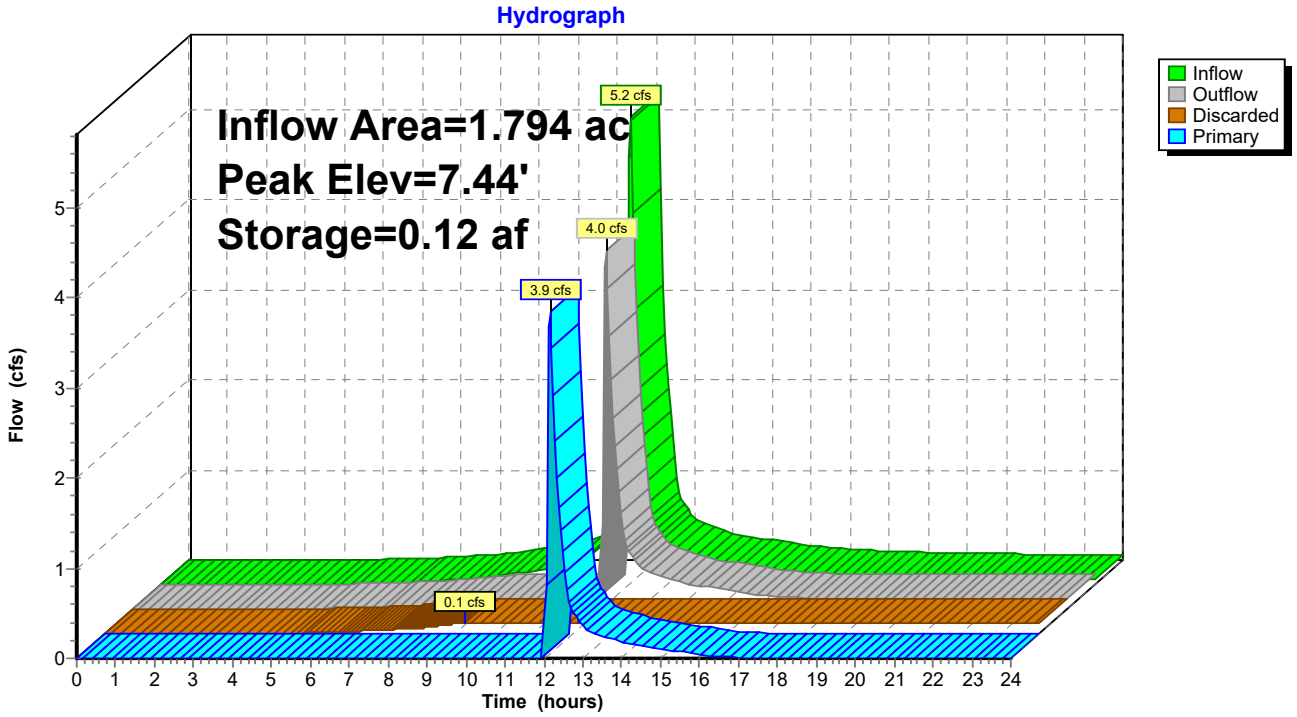
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	3.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-1 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.35' S= 0.0233 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.35'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.80'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 9.25 hrs HW=3.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=3.6 cfs @ 12.17 hrs HW=7.39' (Free Discharge)
└─**2=OCS-1 Outlet** (Passes 3.6 cfs of 8.9 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.1 cfs @ 0.58 fps)
  └─**4=Orifice/Grate** (Orifice Controls 3.5 cfs @ 3.12 fps)

Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.279 ac, 0.00% Impervious, Inflow Depth > 2.39" for 2-Year event
Inflow = 3.4 cfs @ 12.09 hrs, Volume= 0.25 af
Outflow = 1.7 cfs @ 12.26 hrs, Volume= 0.23 af, Atten= 51%, Lag= 10.2 min
Discarded = 0.1 cfs @ 10.35 hrs, Volume= 0.15 af
Primary = 1.6 cfs @ 12.26 hrs, Volume= 0.07 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.23' @ 12.26 hrs Surf.Area= 0.050 ac Storage= 0.08 af

Plug-Flow detention time= 165.5 min calculated for 0.23 af (88% of inflow)
Center-of-Mass det. time= 111.7 min (912.5 - 800.8)

Volume	Invert	Avail.Storage	Storage Description
#1C	4.90'	0.04 af	**10.56'W x 205.74'L x 3.42'H Field C** 0.17 af Overall - 0.07 af Embedded = 0.10 af x 40.0% Voids
#2C	5.15'	0.06 af	**Ferguson R-Tank HD 1.5** x 430 Inside #1 Inside= 15.7"W x 26.0"H => 2.70 sf x 2.35'L = 6.3 cf Outside= 15.7"W x 26.0"H => 2.84 sf x 2.35'L = 6.7 cf 430 Chambers in 5 Rows
		0.10 af	Total Available Storage

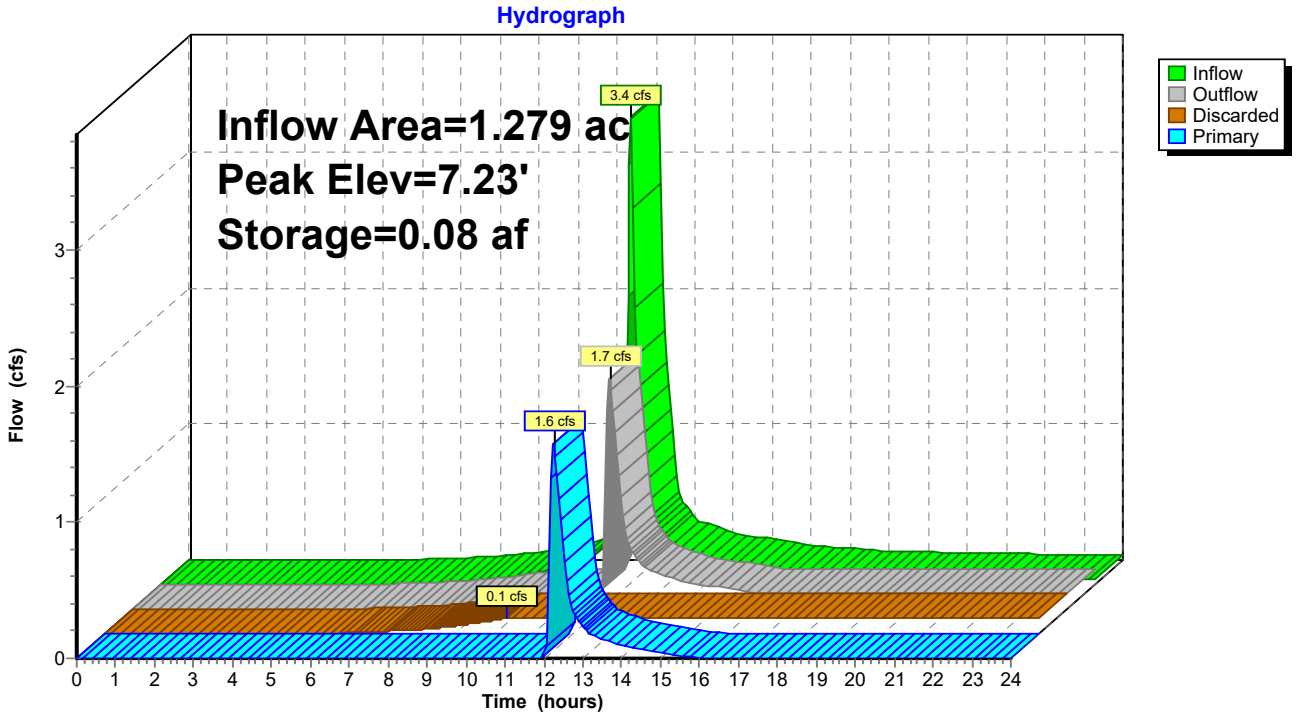
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-2 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.85' S= 0.0067 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.95'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.95'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 10.35 hrs HW=4.93' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.5 cfs @ 12.26 hrs HW=7.23' (Free Discharge)
└─**2=OCS-2 Outlet** (Passes 1.5 cfs of 5.2 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 1.5 cfs @ 1.68 fps)

Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH

Inflow Area = 3.103 ac, 2.11% Impervious, Inflow Depth > 2.58" for 2-Year event
Inflow = 8.9 cfs @ 12.09 hrs, Volume= 0.67 af
Outflow = 1.2 cfs @ 12.64 hrs, Volume= 0.67 af, Atten= 87%, Lag= 32.8 min
Discarded = 0.5 cfs @ 11.15 hrs, Volume= 0.61 af
Primary = 0.6 cfs @ 12.64 hrs, Volume= 0.06 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 6.11' @ 12.64 hrs Surf.Area= 0.226 ac Storage= 0.27 af

Plug-Flow detention time= 155.0 min calculated for 0.66 af (100% of inflow)
Center-of-Mass det. time= 154.0 min (946.4 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1G	3.90'	0.05 af	**27.62'W x 107.22'L x 4.07'H Field G** 0.28 af Overall - 0.16 af Embedded = 0.12 af x 40.0% Voids
#2G	4.15'	0.15 af	**Ferguson R-Tank HD 2** x 792 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 792 Chambers in 18 Rows
#3	3.90'	0.18 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 0.47 af Overall - 0.02 af Embedded = 0.45 af x 40.0% Voids
#4	4.40'	0.01 af	**12.0" Round 12" Perforated HDPE** x 2 Inside #3 L= 320.0' 0.02 af Overall - 1.5" Wall Thickness = 0.01 af
#5H	3.90'	0.00 af	**2.62'W x 27.46'L x 4.07'H Field H** 0.01 af Overall - 0.00 af Embedded = 0.00 af x 40.0% Voids
#6H	4.15'	0.00 af	**Ferguson R-Tank HD 2** x 20 Inside #5 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 20 Chambers in 2 Rows
		0.39 af	Total Available Storage

Storage Group G created with Chamber Wizard
Storage Group H created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
3.90	0.156	0.00	0.00
6.90	0.156	0.47	0.47

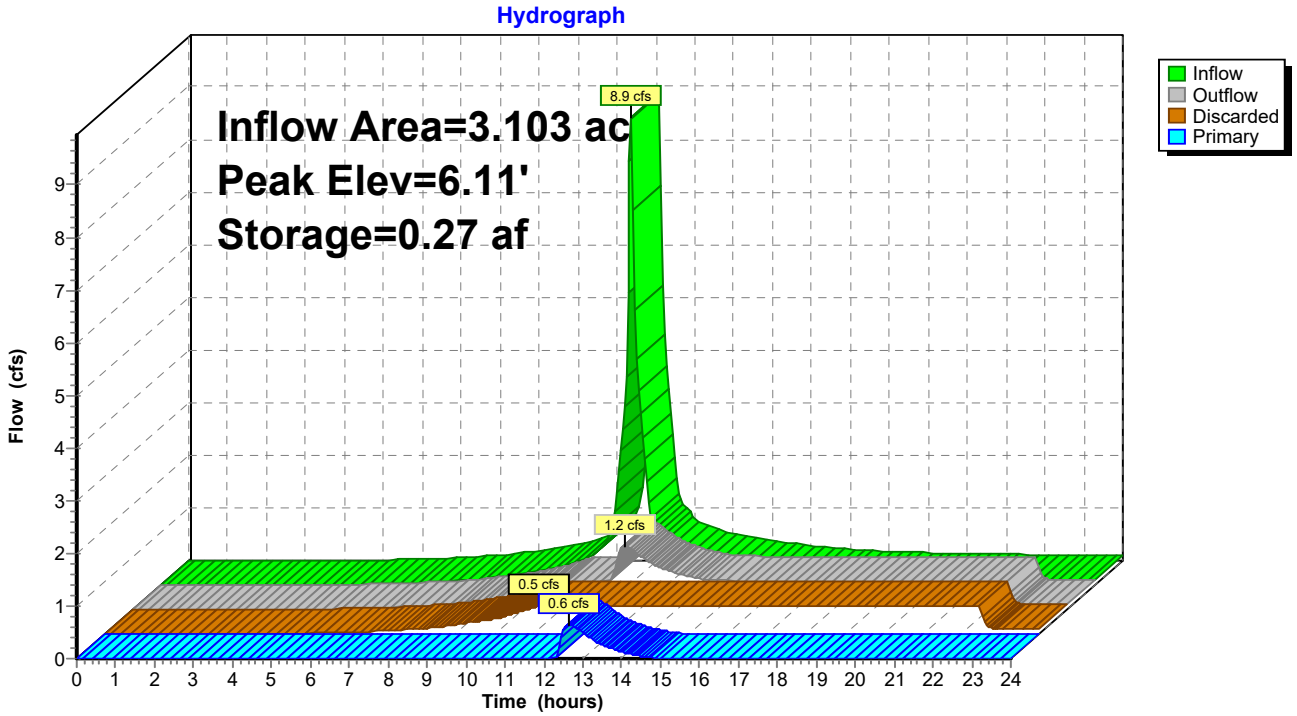
Device	Routing	Invert	Outlet Devices
#1	Discarded	3.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	5.80'	**30.0" Round OCS-3 Outlet** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.80' / 5.50' S= 0.0500 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf
#3	Primary	7.40'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00

Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4 Primary 6.60' **40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Discarded OutFlow Max=0.5 cfs @ 11.15 hrs HW=3.94' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.5 cfs)

Primary OutFlow Max=0.6 cfs @ 12.64 hrs HW=6.11' (Free Discharge)
├─**2=OCS-3 Outlet** (Inlet Controls 0.6 cfs @ 1.88 fps)
├─**3=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)
└─**4=Orifice/Grate** (Controls 0.0 cfs)

Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH



Summary for Pond 5P: DRAINAGE MANHOLE

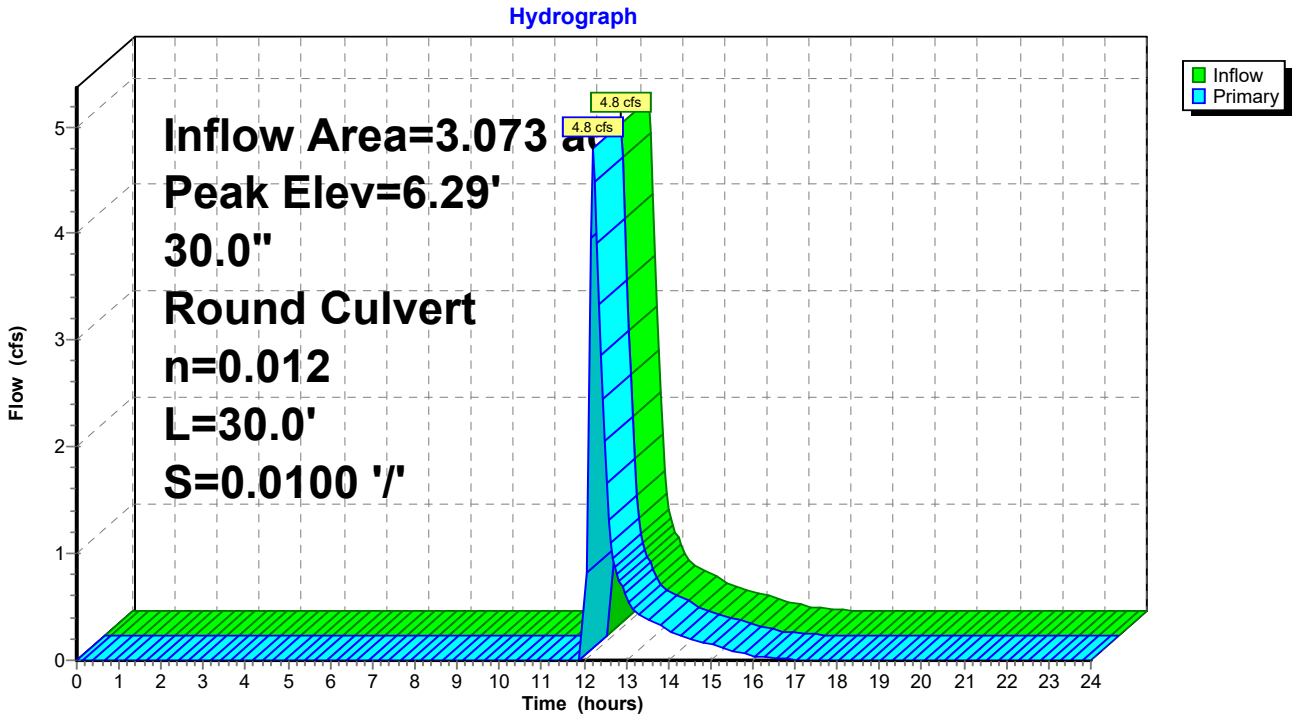
Inflow Area = 3.073 ac, 0.00% Impervious, Inflow Depth = 0.85" for 2-Year event
Inflow = 4.8 cfs @ 12.21 hrs, Volume= 0.22 af
Outflow = 4.8 cfs @ 12.21 hrs, Volume= 0.22 af, Atten= 0%, Lag= 0.0 min
Primary = 4.8 cfs @ 12.21 hrs, Volume= 0.22 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.29' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**30.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 5.05' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=4.7 cfs @ 12.21 hrs HW=6.28' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.7 cfs @ 4.22 fps)

Pond 5P: DRAINAGE MANHOLE



Summary for Pond CB-1: 18" NYLOPLAST DRAIN

Inflow Area = 0.178 ac, 0.00% Impervious, Inflow Depth > 2.44" for 2-Year event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af
Outflow = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min
Primary = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.03' @ 12.09 hrs Surf.Area= 51 sf Storage= 0 cf
Flood Elev= 9.85' Surf.Area= 209 sf Storage= 104 cf

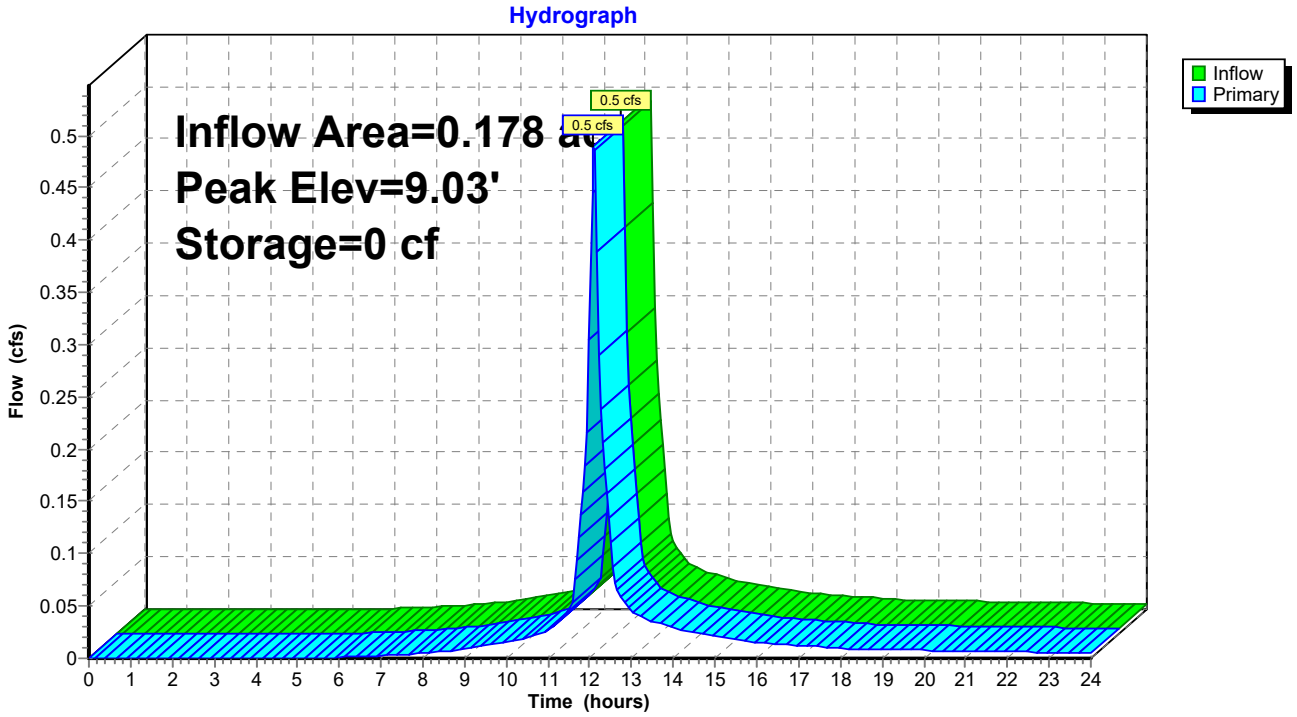
Plug-Flow detention time= 0.0 min calculated for 0.04 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (799.7 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1	9.02'	143 cf	**2.00'W x 25.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.87'	**12.0" Round Culvert** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.87' / 6.53' S= 0.0113 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.02'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.6 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.6 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.6 cfs @ 0.36 fps)

Pond CB-1: 18" NYLOPLAST DRAIN



Summary for Pond CB-10: 18" NYLOPLAST DRAIN

Inflow Area = 0.370 ac, 0.00% Impervious, Inflow Depth > 2.35" for 2-Year event
Inflow = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af
Outflow = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.89' @ 12.09 hrs Surf.Area= 137 sf Storage= 2 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

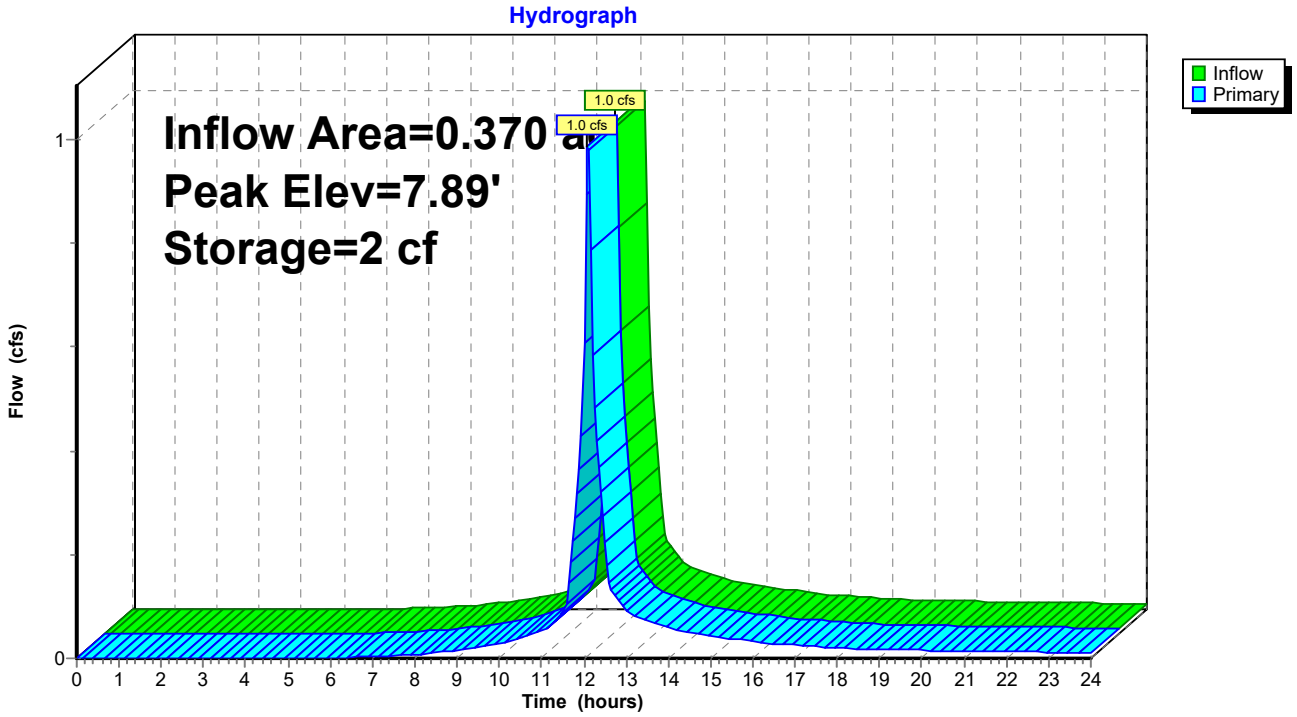
Plug-Flow detention time= 0.0 min calculated for 0.07 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (804.1 - 804.1)

Volume	Invert	Avail.Storage	Storage Description
#1	7.88'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.73'	**12.0" Round Culvert** L= 21.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.73' / 5.45' S= 0.0133 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.88'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.0 cfs @ 12.09 hrs HW=7.89' (Free Discharge)
└─**1=Culvert** (Passes 1.0 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.0 cfs @ 0.55 fps)

Pond CB-10: 18" NYLOPLAST DRAIN



Summary for Pond CB-11: 18" NYLOPLAST DRAIN

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth > 2.35" for 2-Year event
Inflow = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af
Outflow = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.09 hrs, Volume= 0.07 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.85' @ 12.09 hrs Surf.Area= 137 sf Storage= 2 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

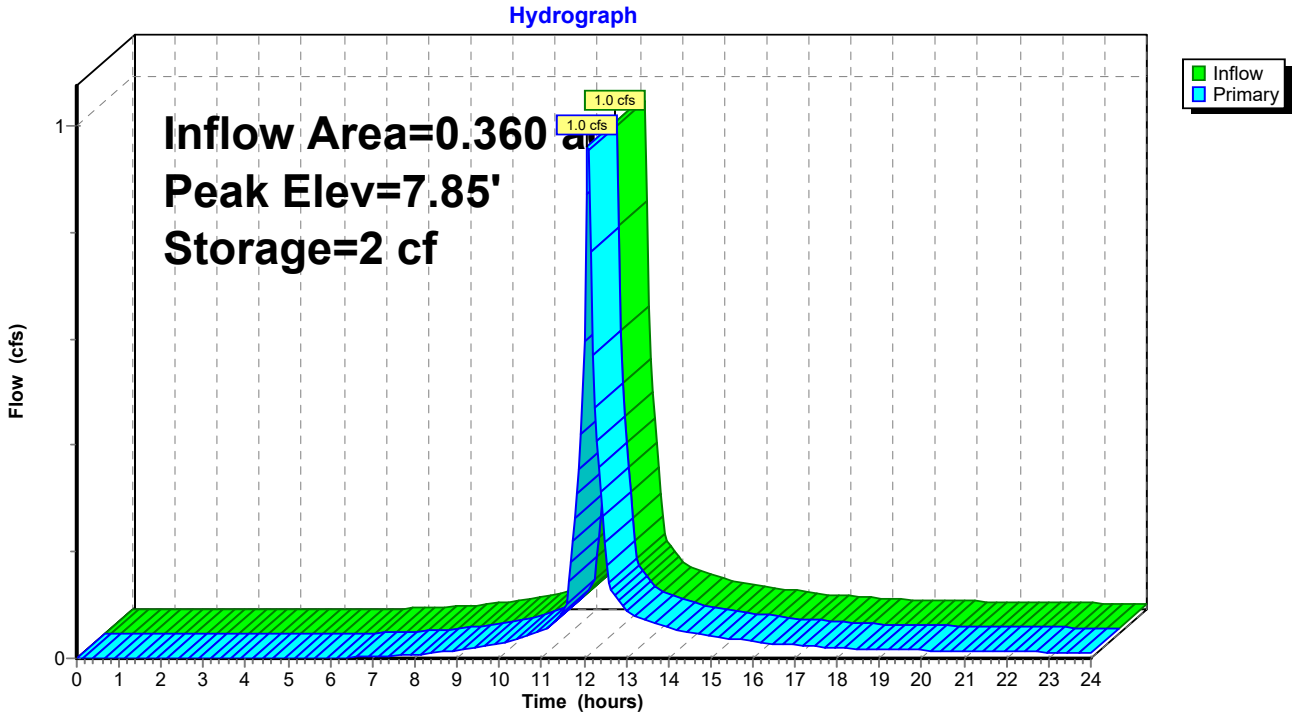
Plug-Flow detention time= 0.0 min calculated for 0.07 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (804.1 - 804.1)

Volume	Invert	Avail.Storage	Storage Description
#1	7.84'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.89'	**12.0" Round Culvert** L= 87.3' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.89' / 5.45' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.84'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.0 cfs @ 12.09 hrs HW=7.85' (Free Discharge)
└─**1=Culvert** (Passes 1.0 cfs of 3.8 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.0 cfs @ 0.54 fps)

Pond CB-11: 18" NYLOPLAST DRAIN



Summary for Pond CB-12: 18" NYLOPLAST DRAIN

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 2.44" for 2-Year event
Inflow = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af
Outflow = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.1 min
Primary = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.88' @ 12.09 hrs Surf.Area= 140 sf Storage= 3 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

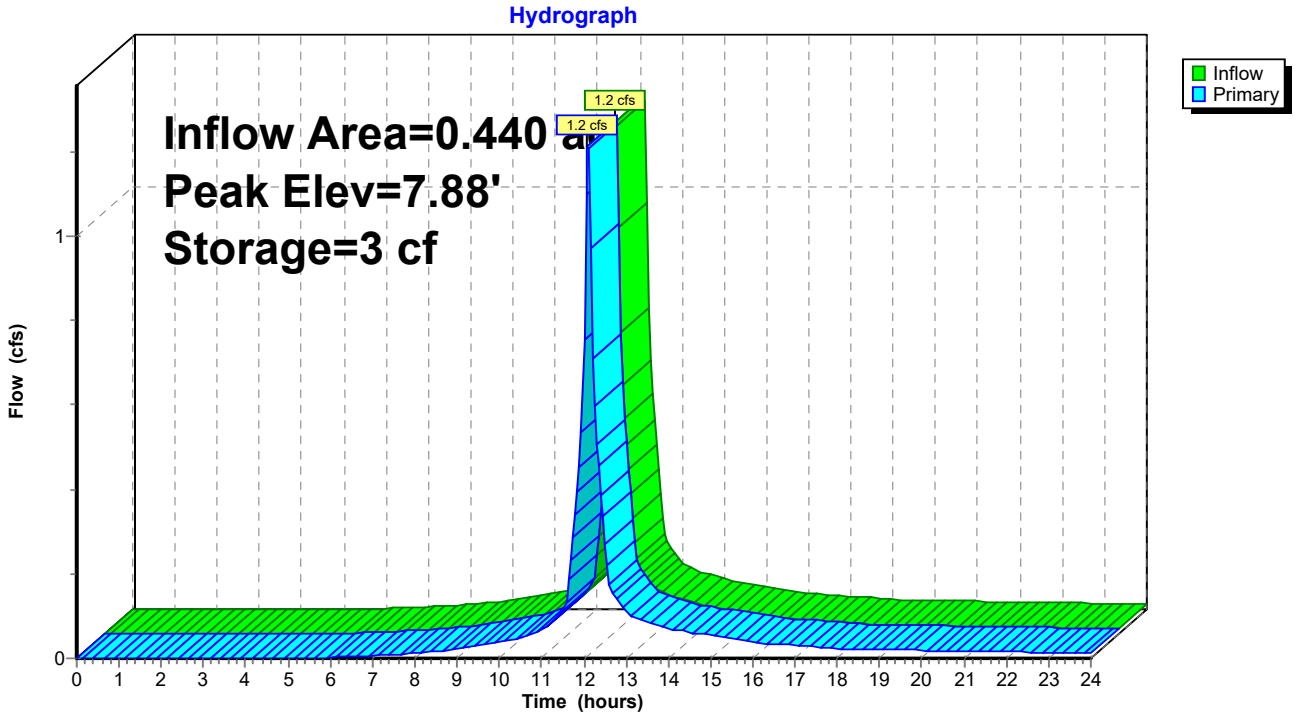
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (799.8 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1	7.86'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.71'	**12.0" Round Culvert** L= 51.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.71' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.86'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.2 cfs @ 12.09 hrs HW=7.88' (Free Discharge)
└─**1=Culvert** (Passes 1.2 cfs of 4.5 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.2 cfs @ 0.68 fps)

Pond CB-12: 18" NYLOPLAST DRAIN



Summary for Pond CB-13: 18" NYLOPLAST DRAIN

Inflow Area = 0.821 ac, 0.00% Impervious, Inflow Depth > 2.64" for 2-Year event
Inflow = 2.4 cfs @ 12.09 hrs, Volume= 0.18 af
Outflow = 2.4 cfs @ 12.09 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.3 min
Primary = 2.4 cfs @ 12.09 hrs, Volume= 0.18 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.90' @ 12.09 hrs Surf.Area= 237 sf Storage= 17 cf
Flood Elev= 9.18' Surf.Area= 810 sf Storage= 494 cf

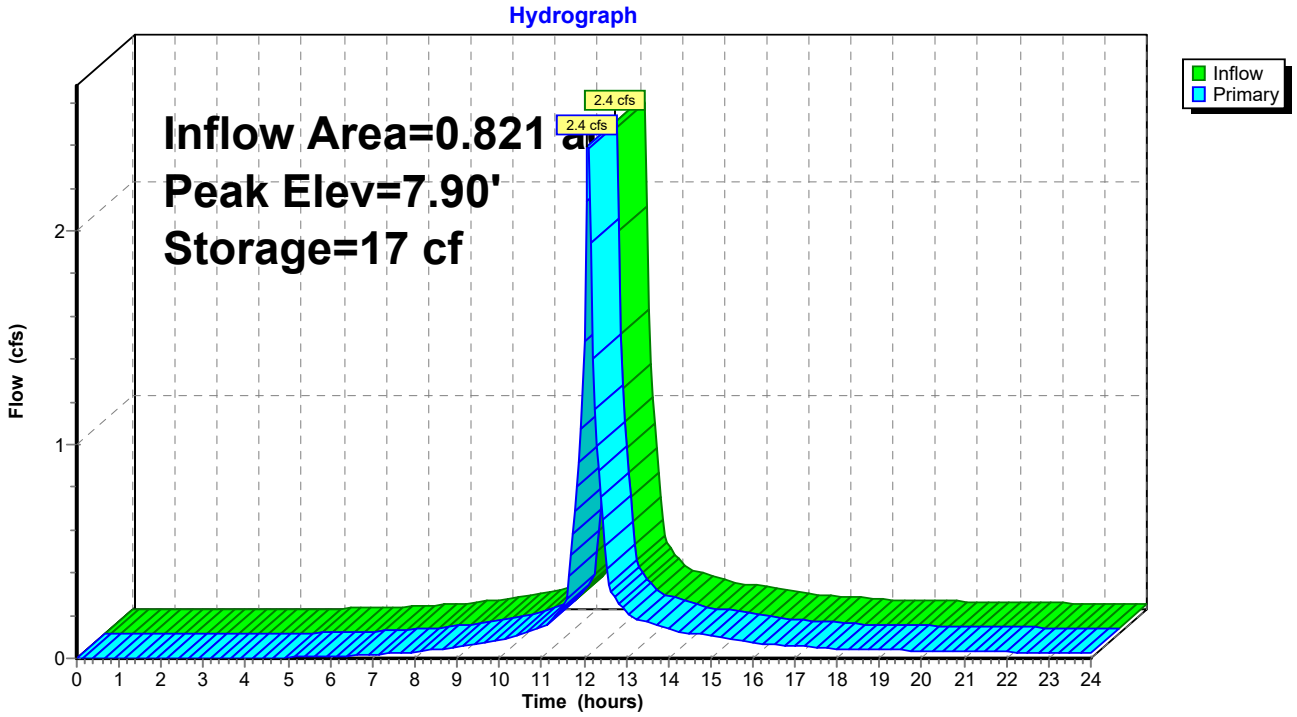
Plug-Flow detention time= 0.1 min calculated for 0.18 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (790.2 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	7.82'	494 cf	**2.00'W x 95.20'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.66'	**12.0" Round Culvert** L= 41.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.66' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.82'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.4 cfs @ 12.09 hrs HW=7.90' (Free Discharge)
└─**1=Culvert** (Passes 2.4 cfs of 4.7 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.4 cfs @ 1.33 fps)

Pond CB-13: 18" NYLOPLAST DRAIN



Summary for Pond CB-2: 18" NYLOPLAST DRAIN

Inflow Area = 0.958 ac, 0.00% Impervious, Inflow Depth > 2.74" for 2-Year event
Inflow = 2.9 cfs @ 12.09 hrs, Volume= 0.22 af
Outflow = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af, Atten= 1%, Lag= 0.1 min
Primary = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.89' @ 12.09 hrs Surf.Area= 162 sf Storage= 16 cf
Flood Elev= 9.85' Surf.Area= 528 sf Storage= 318 cf

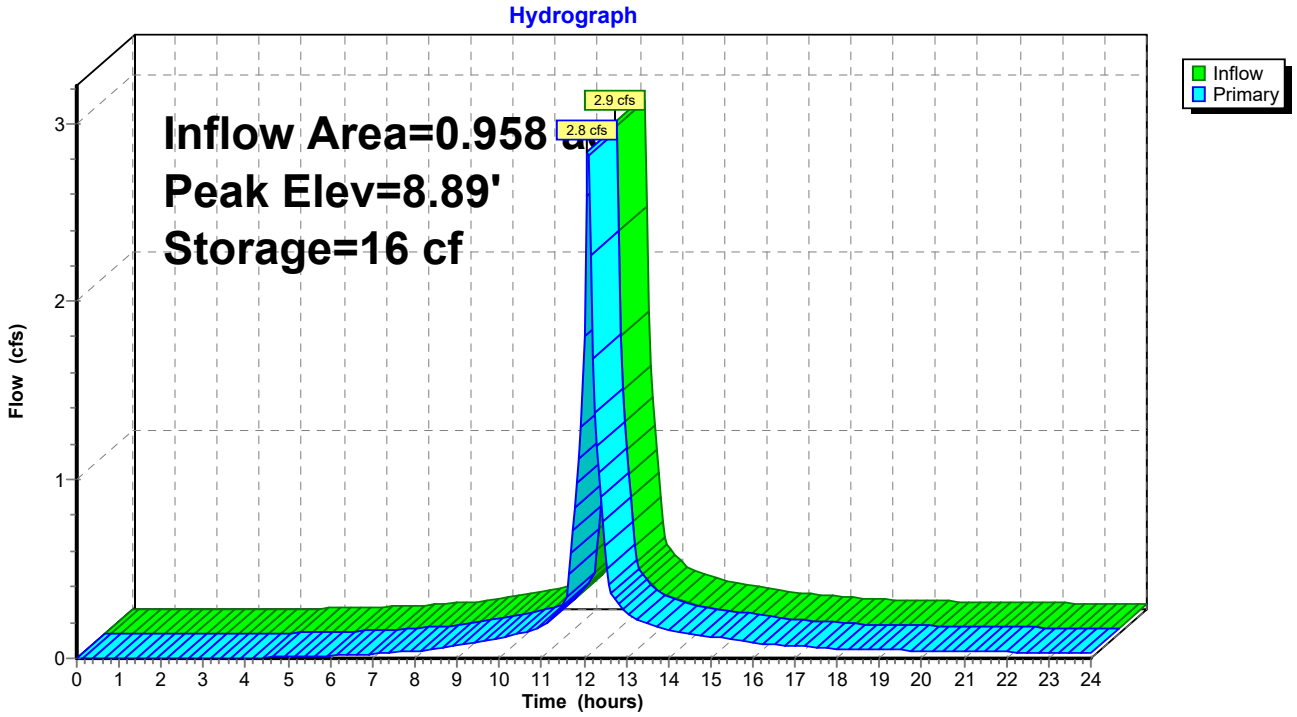
Plug-Flow detention time= 0.5 min calculated for 0.22 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (784.8 - 784.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.78'	318 cf	**2.00'W x 60.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.60'	**12.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.60' / 6.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.78'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.8 cfs @ 12.09 hrs HW=8.89' (Free Discharge)
└─**1=Culvert** (Passes 2.8 cfs of 5.1 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.8 cfs @ 1.57 fps)

Pond CB-2: 18" NYLOPLAST DRAIN



Summary for Pond CB-3: 18" NYLOPLAST DRAIN

Inflow Area = 0.376 ac, 0.00% Impervious, Inflow Depth > 2.64" for 2-Year event
Inflow = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af
Outflow = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af, Atten= 1%, Lag= 0.0 min
Primary = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.77' @ 12.09 hrs Surf.Area= 0.003 ac Storage= 0.00 af
Flood Elev= 9.85' Surf.Area= 0.014 ac Storage= 0.01 af

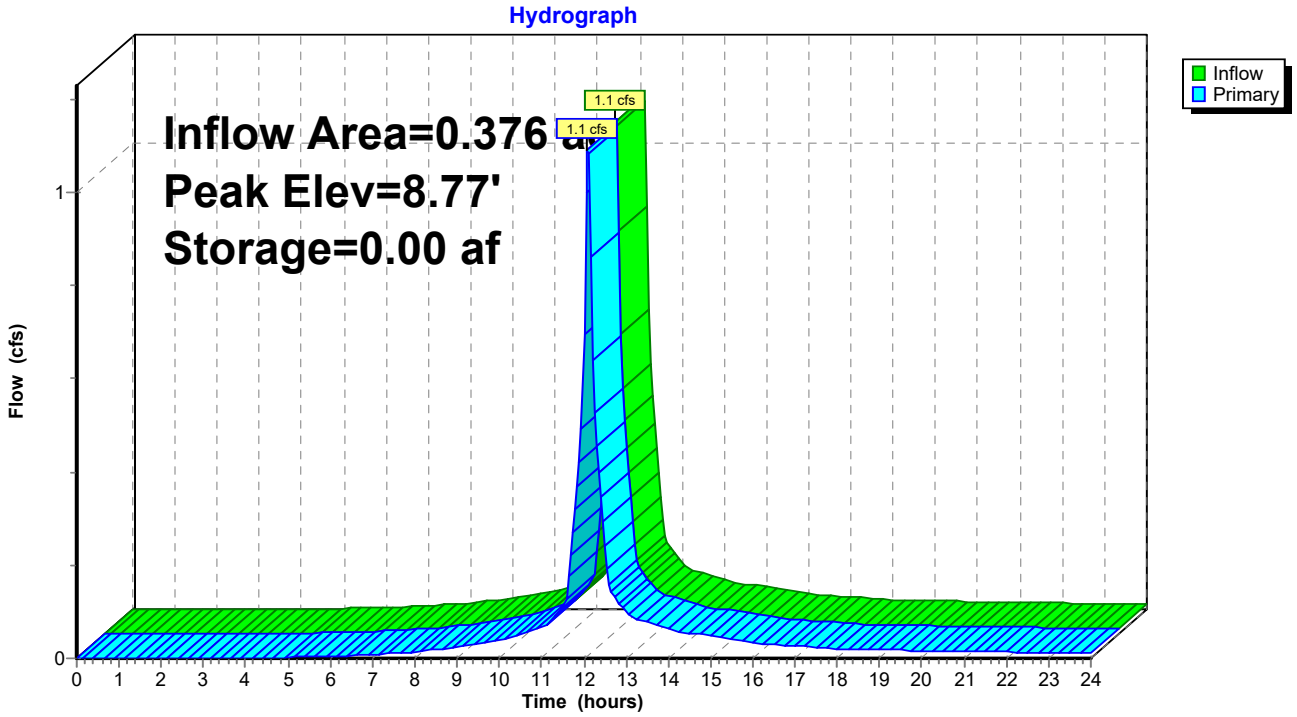
Plug-Flow detention time= 1.1 min calculated for 0.08 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (790.2 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	8.75'	0.01 af	**2.00'W x 71.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.55'	**12.0" Round Culvert** L= 23.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.55' / 6.43' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.75'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.1 cfs @ 12.09 hrs HW=8.77' (Free Discharge)
└─**1=Culvert** (Passes 1.1 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.1 cfs @ 0.61 fps)

Pond CB-3: 18" NYLOPLAST DRAIN



Summary for Pond CB-4: 18" NYLOPLAST DRAIN

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth > 2.44" for 2-Year event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af
Outflow = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min
Primary = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.97' @ 12.09 hrs Surf.Area= 144 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 553 sf Storage= 304 cf

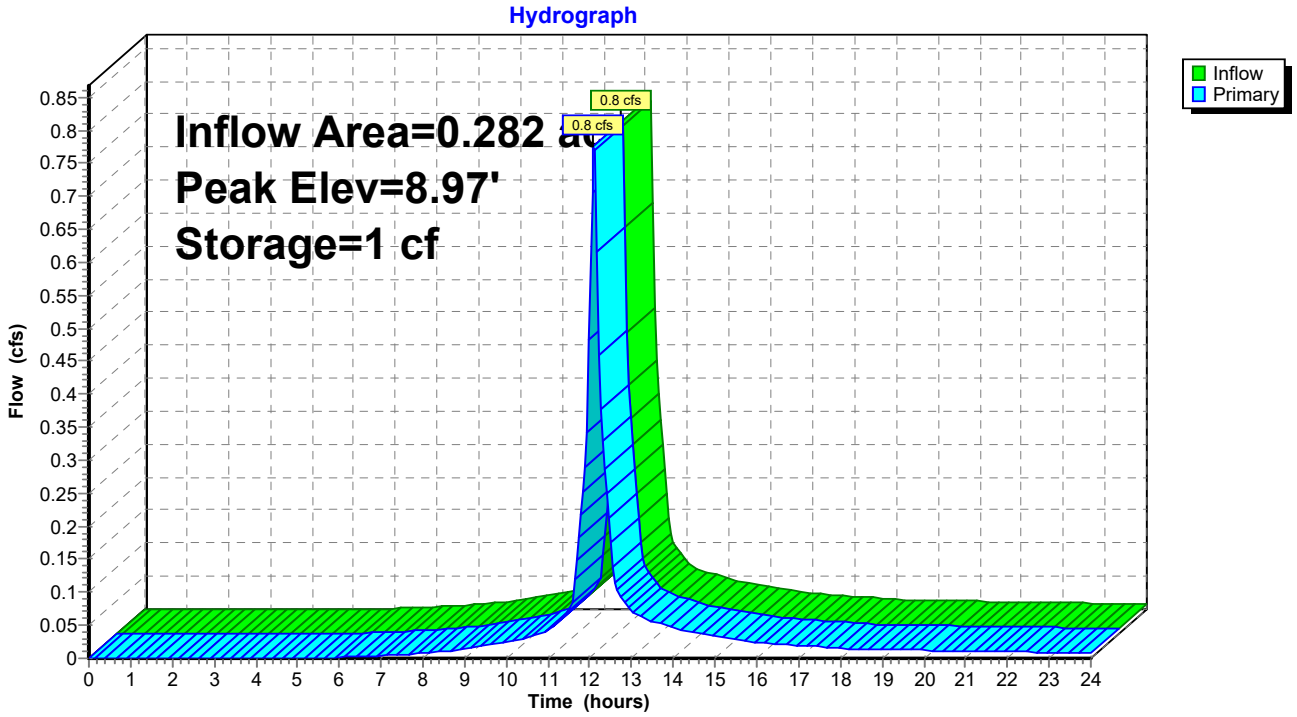
Plug-Flow detention time= 0.0 min calculated for 0.06 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (799.8 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.96'	368 cf	**2.00'W x 70.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.70'	**12.0" Round Culvert** L= 53.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.70' / 6.43' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.96'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.8 cfs @ 12.09 hrs HW=8.97' (Free Discharge)
└─**1=Culvert** (Passes 0.8 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.8 cfs @ 0.45 fps)

Pond CB-4: 18" NYLOPLAST DRAIN



Summary for Pond CB-5: 18" NYLOPLAST DRAIN

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth > 1.77" for 2-Year event
Inflow = 0.2 cfs @ 12.09 hrs, Volume= 0.01 af
Outflow = 0.2 cfs @ 12.09 hrs, Volume= 0.01 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 12.09 hrs, Volume= 0.01 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.03' @ 12.09 hrs Surf.Area= 137 sf Storage= 0 cf
Flood Elev= 9.85' Surf.Area= 505 sf Storage= 259 cf

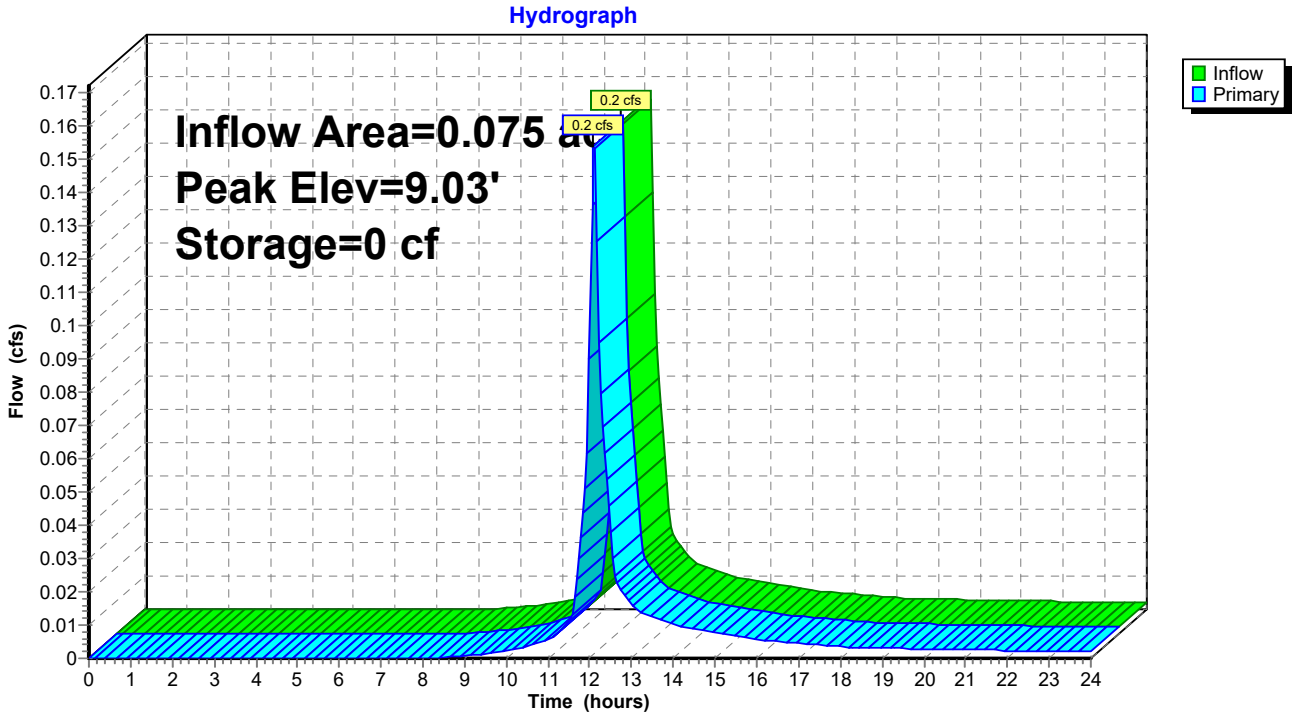
Plug-Flow detention time= 0.0 min calculated for 0.01 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (829.6 - 829.5)

Volume	Invert	Avail.Storage	Storage Description
#1	9.03'	358 cf	**2.00'W x 68.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.88'	**12.0" Round Culvert** L= 66.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.88' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.03'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.4 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.4 cfs of 4.3 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.4 cfs @ 0.20 fps)

Pond CB-5: 18" NYLOPLAST DRAIN



Summary for Pond CB-6: 18" NYLOPLAST DRAIN

Inflow Area = 0.072 ac, 0.00% Impervious, Inflow Depth > 1.56" for 2-Year event
Inflow = 0.1 cfs @ 12.10 hrs, Volume= 0.01 af
Outflow = 0.1 cfs @ 12.10 hrs, Volume= 0.01 af, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.10 hrs, Volume= 0.01 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.91' @ 12.10 hrs Surf.Area= 211 sf Storage= 0 cf
Flood Elev= 9.85' Surf.Area= 845 sf Storage= 491 cf

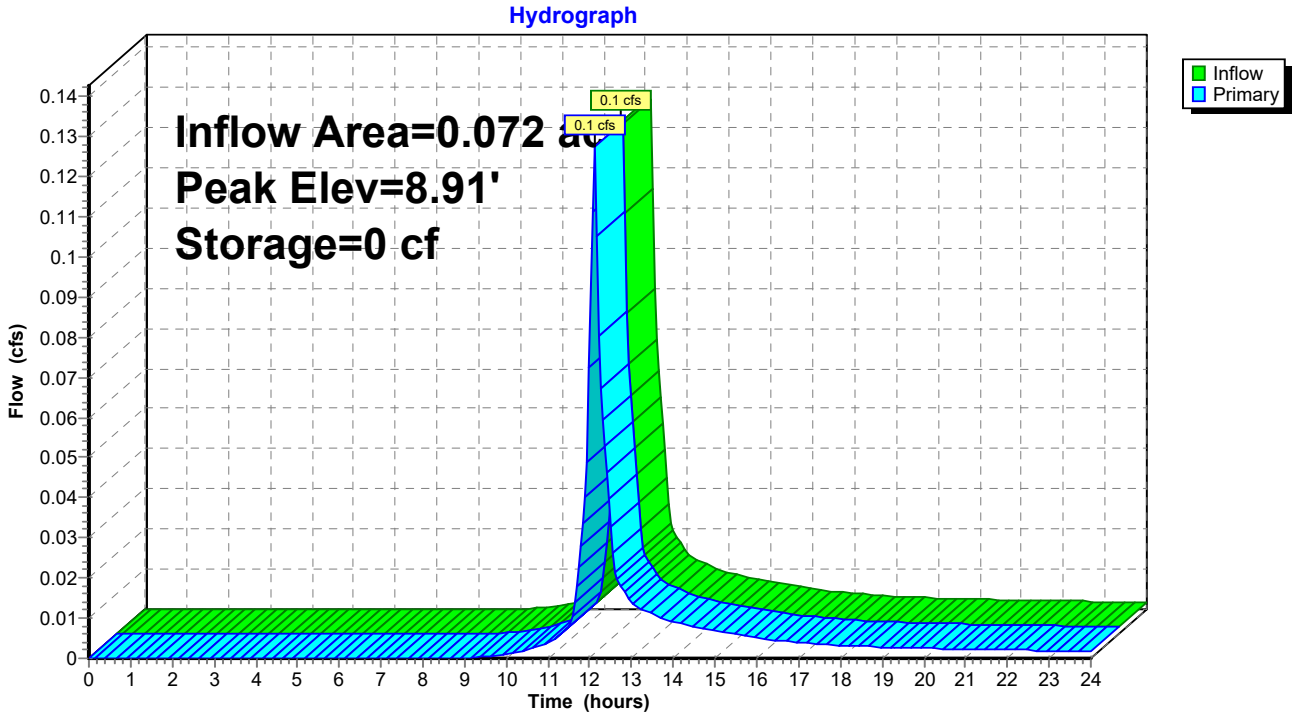
Plug-Flow detention time= 0.0 min calculated for 0.01 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (839.1 - 839.1)

Volume	Invert	Avail.Storage	Storage Description
#1	8.91'	543 cf	**2.00'W x 105.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.76'	**12.0" Round Culvert** L= 42.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.76' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.91'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.3 cfs @ 12.10 hrs HW=8.91' (Free Discharge)
└─**1=Culvert** (Passes 0.3 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.3 cfs @ 0.19 fps)

Pond CB-6: 18" NYLOPLAST DRAIN



Summary for Pond CB-7: 18" NYLOPLAST DRAIN

Inflow Area = 0.451 ac, 0.00% Impervious, Inflow Depth > 2.54" for 2-Year event
Inflow = 1.3 cfs @ 12.09 hrs, Volume= 0.10 af
Outflow = 1.3 cfs @ 12.09 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.1 min
Primary = 1.3 cfs @ 12.09 hrs, Volume= 0.10 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.67' @ 12.09 hrs Surf.Area= 161 sf Storage= 4 cf
Flood Elev= 9.85' Surf.Area= 648 sf Storage= 393 cf

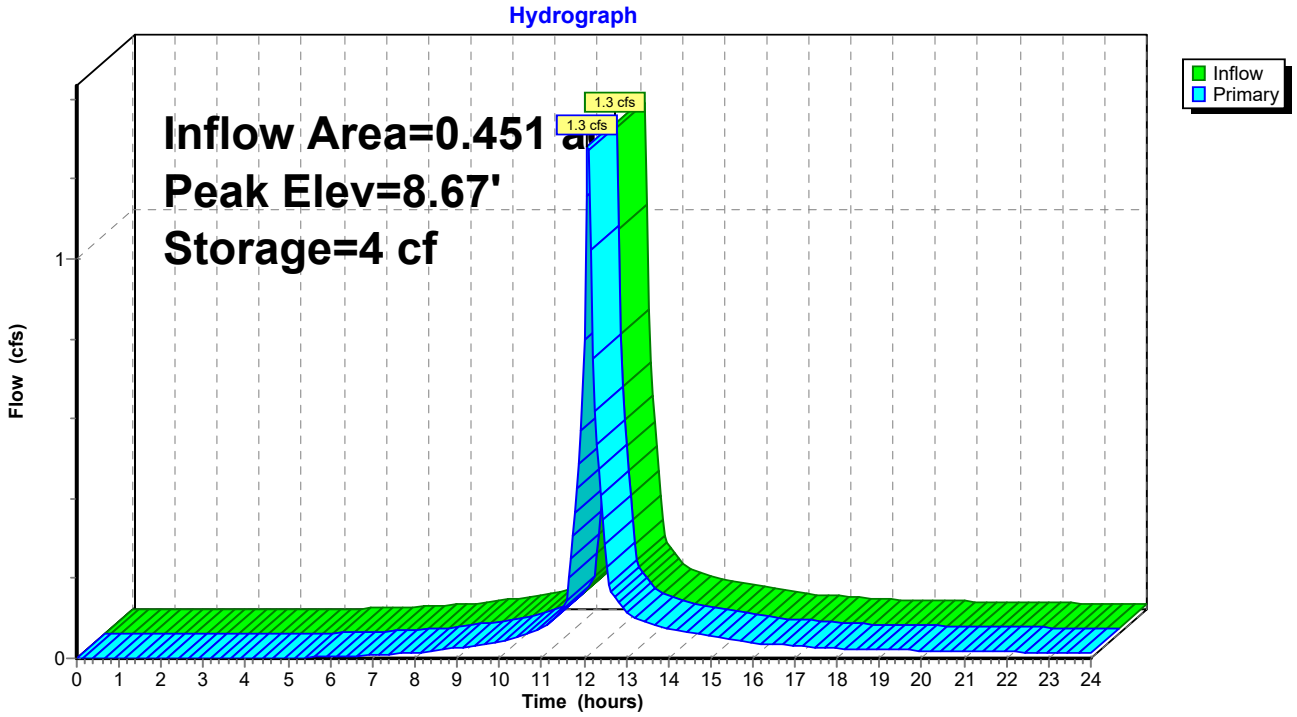
Plug-Flow detention time= 0.0 min calculated for 0.10 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (795.1 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1	8.65'	393 cf	**2.00'W x 75.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.50'	**12.0" Round Culvert** L= 49.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.50' / 6.25' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.65'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.3 cfs @ 12.09 hrs HW=8.67' (Free Discharge)
└─**1=Culvert** (Passes 1.3 cfs of 4.5 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.3 cfs @ 0.71 fps)

Pond CB-7: 18" NYLOPLAST DRAIN



Summary for Pond CB-8: 18" NYLOPLAST DRAIN

Inflow Area = 0.682 ac, 0.00% Impervious, Inflow Depth > 2.44" for 2-Year event
Inflow = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af
Outflow = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.2 min
Primary = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.58' @ 12.09 hrs Surf.Area= 200 sf Storage= 9 cf
Flood Elev= 9.85' Surf.Area= 744 sf Storage= 453 cf

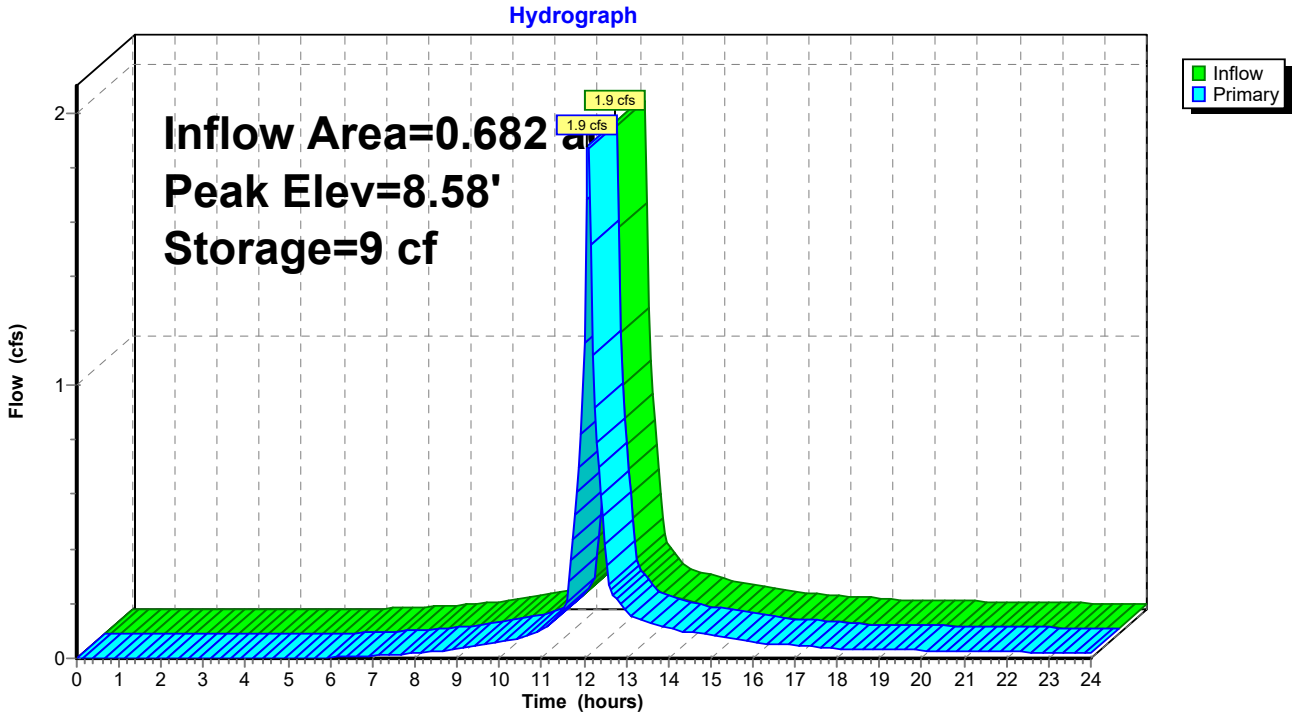
Plug-Flow detention time= 0.0 min calculated for 0.14 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (799.8 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.53'	453 cf	**2.00'W x 87.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.38'	**12.0" Round Culvert** L= 26.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.38' / 6.25' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.53'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.8 cfs @ 12.09 hrs HW=8.58' (Free Discharge)
└─**1=Culvert** (Passes 1.8 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.8 cfs @ 1.05 fps)

Pond CB-8: 18" NYLOPLAST DRAIN



Summary for Pond CB-9: 18" NYLOPLAST DRAIN

Inflow Area = 1.111 ac, 5.88% Impervious, Inflow Depth > 2.74" for 2-Year event
Inflow = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af
Outflow = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af, Atten= 0%, Lag= 0.1 min
Primary = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.97' @ 12.09 hrs Surf.Area= 159 sf Storage= 7 cf
Flood Elev= 9.18' Surf.Area= 600 sf Storage= 363 cf

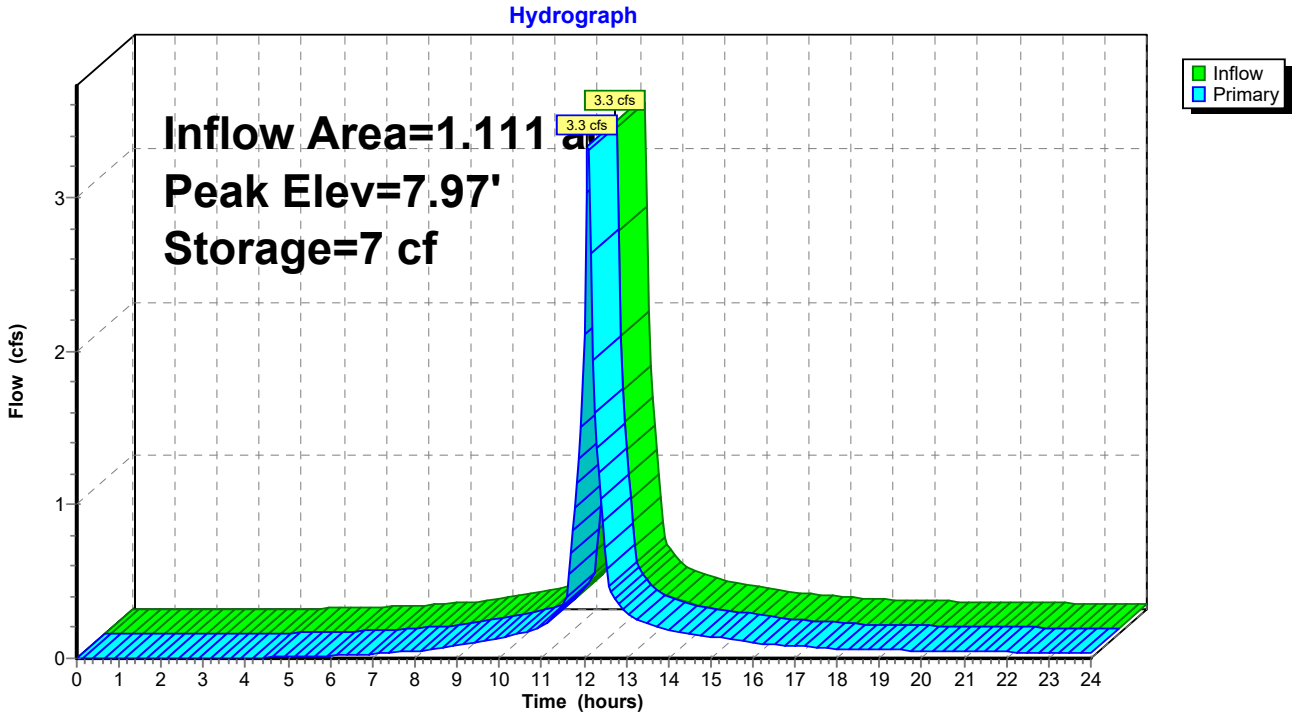
Plug-Flow detention time= 0.0 min calculated for 0.25 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (784.7 - 784.7)

Volume	Invert	Avail.Storage	Storage Description
#1	7.92'	363 cf	**2.00'W x 69.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.78'	**18.0" Round Culvert** L= 65.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.78' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	7.92'	**24.0" Horiz. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.3 cfs @ 12.09 hrs HW=7.97' (Free Discharge)
└─**1=Culvert** (Passes 3.3 cfs of 9.0 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 3.3 cfs @ 1.04 fps)

Pond CB-9: 18" NYLOPLAST DRAIN



Summary for Pond WQU-1: STORMCEPTOR STC-900

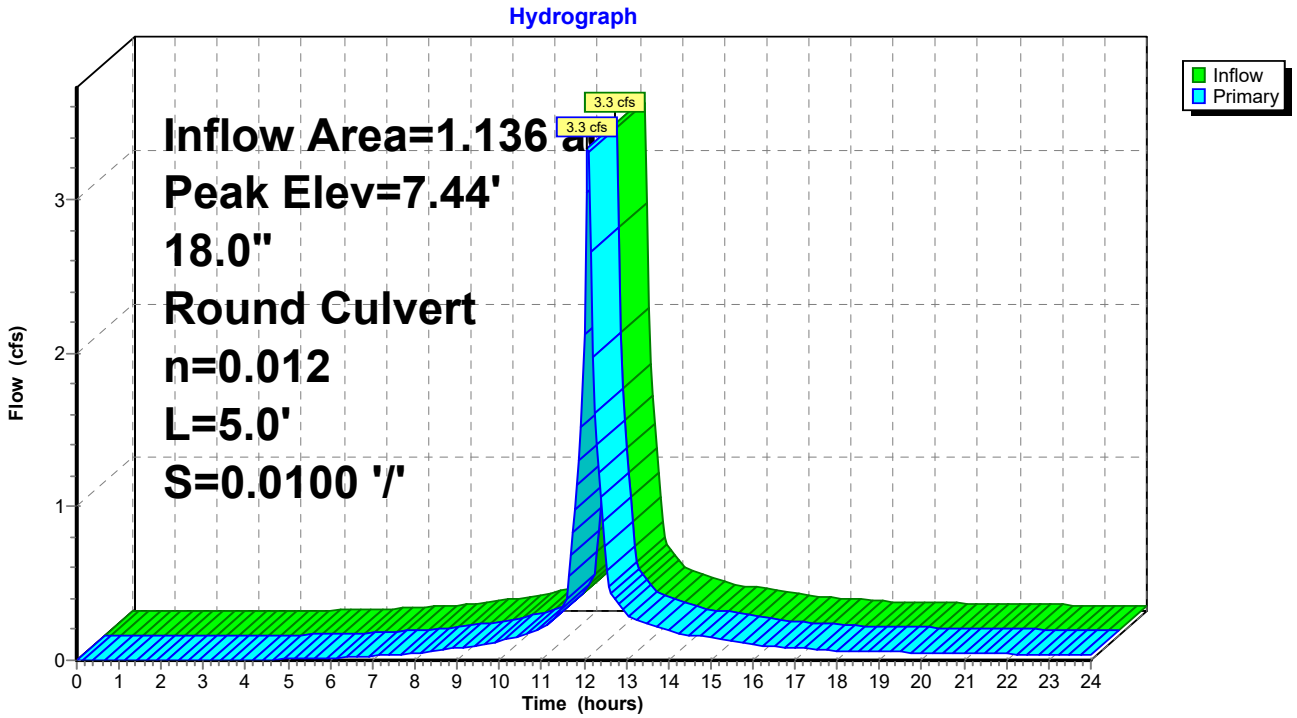
Inflow Area = 1.136 ac, 0.00% Impervious, Inflow Depth > 2.69" for 2-Year event
Inflow = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af
Outflow = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af, Atten= 0%, Lag= 0.0 min
Primary = 3.3 cfs @ 12.09 hrs, Volume= 0.25 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.44' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.40'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.40' / 6.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.3 cfs @ 12.09 hrs HW=7.43' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 3.3 cfs @ 3.54 fps)

Pond WQU-1: STORMCEPTOR STC-900



Summary for Pond WQU-2: STORMCEPTOR STC-900

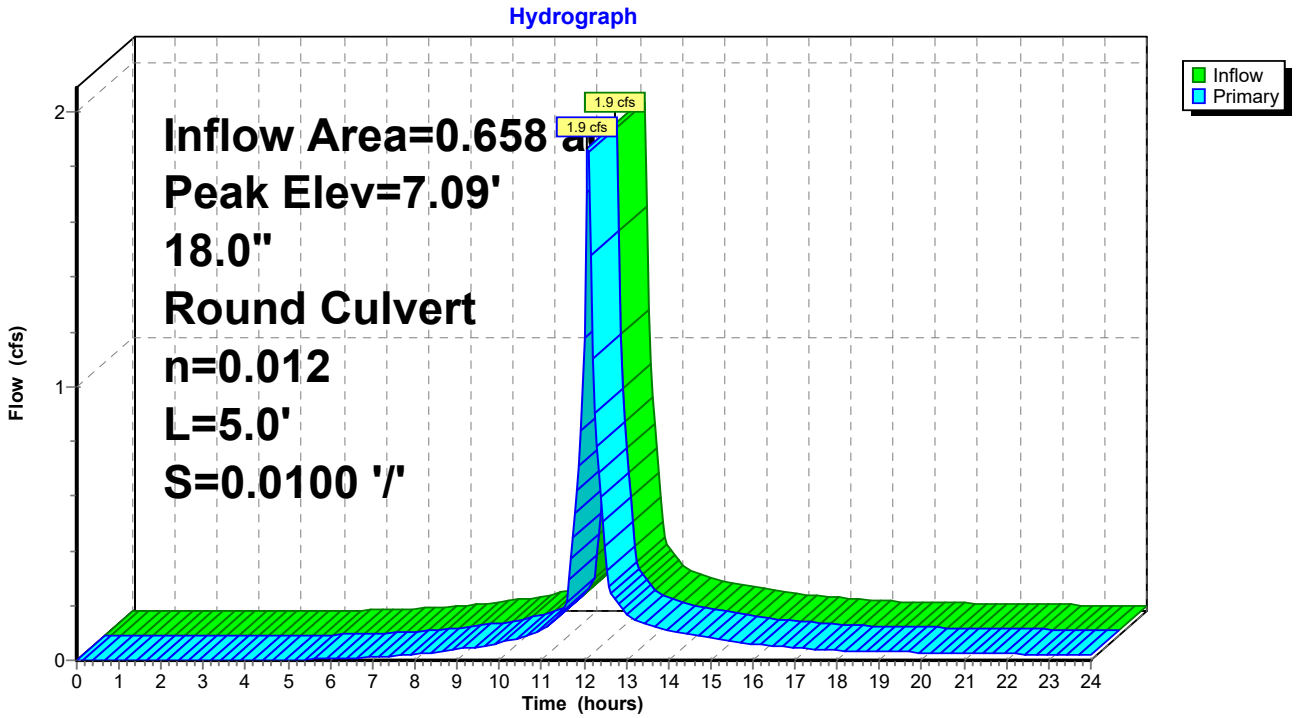
Inflow Area = 0.658 ac, 0.00% Impervious, Inflow Depth > 2.55" for 2-Year event
Inflow = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af
Outflow = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.0 min
Primary = 1.9 cfs @ 12.09 hrs, Volume= 0.14 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.09' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.34'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.34' / 6.29' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.8 cfs @ 12.09 hrs HW=7.08' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 1.8 cfs @ 3.07 fps)

Pond WQU-2: STORMCEPTOR STC-900



Summary for Pond WQU-3: STORMCEPTOR STC-900

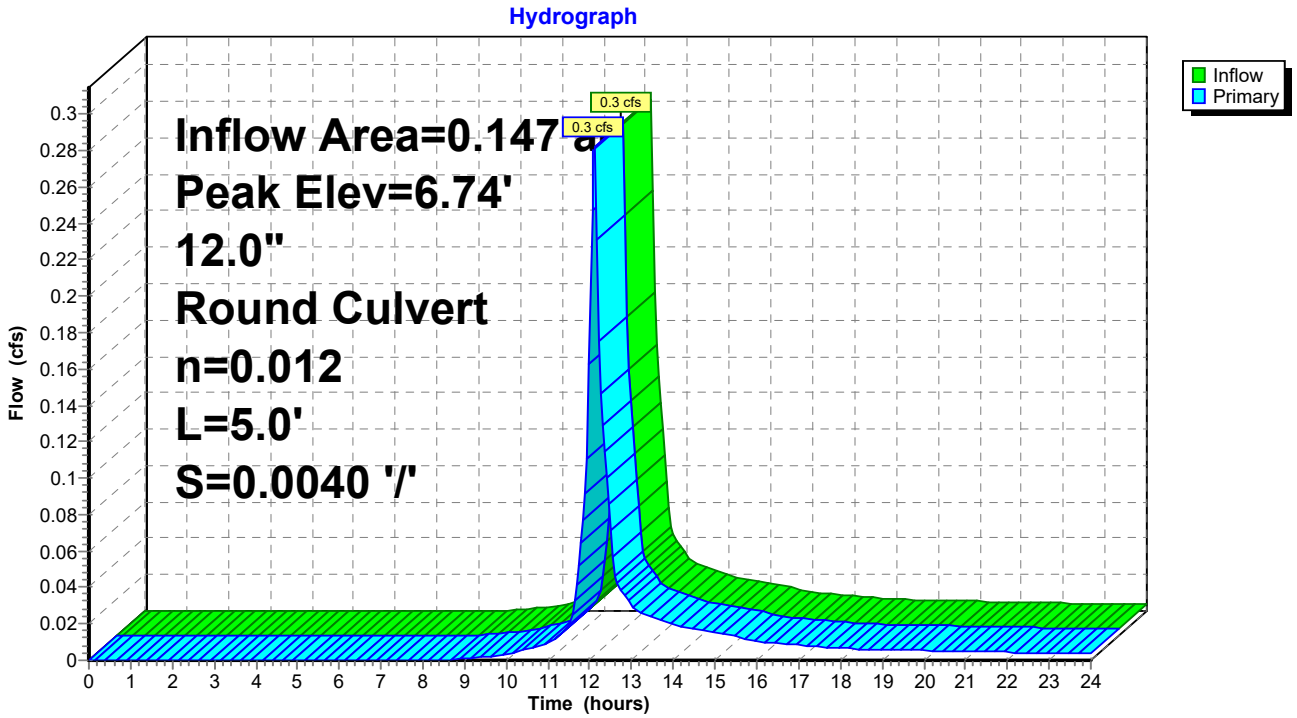
Inflow Area = 0.147 ac, 0.00% Impervious, Inflow Depth > 1.67" for 2-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Outflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.42'	**12.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.42' / 6.40' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.3 cfs @ 12.09 hrs HW=6.74' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 0.3 cfs @ 1.90 fps)

Pond WQU-3: STORMCEPTOR STC-900



Summary for Pond WQU-4: STORMCEPTOR STC-900

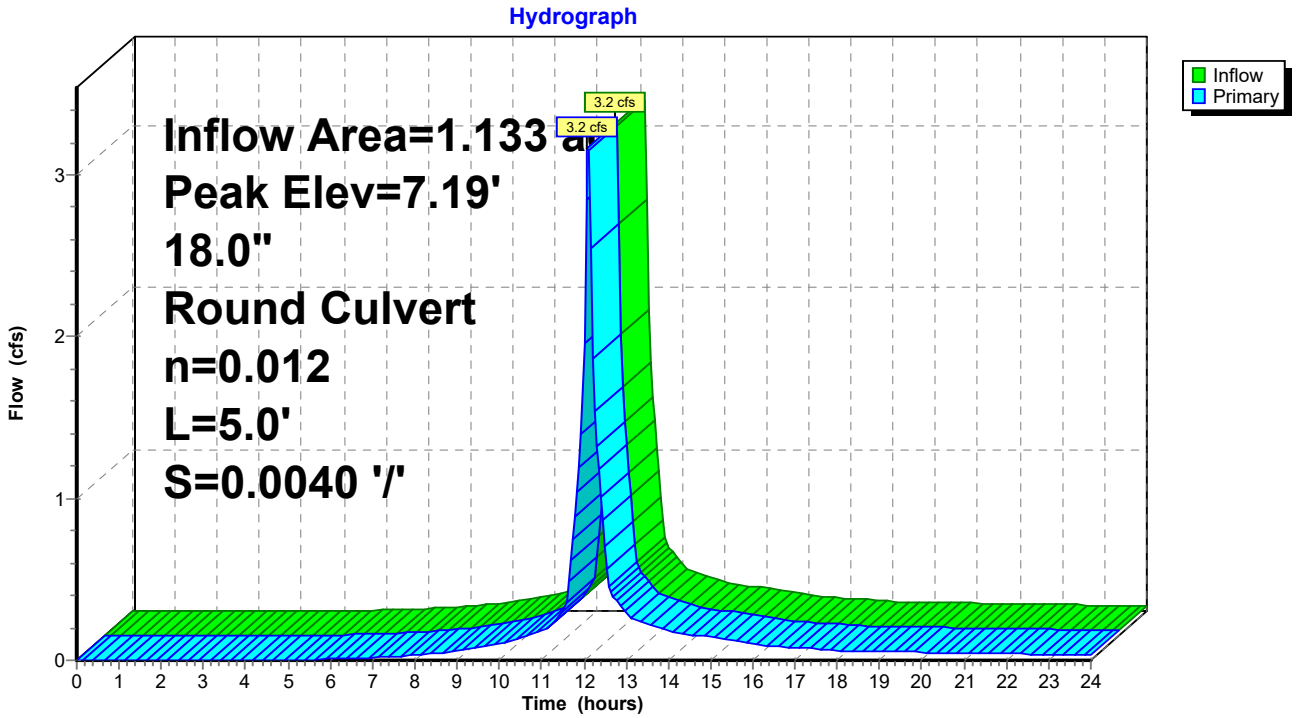
Inflow Area = 1.133 ac, 0.00% Impervious, Inflow Depth > 2.48" for 2-Year event
Inflow = 3.2 cfs @ 12.09 hrs, Volume= 0.23 af
Outflow = 3.2 cfs @ 12.09 hrs, Volume= 0.23 af, Atten= 0%, Lag= 0.0 min
Primary = 3.2 cfs @ 12.09 hrs, Volume= 0.23 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.19' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.15'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.15' / 6.13' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.1 cfs @ 12.09 hrs HW=7.18' (Free Discharge)
└─**1=Outlet to Pond** (Barrel Controls 3.1 cfs @ 3.37 fps)

Pond WQU-4: STORMCEPTOR STC-900



Summary for Pond WQU-5: STORMCEPTOR STC-900

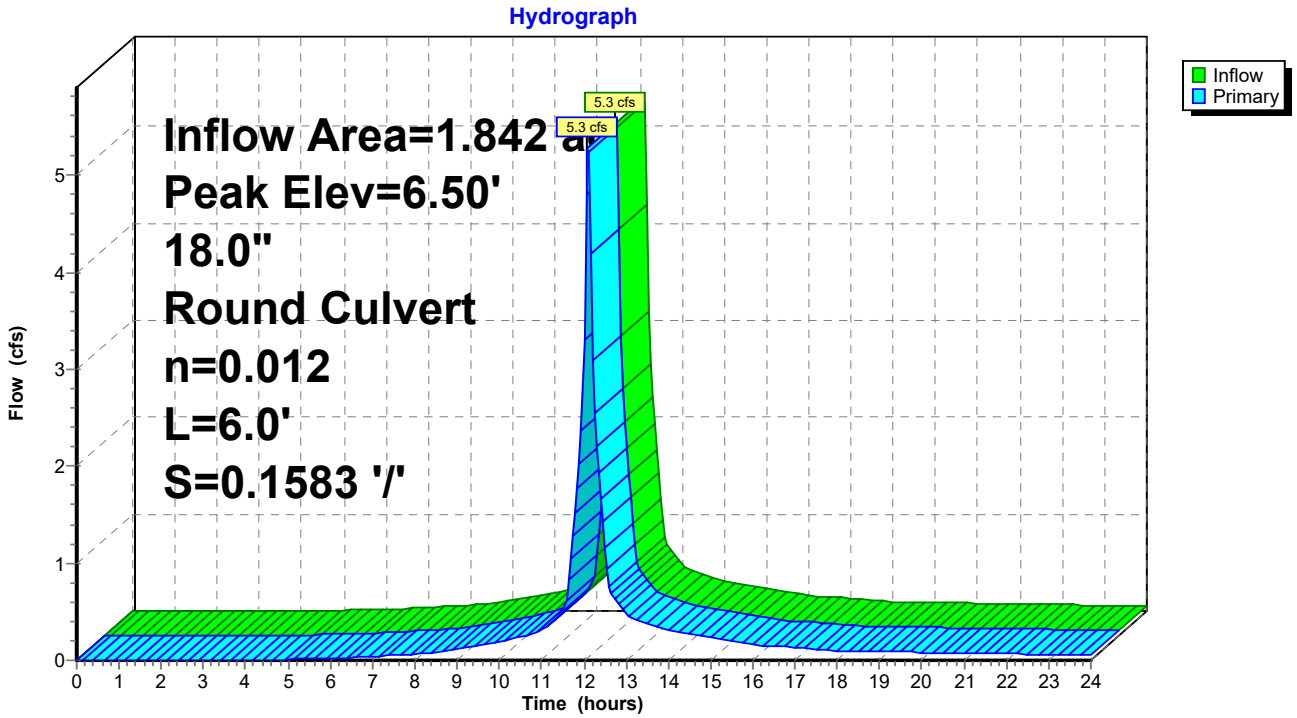
Inflow Area = 1.842 ac, 3.55% Impervious, Inflow Depth > 2.58" for 2-Year event
Inflow = 5.3 cfs @ 12.09 hrs, Volume= 0.40 af
Outflow = 5.3 cfs @ 12.09 hrs, Volume= 0.40 af, Atten= 0%, Lag= 0.0 min
Primary = 5.3 cfs @ 12.09 hrs, Volume= 0.40 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 6.50' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.2 cfs @ 12.09 hrs HW=6.48' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 5.2 cfs @ 3.62 fps)

Pond WQU-5: STORMCEPTOR STC-900



Summary for Pond WQU-6: STORMCEPTOR STC-900

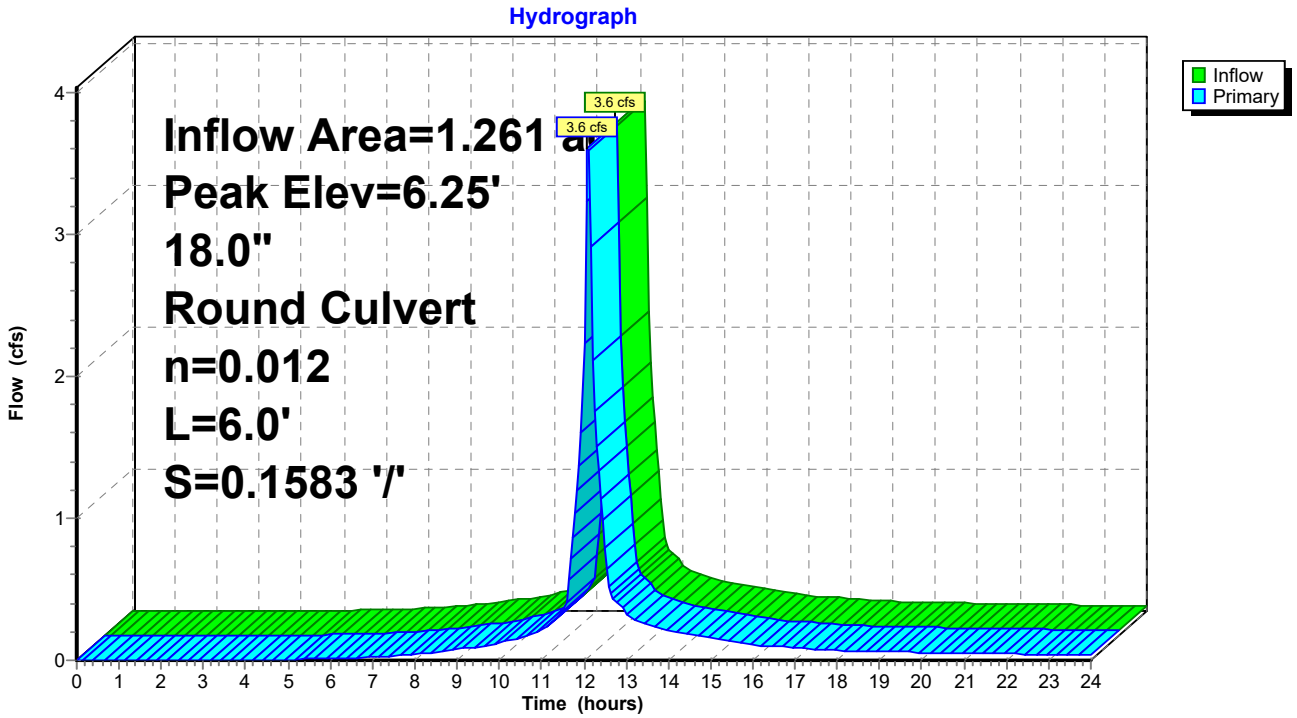
Inflow Area = 1.261 ac, 0.00% Impervious, Inflow Depth > 2.57" for 2-Year event
Inflow = 3.6 cfs @ 12.09 hrs, Volume= 0.27 af
Outflow = 3.6 cfs @ 12.09 hrs, Volume= 0.27 af, Atten= 0%, Lag= 0.0 min
Primary = 3.6 cfs @ 12.09 hrs, Volume= 0.27 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.25' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.5 cfs @ 12.09 hrs HW=6.24' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 3.5 cfs @ 3.22 fps)

Pond WQU-6: STORMCEPTOR STC-900

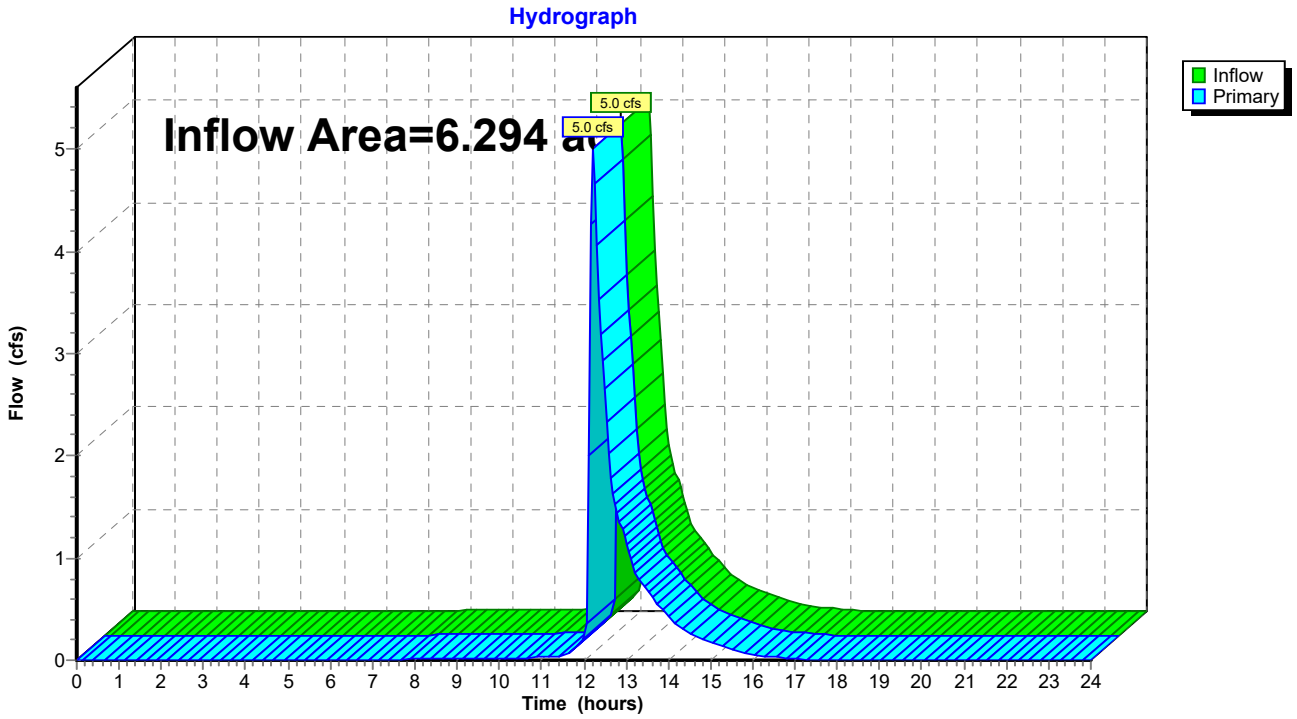


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 6.294 ac, 2.92% Impervious, Inflow Depth > 0.58" for 2-Year event
Inflow = 5.0 cfs @ 12.21 hrs, Volume= 0.31 af
Primary = 5.0 cfs @ 12.21 hrs, Volume= 0.31 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

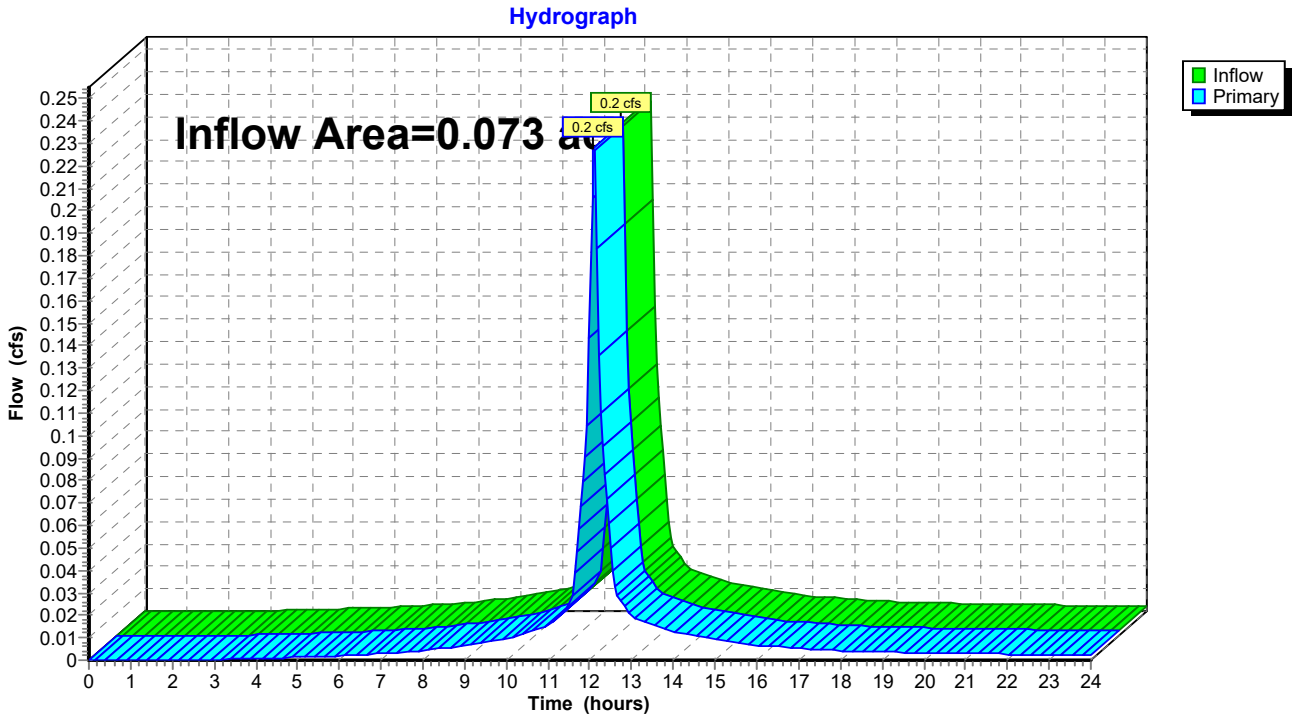


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 0.073 ac, 0.00% Impervious, Inflow Depth > 2.94" for 2-Year event
Inflow = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af
Primary = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2A-PR: SUBCATCHMENT Runoff Area=5,164 sf 100.00% Impervious Runoff Depth>4.56"
Tc=6.0 min CN=98 Runoff=0.5 cfs 0.05 af

Subcatchment2B-PR: SUBCATCHMENT Runoff Area=7,746 sf 0.00% Impervious Runoff Depth>3.79"
Flow Length=320' Tc=6.0 min CN=91 Runoff=0.7 cfs 0.06 af

Subcatchment2C-PR: SUBCATCHMENT Runoff Area=41,736 sf 0.00% Impervious Runoff Depth>4.11"
Flow Length=378' Tc=6.0 min CN=94 Runoff=4.2 cfs 0.33 af

Subcatchment2D-PR: SUBCATCHMENT Runoff Area=16,382 sf 0.00% Impervious Runoff Depth>4.00"
Flow Length=380' Tc=6.0 min CN=93 Runoff=1.6 cfs 0.13 af

Subcatchment2E-PR: SUBCATCHMENT Runoff Area=12,269 sf 0.00% Impervious Runoff Depth>3.79"
Flow Length=161' Tc=6.0 min CN=91 Runoff=1.2 cfs 0.09 af

Subcatchment2F-PR: SUBCATCHMENT Runoff Area=3,277 sf 0.00% Impervious Runoff Depth>2.99"
Flow Length=137' Tc=6.0 min CN=83 Runoff=0.3 cfs 0.02 af

Subcatchment2G-PR: SUBCATCHMENT Runoff Area=3,117 sf 0.00% Impervious Runoff Depth>2.72"
Flow Length=258' Tc=6.0 min CN=80 Runoff=0.2 cfs 0.02 af

Subcatchment2H-PR: SUBCATCHMENT Runoff Area=19,639 sf 0.00% Impervious Runoff Depth>3.89"
Flow Length=320' Tc=6.0 min CN=92 Runoff=1.9 cfs 0.15 af

Subcatchment2I-PR: SUBCATCHMENT Runoff Area=29,698 sf 0.00% Impervious Runoff Depth>3.79"
Flow Length=385' Tc=6.0 min CN=91 Runoff=2.8 cfs 0.22 af

Subcatchment2J-PR: SUBCATCHMENT Runoff Area=48,397 sf 5.88% Impervious Runoff Depth>4.11"
Flow Length=340' Tc=6.0 min CN=94 Runoff=4.9 cfs 0.38 af

Subcatchment2K-PR: SUBCATCHMENT Runoff Area=16,131 sf 0.00% Impervious Runoff Depth>3.68"
Flow Length=340' Tc=6.0 min CN=90 Runoff=1.5 cfs 0.11 af

Subcatchment2L-PR: SUBCATCHMENT Runoff Area=15,693 sf 0.00% Impervious Runoff Depth>3.68"
Flow Length=340' Tc=6.0 min CN=90 Runoff=1.5 cfs 0.11 af

Subcatchment2M-PR: SUBCATCHMENT Runoff Area=19,164 sf 0.00% Impervious Runoff Depth>3.79"
Flow Length=275' Tc=6.0 min CN=91 Runoff=1.8 cfs 0.14 af

Subcatchment2N-PR: SUBCATCHMENT Runoff Area=35,765 sf 0.00% Impervious Runoff Depth>4.00"
Flow Length=370' Tc=6.0 min CN=93 Runoff=3.5 cfs 0.27 af

Subcatchment3A-PR: SUBCATCHMENT Runoff Area=3,190 sf 0.00% Impervious Runoff Depth>4.33"
Flow Length=1,325' Tc=6.3 min CN=96 Runoff=0.3 cfs 0.03 af

Subcatchment3B-PR: SUBCATCHMENT Runoff Area=2,795 sf 100.00% Impervious Runoff Depth>4.56"
Tc=6.0 min CN=98 Runoff=0.3 cfs 0.02 af

Pond 1P: FERGUSON R-TANK CHAMBER Peak Elev=7.74' Storage=0.12 af Inflow=7.7 cfs 0.60 af
Discarded=0.1 cfs 0.19 af Primary=7.6 cfs 0.32 af Outflow=7.7 cfs 0.51 af

Pond 2P: FERGUSON R-TANK CHAMBER Peak Elev=7.76' Storage=0.09 af Inflow=5.2 cfs 0.40 af
Discarded=0.1 cfs 0.17 af Primary=4.3 cfs 0.18 af Outflow=4.4 cfs 0.35 af

Pond 3P: FERGUSON R-TANK / INFILTRATION Peak Elev=6.66' Storage=0.33 af Inflow=13.2 cfs 1.02 af
Discarded=0.5 cfs 0.72 af Primary=4.7 cfs 0.29 af Outflow=5.2 cfs 1.01 af

Pond 5P: DRAINAGE MANHOLE Peak Elev=6.93' Inflow=11.6 cfs 0.51 af
30.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=11.6 cfs 0.51 af

Pond CB-1: 18" NYLOPLAST DRAIN Peak Elev=9.03' Storage=0 cf Inflow=0.7 cfs 0.06 af
Outflow=0.7 cfs 0.06 af

Pond CB-10: 18" NYLOPLAST DRAIN Peak Elev=7.91' Storage=4 cf Inflow=1.5 cfs 0.11 af
Outflow=1.5 cfs 0.11 af

Pond CB-11: 18" NYLOPLAST DRAIN Peak Elev=7.87' Storage=4 cf Inflow=1.5 cfs 0.11 af
Outflow=1.5 cfs 0.11 af

Pond CB-12: 18" NYLOPLAST DRAIN Peak Elev=7.91' Storage=7 cf Inflow=1.8 cfs 0.14 af
Outflow=1.8 cfs 0.14 af

Pond CB-13: 18" NYLOPLAST DRAIN Peak Elev=7.99' Storage=42 cf Inflow=3.5 cfs 0.27 af
Outflow=3.5 cfs 0.27 af

Pond CB-2: 18" NYLOPLAST DRAIN Peak Elev=9.02' Storage=39 cf Inflow=4.2 cfs 0.33 af
Outflow=4.1 cfs 0.33 af

Pond CB-3: 18" NYLOPLAST DRAIN Peak Elev=8.79' Storage=0.00 af Inflow=1.6 cfs 0.13 af
Outflow=1.6 cfs 0.13 af

Pond CB-4: 18" NYLOPLAST DRAIN Peak Elev=8.98' Storage=3 cf Inflow=1.2 cfs 0.09 af
Outflow=1.2 cfs 0.09 af

Pond CB-5: 18" NYLOPLAST DRAIN Peak Elev=9.03' Storage=0 cf Inflow=0.3 cfs 0.02 af
Outflow=0.3 cfs 0.02 af

Pond CB-6: 18" NYLOPLAST DRAIN Peak Elev=8.91' Storage=1 cf Inflow=0.2 cfs 0.02 af
Outflow=0.2 cfs 0.02 af

Pond CB-7: 18" NYLOPLAST DRAIN Peak Elev=8.70' Storage=8 cf Inflow=1.9 cfs 0.15 af
Outflow=1.9 cfs 0.15 af

Pond CB-8: 18" NYLOPLAST DRAIN Peak Elev=8.64' Storage=23 cf Inflow=2.8 cfs 0.22 af
Outflow=2.8 cfs 0.22 af

Pond CB-9: 18" NYLOPLAST DRAIN Peak Elev=8.02' Storage=17 cf Inflow=4.9 cfs 0.38 af
Outflow=4.9 cfs 0.38 af

Pond WQU-1: STORMCEPTORSTC-900 Peak Elev=7.72' Inflow=4.9 cfs 0.38 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=4.9 cfs 0.38 af

Pond WQU-2: STORMCEPTORSTC-900 Peak Elev=7.28' Inflow=2.8 cfs 0.21 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=2.8 cfs 0.21 af

Pond WQU-3: STORMCEPTORSTC-900 Peak Elev=6.85' Inflow=0.5 cfs 0.03 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=0.5 cfs 0.03 af

Pond WQU-4: STORMCEPTORSTC-900 Peak Elev=7.48' Inflow=4.8 cfs 0.36 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=4.8 cfs 0.36 af

Pond WQU-5: STORMCEPTORSTC-900 Peak Elev=6.95' Inflow=7.9 cfs 0.60 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=7.9 cfs 0.60 af

Pond WQU-6: STORMCEPTORSTC-900 Peak Elev=6.51' Inflow=5.4 cfs 0.41 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=5.4 cfs 0.41 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=12.8 cfs 0.84 af
Primary=12.8 cfs 0.84 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=0.3 cfs 0.03 af
Primary=0.3 cfs 0.03 af

Total Runoff Area = 6.432 ac Runoff Volume = 2.11 af Average Runoff Depth = 3.93"
96.14% Pervious = 6.184 ac 3.86% Impervious = 0.248 ac

Summary for Subcatchment 2A-PR: SUBCATCHMENT 2A-PR

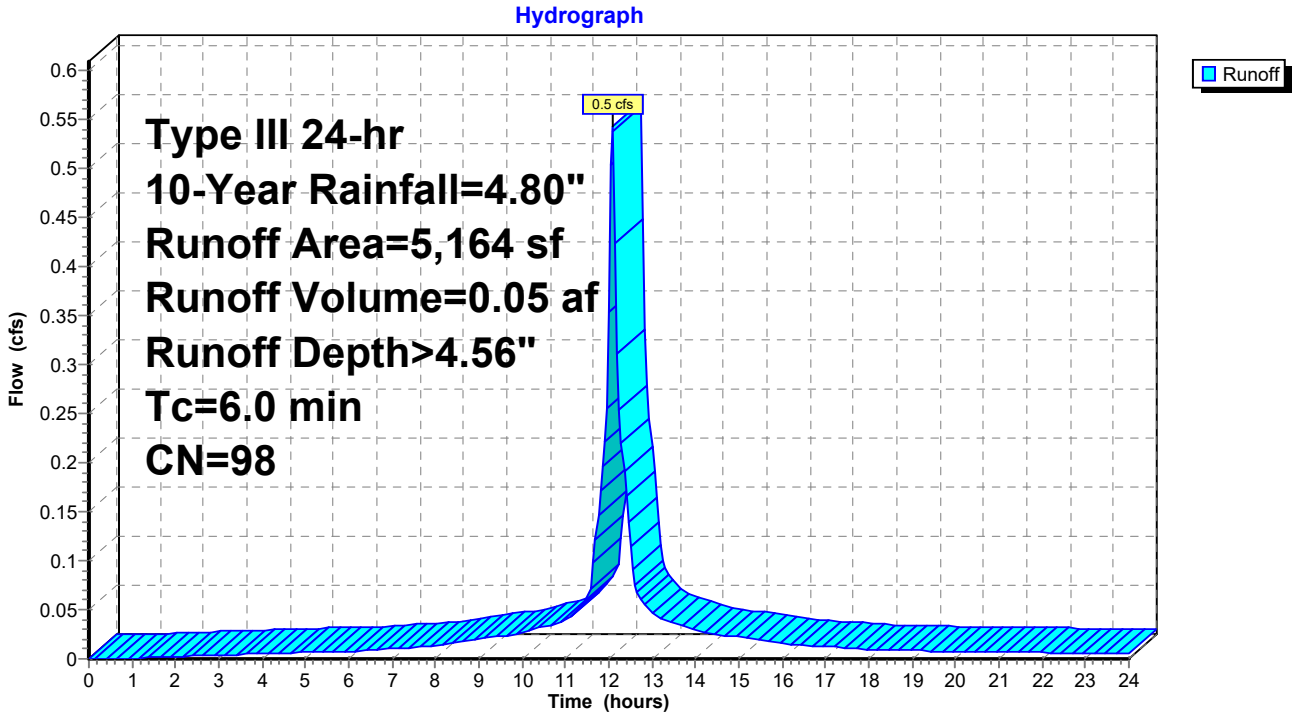
Runoff = 0.5 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 4.56"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
5,164	98	Paved parking, HSG A
5,164		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 2A-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2B-PR: SUBCATCHMENT 2A-PR

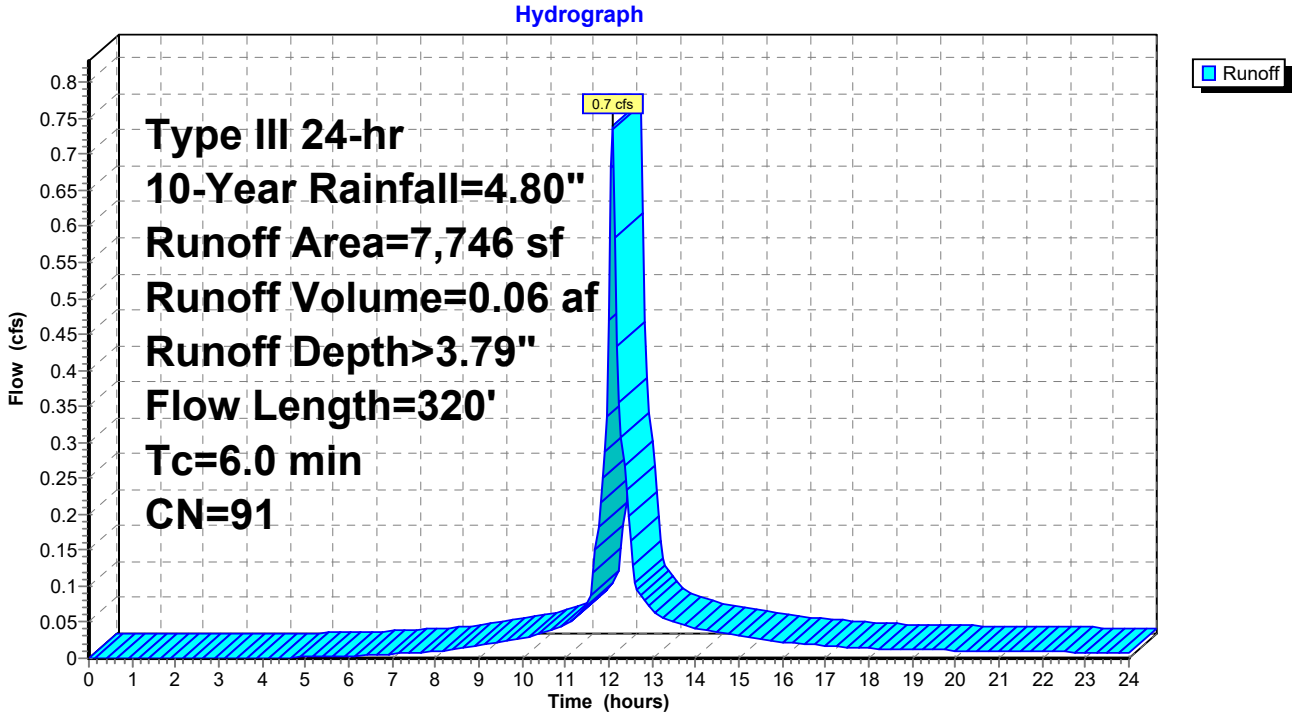
Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.06 af, Depth> 3.79"
Routed to Pond CB-1 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	693	39	Landscaped area >75% Grass cover, Good, HSG A
*	7,053	96	Heavy lift Gravel surface, HSG A
	7,746	91	Weighted Average
	7,746		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	260	0.0053	1.17		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	60	0.0100	3.53	17.63	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
4.0	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2B-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2C-PR: SUBCATCHMENT 2C-PR

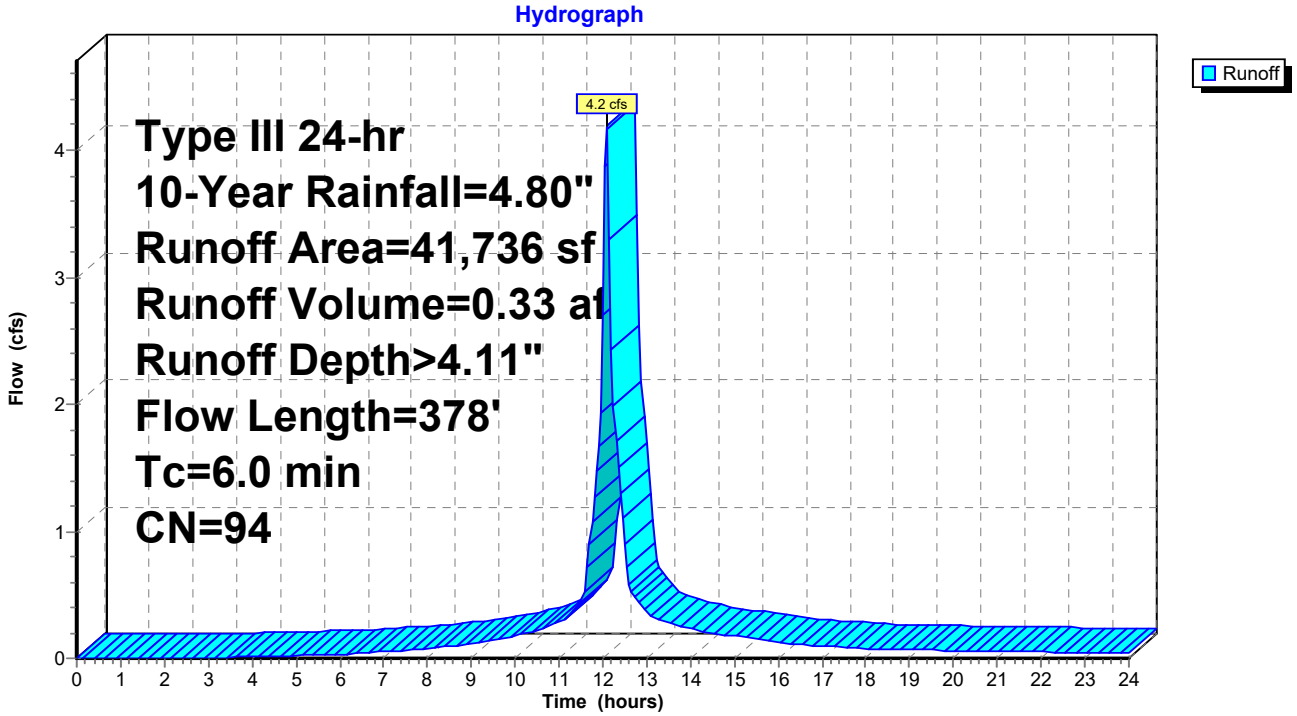
Runoff = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af, Depth> 4.11"
Routed to Pond CB-2 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,298	39	Landscaped area >75% Grass cover, Good, HSG A
*	40,438	96	Heavy lift Gravel surface, HSG A
	41,736	94	Weighted Average
	41,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	328	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
5.1	378	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2D-PR: SUBCATCHMENT 2D-PR

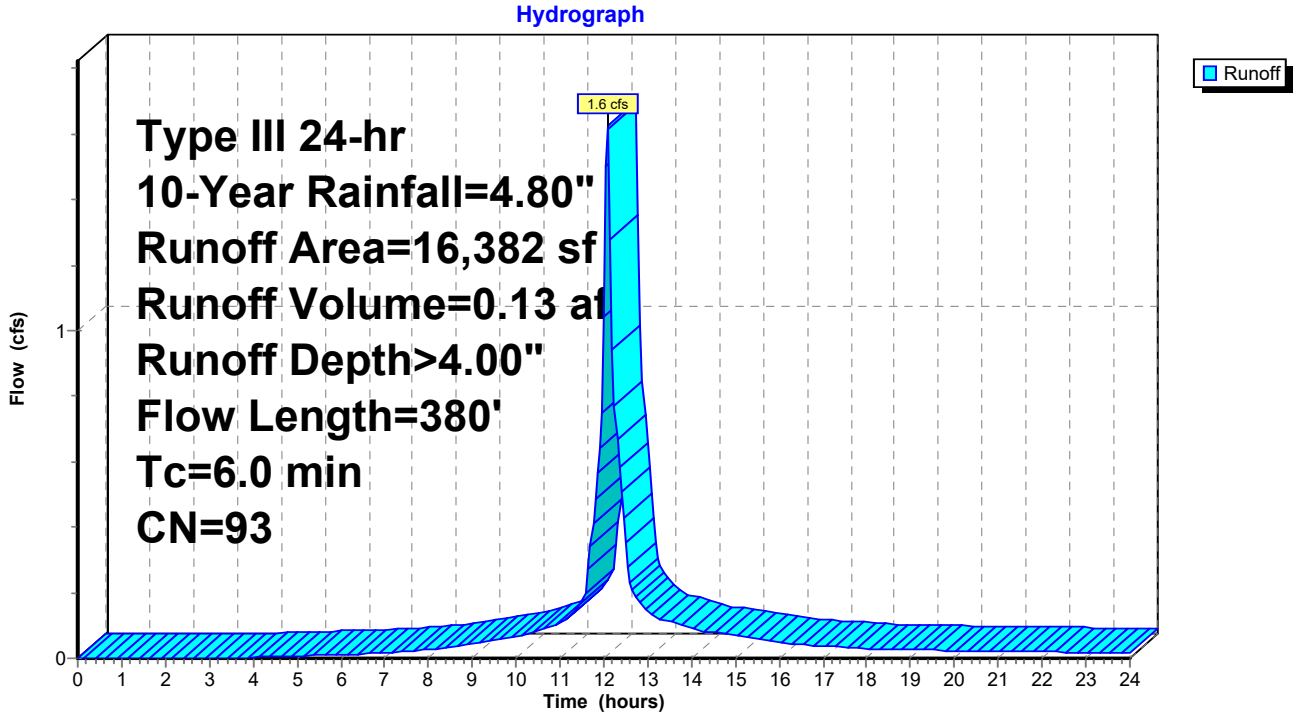
Runoff = 1.6 cfs @ 12.09 hrs, Volume= 0.13 af, Depth> 4.00"
Routed to Pond CB-3 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	962	39	Landscaped area >75% Grass cover, Good, HSG A
*	15,420	96	Heavy lift Gravel surface, HSG A
	16,382	93	Weighted Average
	16,382		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	335	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.8	380	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2D-PR: SUBCATCHMENT 2D-PR



Summary for Subcatchment 2E-PR: SUBCATCHMENT 2C-PR

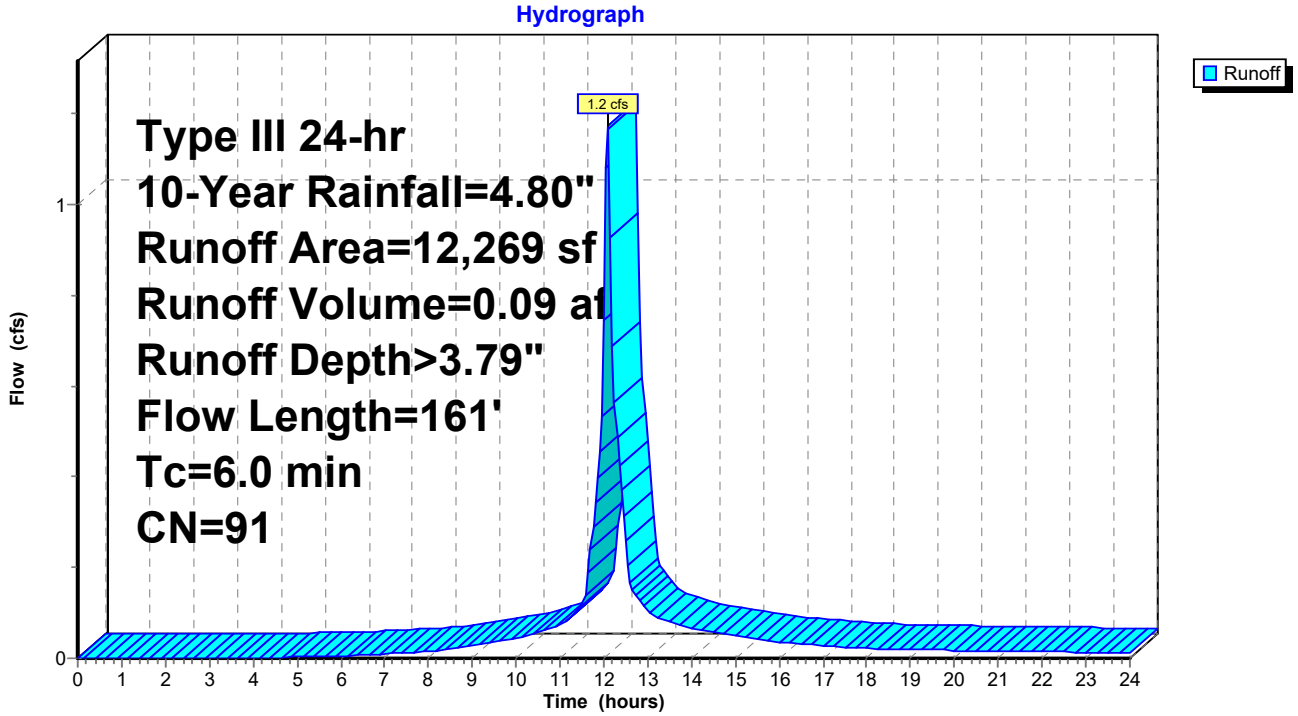
Runoff = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af, Depth> 3.79"
Routed to Pond CB-4 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,043	39	Landscaped area >75% Grass cover, Good, HSG A
*	11,226	96	Heavy lift Gravel surface, HSG A
	12,269	91	Weighted Average
	12,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	116	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.8	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2E-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2F-PR: SUBCATCHMENT 2F-PR

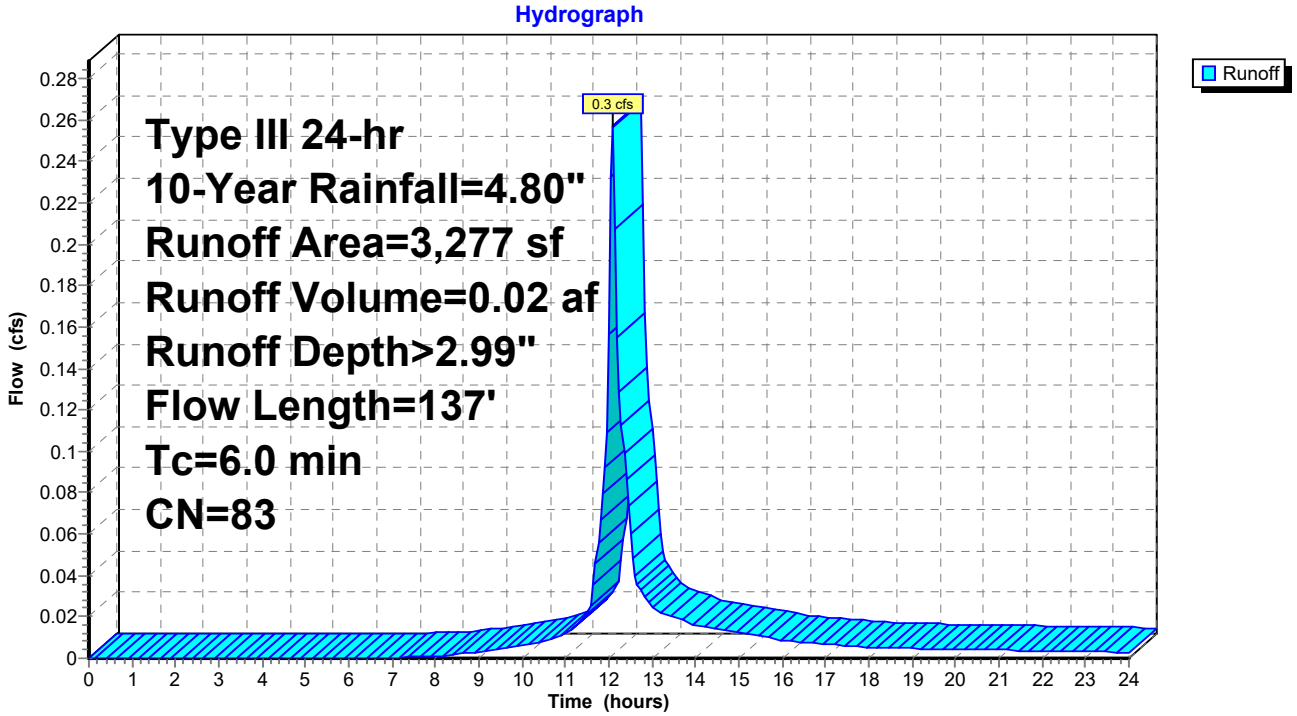
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 2.99"
Routed to Pond CB-5 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	751	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,526	96	Heavy lift Gravel surface, HSG A
	3,277	83	Weighted Average
	3,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	37	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.6	137	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2F-PR: SUBCATCHMENT 2F-PR



Summary for Subcatchment 2G-PR: SUBCATCHMENT 2G-PR

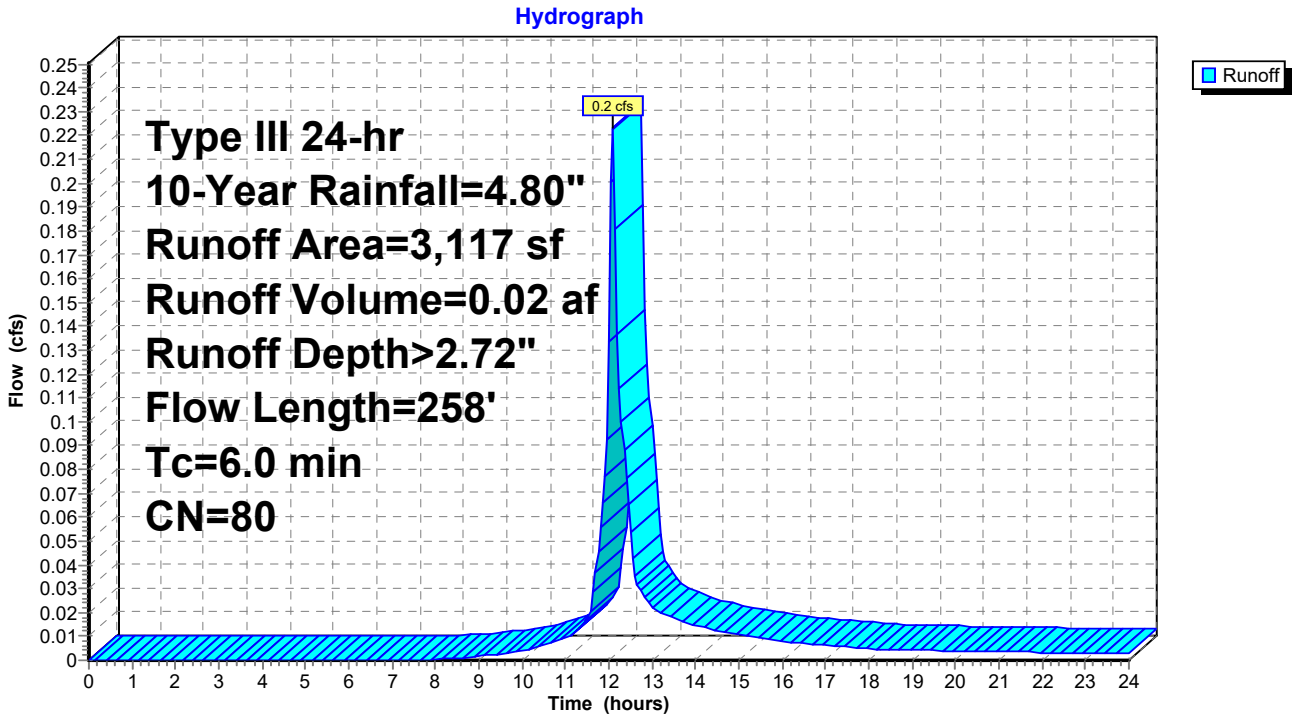
Runoff = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 2.72"
Routed to Pond CB-6 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	902	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,215	96	Heavy lift Gravel surface, HSG A
	3,117	80	Weighted Average
	3,117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	208	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
3.3	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2G-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2H-PR: SUBCATCHMENT 2G-PR

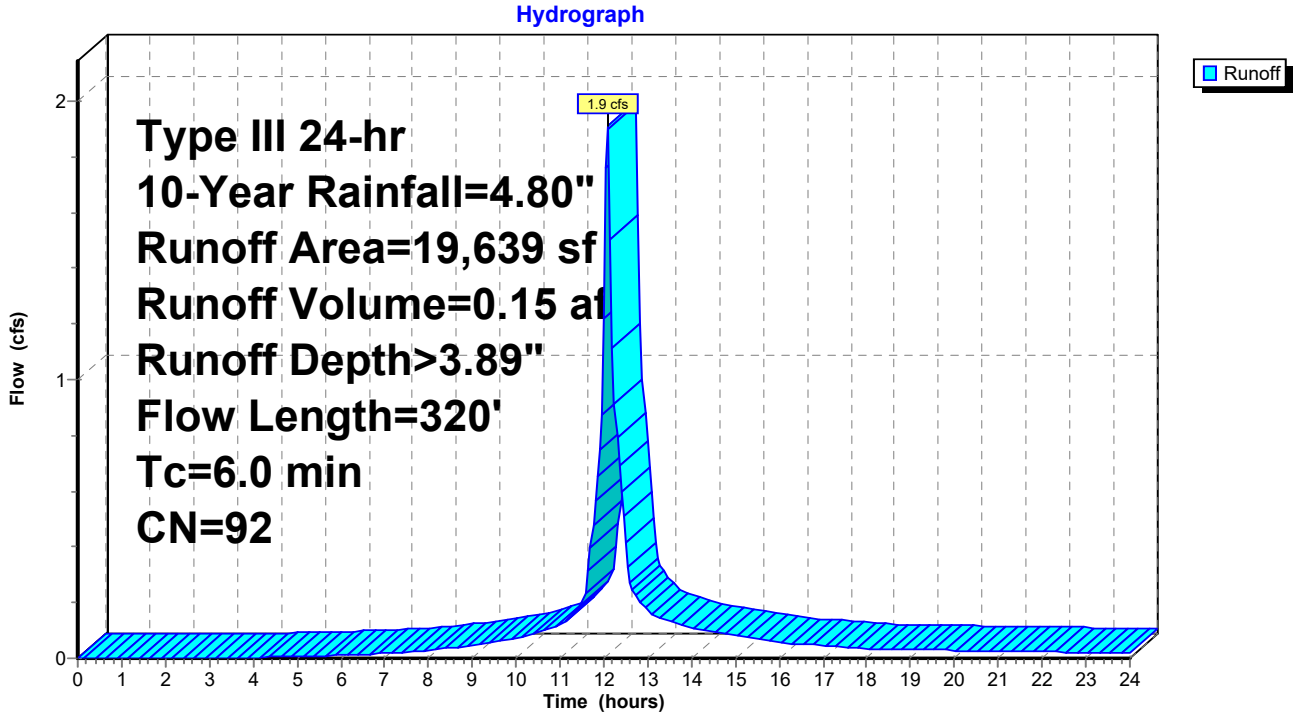
Runoff = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af, Depth> 3.89"
Routed to Pond CB-7 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,347	39	Landscaped area >75% Grass cover, Good, HSG A
*	18,292	96	Heavy lift Gravel surface, HSG A
	19,639	92	Weighted Average
	19,639		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	270	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.3	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2H-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2I-PR: SUBCATCHMENT 2H-PR

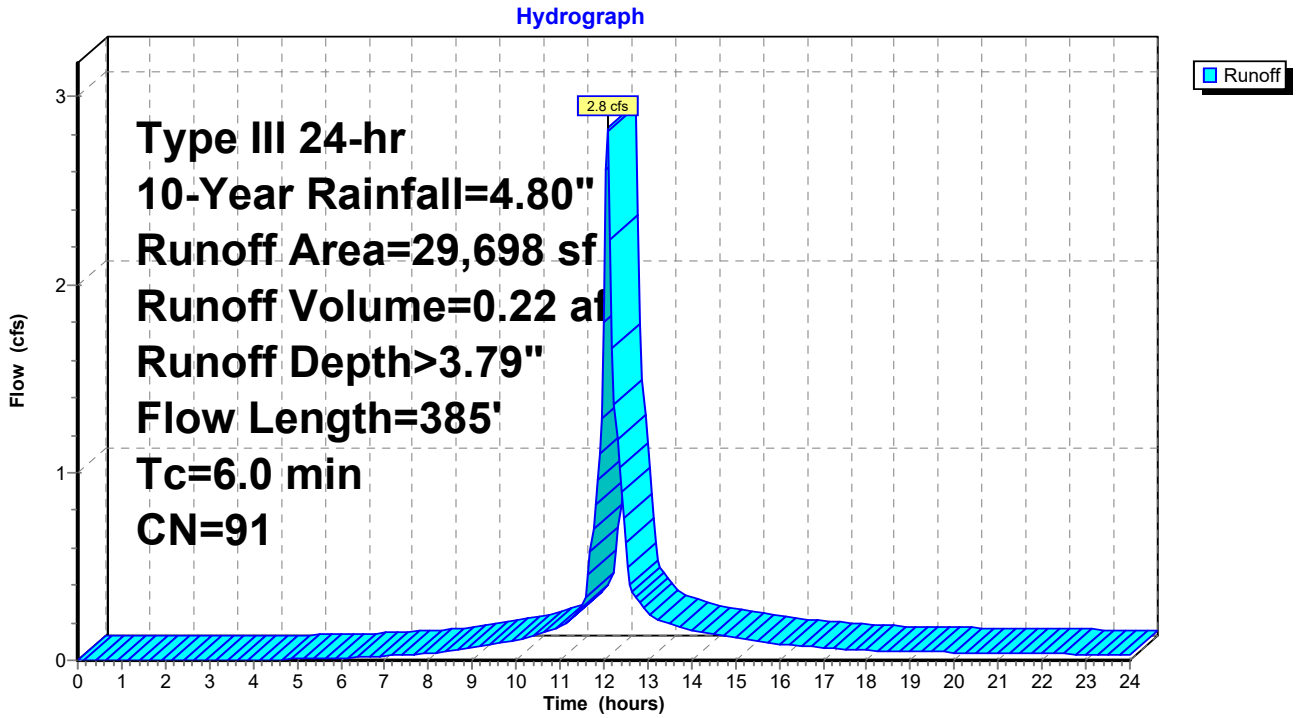
Runoff = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af, Depth> 3.79"
Routed to Pond CB-8 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	2,542	39	Landscaped area >75% Grass cover, Good, HSG A
*	27,156	96	Heavy lift Gravel surface, HSG A
	29,698	91	Weighted Average
	29,698		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	335	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.6	385	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2I-PR: SUBCATCHMENT 2H-PR



Summary for Subcatchment 2J-PR: SUBCATCHMENT 2I-PR

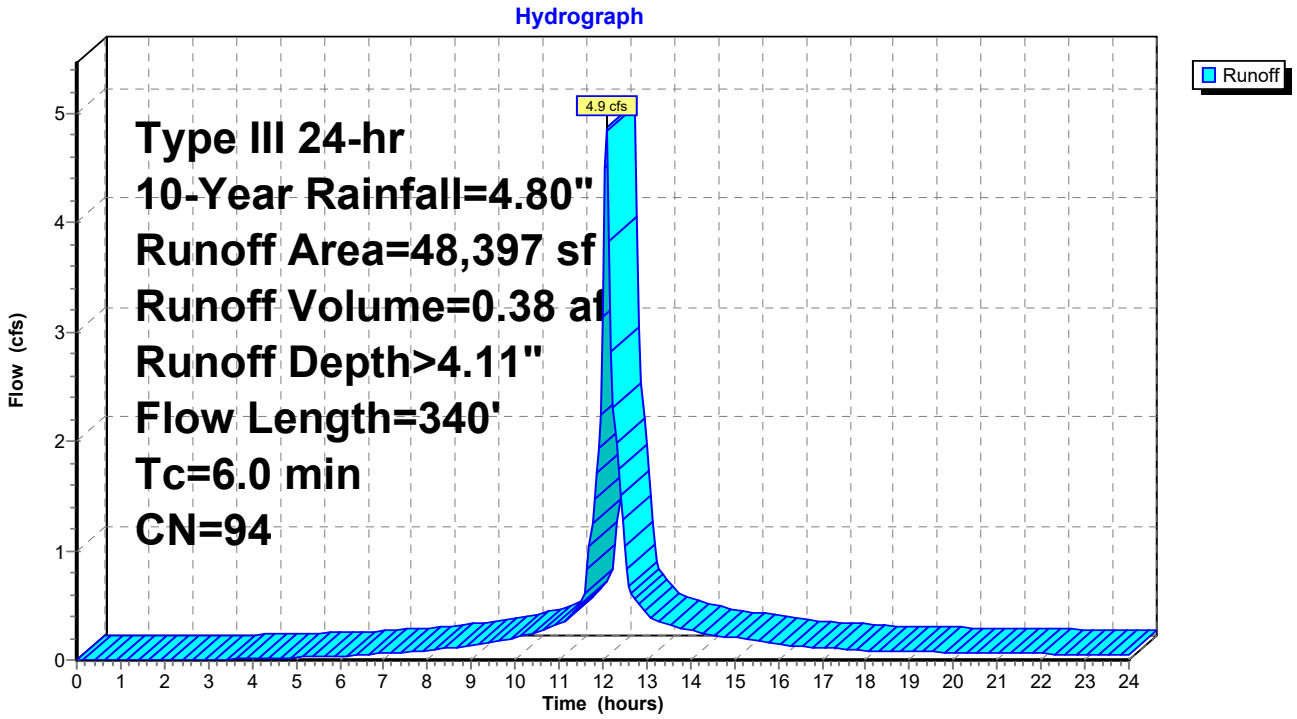
Runoff = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af, Depth> 4.11"
Routed to Pond CB-9 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	2,106	39	Landscaped area >75% Grass cover, Good, HSG A
*	43,443	96	Heavy lift Gravel surface, HSG A
	2,848	98	Paved parking, HSG A
	48,397	94	Weighted Average
	45,549		94.12% Pervious Area
	2,848		5.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2J-PR: SUBCATCHMENT 2I-PR



Summary for Subcatchment 2K-PR: SUBCATCHMENT 2J-PR

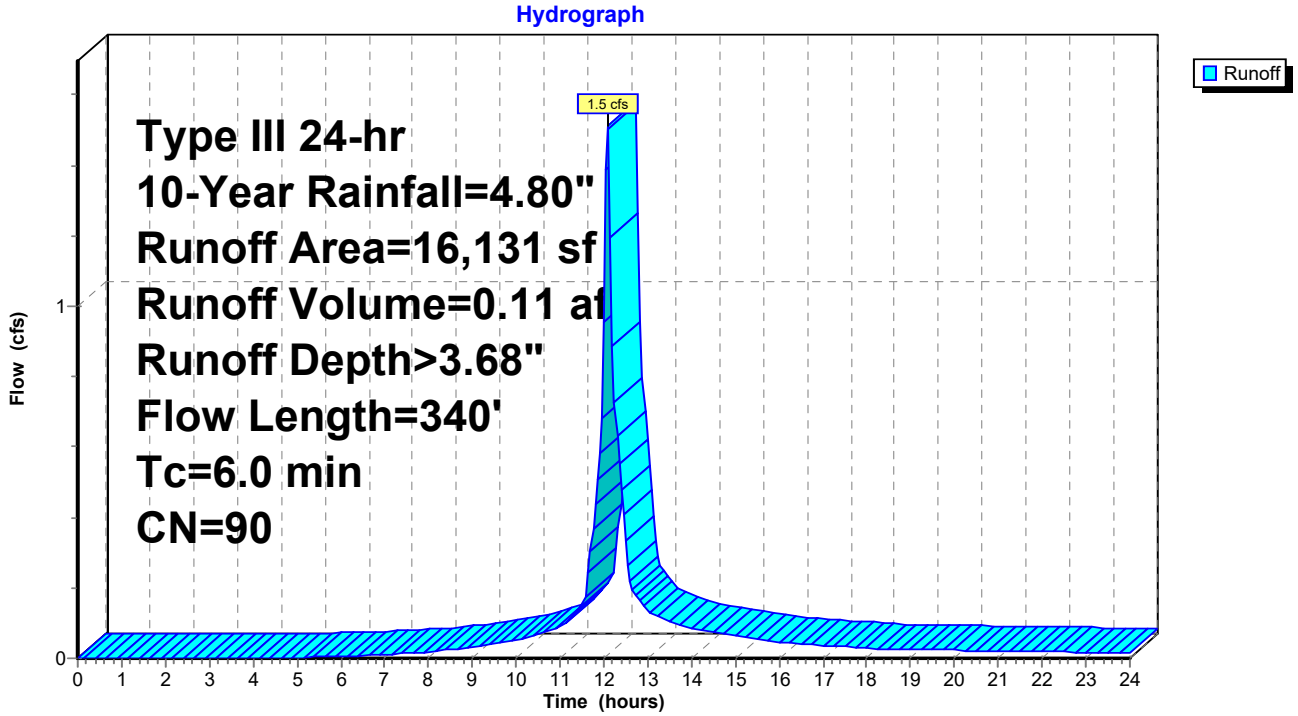
Runoff = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af, Depth> 3.68"
Routed to Pond CB-10 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,634	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,497	96	Heavy lift Gravel surface, HSG A
	16,131	90	Weighted Average
	16,131		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2K-PR: SUBCATCHMENT 2J-PR



Summary for Subcatchment 2L-PR: SUBCATCHMENT 2K-PR

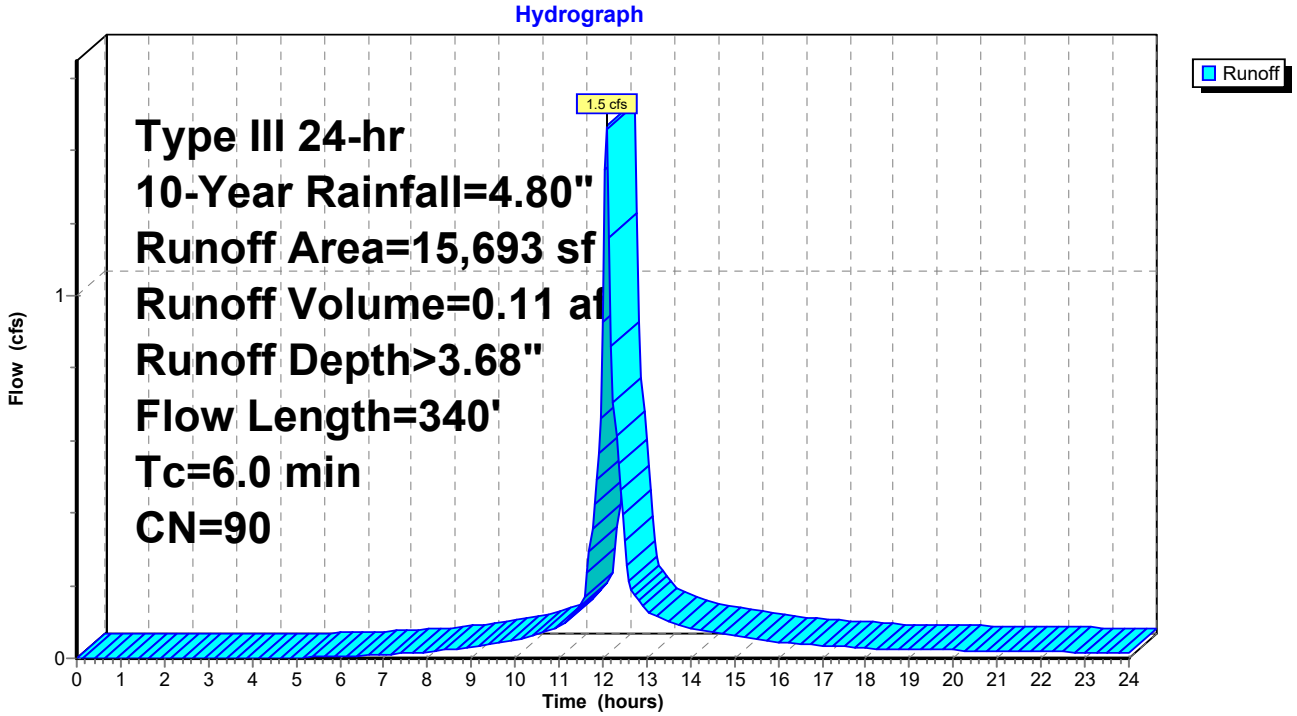
Runoff = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af, Depth> 3.68"
Routed to Pond CB-11 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,630	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,063	96	Heavy lift Gravel surface, HSG A
	15,693	90	Weighted Average
	15,693		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2L-PR: SUBCATCHMENT 2K-PR



Summary for Subcatchment 2M-PR: SUBCATCHMENT 2L-PR

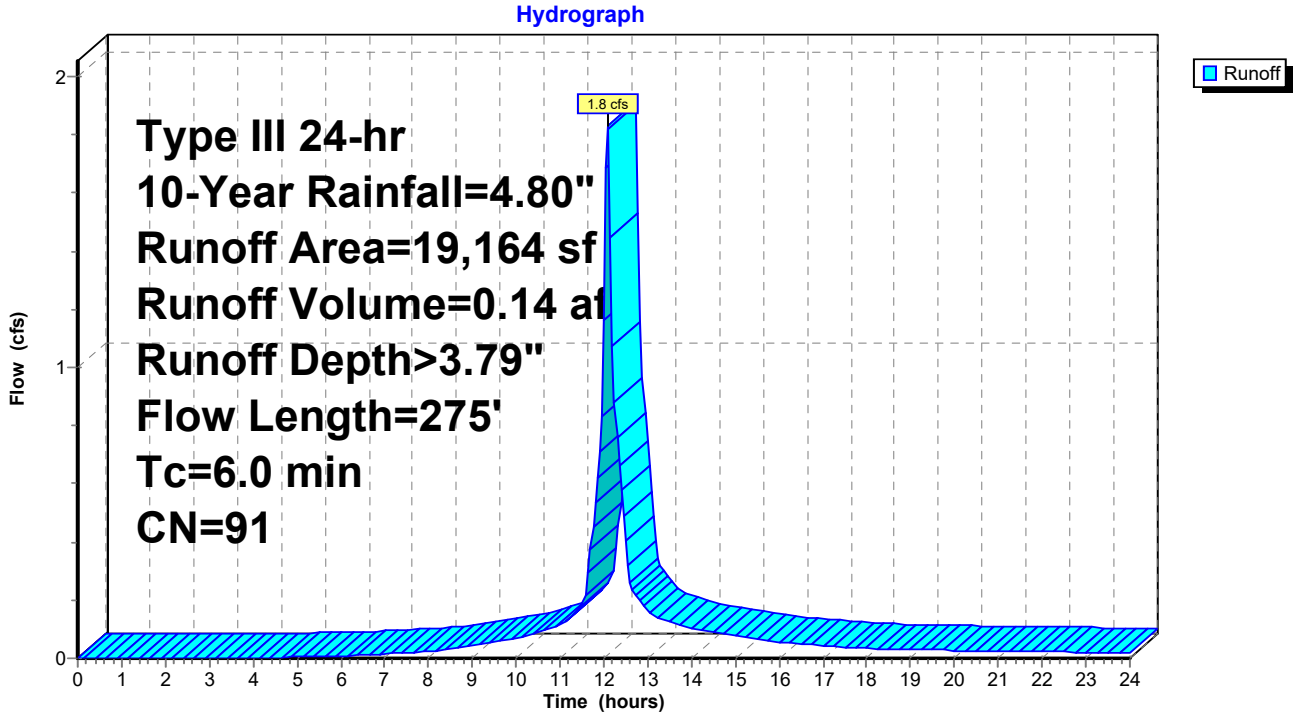
Runoff = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af, Depth> 3.79"
Routed to Pond CB-12 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,629	39	Landscaped area >75% Grass cover, Good, HSG A
*	17,535	96	Heavy lift Gravel surface, HSG A
	19,164	91	Weighted Average
	19,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	225	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.0	275	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2M-PR: SUBCATCHMENT 2L-PR



Summary for Subcatchment 2N-PR: SUBCATCHMENT 2M-PR

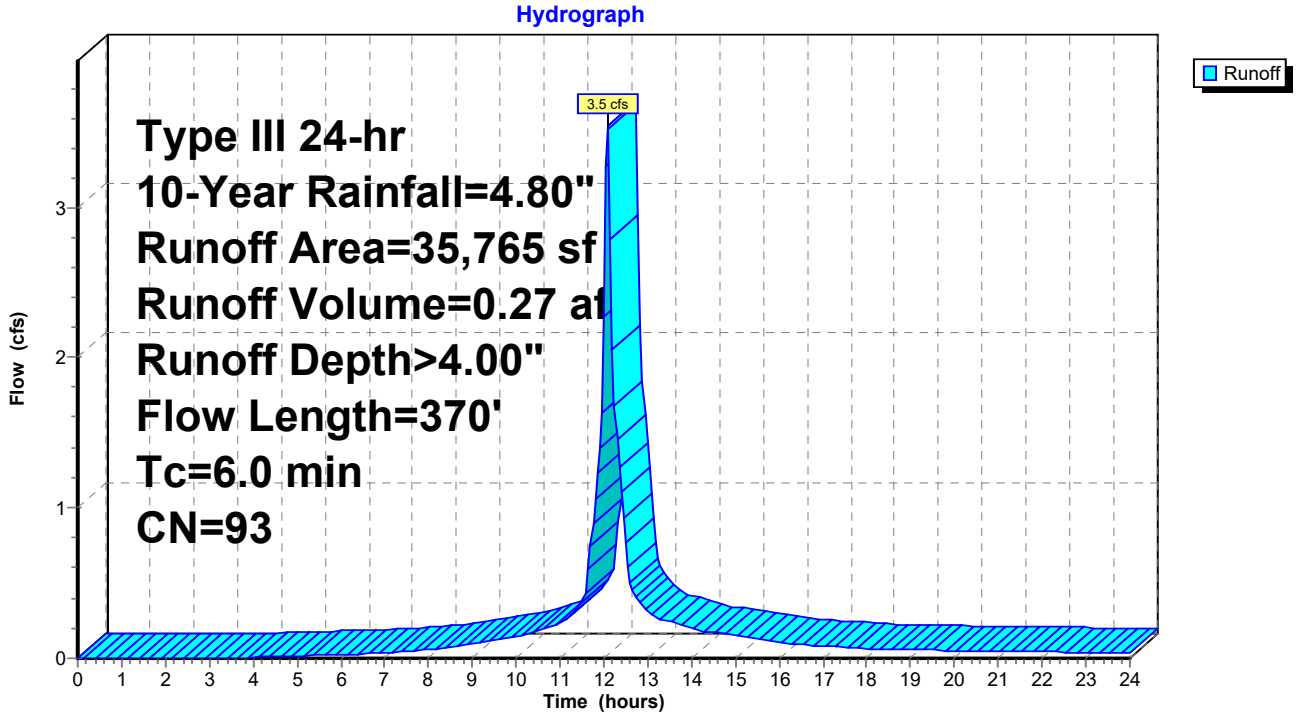
Runoff = 3.5 cfs @ 12.09 hrs, Volume= 0.27 af, Depth> 4.00"
Routed to Pond CB-13 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	2,016	39	15' Landscaped area >75% Grass cover, Good, HSG A
*	33,749	96	Heavy lift Gravel surface, HSG A
	35,765	93	Weighted Average
	35,765		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	320	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.4	370	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2N-PR: SUBCATCHMENT 2M-PR



Summary for Subcatchment 3A-PR: SUBCATCHMENT 3A-PR

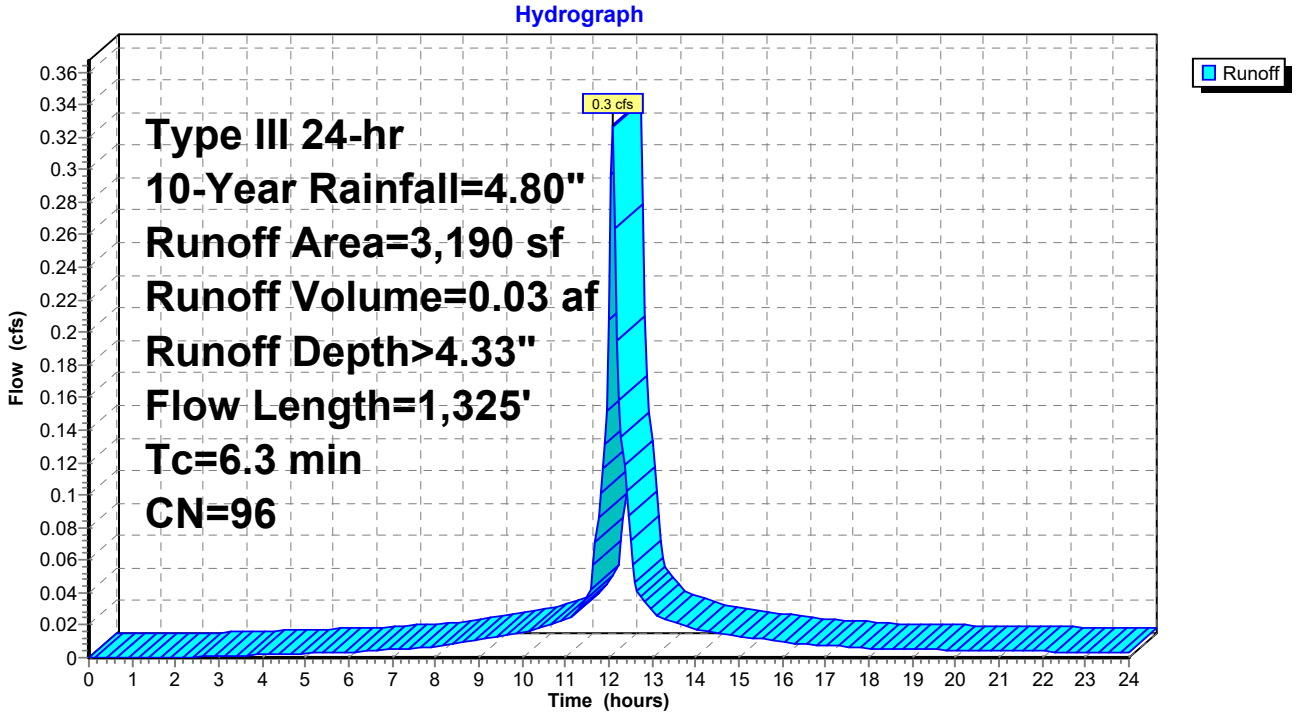
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 4.33"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	3,190	96	Heavy lift Gravel surface, HSG A
	3,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	50	0.0050	0.54		**Sheet Flow, Gravel surface** Smooth surfaces n= 0.011 P2= 2.00"
3.5	740	0.0050	3.47	2.73	**Pipe Channel, Infiltration trench** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
1.3	535	0.0020	6.70	189.40	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.3	1,325	Total			

Subcatchment 3A-PR: SUBCATCHMENT 3A-PR



Summary for Subcatchment 3B-PR: SUBCATCHMENT 3B-PR

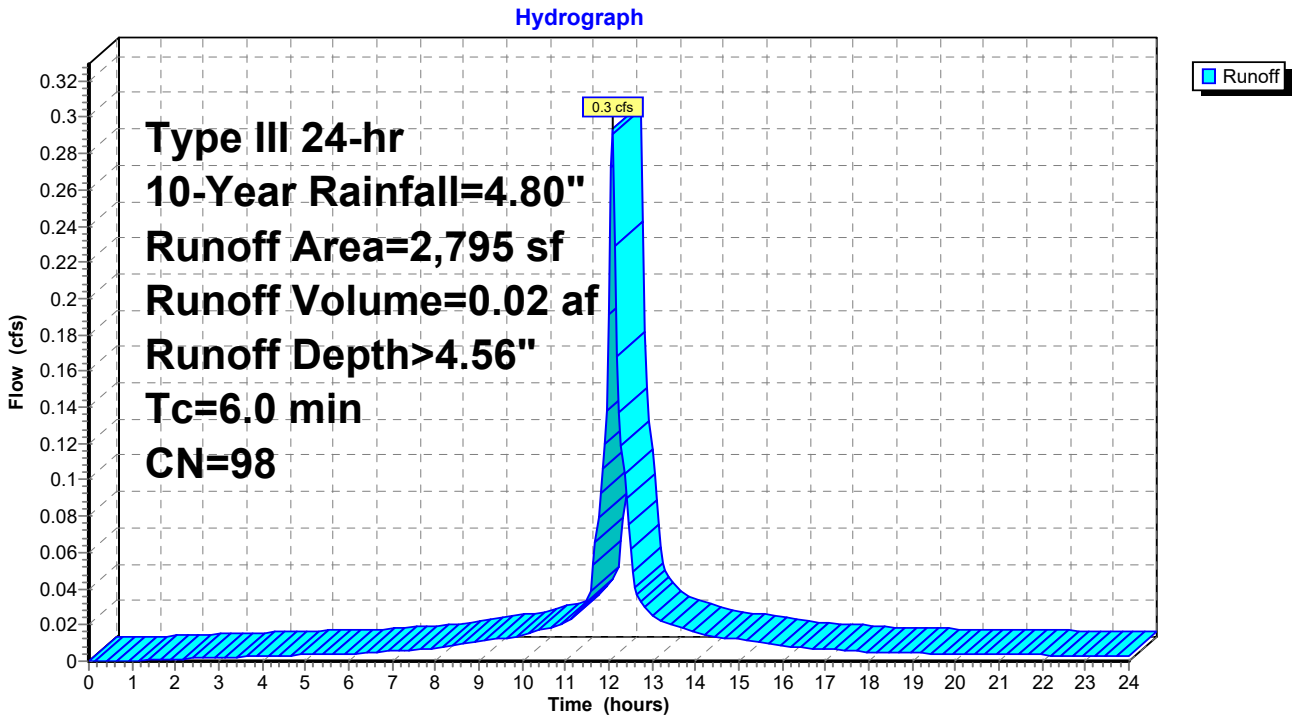
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
2,795	98	Water Surface, HSG A
2,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3B-PR: SUBCATCHMENT 3B-PR



Summary for Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.794 ac, 0.00% Impervious, Inflow Depth > 4.00" for 10-Year event
Inflow = 7.7 cfs @ 12.09 hrs, Volume= 0.60 af
Outflow = 7.7 cfs @ 12.09 hrs, Volume= 0.51 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.1 cfs @ 8.10 hrs, Volume= 0.19 af
Primary = 7.6 cfs @ 12.09 hrs, Volume= 0.32 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.74' @ 12.09 hrs Surf.Area= 0.052 ac Storage= 0.12 af

Plug-Flow detention time= 101.9 min calculated for 0.51 af (85% of inflow)
Center-of-Mass det. time= 39.0 min (817.5 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	3.50'	0.06 af	**11.25'W x 201.05'L x 4.07'H Field A** 0.21 af Overall - 0.07 af Embedded = 0.14 af x 40.0% Voids
#2A	3.75'	0.06 af	**Ferguson R-Tank HD 2** x 336 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 336 Chambers in 4 Rows
		0.12 af	Total Available Storage

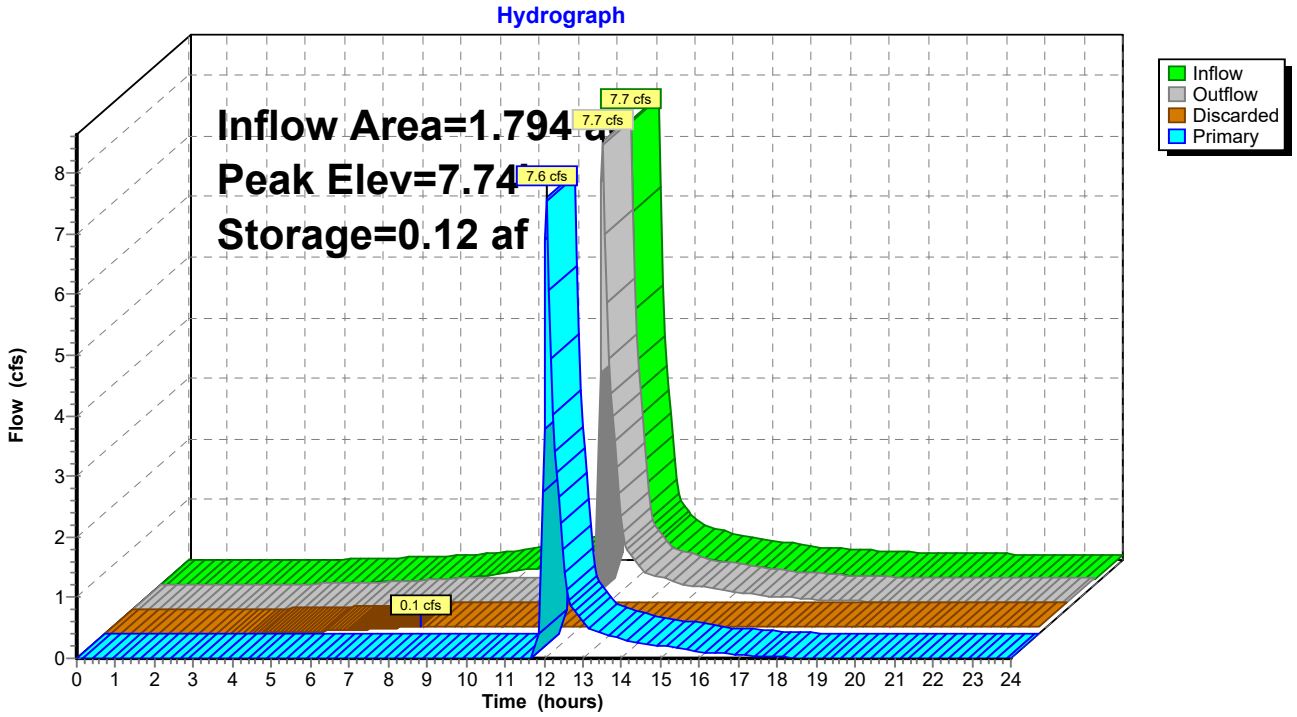
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	3.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-1 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.35' S= 0.0233 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.35'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.80'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 8.10 hrs HW=3.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=7.4 cfs @ 12.09 hrs HW=7.73' (Free Discharge)
└─**2=OCS-1 Outlet** (Passes 7.4 cfs of 12.4 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.7 cfs @ 1.80 fps)
  └─**4=Orifice/Grate** (Orifice Controls 4.7 cfs @ 4.20 fps)

Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.279 ac, 0.00% Impervious, Inflow Depth > 3.72" for 10-Year event
Inflow = 5.2 cfs @ 12.09 hrs, Volume= 0.40 af
Outflow = 4.4 cfs @ 12.15 hrs, Volume= 0.35 af, Atten= 16%, Lag= 3.2 min
Discarded = 0.1 cfs @ 9.15 hrs, Volume= 0.17 af
Primary = 4.3 cfs @ 12.15 hrs, Volume= 0.18 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.76' @ 12.15 hrs Surf.Area= 0.050 ac Storage= 0.09 af

Plug-Flow detention time= 112.1 min calculated for 0.35 af (88% of inflow)
Center-of-Mass det. time= 59.4 min (848.4 - 788.9)

Volume	Invert	Avail.Storage	Storage Description
#1C	4.90'	0.04 af	**10.56'W x 205.74'L x 3.42'H Field C** 0.17 af Overall - 0.07 af Embedded = 0.10 af x 40.0% Voids
#2C	5.15'	0.06 af	**Ferguson R-Tank HD 1.5** x 430 Inside #1 Inside= 15.7"W x 26.0"H => 2.70 sf x 2.35'L = 6.3 cf Outside= 15.7"W x 26.0"H => 2.84 sf x 2.35'L = 6.7 cf 430 Chambers in 5 Rows
		0.10 af	Total Available Storage

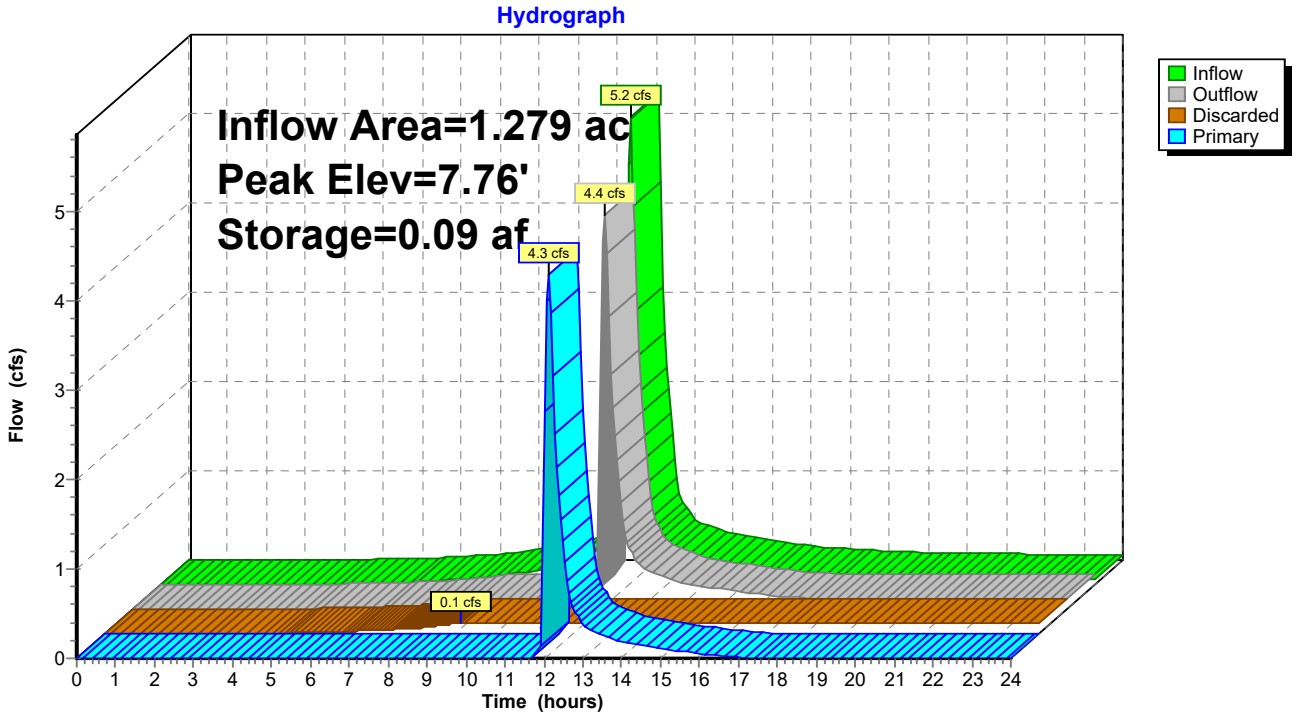
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-2 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.85' S= 0.0067 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.95'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.95'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 9.15 hrs HW=4.94' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=4.3 cfs @ 12.15 hrs HW=7.76' (Free Discharge)
└─**2=OCS-2 Outlet** (Passes 4.3 cfs of 9.7 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 4.3 cfs @ 3.84 fps)

Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH

Inflow Area = 3.103 ac, 2.11% Impervious, Inflow Depth > 3.93" for 10-Year event
Inflow = 13.2 cfs @ 12.09 hrs, Volume= 1.02 af
Outflow = 5.2 cfs @ 12.32 hrs, Volume= 1.01 af, Atten= 61%, Lag= 13.8 min
Discarded = 0.5 cfs @ 10.25 hrs, Volume= 0.72 af
Primary = 4.7 cfs @ 12.32 hrs, Volume= 0.29 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 6.66' @ 12.32 hrs Surf.Area= 0.226 ac Storage= 0.33 af

Plug-Flow detention time= 130.1 min calculated for 1.01 af (99% of inflow)
Center-of-Mass det. time= 124.1 min (905.3 - 781.2)

Volume	Invert	Avail.Storage	Storage Description
#1G	3.90'	0.05 af	**27.62'W x 107.22'L x 4.07'H Field G** 0.28 af Overall - 0.16 af Embedded = 0.12 af x 40.0% Voids
#2G	4.15'	0.15 af	**Ferguson R-Tank HD 2** x 792 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 792 Chambers in 18 Rows
#3	3.90'	0.18 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 0.47 af Overall - 0.02 af Embedded = 0.45 af x 40.0% Voids
#4	4.40'	0.01 af	**12.0" Round 12" Perforated HDPE** x 2 Inside #3 L= 320.0' 0.02 af Overall - 1.5" Wall Thickness = 0.01 af
#5H	3.90'	0.00 af	**2.62'W x 27.46'L x 4.07'H Field H** 0.01 af Overall - 0.00 af Embedded = 0.00 af x 40.0% Voids
#6H	4.15'	0.00 af	**Ferguson R-Tank HD 2** x 20 Inside #5 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 20 Chambers in 2 Rows
		0.39 af	Total Available Storage

Storage Group G created with Chamber Wizard
Storage Group H created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
3.90	0.156	0.00	0.00
6.90	0.156	0.47	0.47

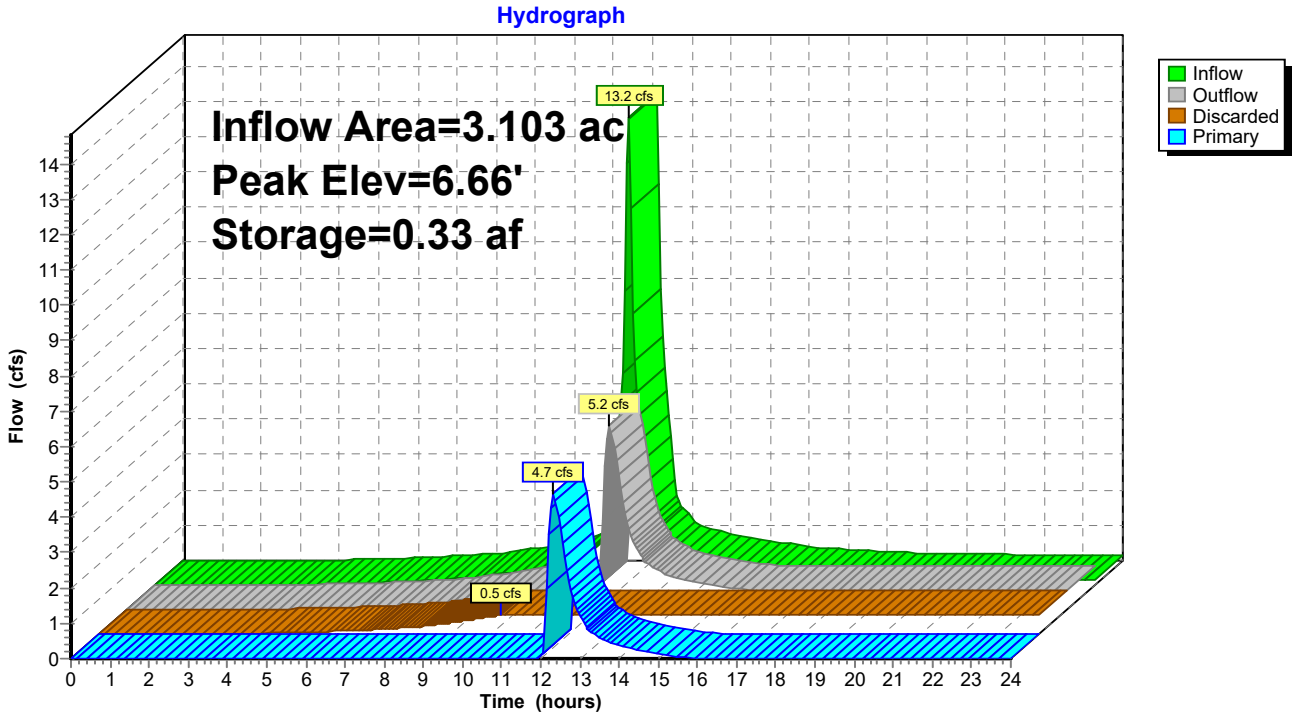
Device	Routing	Invert	Outlet Devices
#1	Discarded	3.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	5.80'	**30.0" Round OCS-3 Outlet** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.80' / 5.50' S= 0.0500 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf
#3	Primary	7.40'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00

			Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	6.60'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.5 cfs @ 10.25 hrs HW=3.94' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.5 cfs)

Primary OutFlow Max=4.6 cfs @ 12.32 hrs HW=6.66' (Free Discharge)
├─**2=OCS-3 Outlet** (Barrel Controls 4.5 cfs @ 4.48 fps)
├─**3=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)
└─**4=Orifice/Grate** (Orifice Controls 0.1 cfs @ 0.76 fps)

Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH



Summary for Pond 5P: DRAINAGE MANHOLE

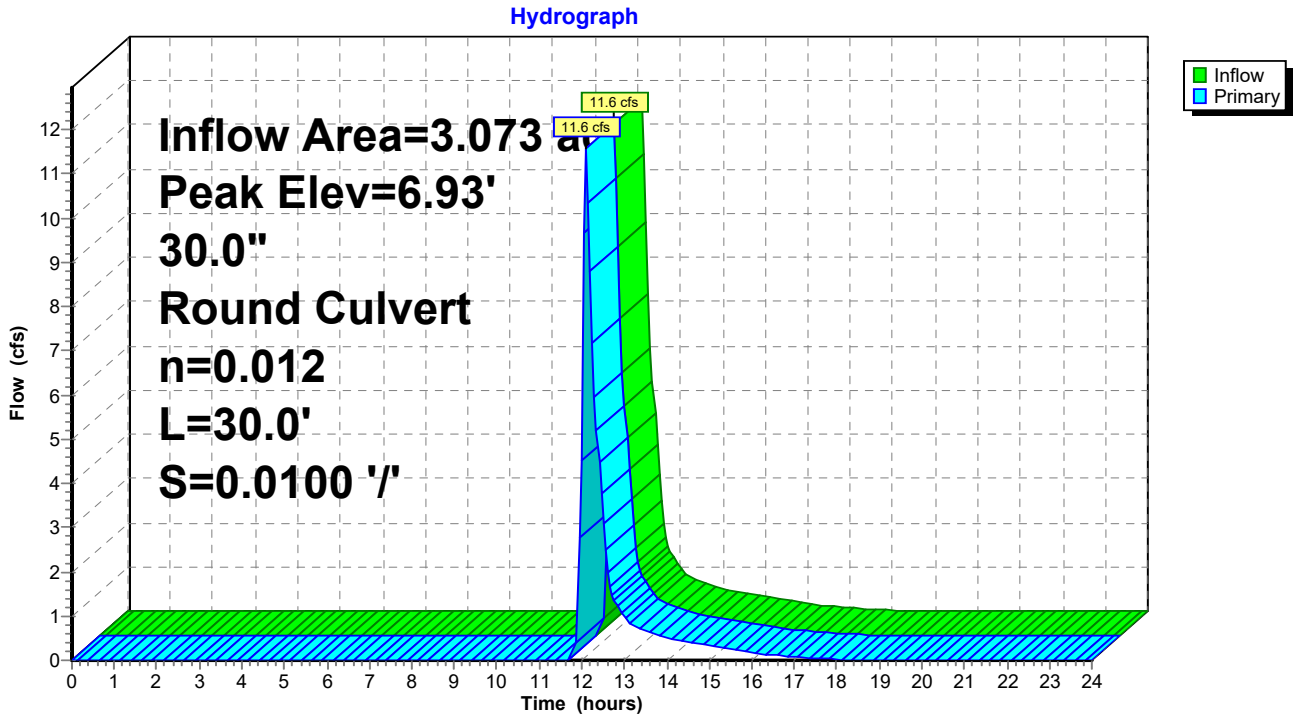
Inflow Area = 3.073 ac, 0.00% Impervious, Inflow Depth = 1.98" for 10-Year event
Inflow = 11.6 cfs @ 12.11 hrs, Volume= 0.51 af
Outflow = 11.6 cfs @ 12.11 hrs, Volume= 0.51 af, Atten= 0%, Lag= 0.0 min
Primary = 11.6 cfs @ 12.11 hrs, Volume= 0.51 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.93' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**30.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 5.05' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=11.4 cfs @ 12.11 hrs HW=6.91' (Free Discharge)
└**1=Culvert** (Barrel Controls 11.4 cfs @ 5.04 fps)

Pond 5P: DRAINAGE MANHOLE



Summary for Pond CB-1: 18" NYLOPLAST DRAIN

Inflow Area = 0.178 ac, 0.00% Impervious, Inflow Depth > 3.79" for 10-Year event
Inflow = 0.7 cfs @ 12.09 hrs, Volume= 0.06 af
Outflow = 0.7 cfs @ 12.09 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min
Primary = 0.7 cfs @ 12.09 hrs, Volume= 0.06 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.03' @ 12.09 hrs Surf.Area= 51 sf Storage= 0 cf
Flood Elev= 9.85' Surf.Area= 209 sf Storage= 104 cf

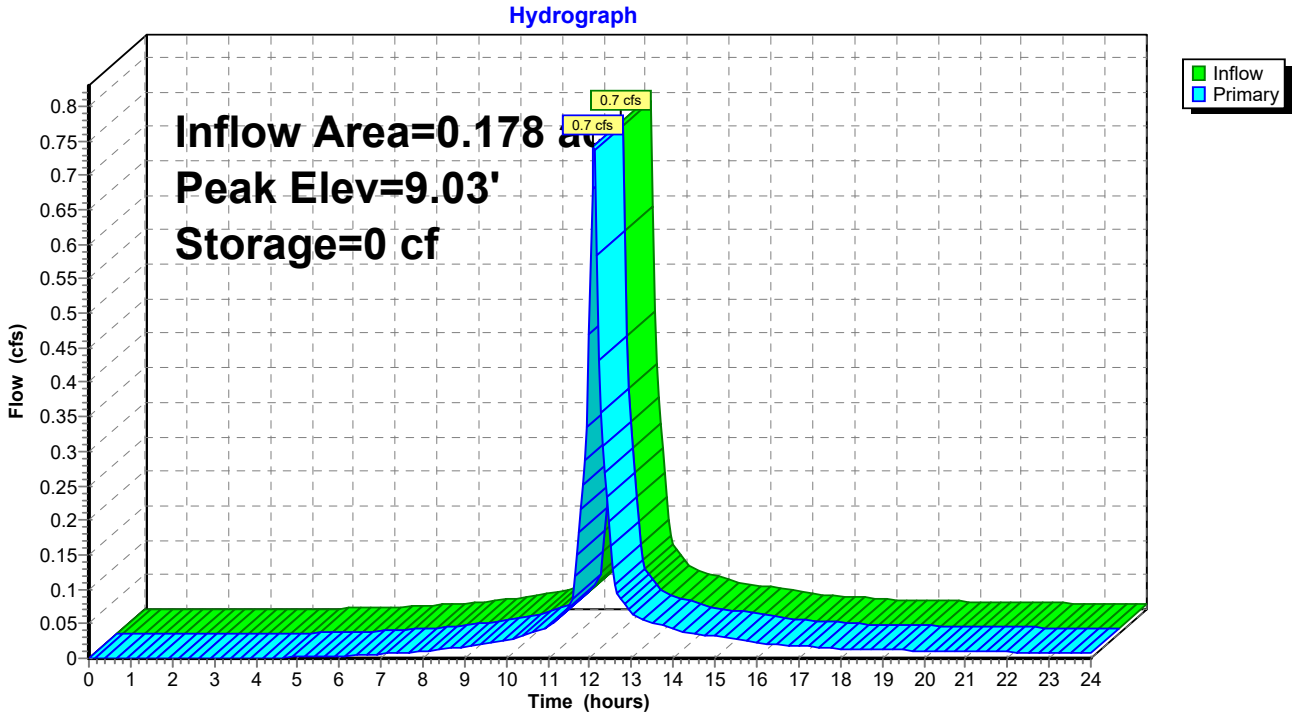
Plug-Flow detention time= 0.0 min calculated for 0.06 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (787.7 - 787.7)

Volume	Invert	Avail.Storage	Storage Description
#1	9.02'	143 cf	**2.00'W x 25.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.87'	**12.0" Round Culvert** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.87' / 6.53' S= 0.0113 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.02'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.8 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.8 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.8 cfs @ 0.44 fps)

Pond CB-1: 18" NYLOPLAST DRAIN



Summary for Pond CB-10: 18" NYLOPLAST DRAIN

Inflow Area = 0.370 ac, 0.00% Impervious, Inflow Depth > 3.68" for 10-Year event
Inflow = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af
Outflow = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.1 min
Primary = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.91' @ 12.09 hrs Surf.Area= 145 sf Storage= 4 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

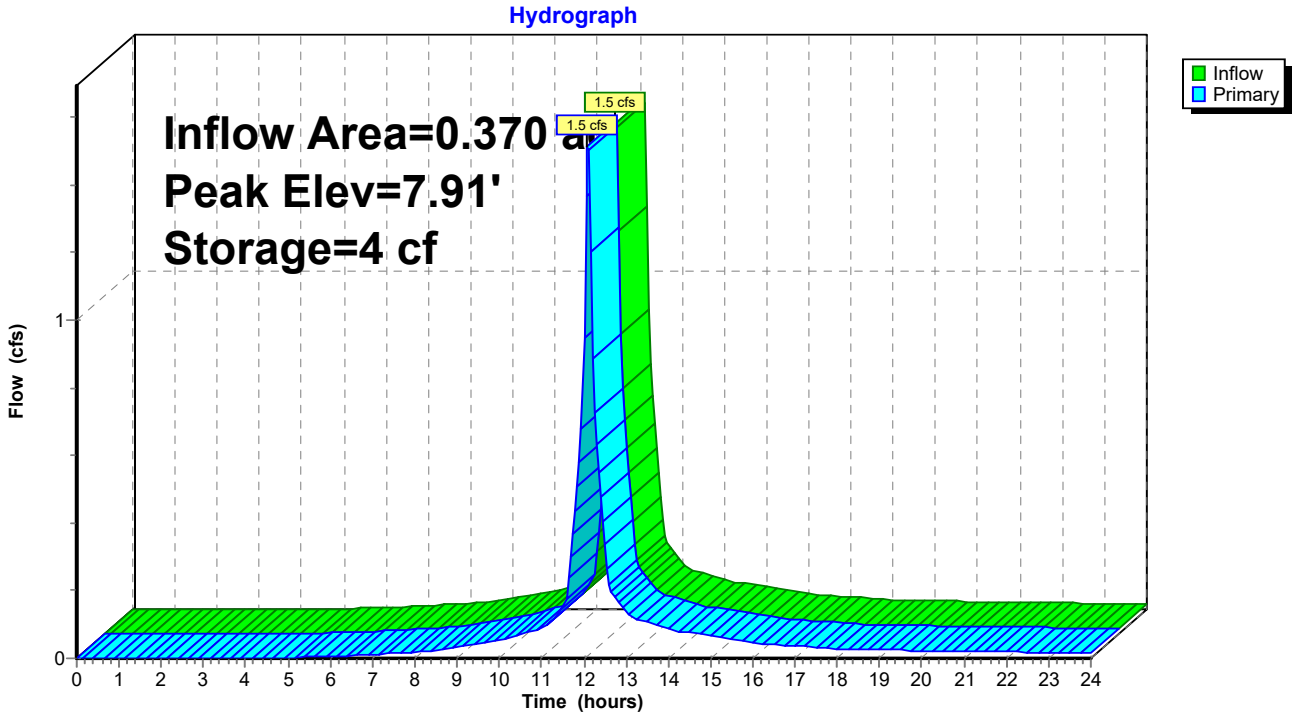
Plug-Flow detention time= 0.0 min calculated for 0.11 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (791.7 - 791.6)

Volume	Invert	Avail.Storage	Storage Description
#1	7.88'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.73'	**12.0" Round Culvert** L= 21.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.73' / 5.45' S= 0.0133 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.88'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.5 cfs @ 12.09 hrs HW=7.91' (Free Discharge)
└─**1=Culvert** (Passes 1.5 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.5 cfs @ 0.84 fps)

Pond CB-10: 18" NYLOPLAST DRAIN



Summary for Pond CB-11: 18" NYLOPLAST DRAIN

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth > 3.68" for 10-Year event
Inflow = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af
Outflow = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.0 min
Primary = 1.5 cfs @ 12.09 hrs, Volume= 0.11 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.87' @ 12.09 hrs Surf.Area= 144 sf Storage= 4 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

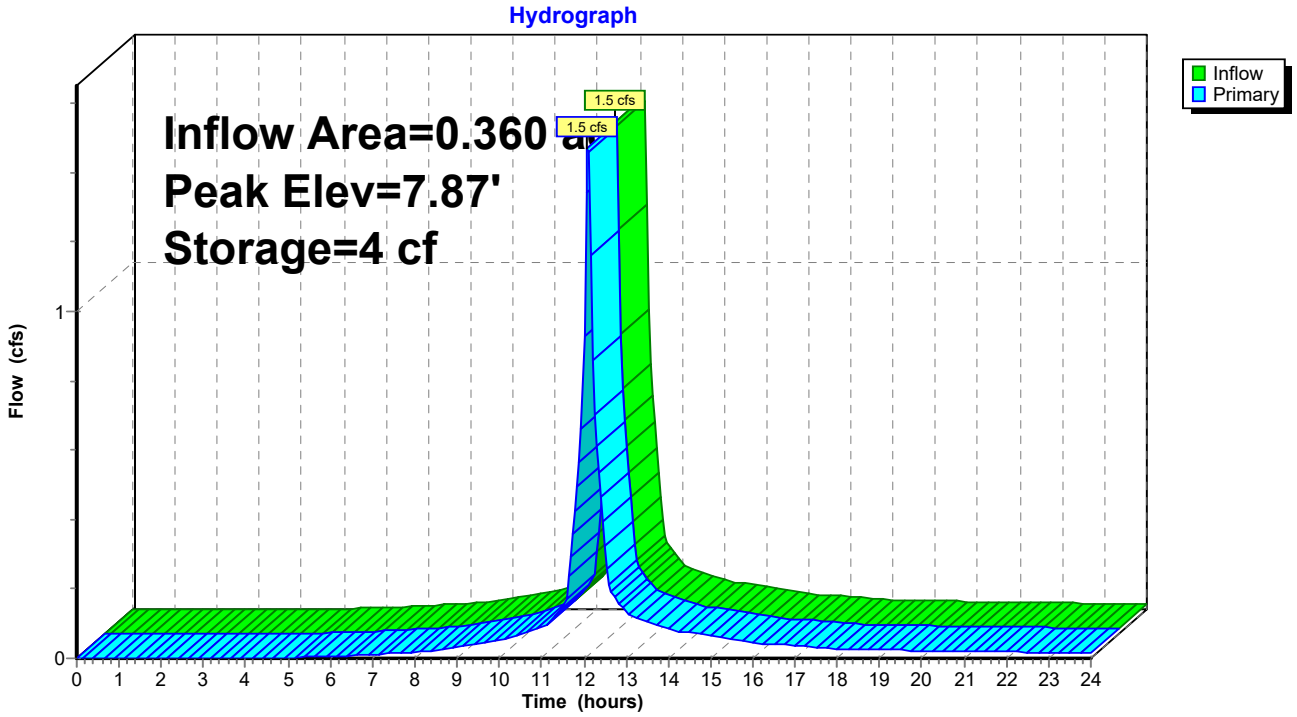
Plug-Flow detention time= 1.6 min calculated for 0.11 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (791.8 - 791.6)

Volume	Invert	Avail.Storage	Storage Description
#1	7.84'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.89'	**12.0" Round Culvert** L= 87.3' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.89' / 5.45' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.84'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.4 cfs @ 12.09 hrs HW=7.87' (Free Discharge)
└─**1=Culvert** (Passes 1.4 cfs of 3.8 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.4 cfs @ 0.81 fps)

Pond CB-11: 18" NYLOPLAST DRAIN



Summary for Pond CB-12: 18" NYLOPLAST DRAIN

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 3.79" for 10-Year event
Inflow = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af
Outflow = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.1 min
Primary = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.91' @ 12.09 hrs Surf.Area= 151 sf Storage= 7 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

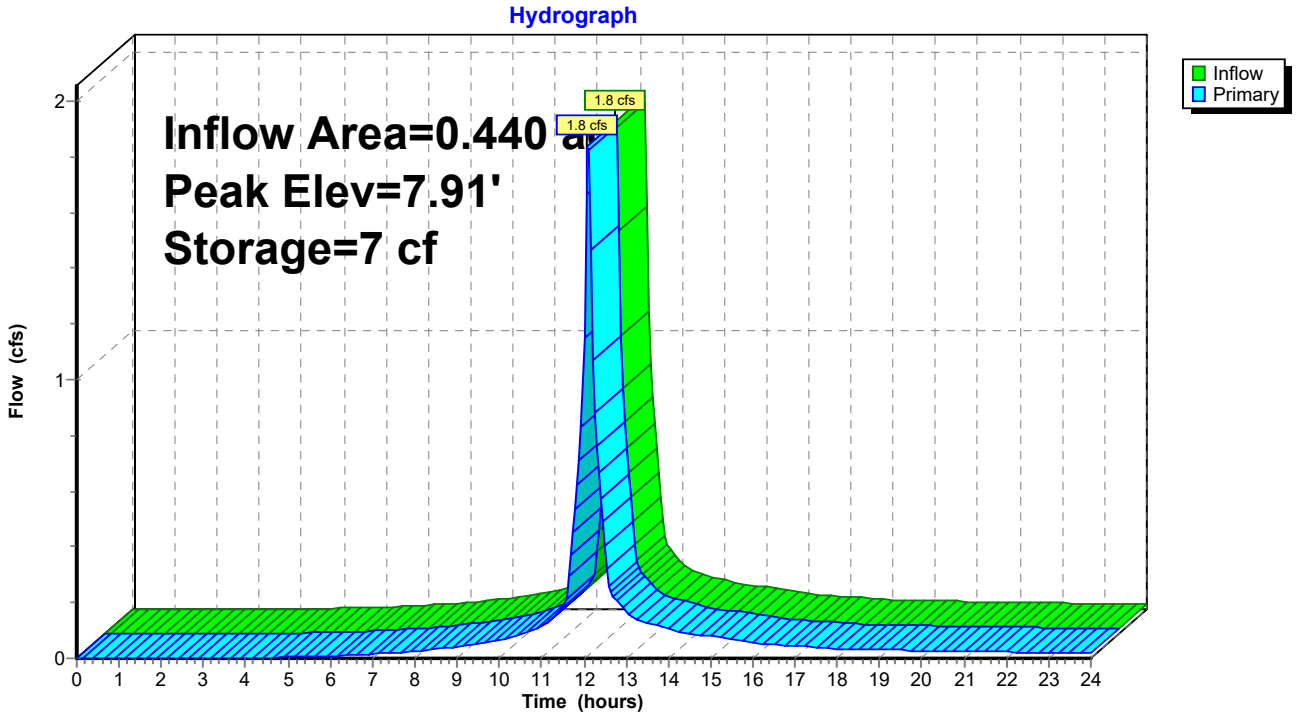
Plug-Flow detention time= 0.0 min calculated for 0.14 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (787.7 - 787.7)

Volume	Invert	Avail.Storage	Storage Description
#1	7.86'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.71'	**12.0" Round Culvert** L= 51.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.71' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.86'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.8 cfs @ 12.09 hrs HW=7.90' (Free Discharge)
└─**1=Culvert** (Passes 1.8 cfs of 4.5 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.8 cfs @ 1.02 fps)

Pond CB-12: 18" NYLOPLAST DRAIN



Summary for Pond CB-13: 18" NYLOPLAST DRAIN

Inflow Area = 0.821 ac, 0.00% Impervious, Inflow Depth > 4.00" for 10-Year event
Inflow = 3.5 cfs @ 12.09 hrs, Volume= 0.27 af
Outflow = 3.5 cfs @ 12.09 hrs, Volume= 0.27 af, Atten= 0%, Lag= 0.4 min
Primary = 3.5 cfs @ 12.09 hrs, Volume= 0.27 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.99' @ 12.10 hrs Surf.Area= 292 sf Storage= 42 cf
Flood Elev= 9.18' Surf.Area= 810 sf Storage= 494 cf

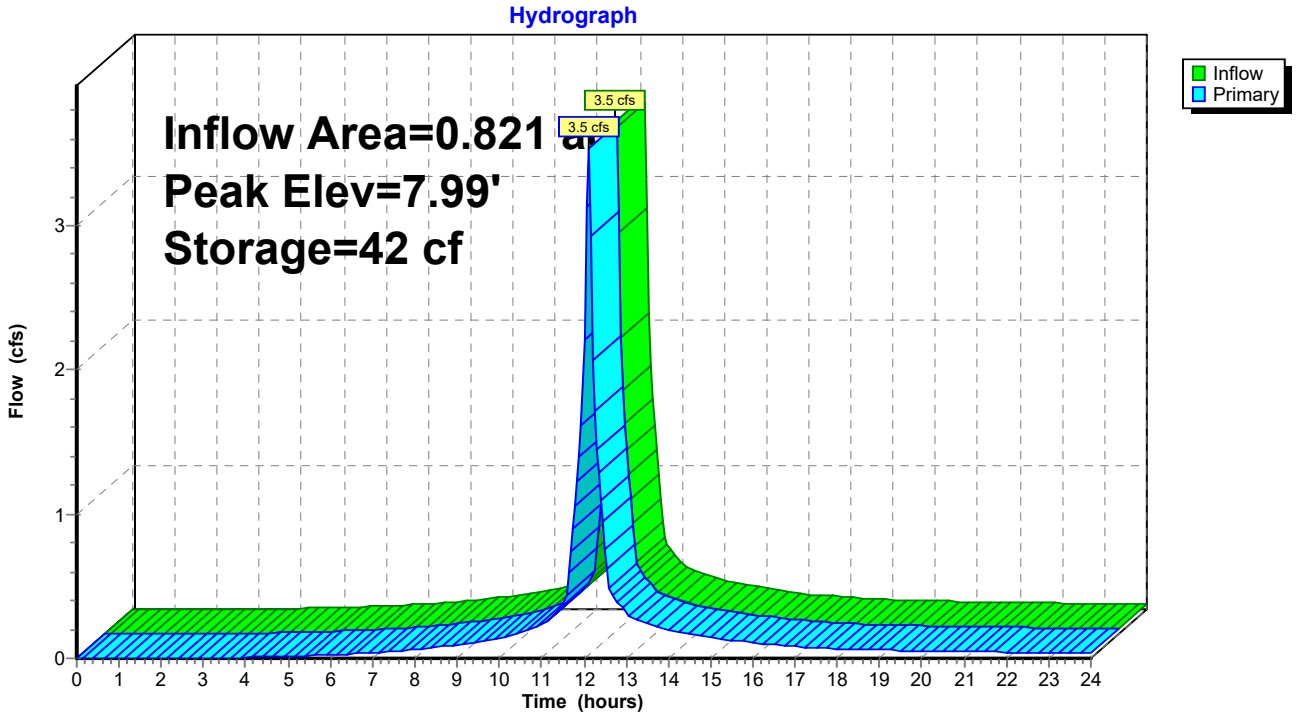
Plug-Flow detention time= 0.1 min calculated for 0.27 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (779.1 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	7.82'	494 cf	**2.00'W x 95.20'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.66'	**12.0" Round Culvert** L= 41.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.66' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.82'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=3.5 cfs @ 12.09 hrs HW=7.99' (Free Discharge)
└─**1=Culvert** (Passes 3.5 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 3.5 cfs @ 1.98 fps)

Pond CB-13: 18" NYLOPLAST DRAIN



Summary for Pond CB-2: 18" NYLOPLAST DRAIN

Inflow Area = 0.958 ac, 0.00% Impervious, Inflow Depth > 4.11" for 10-Year event
Inflow = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af
Outflow = 4.1 cfs @ 12.09 hrs, Volume= 0.33 af, Atten= 2%, Lag= 0.2 min
Primary = 4.1 cfs @ 12.09 hrs, Volume= 0.33 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 9.02' @ 12.09 hrs Surf.Area= 210 sf Storage= 39 cf
Flood Elev= 9.85' Surf.Area= 528 sf Storage= 318 cf

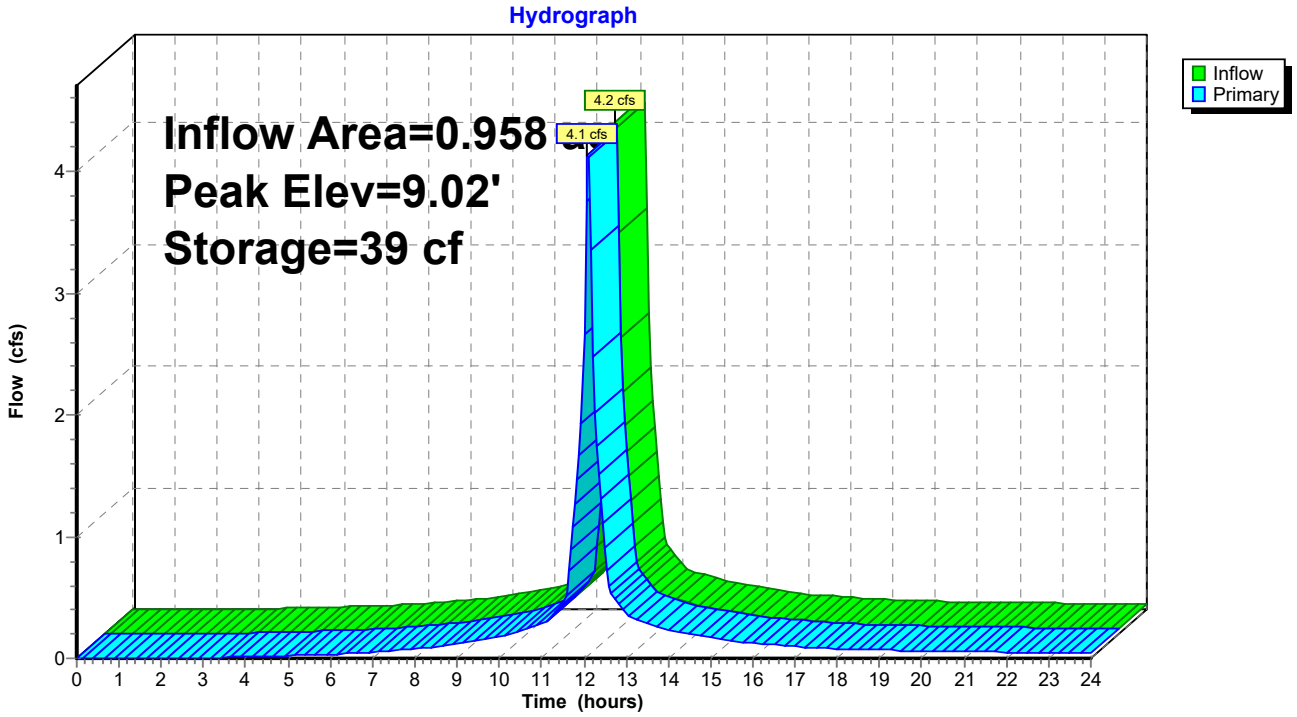
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (774.3 - 774.2)

Volume	Invert	Avail.Storage	Storage Description
#1	8.78'	318 cf	**2.00'W x 60.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.60'	**12.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.60' / 6.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.78'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=4.1 cfs @ 12.09 hrs HW=9.01' (Free Discharge)
└─**1=Culvert** (Passes 4.1 cfs of 5.2 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 4.1 cfs @ 2.30 fps)

Pond CB-2: 18" NYLOPLAST DRAIN



Summary for Pond CB-3: 18" NYLOPLAST DRAIN

Inflow Area = 0.376 ac, 0.00% Impervious, Inflow Depth > 4.00" for 10-Year event
Inflow = 1.6 cfs @ 12.09 hrs, Volume= 0.13 af
Outflow = 1.6 cfs @ 12.09 hrs, Volume= 0.13 af, Atten= 1%, Lag= 0.0 min
Primary = 1.6 cfs @ 12.09 hrs, Volume= 0.13 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.79' @ 12.09 hrs Surf.Area= 0.004 ac Storage= 0.00 af
Flood Elev= 9.85' Surf.Area= 0.014 ac Storage= 0.01 af

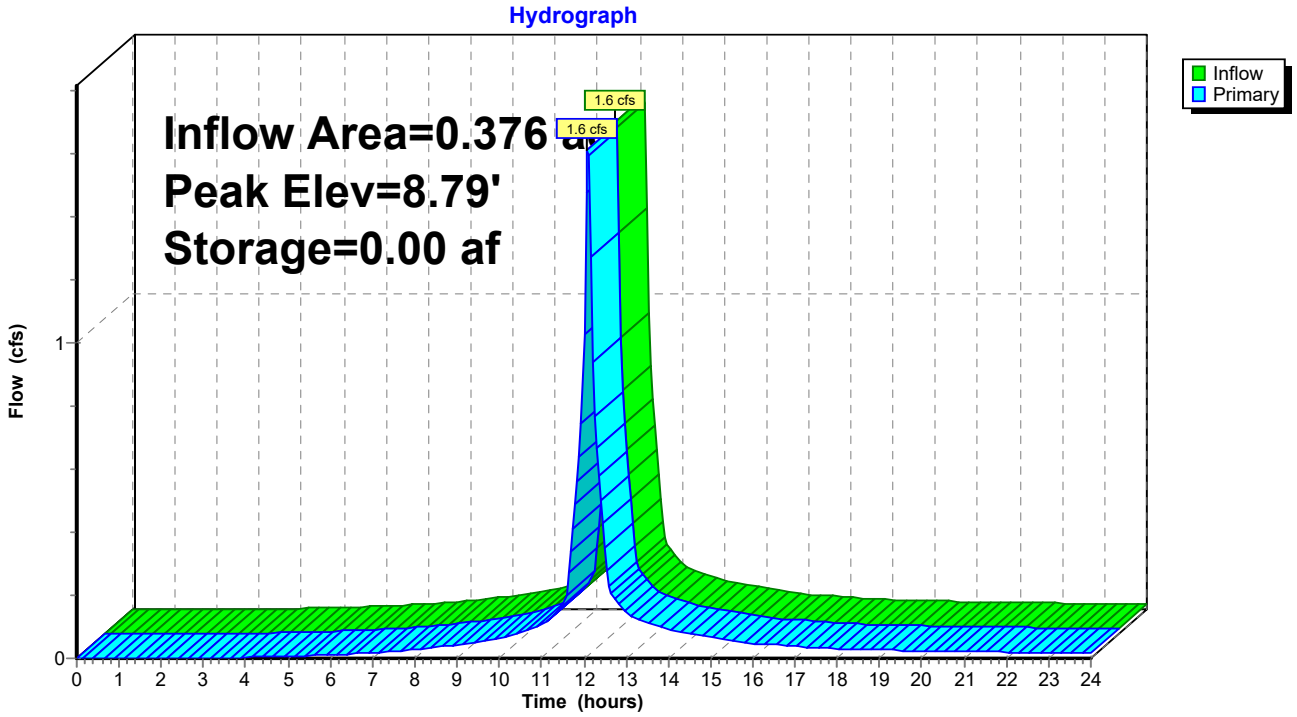
Plug-Flow detention time= 1.2 min calculated for 0.13 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (779.2 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	8.75'	0.01 af	**2.00'W x 71.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.55'	**12.0" Round Culvert** L= 23.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.55' / 6.43' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.75'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.6 cfs @ 12.09 hrs HW=8.78' (Free Discharge)
└─**1=Culvert** (Passes 1.6 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.6 cfs @ 0.89 fps)

Pond CB-3: 18" NYLOPLAST DRAIN



Summary for Pond CB-4: 18" NYLOPLAST DRAIN

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth > 3.79" for 10-Year event
Inflow = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af
Outflow = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.1 min
Primary = 1.2 cfs @ 12.09 hrs, Volume= 0.09 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.98' @ 12.09 hrs Surf.Area= 148 sf Storage= 3 cf
Flood Elev= 9.85' Surf.Area= 553 sf Storage= 304 cf

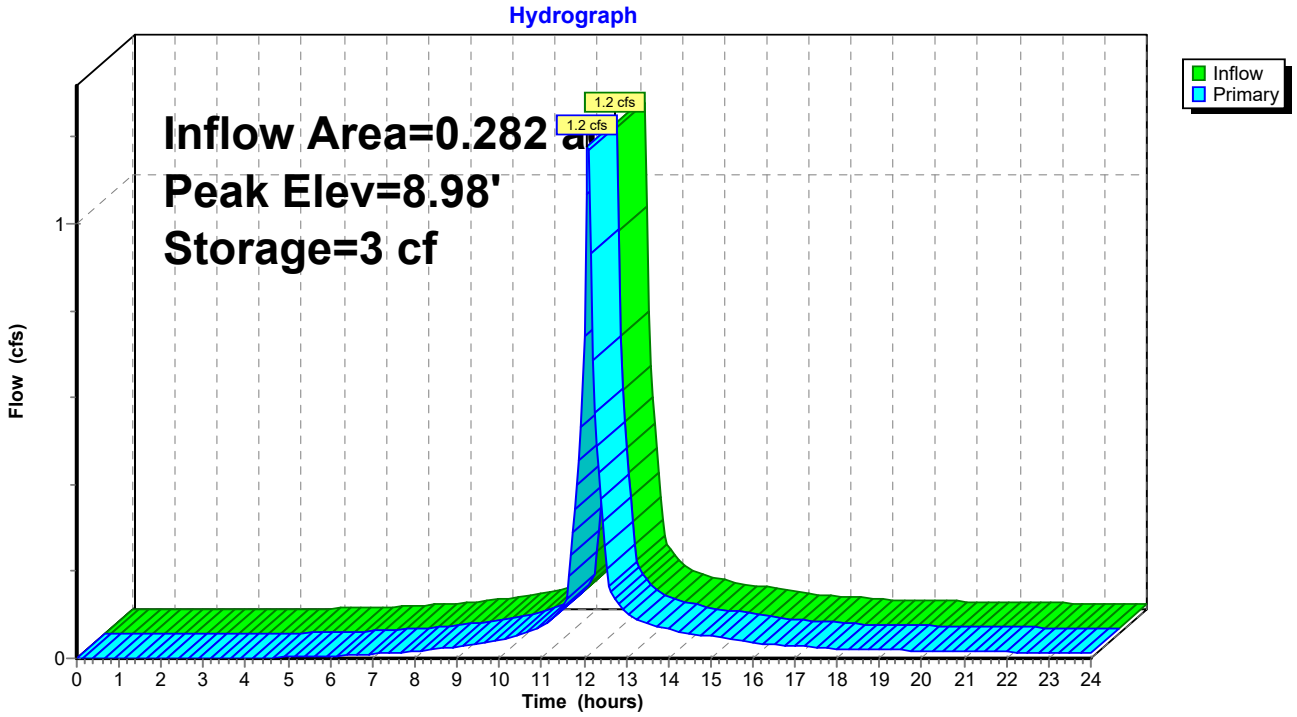
Plug-Flow detention time= 0.0 min calculated for 0.09 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (787.7 - 787.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.96'	368 cf	**2.00'W x 70.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.70'	**12.0" Round Culvert** L= 53.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.70' / 6.43' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.96'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.2 cfs @ 12.09 hrs HW=8.98' (Free Discharge)
└─**1=Culvert** (Passes 1.2 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.2 cfs @ 0.65 fps)

Pond CB-4: 18" NYLOPLAST DRAIN



Summary for Pond CB-5: 18" NYLOPLAST DRAIN

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth > 2.99" for 10-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Outflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.03' @ 12.09 hrs Surf.Area= 137 sf Storage= 0 cf
Flood Elev= 9.85' Surf.Area= 505 sf Storage= 259 cf

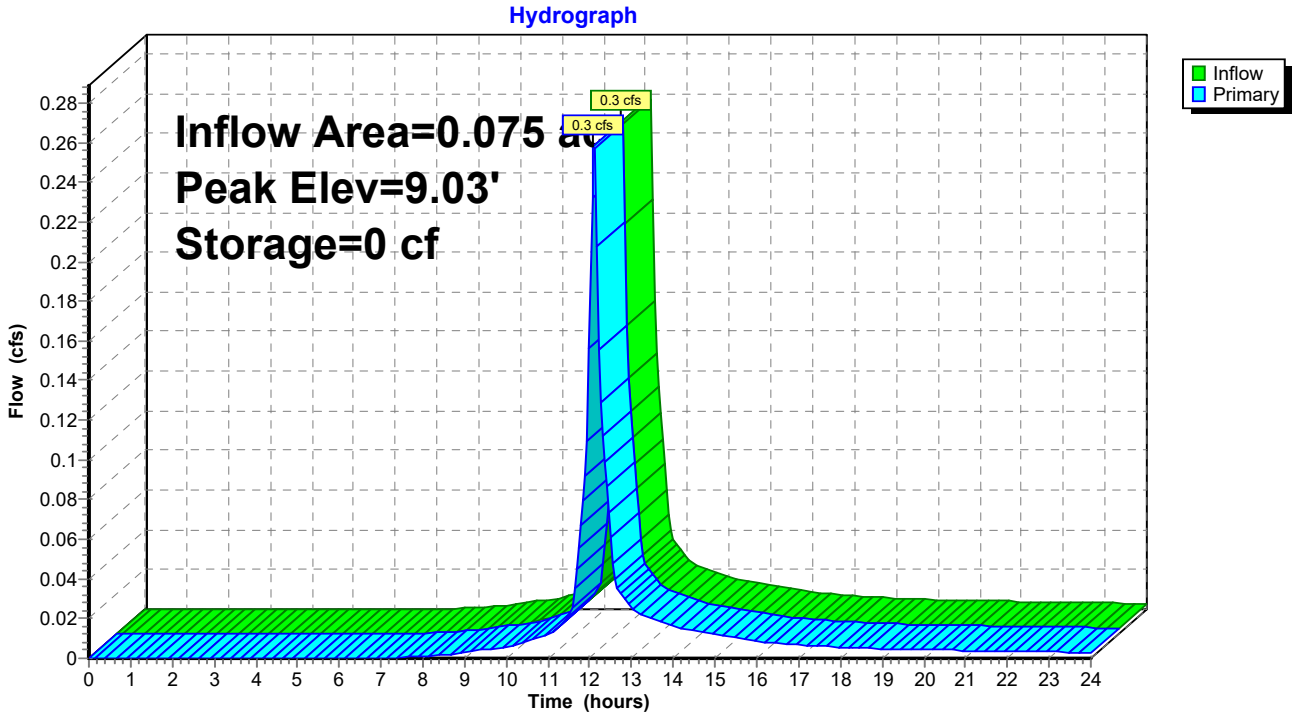
Plug-Flow detention time= 0.0 min calculated for 0.02 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (814.6 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.03'	358 cf	**2.00'W x 68.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.88'	**12.0" Round Culvert** L= 66.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.88' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.03'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.5 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.5 cfs of 4.3 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.5 cfs @ 0.26 fps)

Pond CB-5: 18" NYLOPLAST DRAIN



Summary for Pond CB-6: 18" NYLOPLAST DRAIN

Inflow Area = 0.072 ac, 0.00% Impervious, Inflow Depth > 2.72" for 10-Year event
Inflow = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af
Outflow = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 12.09 hrs, Volume= 0.02 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.91' @ 12.09 hrs Surf.Area= 212 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 845 sf Storage= 491 cf

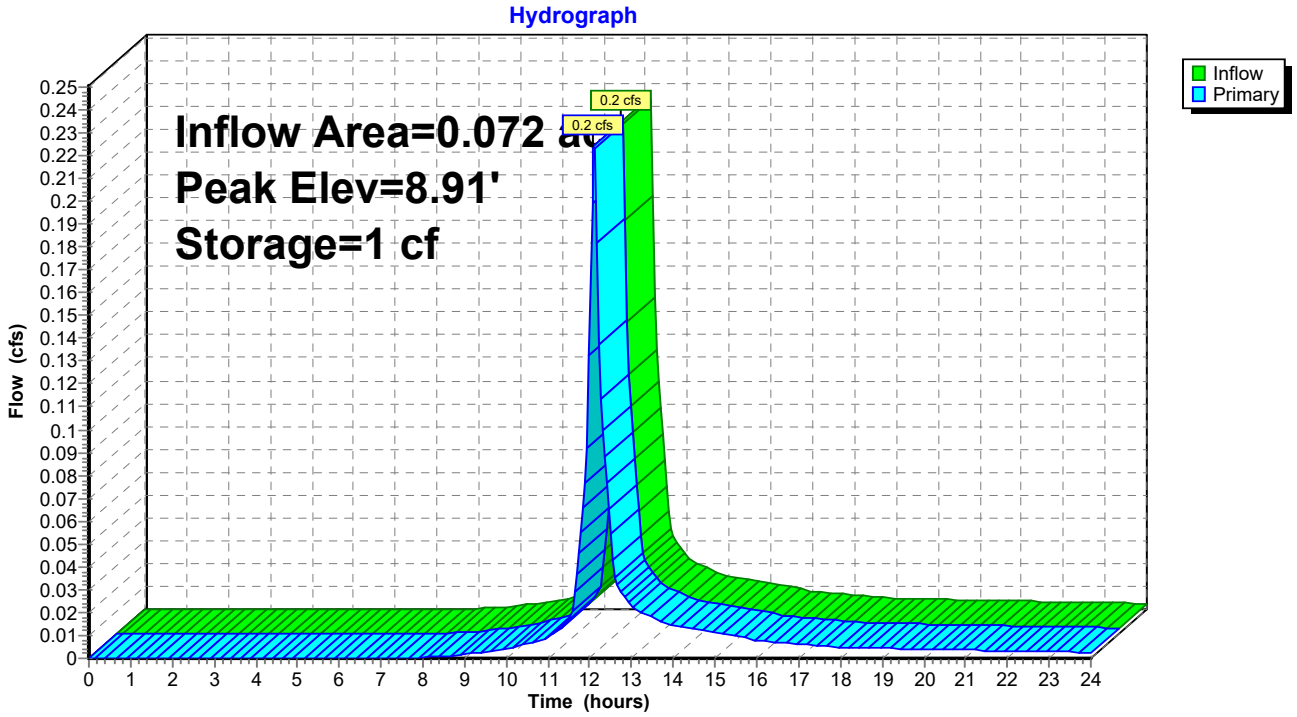
Plug-Flow detention time= 0.0 min calculated for 0.02 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (823.1 - 823.0)

Volume	Invert	Avail.Storage	Storage Description
#1	8.91'	543 cf	**2.00'W x 105.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.76'	**12.0" Round Culvert** L= 42.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.76' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.91'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.4 cfs @ 12.09 hrs HW=8.91' (Free Discharge)
└─**1=Culvert** (Passes 0.4 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.4 cfs @ 0.24 fps)

Pond CB-6: 18" NYLOPLAST DRAIN



Summary for Pond CB-7: 18" NYLOPLAST DRAIN

Inflow Area = 0.451 ac, 0.00% Impervious, Inflow Depth > 3.89" for 10-Year event
Inflow = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af
Outflow = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af, Atten= 0%, Lag= 0.2 min
Primary = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.70' @ 12.09 hrs Surf.Area= 174 sf Storage= 8 cf
Flood Elev= 9.85' Surf.Area= 648 sf Storage= 393 cf

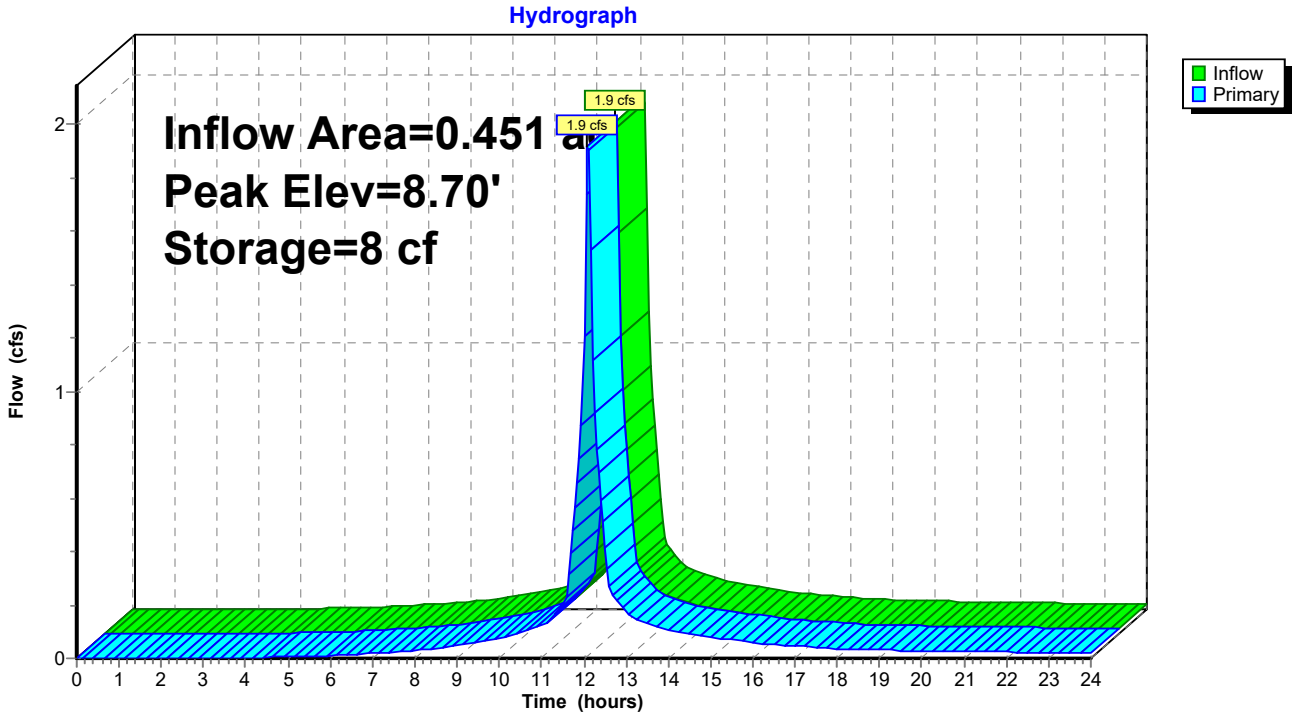
Plug-Flow detention time= 0.0 min calculated for 0.15 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (783.6 - 783.5)

Volume	Invert	Avail.Storage	Storage Description
#1	8.65'	393 cf	**2.00'W x 75.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.50'	**12.0" Round Culvert** L= 49.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.50' / 6.25' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.65'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.9 cfs @ 12.09 hrs HW=8.70' (Free Discharge)
└─**1=Culvert** (Passes 1.9 cfs of 4.5 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.9 cfs @ 1.06 fps)

Pond CB-7: 18" NYLOPLAST DRAIN



Summary for Pond CB-8: 18" NYLOPLAST DRAIN

Inflow Area = 0.682 ac, 0.00% Impervious, Inflow Depth > 3.79" for 10-Year event
Inflow = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af
Outflow = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af, Atten= 0%, Lag= 0.3 min
Primary = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.64' @ 12.09 hrs Surf.Area= 234 sf Storage= 23 cf
Flood Elev= 9.85' Surf.Area= 744 sf Storage= 453 cf

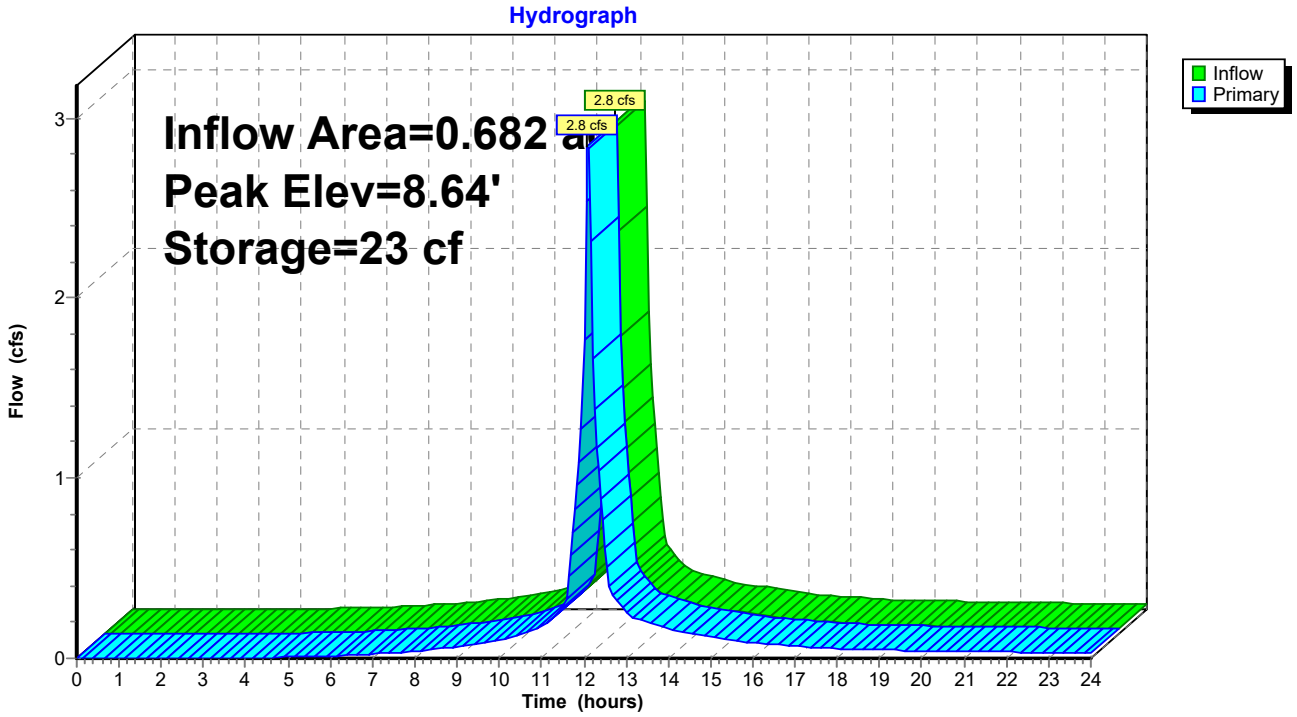
Plug-Flow detention time= 0.1 min calculated for 0.22 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (787.8 - 787.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.53'	453 cf	**2.00'W x 87.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.38'	**12.0" Round Culvert** L= 26.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.38' / 6.25' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.53'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.8 cfs @ 12.09 hrs HW=8.64' (Free Discharge)
└─**1=Culvert** (Passes 2.8 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.8 cfs @ 1.58 fps)

Pond CB-8: 18" NYLOPLAST DRAIN



Summary for Pond CB-9: 18" NYLOPLAST DRAIN

Inflow Area = 1.111 ac, 5.88% Impervious, Inflow Depth > 4.11" for 10-Year event
Inflow = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af
Outflow = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af, Atten= 0%, Lag= 0.1 min
Primary = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.02' @ 12.09 hrs Surf.Area= 183 sf Storage= 17 cf
Flood Elev= 9.18' Surf.Area= 600 sf Storage= 363 cf

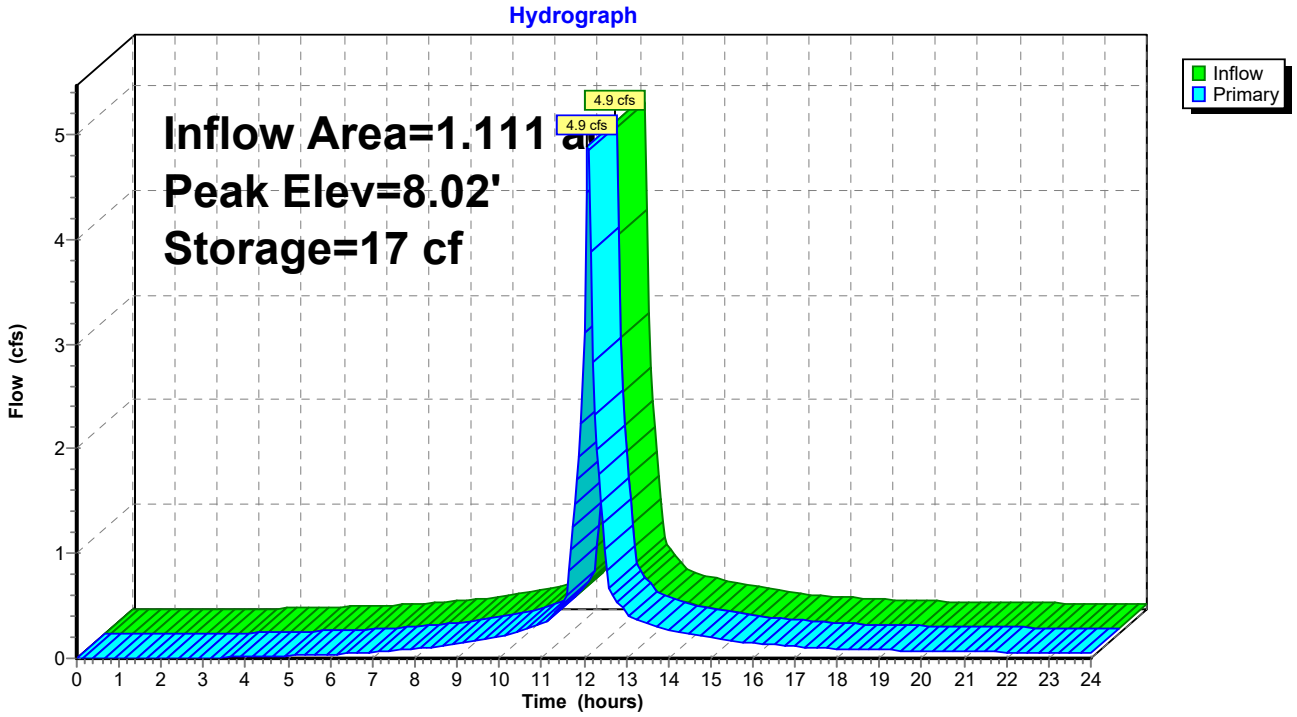
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (774.2 - 774.2)

Volume	Invert	Avail.Storage	Storage Description
#1	7.92'	363 cf	**2.00'W x 69.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.78'	**18.0" Round Culvert** L= 65.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.78' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	7.92'	**24.0" Horiz. Orifice/Grate** C= 0.600

Primary OutFlow Max=4.8 cfs @ 12.09 hrs HW=8.02' (Free Discharge)
└─**1=Culvert** (Passes 4.8 cfs of 9.3 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 4.8 cfs @ 1.52 fps)

Pond CB-9: 18" NYLOPLAST DRAIN



Summary for Pond WQU-1: STORMCEPTOR STC-900

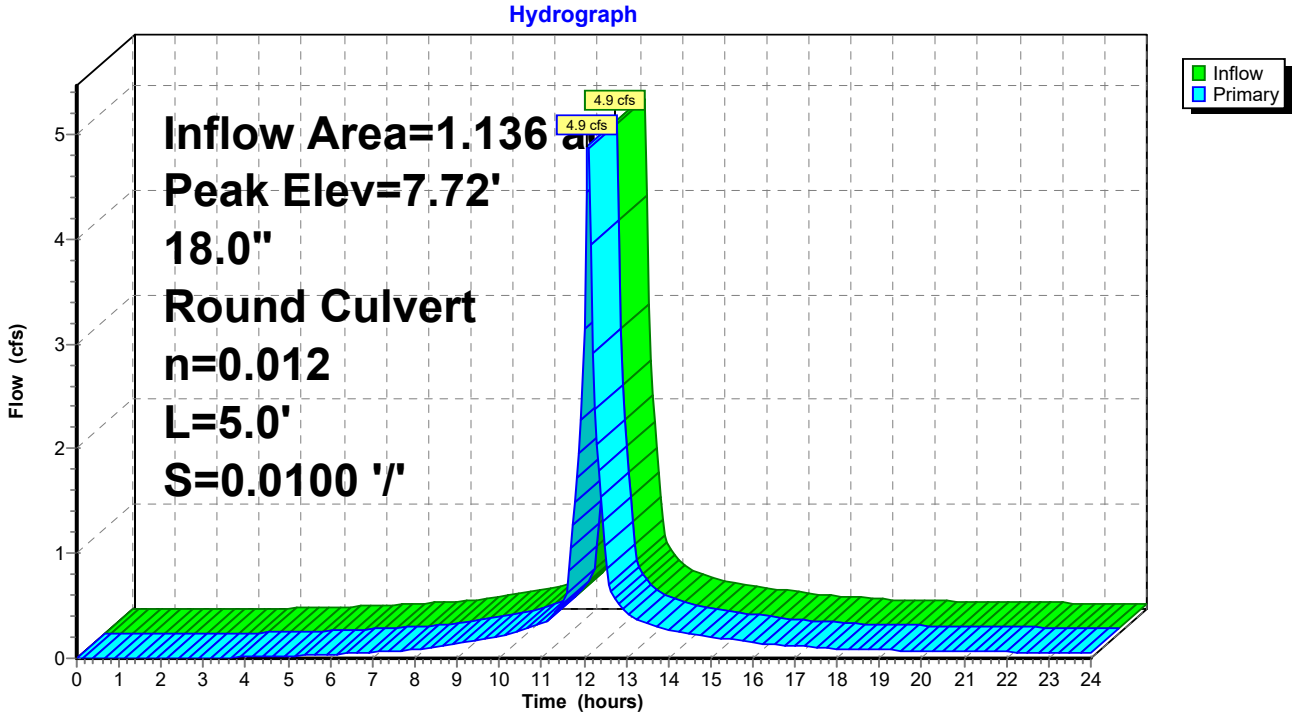
Inflow Area = 1.136 ac, 0.00% Impervious, Inflow Depth > 4.06" for 10-Year event
Inflow = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af
Outflow = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af, Atten= 0%, Lag= 0.0 min
Primary = 4.9 cfs @ 12.09 hrs, Volume= 0.38 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.72' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.40'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.40' / 6.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.8 cfs @ 12.09 hrs HW=7.70' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 4.8 cfs @ 3.93 fps)

Pond WQU-1: STORMCEPTOR STC-900



Summary for Pond WQU-2: STORMCEPTOR STC-900

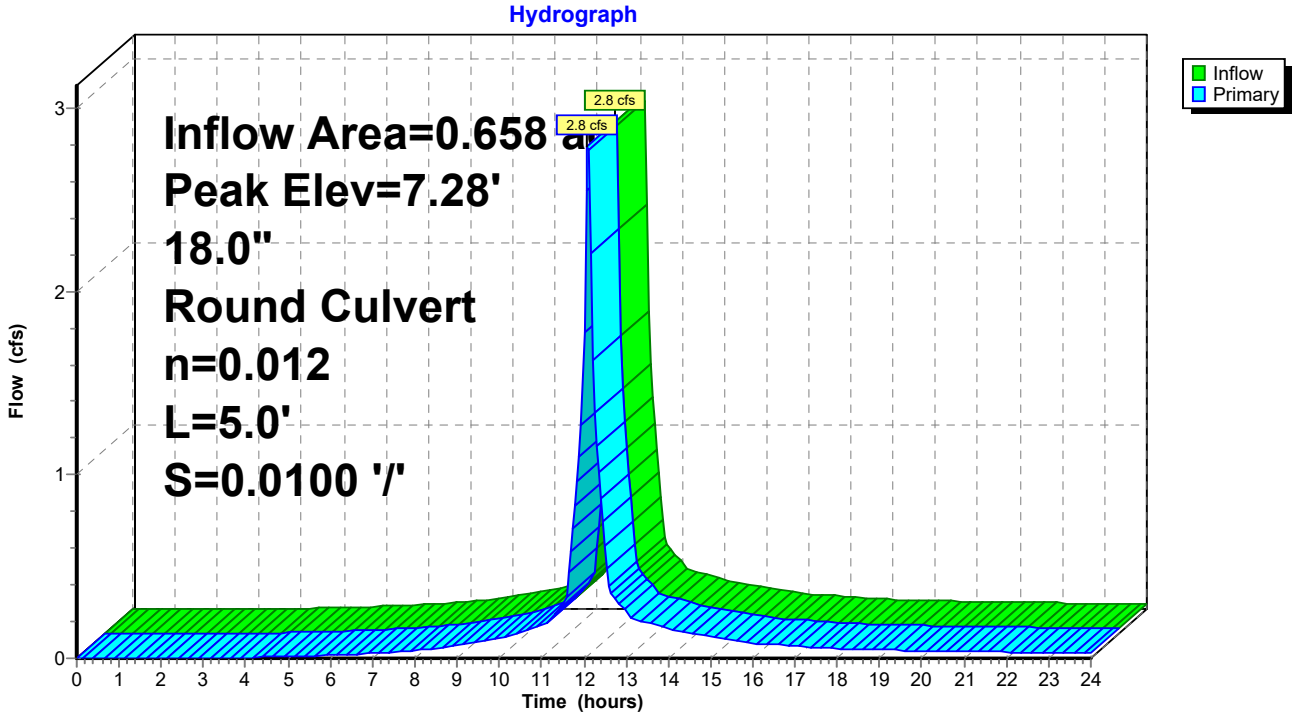
Inflow Area = 0.658 ac, 0.00% Impervious, Inflow Depth > 3.90" for 10-Year event
Inflow = 2.8 cfs @ 12.09 hrs, Volume= 0.21 af
Outflow = 2.8 cfs @ 12.09 hrs, Volume= 0.21 af, Atten= 0%, Lag= 0.0 min
Primary = 2.8 cfs @ 12.09 hrs, Volume= 0.21 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.28' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.34'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.34' / 6.29' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.7 cfs @ 12.09 hrs HW=7.27' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 2.7 cfs @ 3.39 fps)

Pond WQU-2: STORMCEPTOR STC-900



Summary for Pond WQU-3: STORMCEPTOR STC-900

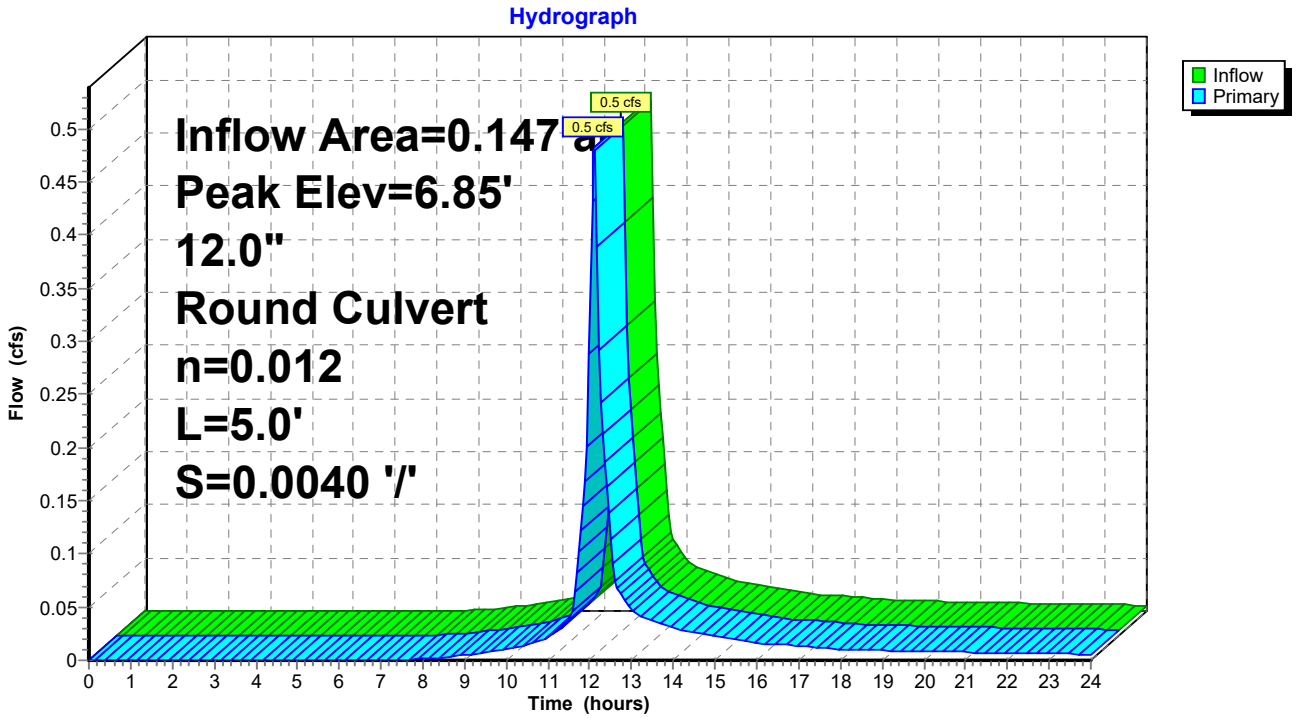
Inflow Area = 0.147 ac, 0.00% Impervious, Inflow Depth > 2.86" for 10-Year event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.5 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.5 cfs @ 12.09 hrs, Volume= 0.03 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.85' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.42'	**12.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.42' / 6.40' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.5 cfs @ 12.09 hrs HW=6.85' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 0.5 cfs @ 2.18 fps)

Pond WQU-3: STORMCEPTOR STC-900



Summary for Pond WQU-4: STORMCEPTOR STC-900

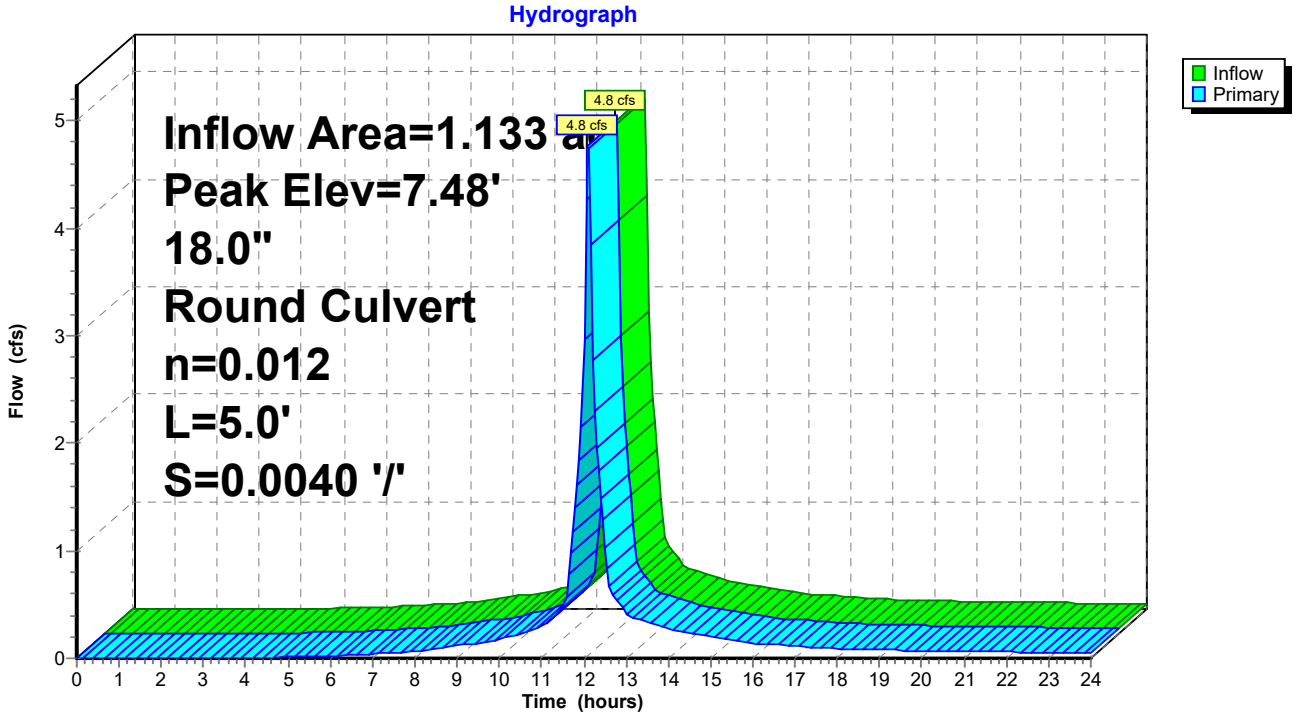
Inflow Area = 1.133 ac, 0.00% Impervious, Inflow Depth > 3.83" for 10-Year event
Inflow = 4.8 cfs @ 12.09 hrs, Volume= 0.36 af
Outflow = 4.8 cfs @ 12.09 hrs, Volume= 0.36 af, Atten= 0%, Lag= 0.0 min
Primary = 4.8 cfs @ 12.09 hrs, Volume= 0.36 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.48' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.15'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.15' / 6.13' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.7 cfs @ 12.09 hrs HW=7.46' (Free Discharge)
└─**1=Outlet to Pond** (Barrel Controls 4.7 cfs @ 3.79 fps)

Pond WQU-4: STORMCEPTOR STC-900



Summary for Pond WQU-5: STORMCEPTOR STC-900

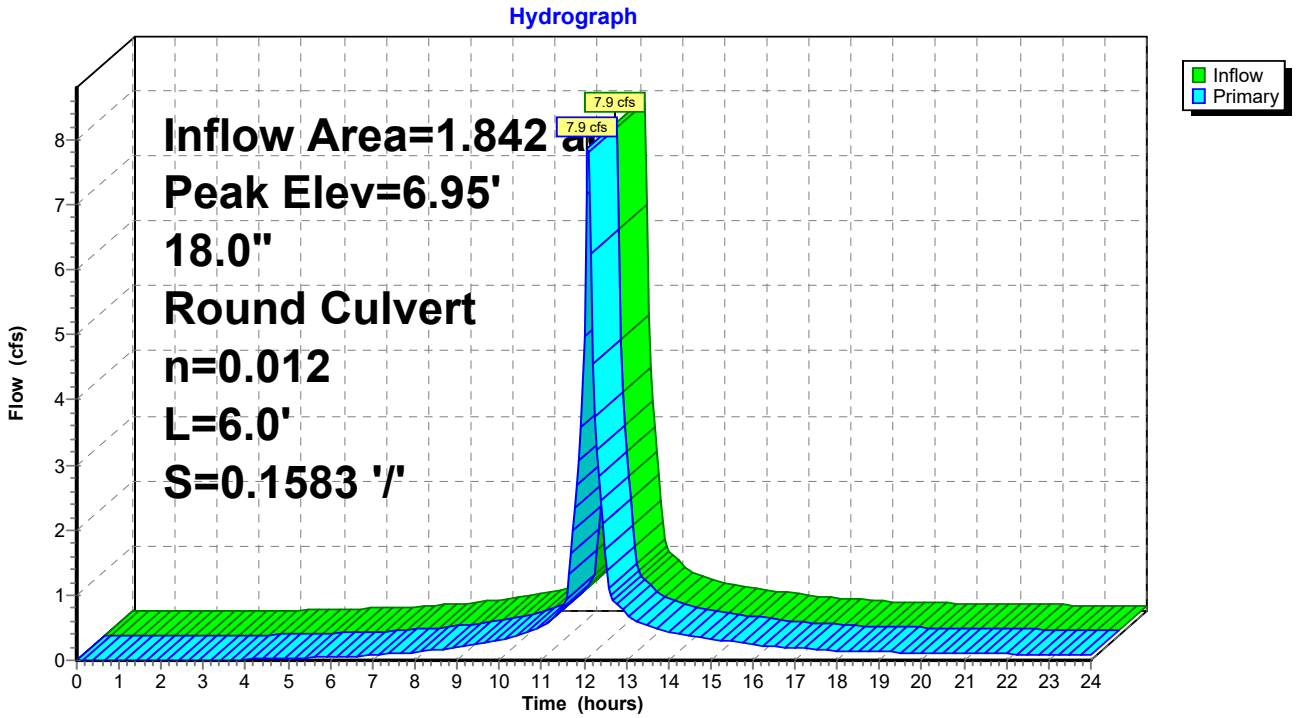
Inflow Area = 1.842 ac, 3.55% Impervious, Inflow Depth > 3.94" for 10-Year event
Inflow = 7.9 cfs @ 12.09 hrs, Volume= 0.60 af
Outflow = 7.9 cfs @ 12.09 hrs, Volume= 0.60 af, Atten= 0%, Lag= 0.0 min
Primary = 7.9 cfs @ 12.09 hrs, Volume= 0.60 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 6.95' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.7 cfs @ 12.09 hrs HW=6.91' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 7.7 cfs @ 4.34 fps)

Pond WQU-5: STORMCEPTOR STC-900



Summary for Pond WQU-6: STORMCEPTOR STC-900

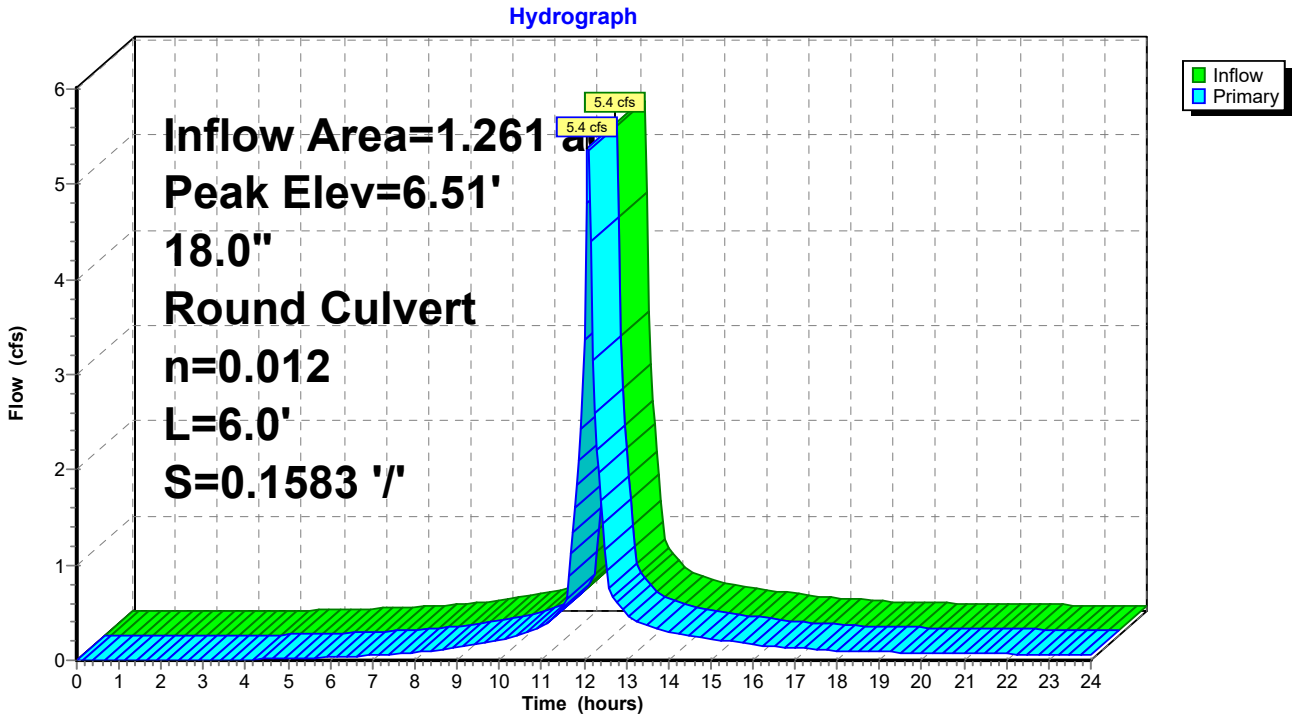
Inflow Area = 1.261 ac, 0.00% Impervious, Inflow Depth > 3.92" for 10-Year event
Inflow = 5.4 cfs @ 12.09 hrs, Volume= 0.41 af
Outflow = 5.4 cfs @ 12.09 hrs, Volume= 0.41 af, Atten= 0%, Lag= 0.0 min
Primary = 5.4 cfs @ 12.09 hrs, Volume= 0.41 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.51' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.3 cfs @ 12.09 hrs HW=6.50' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 5.3 cfs @ 3.65 fps)

Pond WQU-6: STORMCEPTOR STC-900

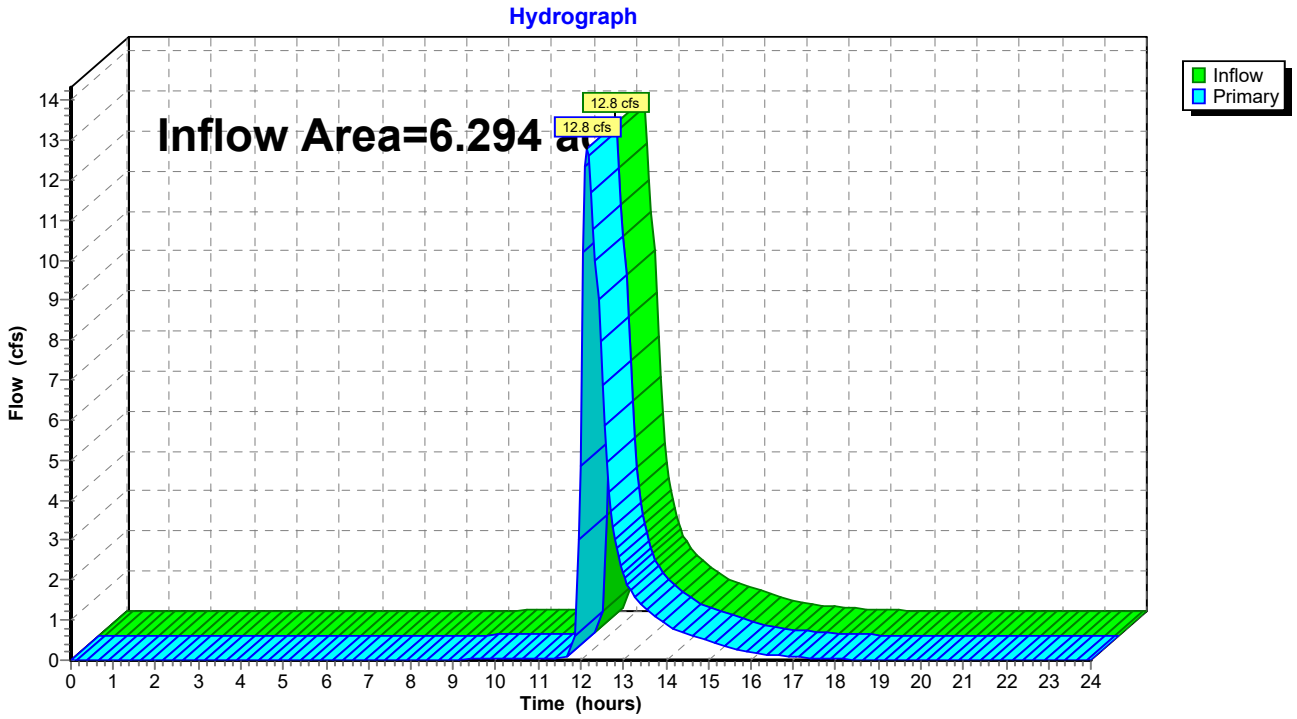


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 6.294 ac, 2.92% Impervious, Inflow Depth > 1.60" for 10-Year event
Inflow = 12.8 cfs @ 12.16 hrs, Volume= 0.84 af
Primary = 12.8 cfs @ 12.16 hrs, Volume= 0.84 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

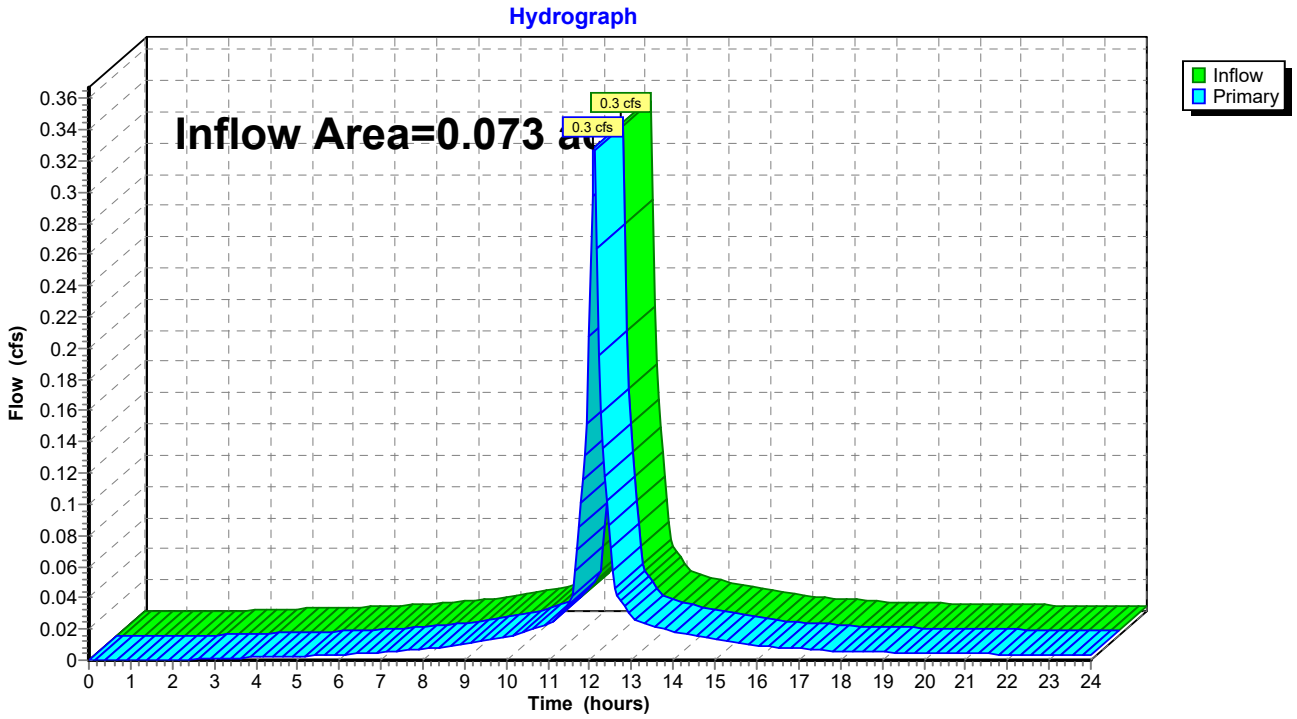


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 0.073 ac, 0.00% Impervious, Inflow Depth > 4.33" for 10-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.03 af
Primary = 0.3 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2A-PR: SUBCATCHMENT Runoff Area=5,164 sf 100.00% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=98 Runoff=0.6 cfs 0.05 af

Subcatchment2B-PR: SUBCATCHMENT Runoff Area=7,746 sf 0.00% Impervious Runoff Depth>4.56"
Flow Length=320' Tc=6.0 min CN=91 Runoff=0.9 cfs 0.07 af

Subcatchment2C-PR: SUBCATCHMENT Runoff Area=41,736 sf 0.00% Impervious Runoff Depth>4.90"
Flow Length=378' Tc=6.0 min CN=94 Runoff=5.0 cfs 0.39 af

Subcatchment2D-PR: SUBCATCHMENT Runoff Area=16,382 sf 0.00% Impervious Runoff Depth>4.78"
Flow Length=380' Tc=6.0 min CN=93 Runoff=1.9 cfs 0.15 af

Subcatchment2E-PR: SUBCATCHMENT Runoff Area=12,269 sf 0.00% Impervious Runoff Depth>4.56"
Flow Length=161' Tc=6.0 min CN=91 Runoff=1.4 cfs 0.11 af

Subcatchment2F-PR: SUBCATCHMENT Runoff Area=3,277 sf 0.00% Impervious Runoff Depth>3.72"
Flow Length=137' Tc=6.0 min CN=83 Runoff=0.3 cfs 0.02 af

Subcatchment2G-PR: SUBCATCHMENT Runoff Area=3,117 sf 0.00% Impervious Runoff Depth>3.42"
Flow Length=258' Tc=6.0 min CN=80 Runoff=0.3 cfs 0.02 af

Subcatchment2H-PR: SUBCATCHMENT Runoff Area=19,639 sf 0.00% Impervious Runoff Depth>4.67"
Flow Length=320' Tc=6.0 min CN=92 Runoff=2.3 cfs 0.18 af

Subcatchment2I-PR: SUBCATCHMENT Runoff Area=29,698 sf 0.00% Impervious Runoff Depth>4.56"
Flow Length=385' Tc=6.0 min CN=91 Runoff=3.4 cfs 0.26 af

Subcatchment2J-PR: SUBCATCHMENT Runoff Area=48,397 sf 5.88% Impervious Runoff Depth>4.90"
Flow Length=340' Tc=6.0 min CN=94 Runoff=5.8 cfs 0.45 af

Subcatchment2K-PR: SUBCATCHMENT Runoff Area=16,131 sf 0.00% Impervious Runoff Depth>4.45"
Flow Length=340' Tc=6.0 min CN=90 Runoff=1.8 cfs 0.14 af

Subcatchment2L-PR: SUBCATCHMENT Runoff Area=15,693 sf 0.00% Impervious Runoff Depth>4.45"
Flow Length=340' Tc=6.0 min CN=90 Runoff=1.8 cfs 0.13 af

Subcatchment2M-PR: SUBCATCHMENT Runoff Area=19,164 sf 0.00% Impervious Runoff Depth>4.56"
Flow Length=275' Tc=6.0 min CN=91 Runoff=2.2 cfs 0.17 af

Subcatchment2N-PR: SUBCATCHMENT Runoff Area=35,765 sf 0.00% Impervious Runoff Depth>4.78"
Flow Length=370' Tc=6.0 min CN=93 Runoff=4.2 cfs 0.33 af

Subcatchment3A-PR: SUBCATCHMENT Runoff Area=3,190 sf 0.00% Impervious Runoff Depth>5.13"
Flow Length=1,325' Tc=6.3 min CN=96 Runoff=0.4 cfs 0.03 af

Subcatchment3B-PR: SUBCATCHMENT Runoff Area=2,795 sf 100.00% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=98 Runoff=0.3 cfs 0.03 af

Pond 1P: FERGUSON R-TANK CHAMBER Peak Elev=7.83' Storage=0.12 af Inflow=9.1 cfs 0.72 af
Discarded=0.1 cfs 0.19 af Primary=8.9 cfs 0.42 af Outflow=9.0 cfs 0.62 af

Pond 2P: FERGUSON R-TANK CHAMBER Peak Elev=8.02' Storage=0.10 af Inflow=6.3 cfs 0.48 af
Discarded=0.1 cfs 0.17 af Primary=5.3 cfs 0.25 af Outflow=5.4 cfs 0.43 af

Pond 3P: FERGUSON R-TANK / INFILTRATION Peak Elev=6.90' Storage=0.36 af Inflow=15.7 cfs 1.22 af
Discarded=0.5 cfs 0.75 af Primary=8.5 cfs 0.43 af Outflow=9.0 cfs 1.18 af

Pond 5P: DRAINAGE MANHOLE Peak Elev=7.10' Inflow=13.7 cfs 0.68 af
30.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=13.7 cfs 0.68 af

Pond CB-1: 18" NYLOPLAST DRAIN Peak Elev=9.03' Storage=1 cf Inflow=0.9 cfs 0.07 af
Outflow=0.9 cfs 0.07 af

Pond CB-10: 18" NYLOPLAST DRAIN Peak Elev=7.93' Storage=6 cf Inflow=1.8 cfs 0.14 af
Outflow=1.8 cfs 0.14 af

Pond CB-11: 18" NYLOPLAST DRAIN Peak Elev=7.88' Storage=6 cf Inflow=1.8 cfs 0.13 af
Outflow=1.7 cfs 0.13 af

Pond CB-12: 18" NYLOPLAST DRAIN Peak Elev=7.93' Storage=10 cf Inflow=2.2 cfs 0.17 af
Outflow=2.2 cfs 0.17 af

Pond CB-13: 18" NYLOPLAST DRAIN Peak Elev=8.06' Storage=63 cf Inflow=4.2 cfs 0.33 af
Outflow=4.2 cfs 0.33 af

Pond CB-2: 18" NYLOPLAST DRAIN Peak Elev=9.11' Storage=60 cf Inflow=5.0 cfs 0.39 af
Outflow=4.9 cfs 0.39 af

Pond CB-3: 18" NYLOPLAST DRAIN Peak Elev=8.80' Storage=0.00 af Inflow=1.9 cfs 0.15 af
Outflow=1.9 cfs 0.15 af

Pond CB-4: 18" NYLOPLAST DRAIN Peak Elev=8.99' Storage=4 cf Inflow=1.4 cfs 0.11 af
Outflow=1.4 cfs 0.11 af

Pond CB-5: 18" NYLOPLAST DRAIN Peak Elev=9.03' Storage=1 cf Inflow=0.3 cfs 0.02 af
Outflow=0.3 cfs 0.02 af

Pond CB-6: 18" NYLOPLAST DRAIN Peak Elev=8.91' Storage=1 cf Inflow=0.3 cfs 0.02 af
Outflow=0.3 cfs 0.02 af

Pond CB-7: 18" NYLOPLAST DRAIN Peak Elev=8.72' Storage=12 cf Inflow=2.3 cfs 0.18 af
Outflow=2.3 cfs 0.18 af

Pond CB-8: 18" NYLOPLAST DRAIN Peak Elev=8.69' Storage=34 cf Inflow=3.4 cfs 0.26 af
Outflow=3.4 cfs 0.26 af

Pond CB-9: 18" NYLOPLAST DRAIN Peak Elev=8.06' Storage=25 cf Inflow=5.8 cfs 0.45 af
Outflow=5.8 cfs 0.45 af

Pond WQU-1: STORMCEPTORSTC-900 Peak Elev=7.87' Inflow=5.8 cfs 0.46 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=5.8 cfs 0.46 af

Pond WQU-2: STORMCEPTORSTC-900 Peak Elev=7.38' Inflow=3.3 cfs 0.26 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=3.3 cfs 0.26 af

Pond WQU-3: STORMCEPTORSTC-900 Peak Elev=6.90' Inflow=0.6 cfs 0.04 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=0.6 cfs 0.04 af

Pond WQU-4: STORMCEPTORSTC-900 Peak Elev=7.64' Inflow=5.7 cfs 0.43 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=5.7 cfs 0.43 af

Pond WQU-5: STORMCEPTORSTC-900 Peak Elev=7.30' Inflow=9.3 cfs 0.72 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=9.3 cfs 0.72 af

Pond WQU-6: STORMCEPTORSTC-900 Peak Elev=6.66' Inflow=6.4 cfs 0.49 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=6.4 cfs 0.49 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=19.8 cfs 1.16 af
Primary=19.8 cfs 1.16 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=0.4 cfs 0.03 af
Primary=0.4 cfs 0.03 af

Total Runoff Area = 6.432 ac Runoff Volume = 2.53 af Average Runoff Depth = 4.71"
96.14% Pervious = 6.184 ac 3.86% Impervious = 0.248 ac

Summary for Subcatchment 2A-PR: SUBCATCHMENT 2A-PR

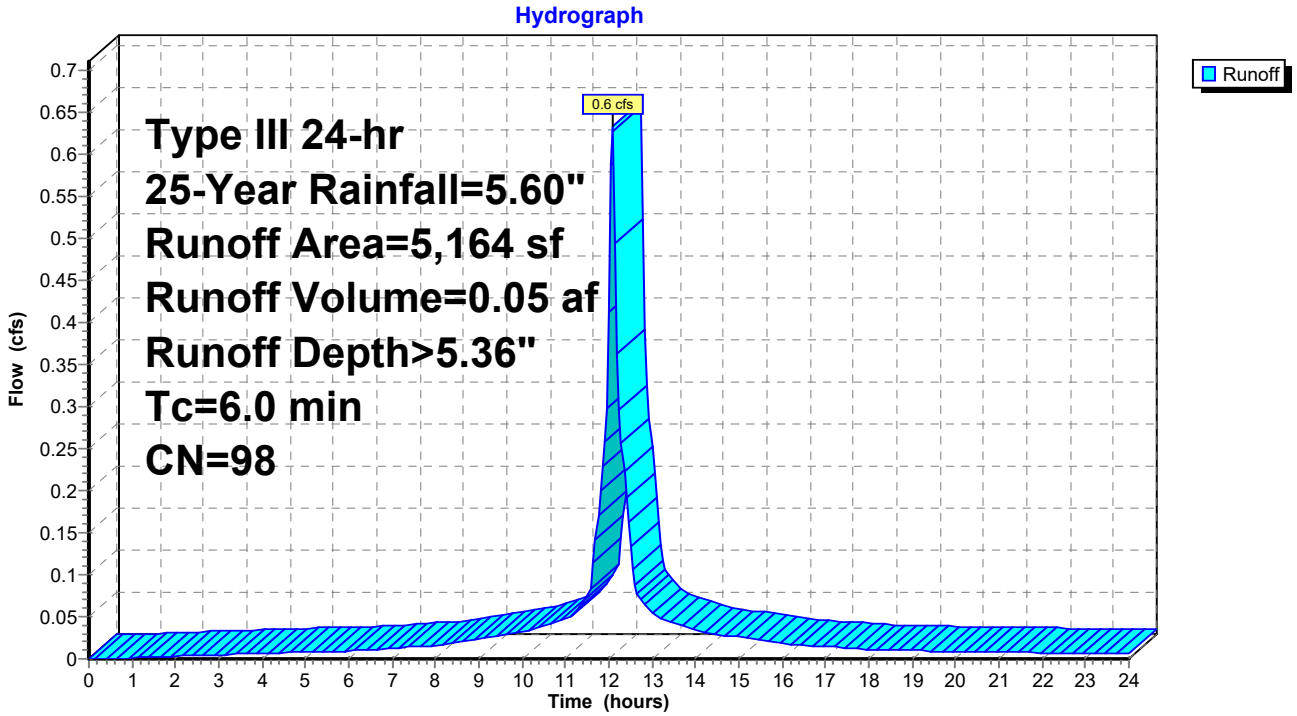
Runoff = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 5.36"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
5,164	98	Paved parking, HSG A
5,164		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 2A-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2B-PR: SUBCATCHMENT 2A-PR

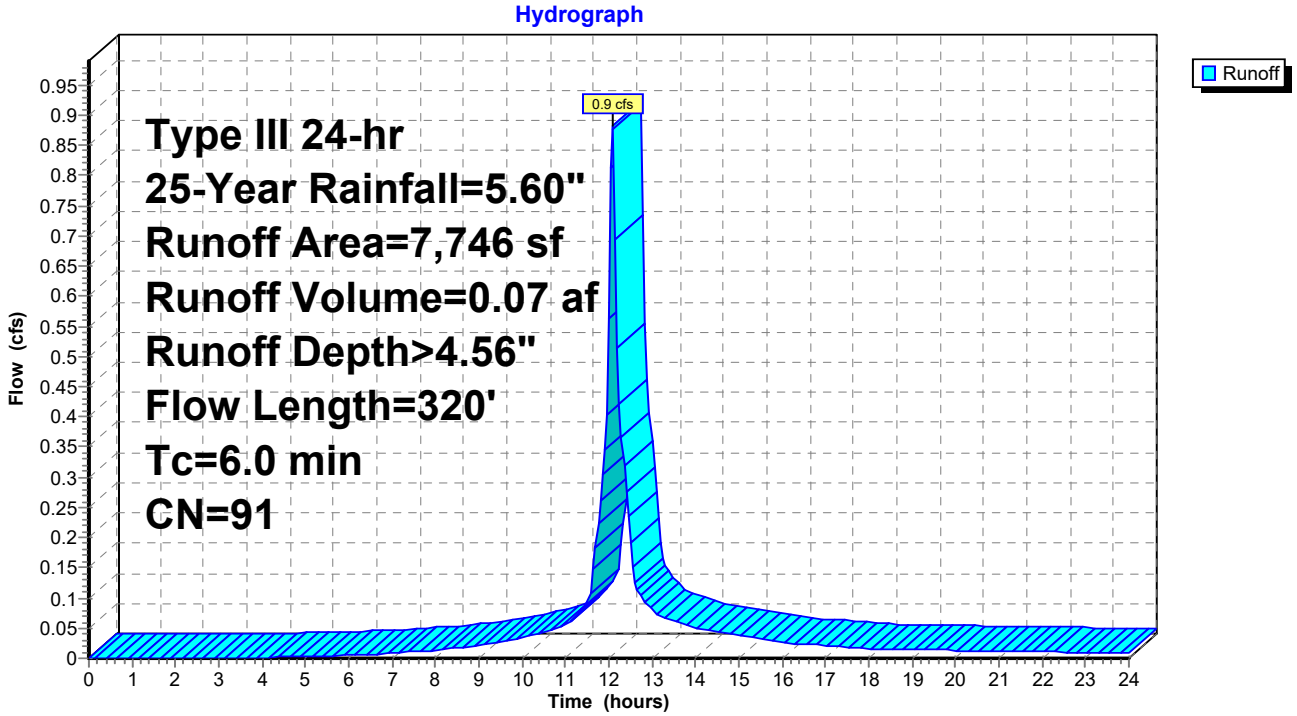
Runoff = 0.9 cfs @ 12.09 hrs, Volume= 0.07 af, Depth> 4.56"
Routed to Pond CB-1 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	693	39	Landscaped area >75% Grass cover, Good, HSG A
*	7,053	96	Heavy lift Gravel surface, HSG A
	7,746	91	Weighted Average
	7,746		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	260	0.0053	1.17		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	60	0.0100	3.53	17.63	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
4.0	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2B-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2C-PR: SUBCATCHMENT 2C-PR

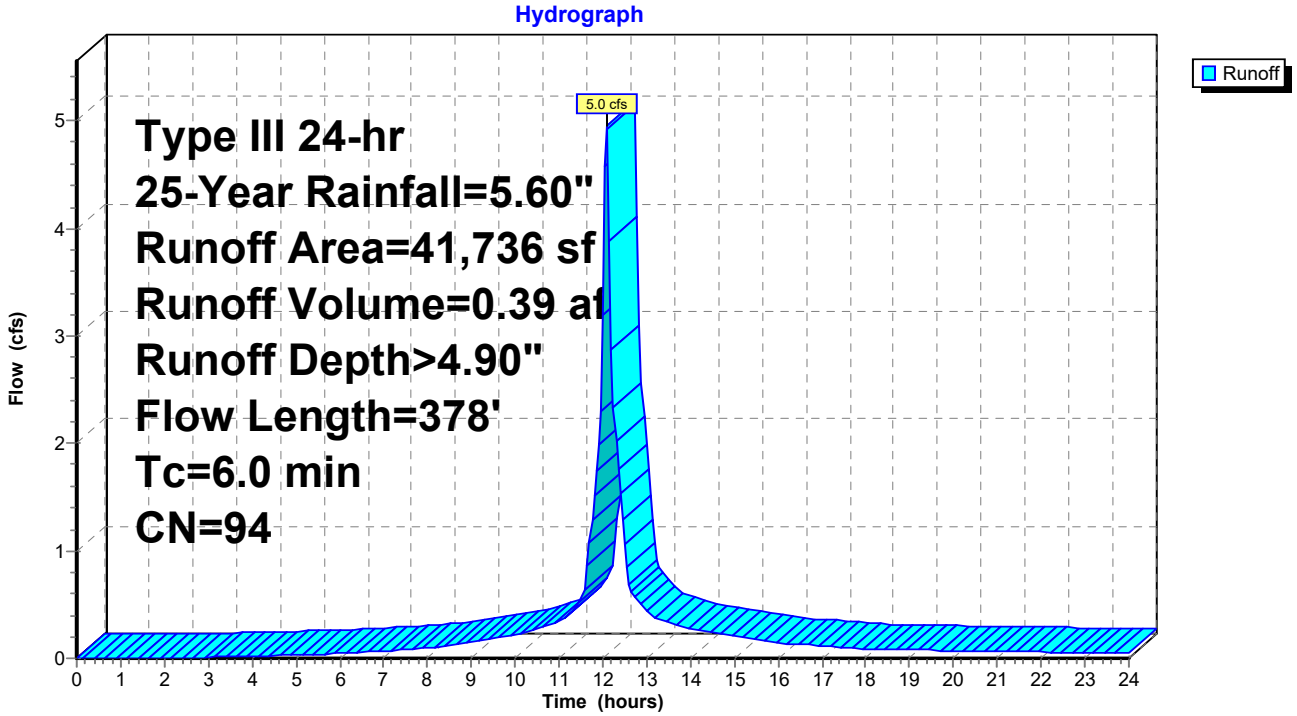
Runoff = 5.0 cfs @ 12.09 hrs, Volume= 0.39 af, Depth> 4.90"
Routed to Pond CB-2 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,298	39	Landscaped area >75% Grass cover, Good, HSG A
*	40,438	96	Heavy lift Gravel surface, HSG A
	41,736	94	Weighted Average
	41,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	328	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
5.1	378	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2D-PR: SUBCATCHMENT 2D-PR

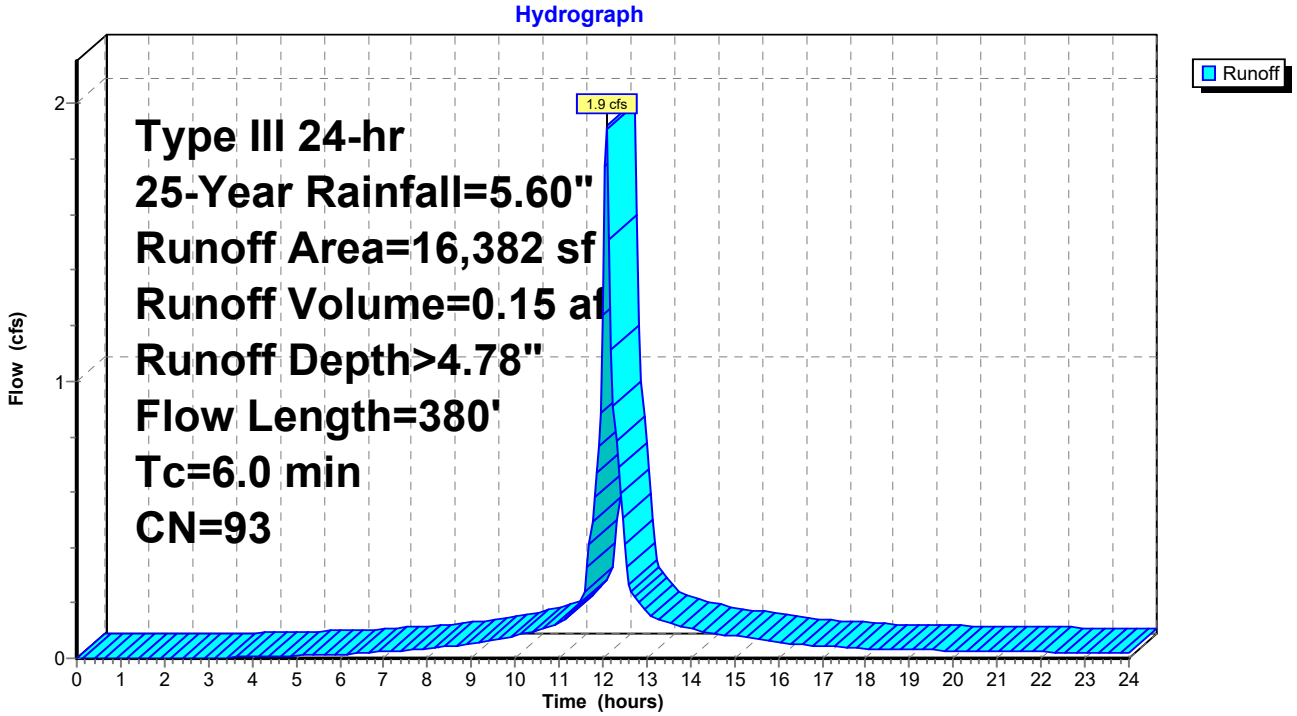
Runoff = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af, Depth> 4.78"
Routed to Pond CB-3 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	962	39	Landscaped area >75% Grass cover, Good, HSG A
*	15,420	96	Heavy lift Gravel surface, HSG A
	16,382	93	Weighted Average
	16,382		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	335	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.8	380	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2D-PR: SUBCATCHMENT 2D-PR



Summary for Subcatchment 2E-PR: SUBCATCHMENT 2C-PR

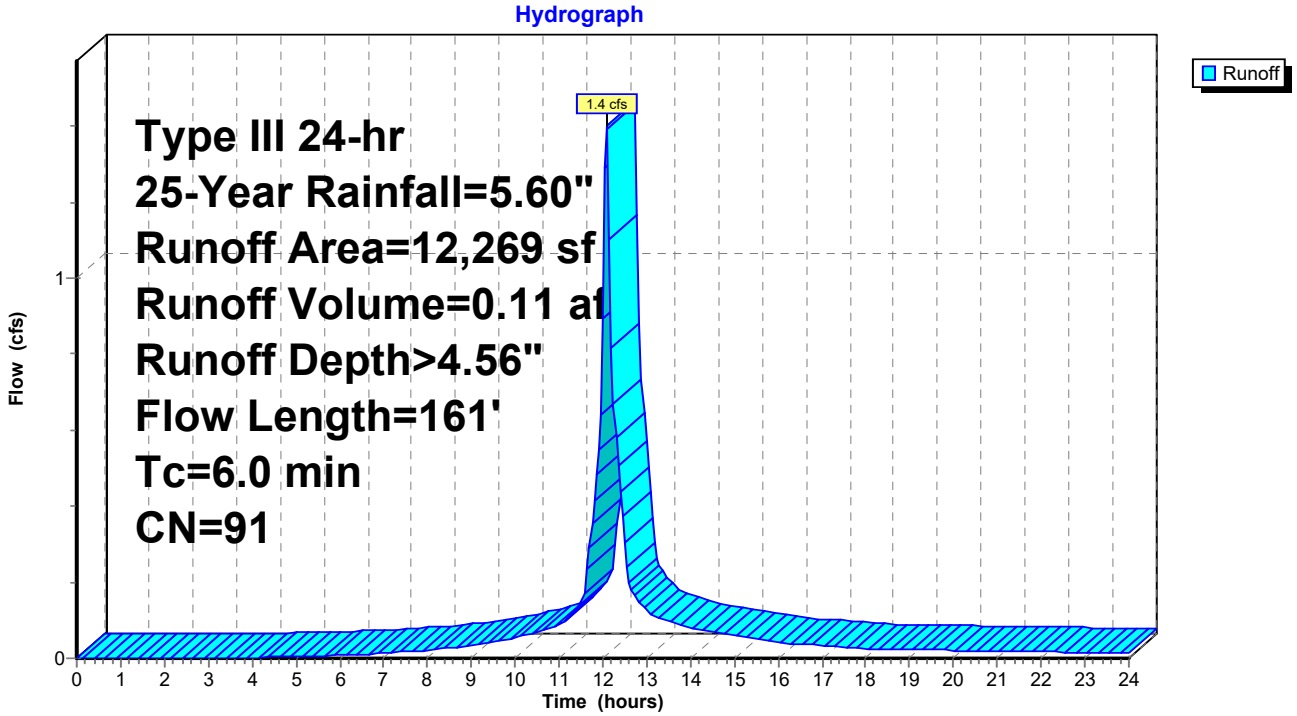
Runoff = 1.4 cfs @ 12.09 hrs, Volume= 0.11 af, Depth> 4.56"
Routed to Pond CB-4 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,043	39	Landscaped area >75% Grass cover, Good, HSG A
*	11,226	96	Heavy lift Gravel surface, HSG A
	12,269	91	Weighted Average
	12,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	116	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.8	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2E-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2F-PR: SUBCATCHMENT 2F-PR

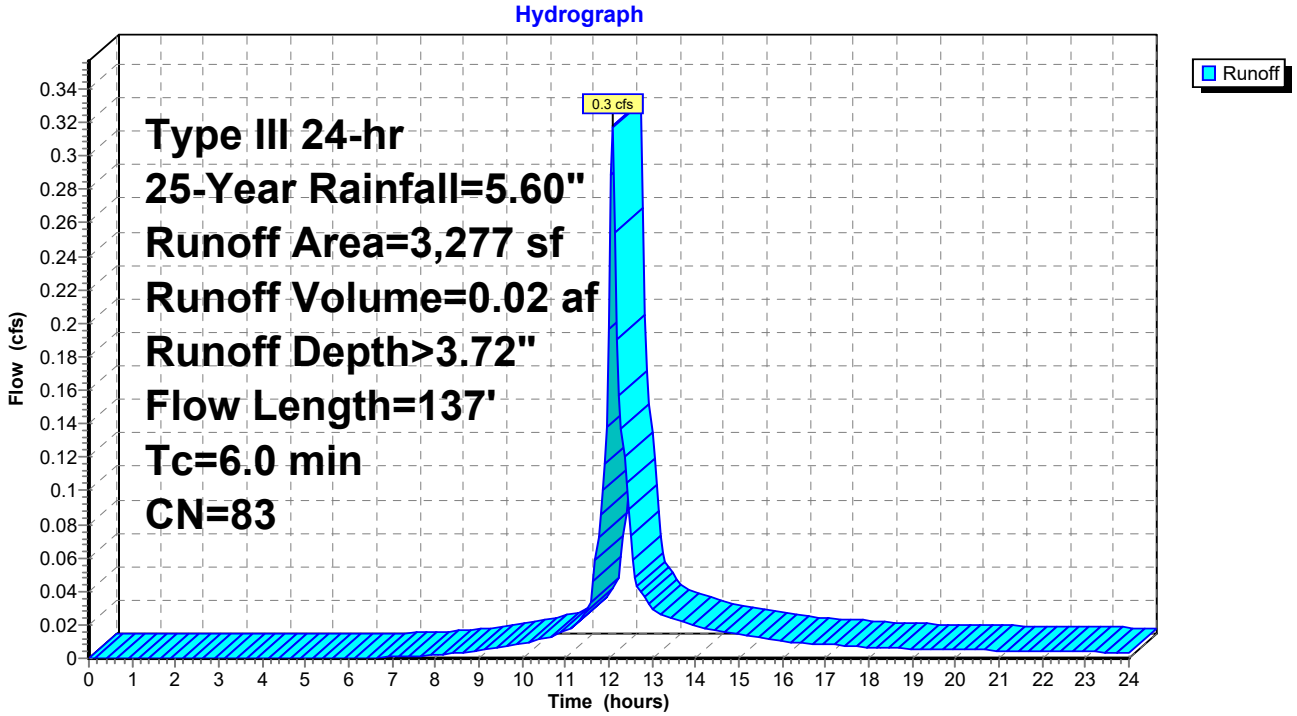
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 3.72"
Routed to Pond CB-5 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	751	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,526	96	Heavy lift Gravel surface, HSG A
	3,277	83	Weighted Average
	3,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	37	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.6	137	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2F-PR: SUBCATCHMENT 2F-PR



Summary for Subcatchment 2G-PR: SUBCATCHMENT 2G-PR

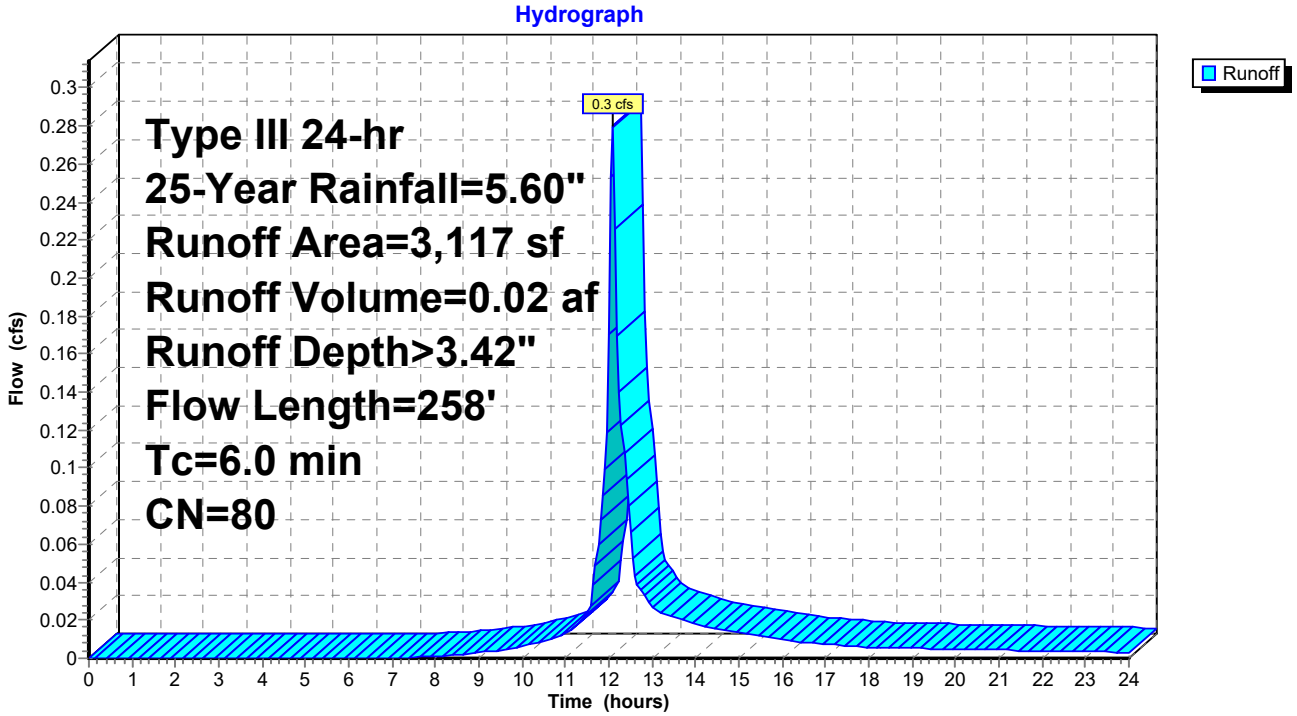
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 3.42"
Routed to Pond CB-6 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	902	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,215	96	Heavy lift Gravel surface, HSG A
	3,117	80	Weighted Average
	3,117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	208	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
3.3	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2G-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2H-PR: SUBCATCHMENT 2G-PR

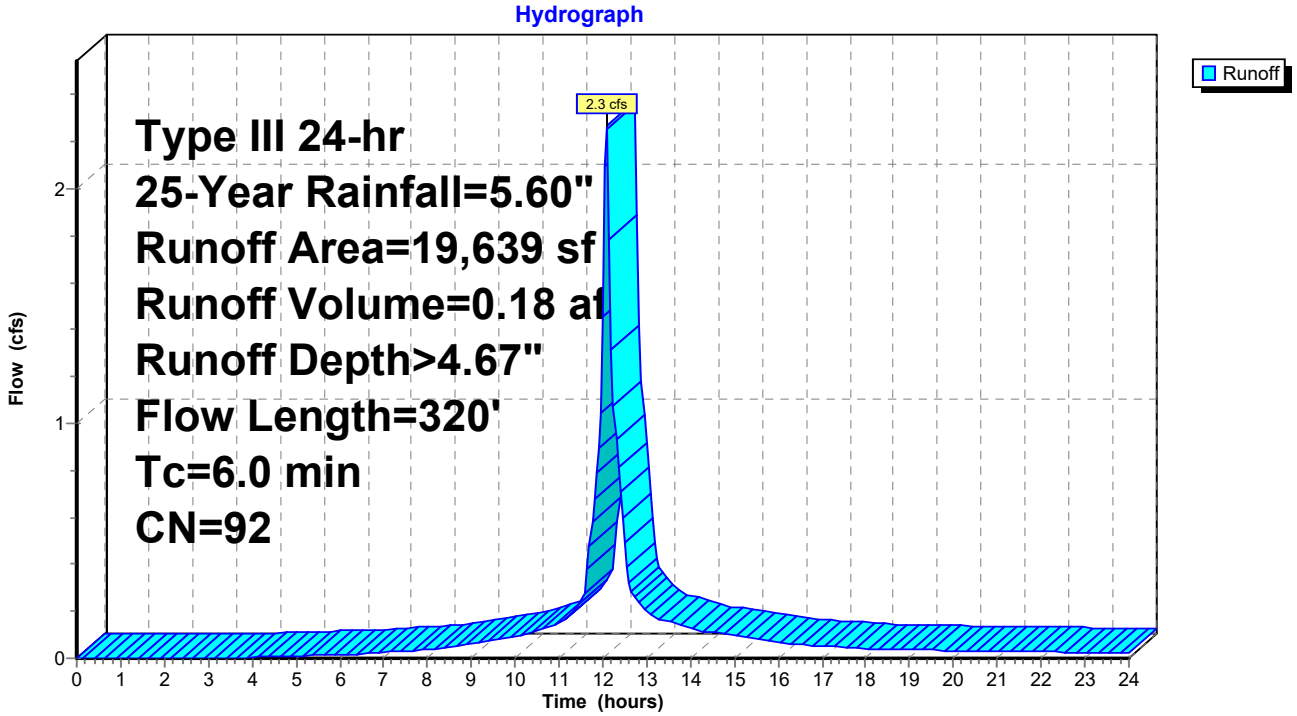
Runoff = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af, Depth> 4.67"
Routed to Pond CB-7 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,347	39	Landscaped area >75% Grass cover, Good, HSG A
*	18,292	96	Heavy lift Gravel surface, HSG A
	19,639	92	Weighted Average
	19,639		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	270	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.3	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2H-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2I-PR: SUBCATCHMENT 2H-PR

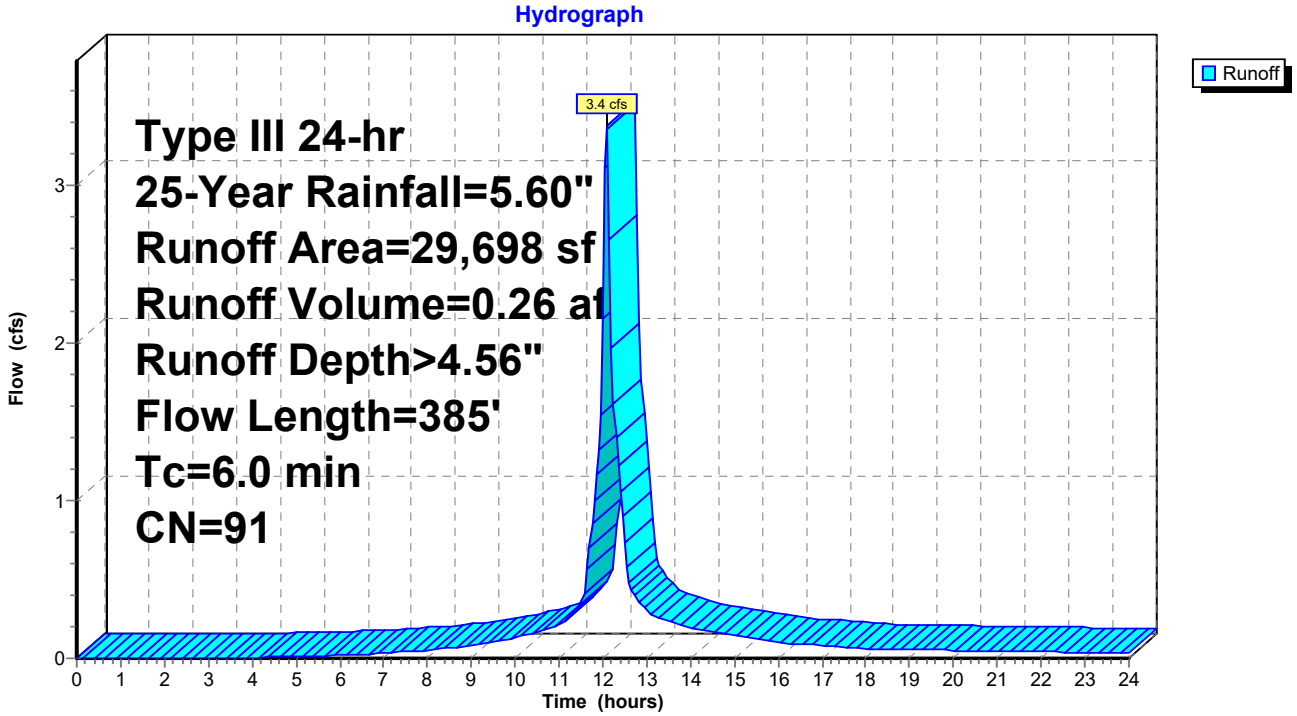
Runoff = 3.4 cfs @ 12.09 hrs, Volume= 0.26 af, Depth> 4.56"
Routed to Pond CB-8 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	2,542	39	Landscaped area >75% Grass cover, Good, HSG A
*	27,156	96	Heavy lift Gravel surface, HSG A
	29,698	91	Weighted Average
	29,698		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	335	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.6	385	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2I-PR: SUBCATCHMENT 2H-PR



Summary for Subcatchment 2J-PR: SUBCATCHMENT 2I-PR

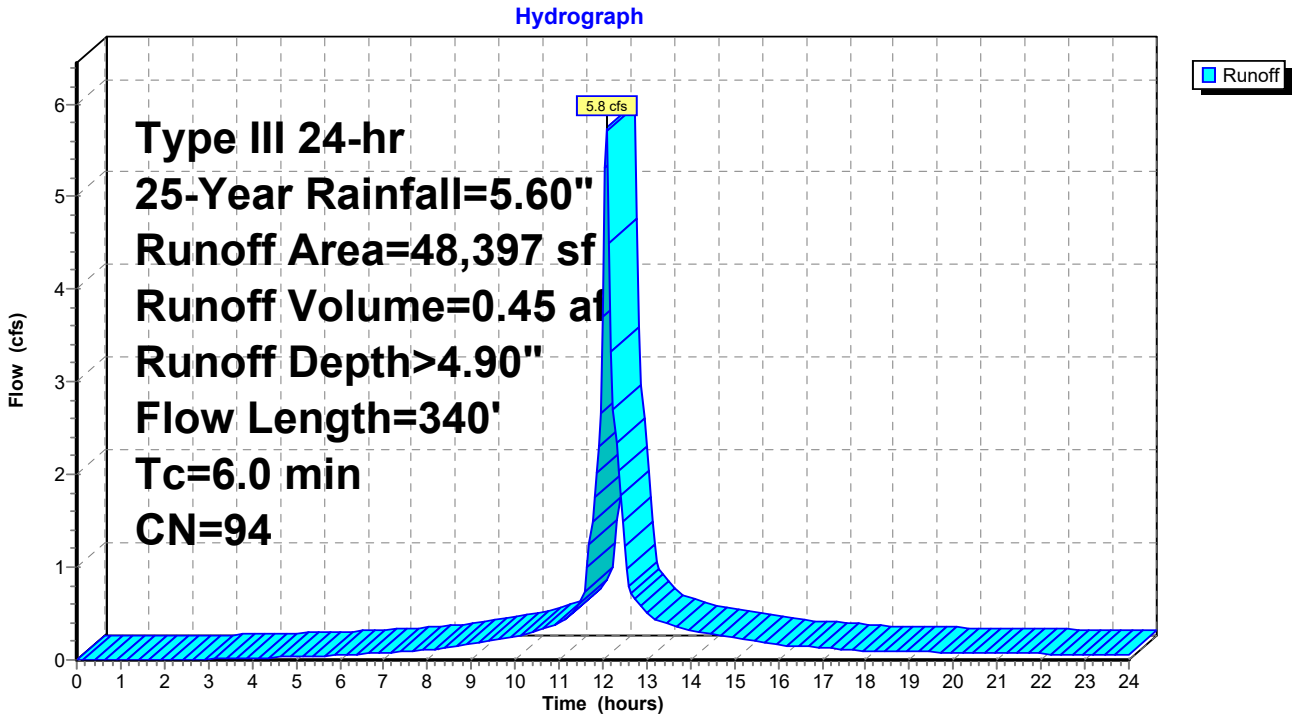
Runoff = 5.8 cfs @ 12.09 hrs, Volume= 0.45 af, Depth> 4.90"
Routed to Pond CB-9 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	2,106	39	Landscaped area >75% Grass cover, Good, HSG A
*	43,443	96	Heavy lift Gravel surface, HSG A
	2,848	98	Paved parking, HSG A
	48,397	94	Weighted Average
	45,549		94.12% Pervious Area
	2,848		5.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2J-PR: SUBCATCHMENT 2I-PR



Summary for Subcatchment 2K-PR: SUBCATCHMENT 2J-PR

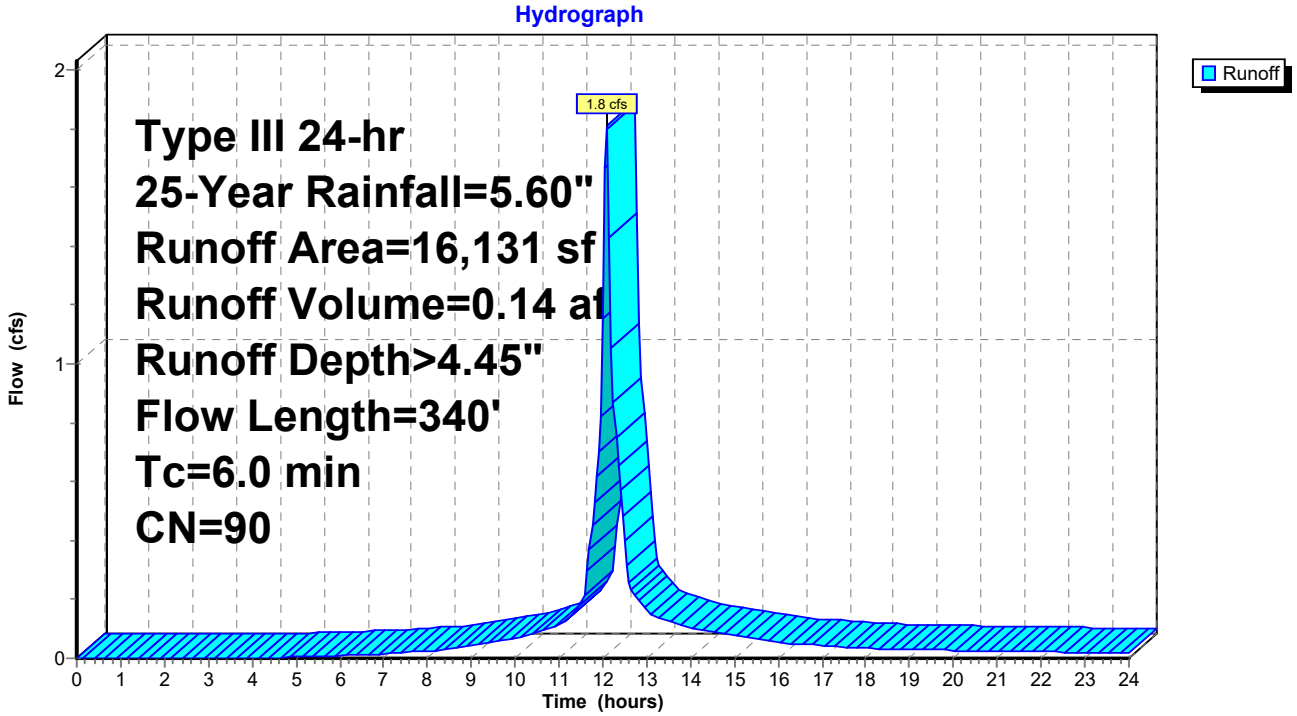
Runoff = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af, Depth> 4.45"
Routed to Pond CB-10 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,634	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,497	96	Heavy lift Gravel surface, HSG A
	16,131	90	Weighted Average
	16,131		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2K-PR: SUBCATCHMENT 2J-PR



Summary for Subcatchment 2L-PR: SUBCATCHMENT 2K-PR

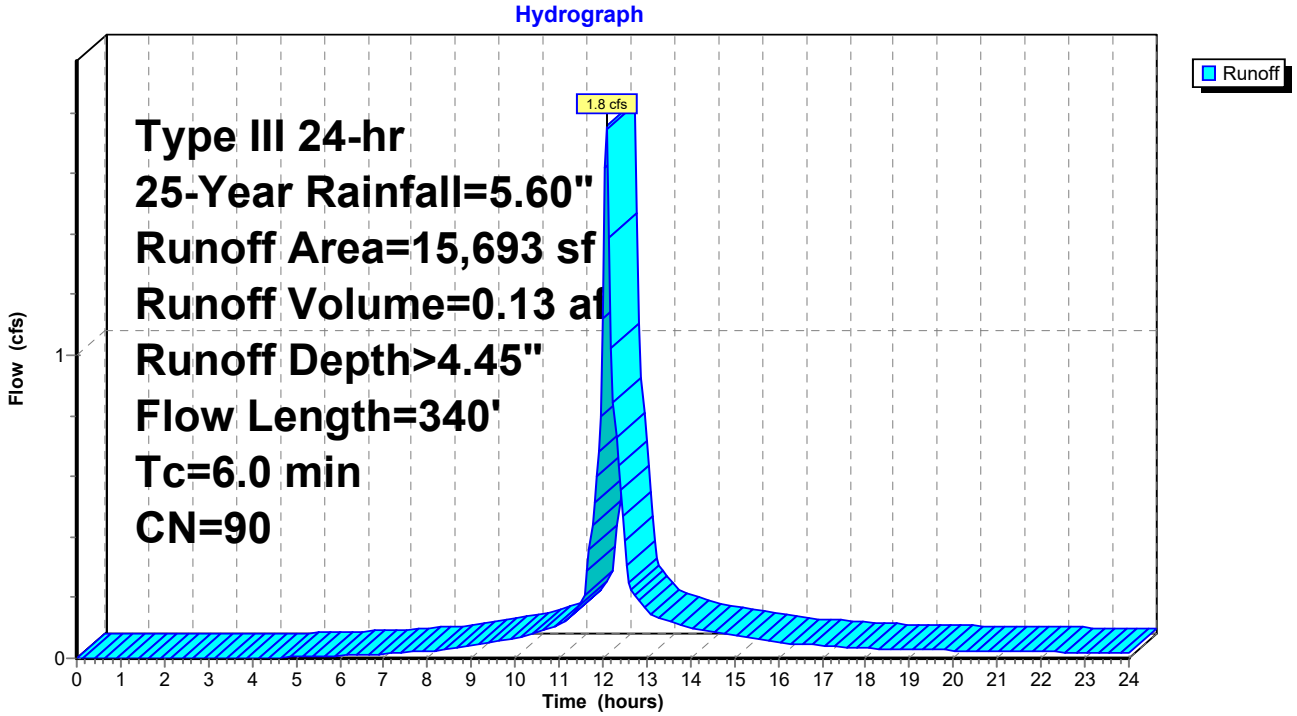
Runoff = 1.8 cfs @ 12.09 hrs, Volume= 0.13 af, Depth> 4.45"
Routed to Pond CB-11 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,630	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,063	96	Heavy lift Gravel surface, HSG A
	15,693	90	Weighted Average
	15,693		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2L-PR: SUBCATCHMENT 2K-PR



Summary for Subcatchment 2M-PR: SUBCATCHMENT 2L-PR

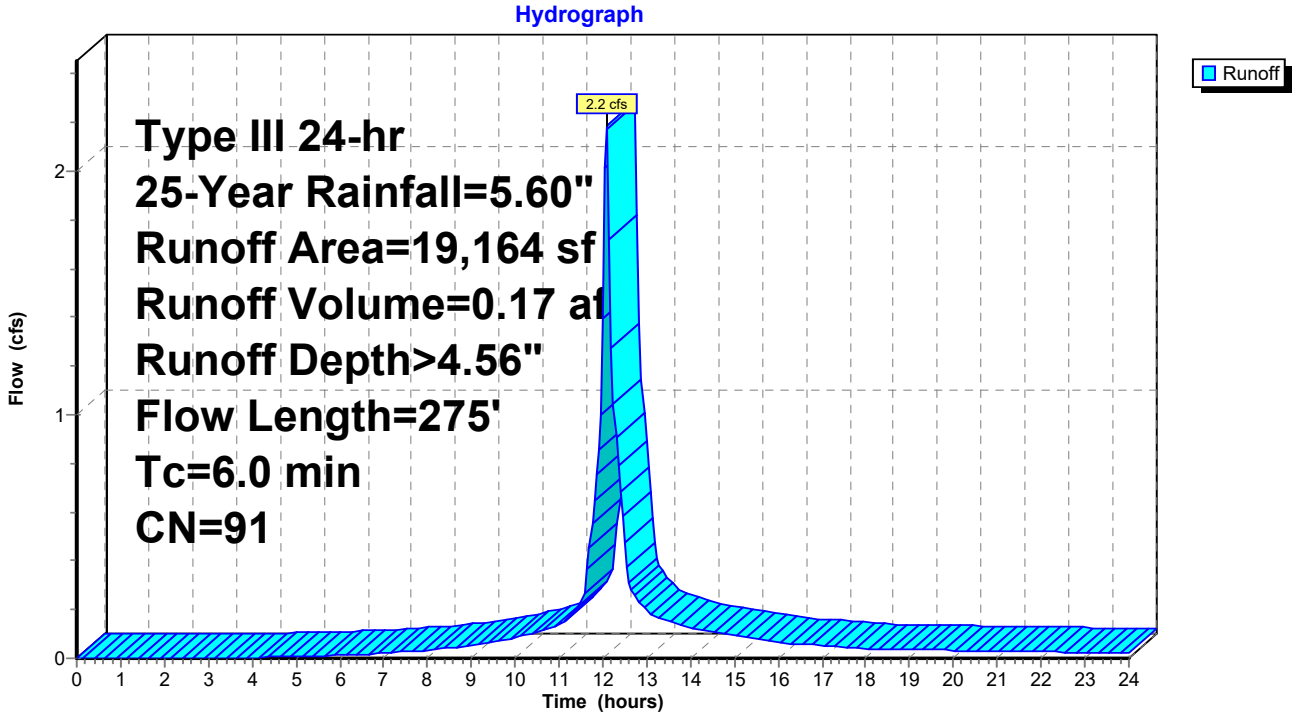
Runoff = 2.2 cfs @ 12.09 hrs, Volume= 0.17 af, Depth> 4.56"
Routed to Pond CB-12 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,629	39	Landscaped area >75% Grass cover, Good, HSG A
*	17,535	96	Heavy lift Gravel surface, HSG A
	19,164	91	Weighted Average
	19,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	225	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.0	275	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2M-PR: SUBCATCHMENT 2L-PR



Summary for Subcatchment 2N-PR: SUBCATCHMENT 2M-PR

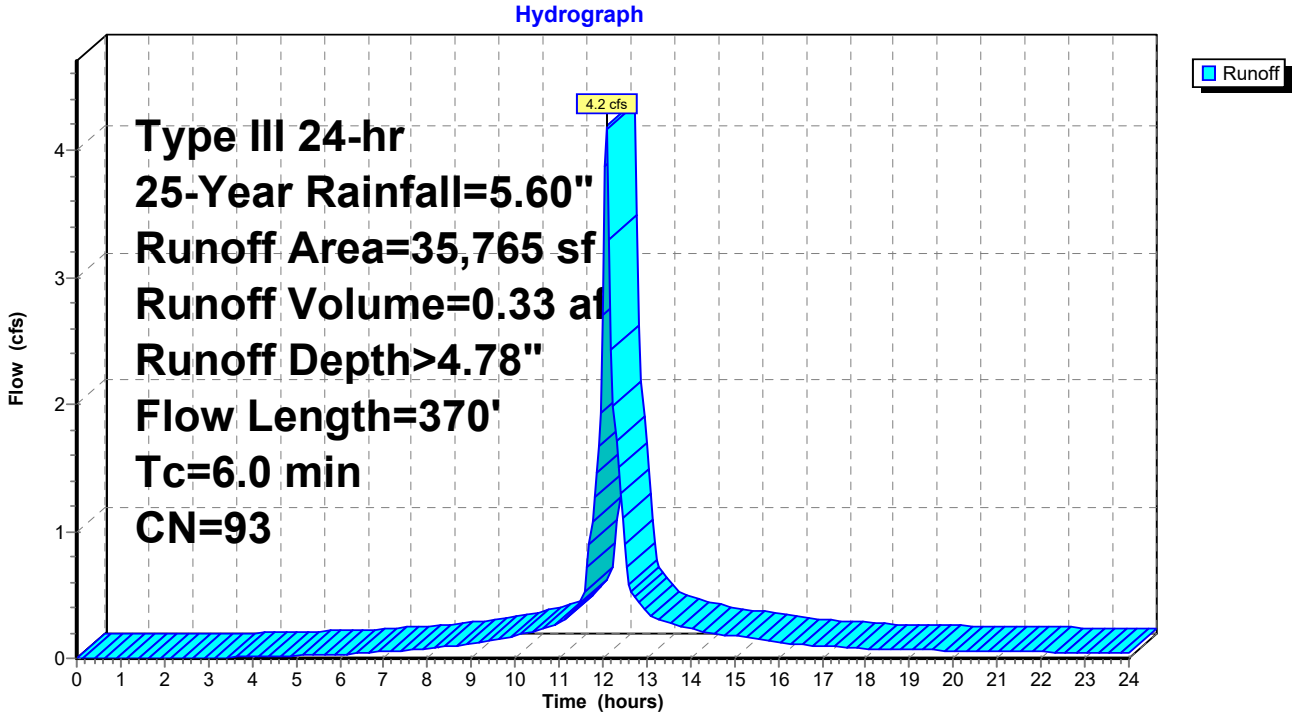
Runoff = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af, Depth> 4.78"
Routed to Pond CB-13 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	2,016	39	15' Landscaped area >75% Grass cover, Good, HSG A
*	33,749	96	Heavy lift Gravel surface, HSG A
	35,765	93	Weighted Average
	35,765		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	320	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.4	370	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2N-PR: SUBCATCHMENT 2M-PR



Summary for Subcatchment 3A-PR: SUBCATCHMENT 3A-PR

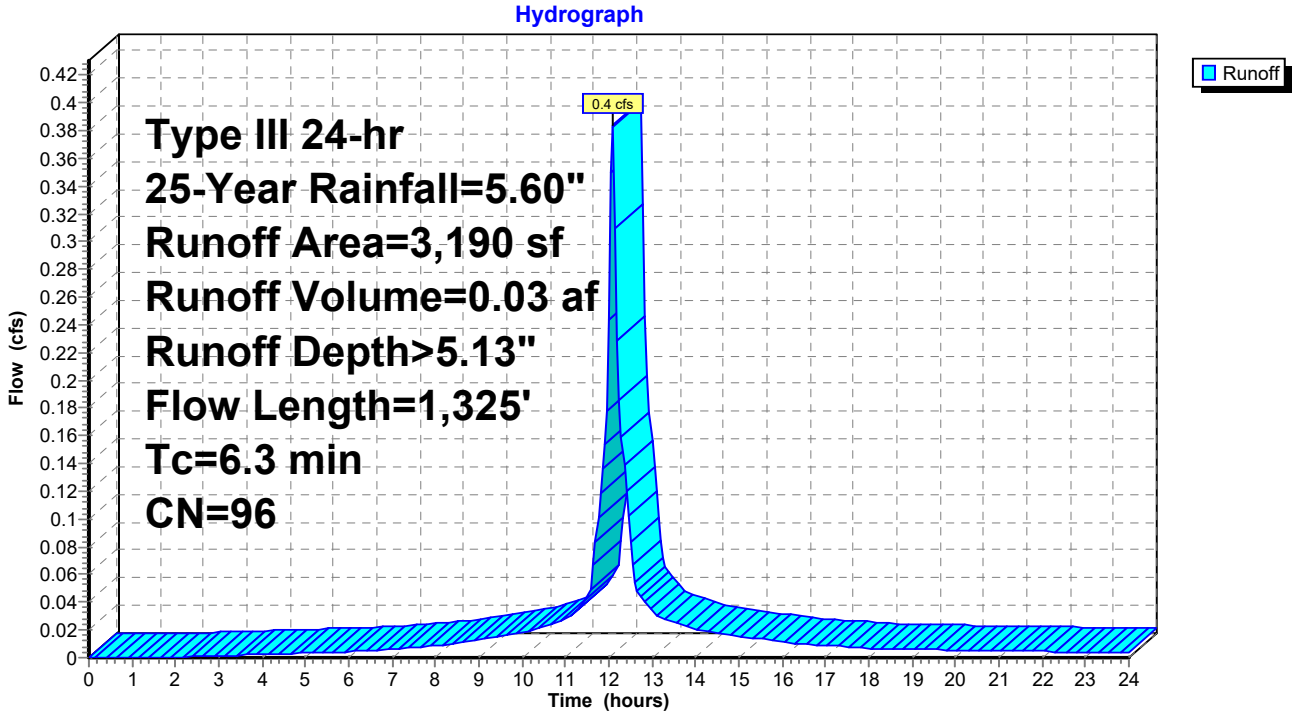
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 5.13"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	3,190	96	Heavy lift Gravel surface, HSG A
	3,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	50	0.0050	0.54		**Sheet Flow, Gravel surface** Smooth surfaces n= 0.011 P2= 2.00"
3.5	740	0.0050	3.47	2.73	**Pipe Channel, Infiltration trench** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
1.3	535	0.0020	6.70	189.40	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.3	1,325	Total			

Subcatchment 3A-PR: SUBCATCHMENT 3A-PR



Summary for Subcatchment 3B-PR: SUBCATCHMENT 3B-PR

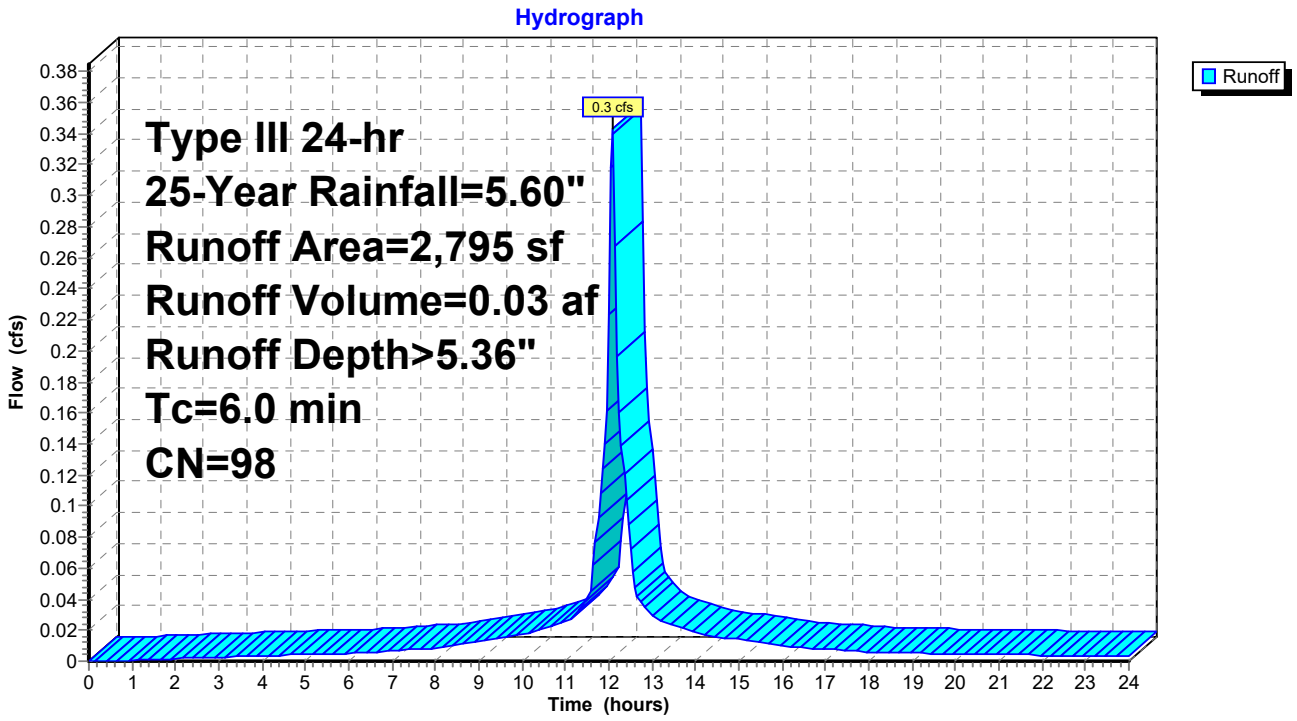
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
2,795	98	Water Surface, HSG A
2,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3B-PR: SUBCATCHMENT 3B-PR



Summary for Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.794 ac, 0.00% Impervious, Inflow Depth > 4.79" for 25-Year event
Inflow = 9.1 cfs @ 12.09 hrs, Volume= 0.72 af
Outflow = 9.0 cfs @ 12.09 hrs, Volume= 0.62 af, Atten= 1%, Lag= 0.0 min
Discarded = 0.1 cfs @ 7.40 hrs, Volume= 0.19 af
Primary = 8.9 cfs @ 12.09 hrs, Volume= 0.42 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.83' @ 12.09 hrs Surf.Area= 0.052 ac Storage= 0.12 af

Plug-Flow detention time= 91.3 min calculated for 0.61 af (86% of inflow)
Center-of-Mass det. time= 31.3 min (805.3 - 774.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	3.50'	0.06 af	**11.25'W x 201.05'L x 4.07'H Field A** 0.21 af Overall - 0.07 af Embedded = 0.14 af x 40.0% Voids
#2A	3.75'	0.06 af	**Ferguson R-Tank HD 2** x 336 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 336 Chambers in 4 Rows
		0.12 af	Total Available Storage

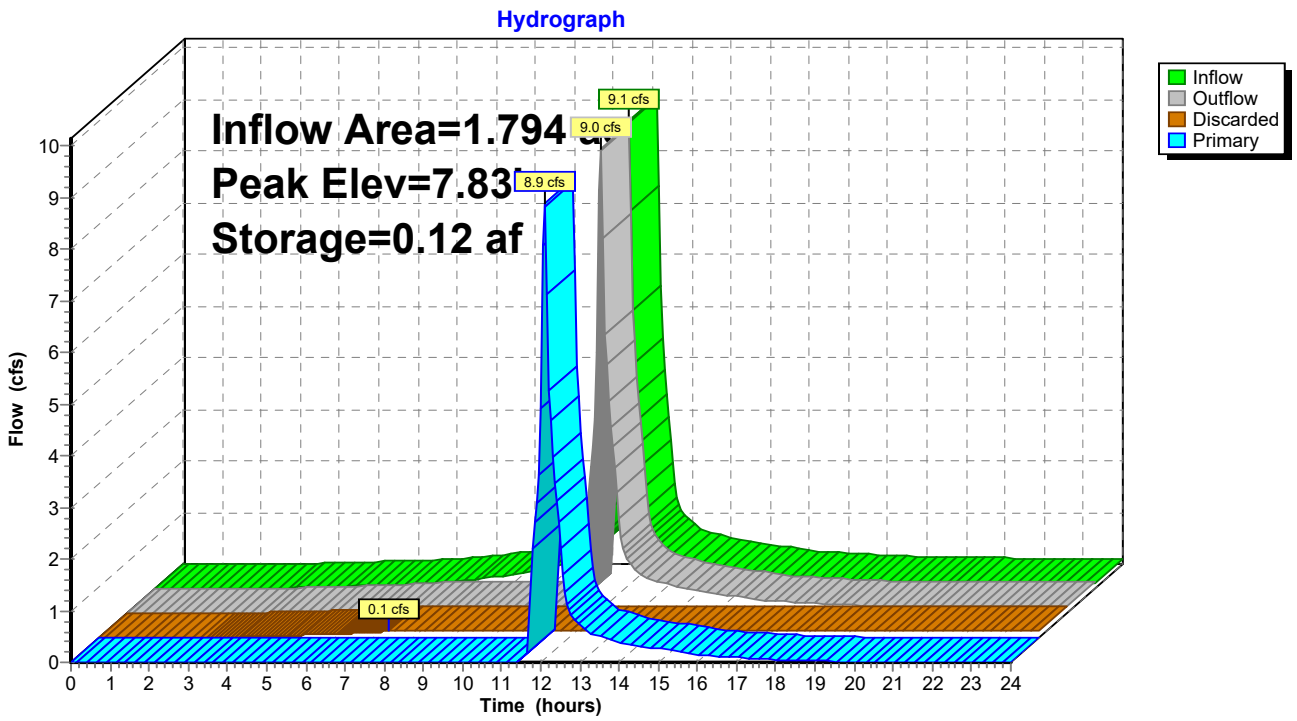
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	3.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-1 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.35' S= 0.0233 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.35'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.80'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 7.40 hrs HW=3.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=8.7 cfs @ 12.09 hrs HW=7.82' (Free Discharge)
└─**2=OCS-1 Outlet** (Passes 8.7 cfs of 13.3 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 3.8 cfs @ 2.03 fps)
  └─**4=Orifice/Grate** (Orifice Controls 4.9 cfs @ 4.43 fps)

Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.279 ac, 0.00% Impervious, Inflow Depth > 4.49" for 25-Year event
Inflow = 6.3 cfs @ 12.09 hrs, Volume= 0.48 af
Outflow = 5.4 cfs @ 12.14 hrs, Volume= 0.43 af, Atten= 13%, Lag= 3.1 min
Discarded = 0.1 cfs @ 8.60 hrs, Volume= 0.17 af
Primary = 5.3 cfs @ 12.14 hrs, Volume= 0.25 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.02' @ 12.14 hrs Surf.Area= 0.050 ac Storage= 0.10 af

Plug-Flow detention time= 97.0 min calculated for 0.43 af (89% of inflow)
Center-of-Mass det. time= 45.0 min (829.0 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1C	4.90'	0.04 af	**10.56'W x 205.74'L x 3.42'H Field C** 0.17 af Overall - 0.07 af Embedded = 0.10 af x 40.0% Voids
#2C	5.15'	0.06 af	**Ferguson R-Tank HD 1.5** x 430 Inside #1 Inside= 15.7"W x 26.0"H => 2.70 sf x 2.35'L = 6.3 cf Outside= 15.7"W x 26.0"H => 2.84 sf x 2.35'L = 6.7 cf 430 Chambers in 5 Rows
		0.10 af	Total Available Storage

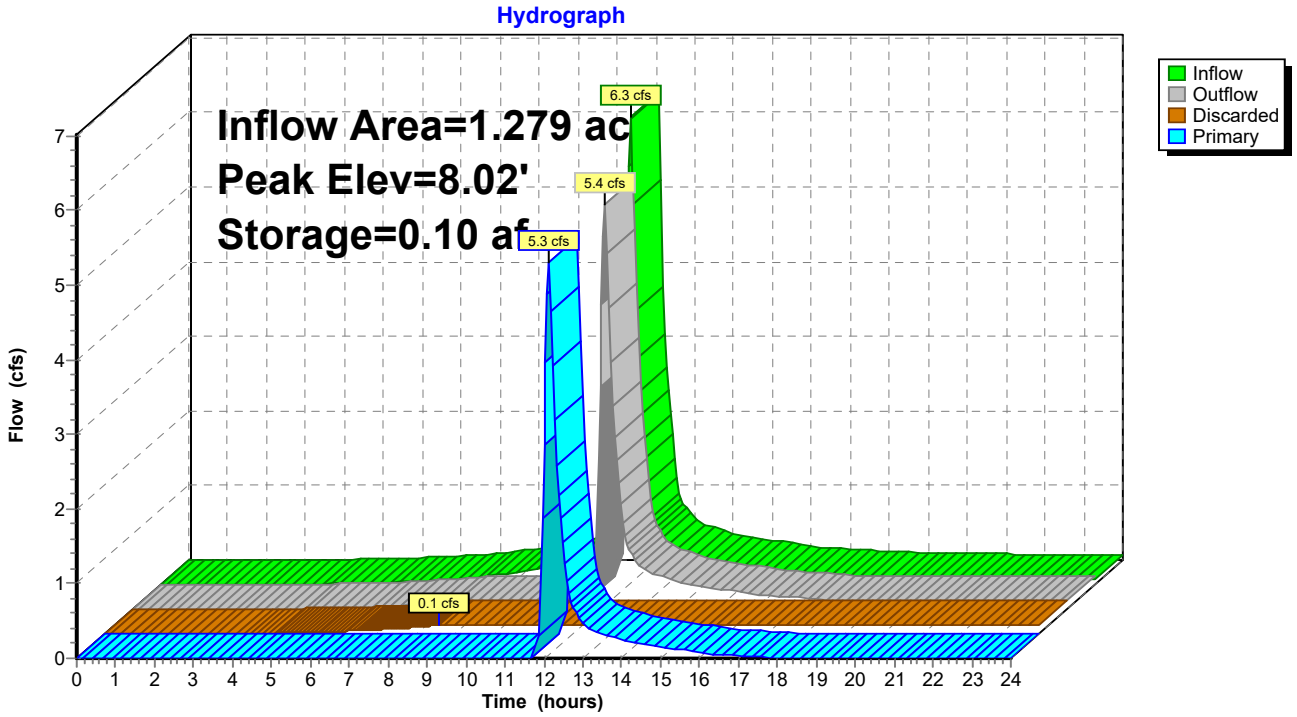
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-2 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.85' S= 0.0067 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.95'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.95'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 8.60 hrs HW=4.93' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=5.2 cfs @ 12.14 hrs HW=8.01' (Free Discharge)
└─**2=OCS-2 Outlet** (Passes 5.2 cfs of 12.0 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.2 cfs @ 0.70 fps)
  └─**4=Orifice/Grate** (Orifice Controls 5.1 cfs @ 4.55 fps)

Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH

Inflow Area = 3.103 ac, 2.11% Impervious, Inflow Depth > 4.72" for 25-Year event
Inflow = 15.7 cfs @ 12.09 hrs, Volume= 1.22 af
Outflow = 9.0 cfs @ 12.22 hrs, Volume= 1.18 af, Atten= 43%, Lag= 7.5 min
Discarded = 0.5 cfs @ 9.70 hrs, Volume= 0.75 af
Primary = 8.5 cfs @ 12.22 hrs, Volume= 0.43 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 6.90' @ 12.22 hrs Surf.Area= 0.226 ac Storage= 0.36 af

Plug-Flow detention time= 119.5 min calculated for 1.18 af (97% of inflow)
Center-of-Mass det. time= 100.8 min (877.5 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1G	3.90'	0.05 af	**27.62'W x 107.22'L x 4.07'H Field G** 0.28 af Overall - 0.16 af Embedded = 0.12 af x 40.0% Voids
#2G	4.15'	0.15 af	**Ferguson R-Tank HD 2** x 792 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 792 Chambers in 18 Rows
#3	3.90'	0.18 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 0.47 af Overall - 0.02 af Embedded = 0.45 af x 40.0% Voids
#4	4.40'	0.01 af	**12.0" Round 12" Perforated HDPE** x 2 Inside #3 L= 320.0' 0.02 af Overall - 1.5" Wall Thickness = 0.01 af
#5H	3.90'	0.00 af	**2.62'W x 27.46'L x 4.07'H Field H** 0.01 af Overall - 0.00 af Embedded = 0.00 af x 40.0% Voids
#6H	4.15'	0.00 af	**Ferguson R-Tank HD 2** x 20 Inside #5 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 20 Chambers in 2 Rows
		0.39 af	Total Available Storage

Storage Group G created with Chamber Wizard
Storage Group H created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
3.90	0.156	0.00	0.00
6.90	0.156	0.47	0.47

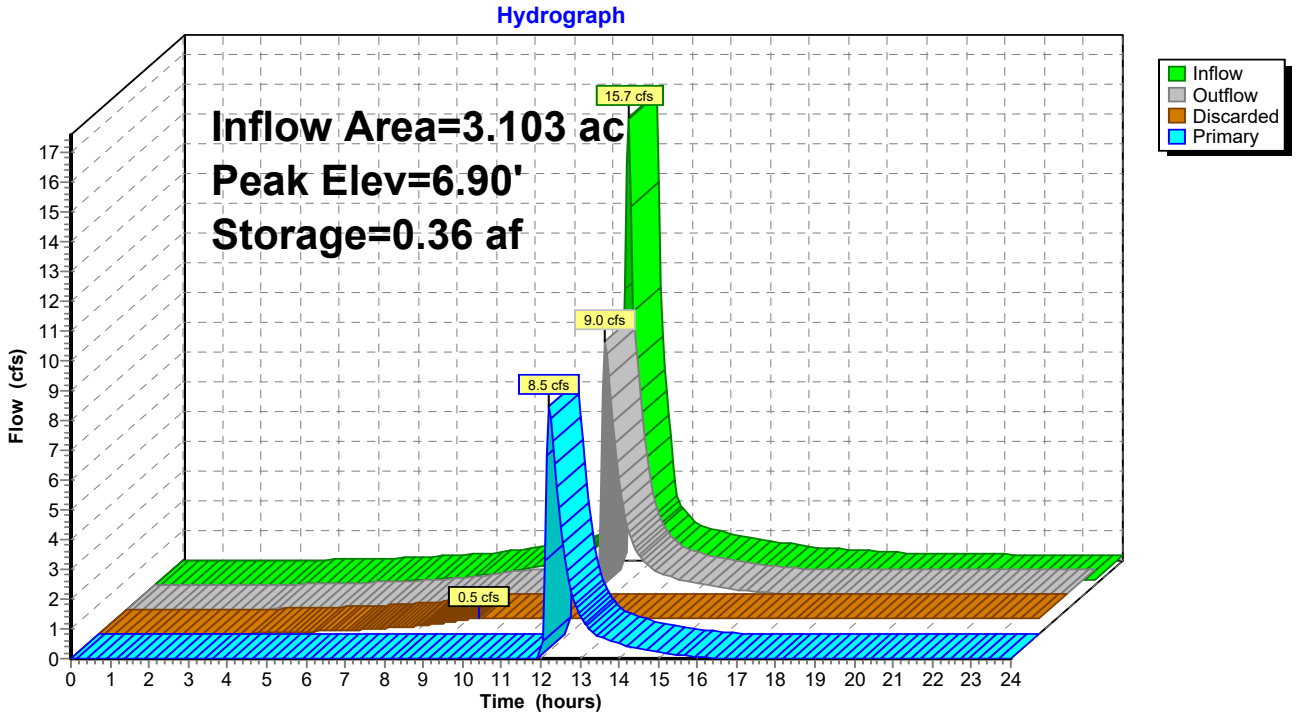
Device	Routing	Invert	Outlet Devices
#1	Discarded	3.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	5.80'	**30.0" Round OCS-3 Outlet** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.80' / 5.50' S= 0.0500 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf
#3	Primary	7.40'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00

			Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	6.60'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.5 cfs @ 9.70 hrs HW=3.94' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.5 cfs)

Primary OutFlow Max=8.2 cfs @ 12.22 hrs HW=6.88' (Free Discharge)
├─**2=OCS-3 Outlet** (Barrel Controls 6.6 cfs @ 4.78 fps)
├─**3=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)
└─**4=Orifice/Grate** (Orifice Controls 1.6 cfs @ 1.71 fps)

Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH



Summary for Pond 5P: DRAINAGE MANHOLE

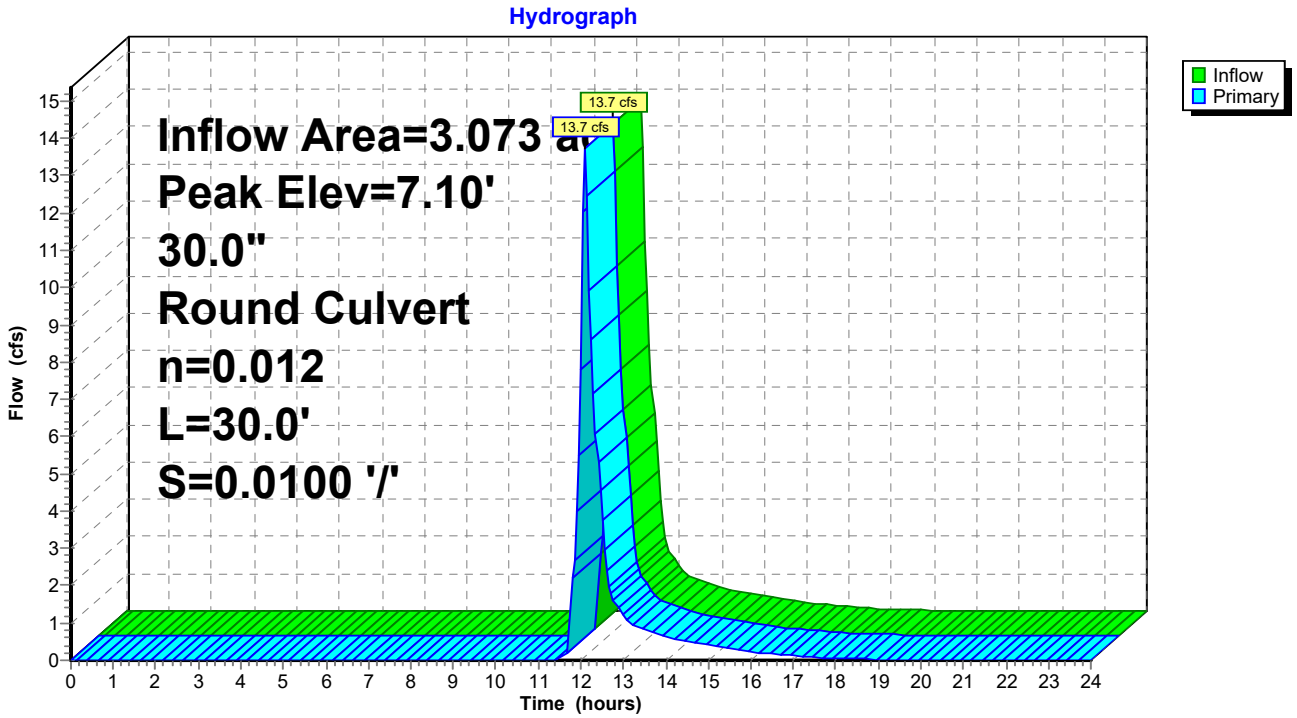
Inflow Area = 3.073 ac, 0.00% Impervious, Inflow Depth = 2.64" for 25-Year event
Inflow = 13.7 cfs @ 12.10 hrs, Volume= 0.68 af
Outflow = 13.7 cfs @ 12.10 hrs, Volume= 0.68 af, Atten= 0%, Lag= 0.0 min
Primary = 13.7 cfs @ 12.10 hrs, Volume= 0.68 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.10' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**30.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 5.05' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=13.6 cfs @ 12.10 hrs HW=7.10' (Free Discharge)
└**1=Culvert** (Barrel Controls 13.6 cfs @ 5.24 fps)

Pond 5P: DRAINAGE MANHOLE



Summary for Pond CB-1: 18" NYLOPLAST DRAIN

Inflow Area = 0.178 ac, 0.00% Impervious, Inflow Depth > 4.56" for 25-Year event
Inflow = 0.9 cfs @ 12.09 hrs, Volume= 0.07 af
Outflow = 0.9 cfs @ 12.09 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.09 hrs, Volume= 0.07 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.03' @ 12.09 hrs Surf.Area= 52 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 209 sf Storage= 104 cf

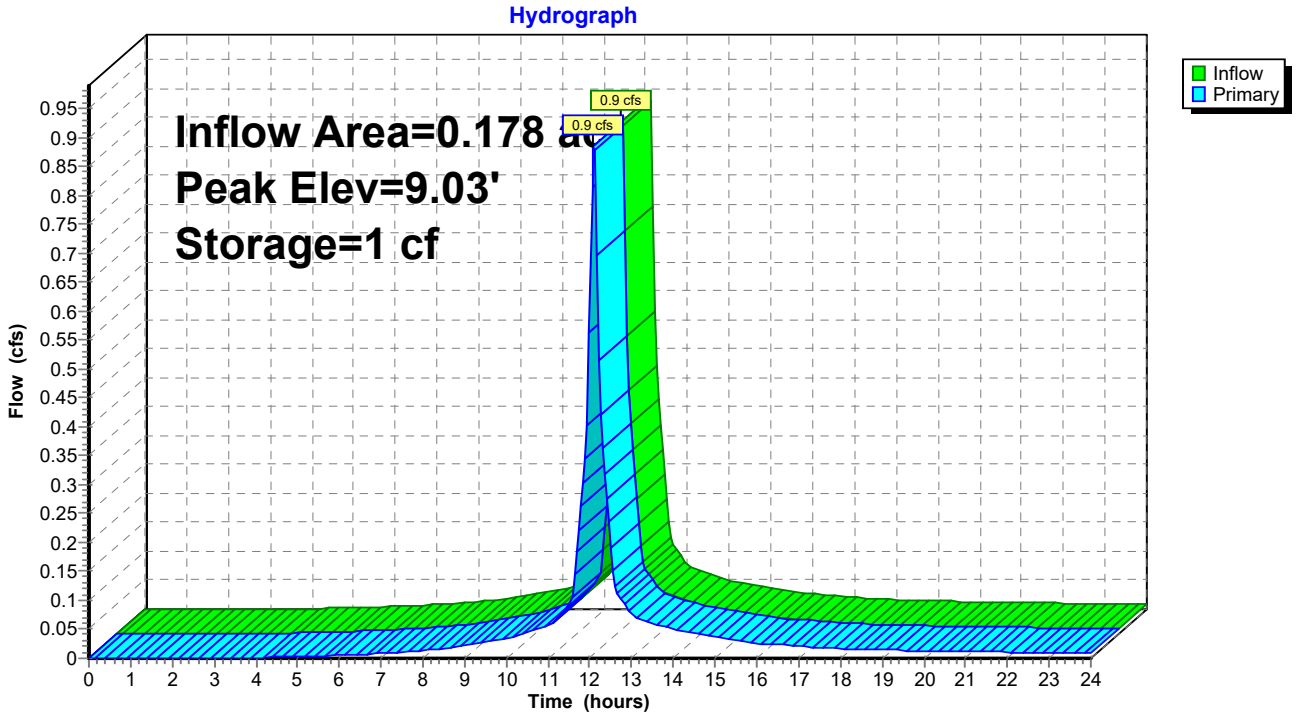
Plug-Flow detention time= 0.0 min calculated for 0.07 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (782.7 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	9.02'	143 cf	**2.00'W x 25.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.87'	**12.0" Round Culvert** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.87' / 6.53' S= 0.0113 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.02'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.9 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.9 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.9 cfs @ 0.49 fps)

Pond CB-1: 18" NYLOPLAST DRAIN



Summary for Pond CB-10: 18" NYLOPLAST DRAIN

Inflow Area = 0.370 ac, 0.00% Impervious, Inflow Depth > 4.45" for 25-Year event
Inflow = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af
Outflow = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.1 min
Primary = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.93' @ 12.09 hrs Surf.Area= 151 sf Storage= 6 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

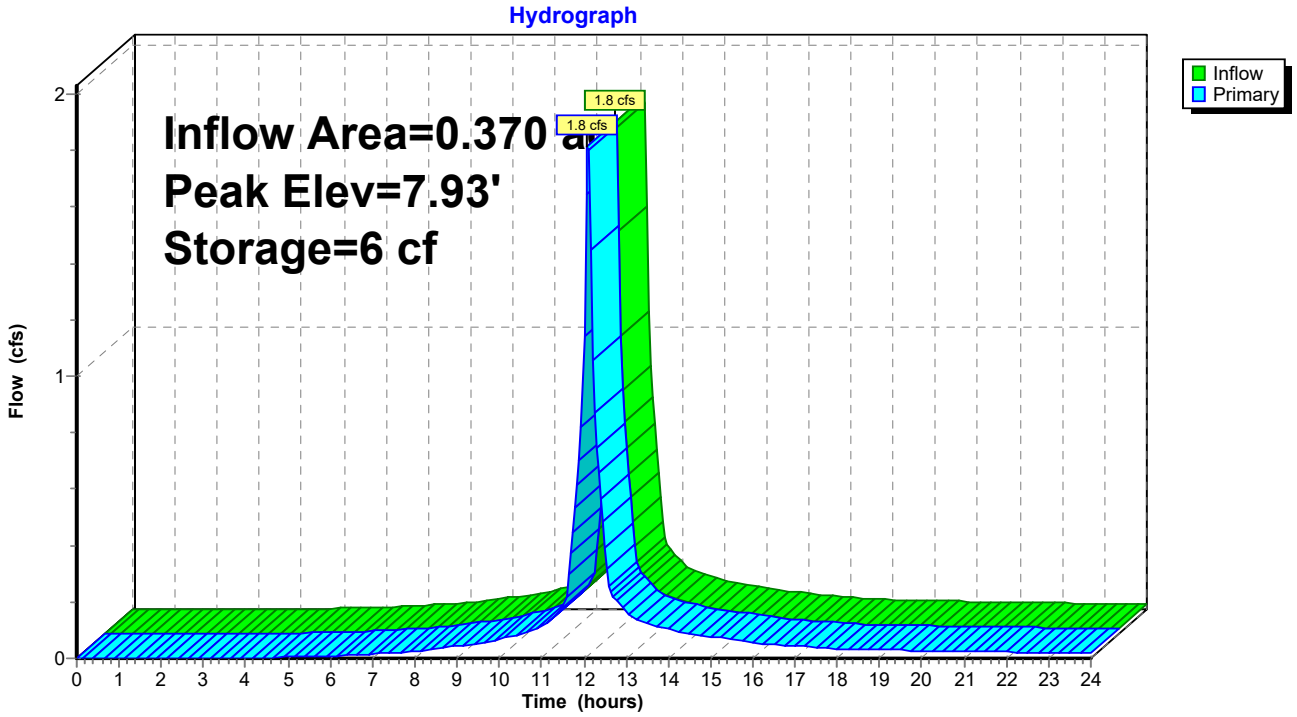
Plug-Flow detention time= 0.0 min calculated for 0.14 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (786.5 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	7.88'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.73'	**12.0" Round Culvert** L= 21.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.73' / 5.45' S= 0.0133 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.88'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.8 cfs @ 12.09 hrs HW=7.92' (Free Discharge)
└─**1=Culvert** (Passes 1.8 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.8 cfs @ 1.01 fps)

Pond CB-10: 18" NYLOPLAST DRAIN



Summary for Pond CB-11: 18" NYLOPLAST DRAIN

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth > 4.45" for 25-Year event
Inflow = 1.8 cfs @ 12.09 hrs, Volume= 0.13 af
Outflow = 1.7 cfs @ 12.09 hrs, Volume= 0.13 af, Atten= 1%, Lag= 0.0 min
Primary = 1.7 cfs @ 12.09 hrs, Volume= 0.13 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.88' @ 12.09 hrs Surf.Area= 149 sf Storage= 6 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

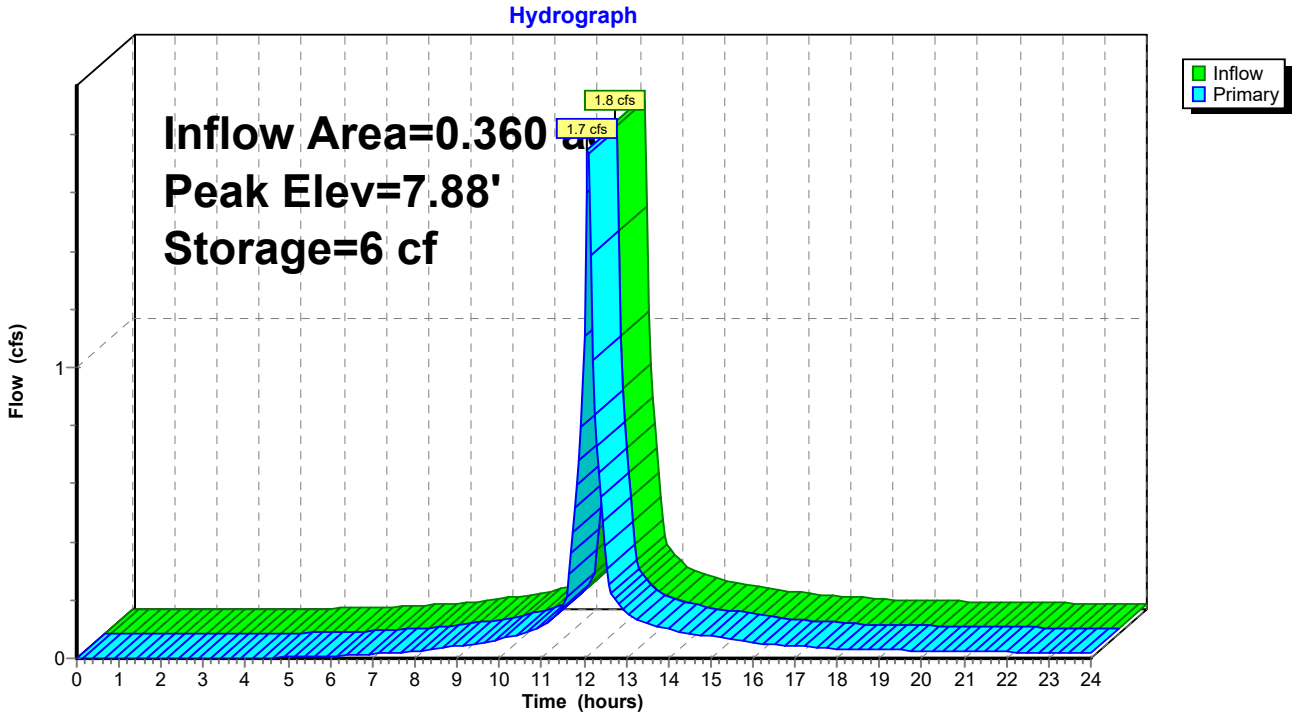
Plug-Flow detention time= 0.9 min calculated for 0.13 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (786.6 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	7.84'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.89'	**12.0" Round Culvert** L= 87.3' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.89' / 5.45' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.84'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.7 cfs @ 12.09 hrs HW=7.88' (Free Discharge)
└─**1=Culvert** (Passes 1.7 cfs of 3.8 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.7 cfs @ 0.97 fps)

Pond CB-11: 18" NYLOPLAST DRAIN



Summary for Pond CB-12: 18" NYLOPLAST DRAIN

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 4.56" for 25-Year event
Inflow = 2.2 cfs @ 12.09 hrs, Volume= 0.17 af
Outflow = 2.2 cfs @ 12.09 hrs, Volume= 0.17 af, Atten= 0%, Lag= 0.2 min
Primary = 2.2 cfs @ 12.09 hrs, Volume= 0.17 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.93' @ 12.09 hrs Surf.Area= 159 sf Storage= 10 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

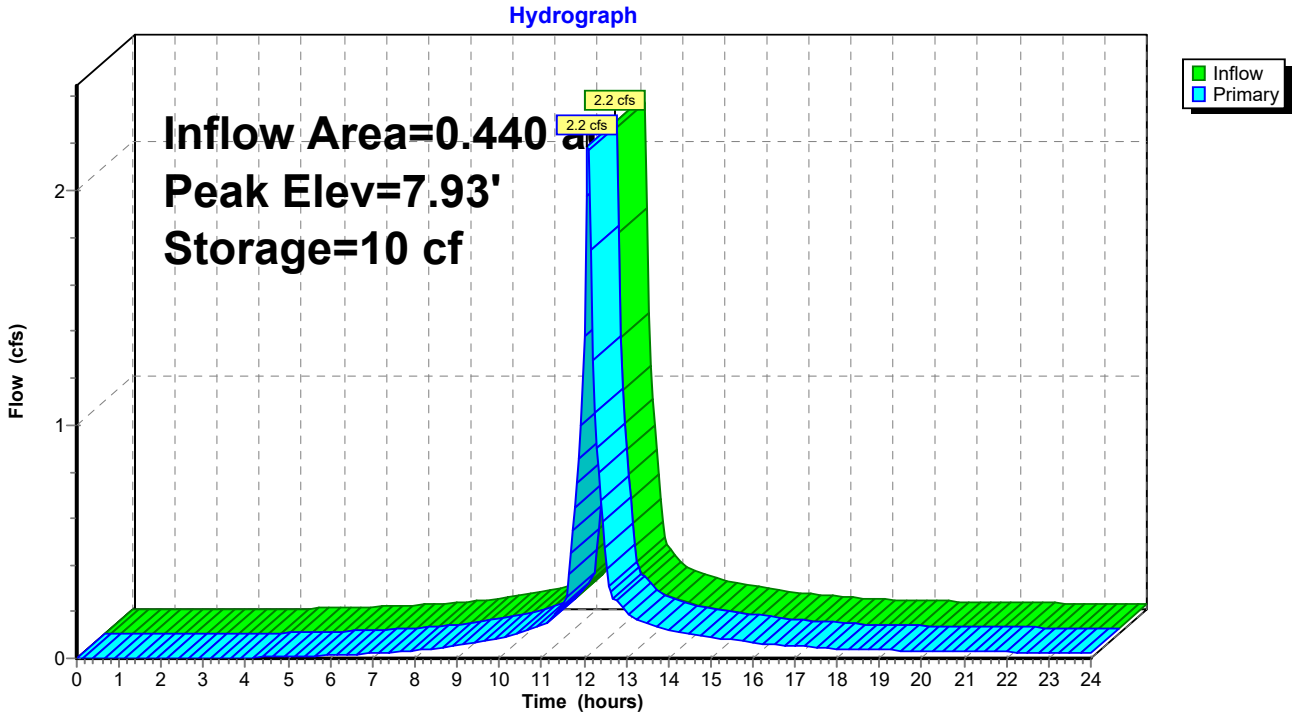
Plug-Flow detention time= 0.0 min calculated for 0.17 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (782.8 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	7.86'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.71'	**12.0" Round Culvert** L= 51.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.71' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.86'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.1 cfs @ 12.09 hrs HW=7.92' (Free Discharge)
└─**1=Culvert** (Passes 2.1 cfs of 4.5 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.1 cfs @ 1.21 fps)

Pond CB-12: 18" NYLOPLAST DRAIN



Summary for Pond CB-13: 18" NYLOPLAST DRAIN

Inflow Area = 0.821 ac, 0.00% Impervious, Inflow Depth > 4.78" for 25-Year event
Inflow = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af
Outflow = 4.2 cfs @ 12.10 hrs, Volume= 0.33 af, Atten= 1%, Lag= 0.5 min
Primary = 4.2 cfs @ 12.10 hrs, Volume= 0.33 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.06' @ 12.10 hrs Surf.Area= 333 sf Storage= 63 cf
Flood Elev= 9.18' Surf.Area= 810 sf Storage= 494 cf

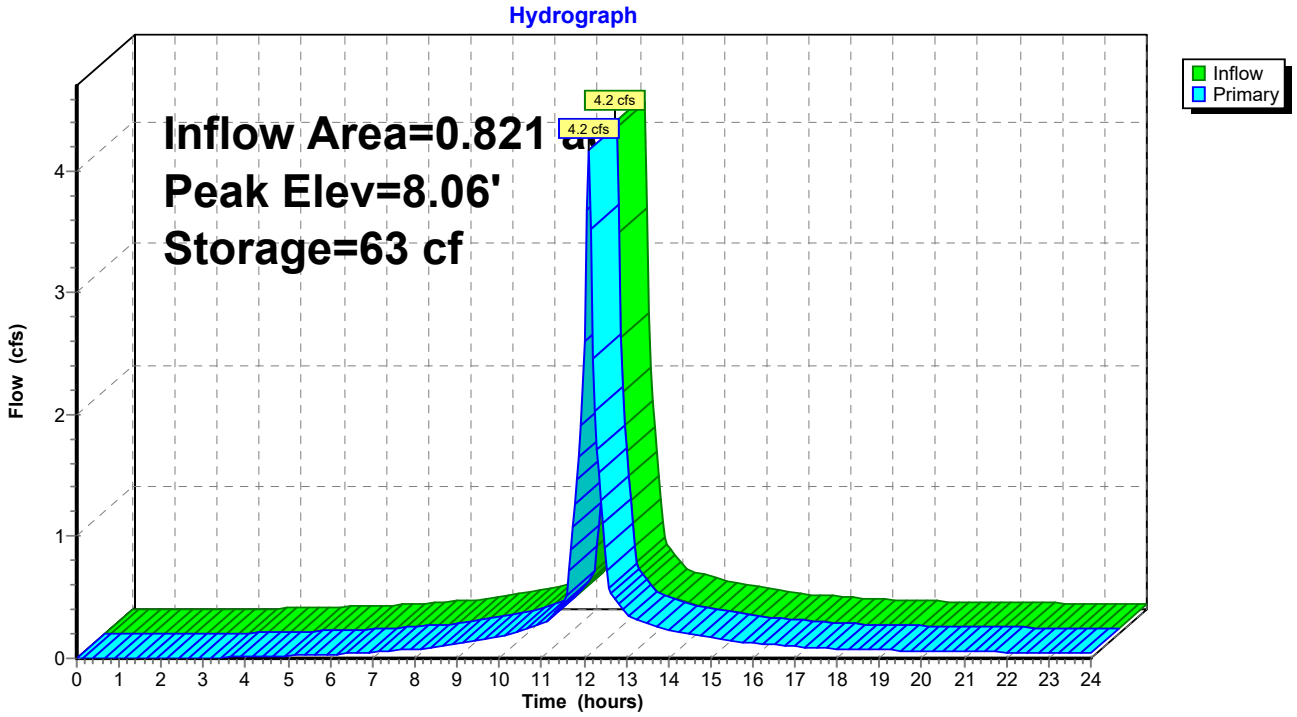
Plug-Flow detention time= 0.1 min calculated for 0.33 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (774.6 - 774.5)

Volume	Invert	Avail.Storage	Storage Description
#1	7.82'	494 cf	**2.00'W x 95.20'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.66'	**12.0" Round Culvert** L= 41.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.66' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.82'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=4.1 cfs @ 12.10 hrs HW=8.06' (Free Discharge)
└─**1=Culvert** (Passes 4.1 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 4.1 cfs @ 2.34 fps)

Pond CB-13: 18" NYLOPLAST DRAIN



Summary for Pond CB-2: 18" NYLOPLAST DRAIN

Inflow Area = 0.958 ac, 0.00% Impervious, Inflow Depth > 4.90" for 25-Year event
Inflow = 5.0 cfs @ 12.09 hrs, Volume= 0.39 af
Outflow = 4.9 cfs @ 12.09 hrs, Volume= 0.39 af, Atten= 2%, Lag= 0.3 min
Primary = 4.9 cfs @ 12.09 hrs, Volume= 0.39 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 9.11' @ 12.09 hrs Surf.Area= 245 sf Storage= 60 cf
Flood Elev= 9.85' Surf.Area= 528 sf Storage= 318 cf

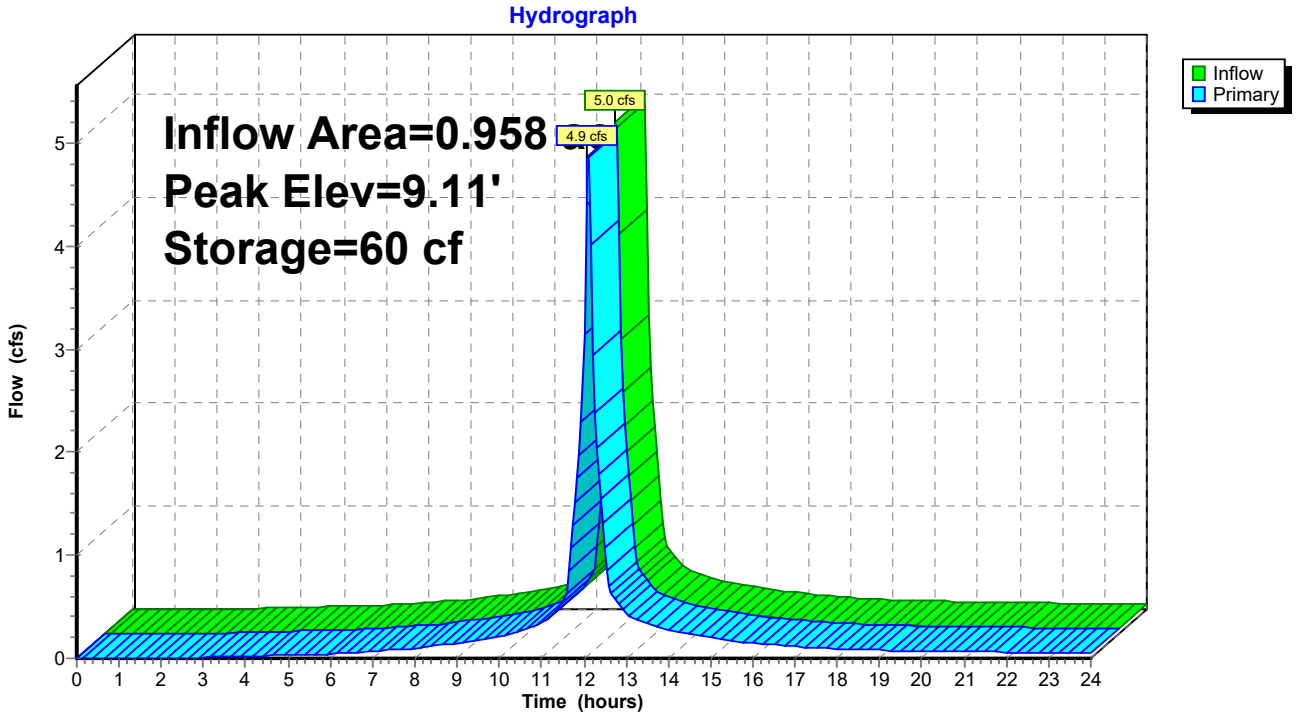
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (770.0 - 769.9)

Volume	Invert	Avail.Storage	Storage Description
#1	8.78'	318 cf	**2.00'W x 60.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.60'	**12.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.60' / 6.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.78'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=4.8 cfs @ 12.09 hrs HW=9.10' (Free Discharge)
└─**1=Culvert** (Passes 4.8 cfs of 5.3 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 4.8 cfs @ 2.71 fps)

Pond CB-2: 18" NYLOPLAST DRAIN



Summary for Pond CB-3: 18" NYLOPLAST DRAIN

Inflow Area = 0.376 ac, 0.00% Impervious, Inflow Depth > 4.78" for 25-Year event
Inflow = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af
Outflow = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af, Atten= 1%, Lag= 0.0 min
Primary = 1.9 cfs @ 12.09 hrs, Volume= 0.15 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.80' @ 12.09 hrs Surf.Area= 0.004 ac Storage= 0.00 af
Flood Elev= 9.85' Surf.Area= 0.014 ac Storage= 0.01 af

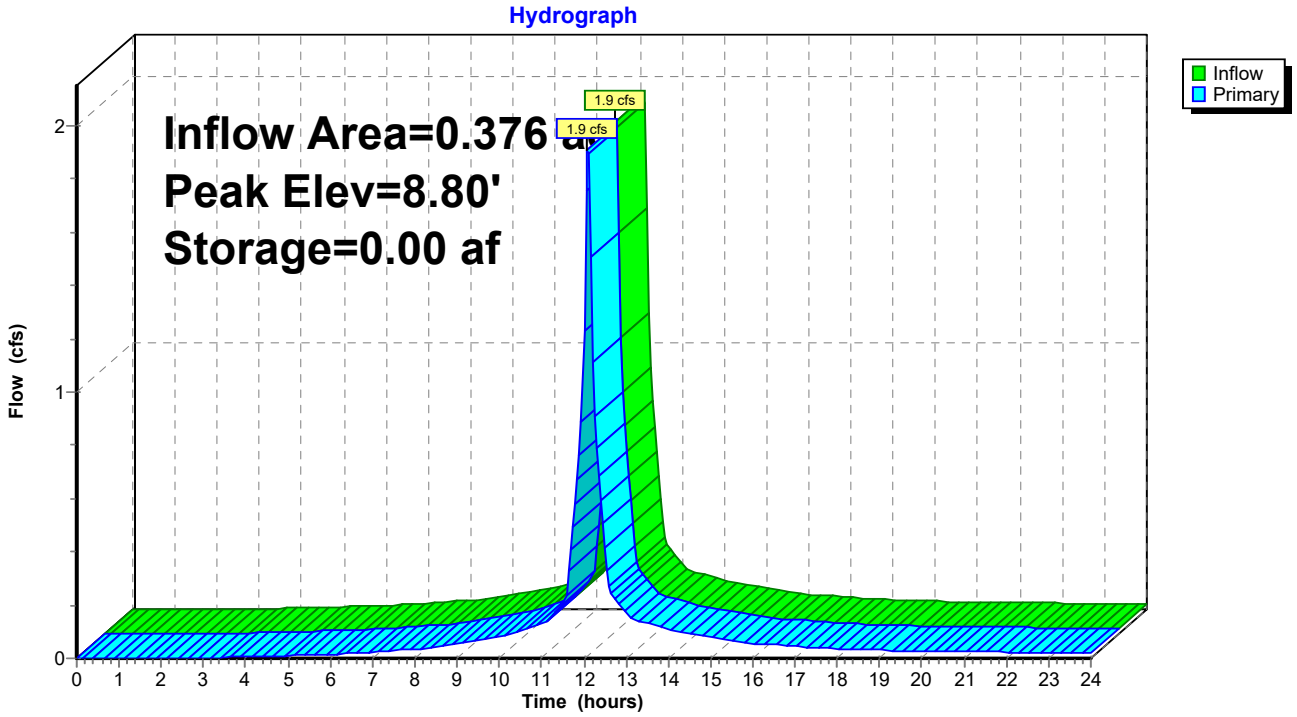
Plug-Flow detention time= 0.4 min calculated for 0.15 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (774.6 - 774.5)

Volume	Invert	Avail.Storage	Storage Description
#1	8.75'	0.01 af	**2.00'W x 71.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.55'	**12.0" Round Culvert** L= 23.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.55' / 6.43' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.75'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.9 cfs @ 12.09 hrs HW=8.80' (Free Discharge)
└─**1=Culvert** (Passes 1.9 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.9 cfs @ 1.06 fps)

Pond CB-3: 18" NYLOPLAST DRAIN



Summary for Pond CB-4: 18" NYLOPLAST DRAIN

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth > 4.56" for 25-Year event
Inflow = 1.4 cfs @ 12.09 hrs, Volume= 0.11 af
Outflow = 1.4 cfs @ 12.09 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.1 min
Primary = 1.4 cfs @ 12.09 hrs, Volume= 0.11 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.99' @ 12.09 hrs Surf.Area= 152 sf Storage= 4 cf
Flood Elev= 9.85' Surf.Area= 553 sf Storage= 304 cf

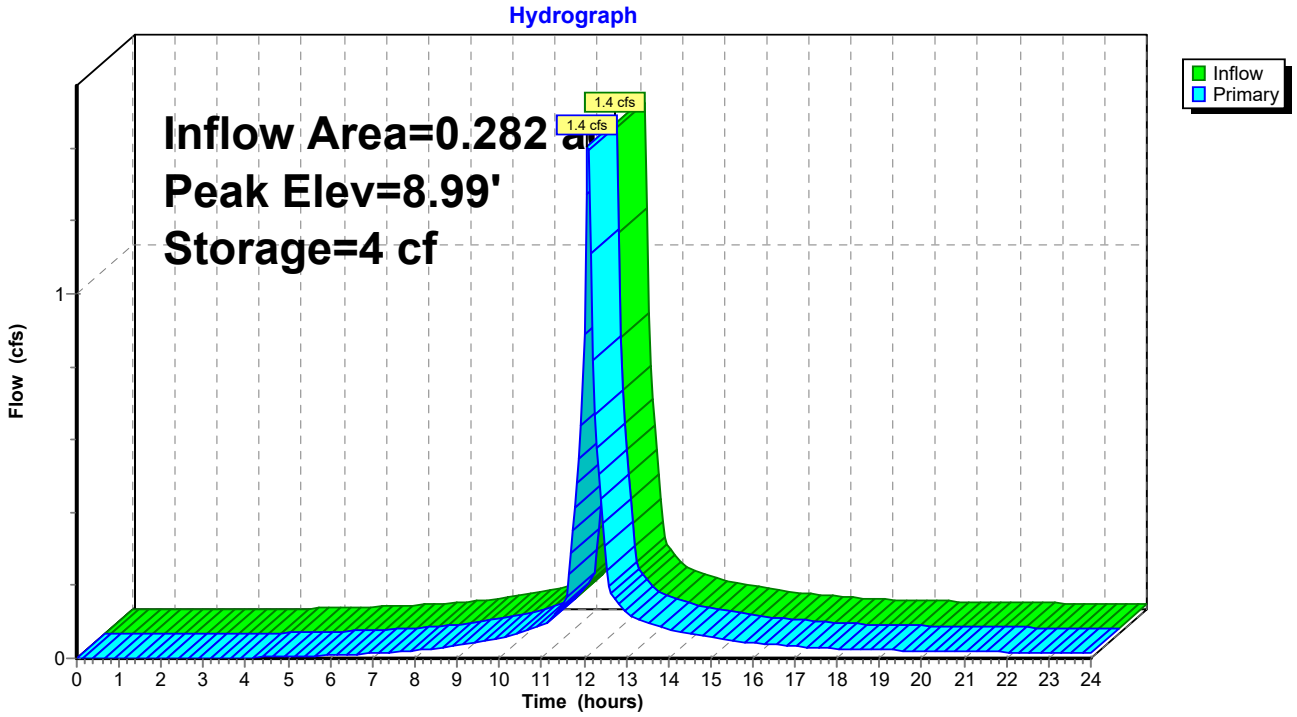
Plug-Flow detention time= 0.0 min calculated for 0.11 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (782.8 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.96'	368 cf	**2.00'W x 70.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.70'	**12.0" Round Culvert** L= 53.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.70' / 6.43' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.96'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.4 cfs @ 12.09 hrs HW=8.99' (Free Discharge)
└─**1=Culvert** (Passes 1.4 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.4 cfs @ 0.78 fps)

Pond CB-4: 18" NYLOPLAST DRAIN



Summary for Pond CB-5: 18" NYLOPLAST DRAIN

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth > 3.72" for 25-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Outflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.03' @ 12.09 hrs Surf.Area= 138 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 505 sf Storage= 259 cf

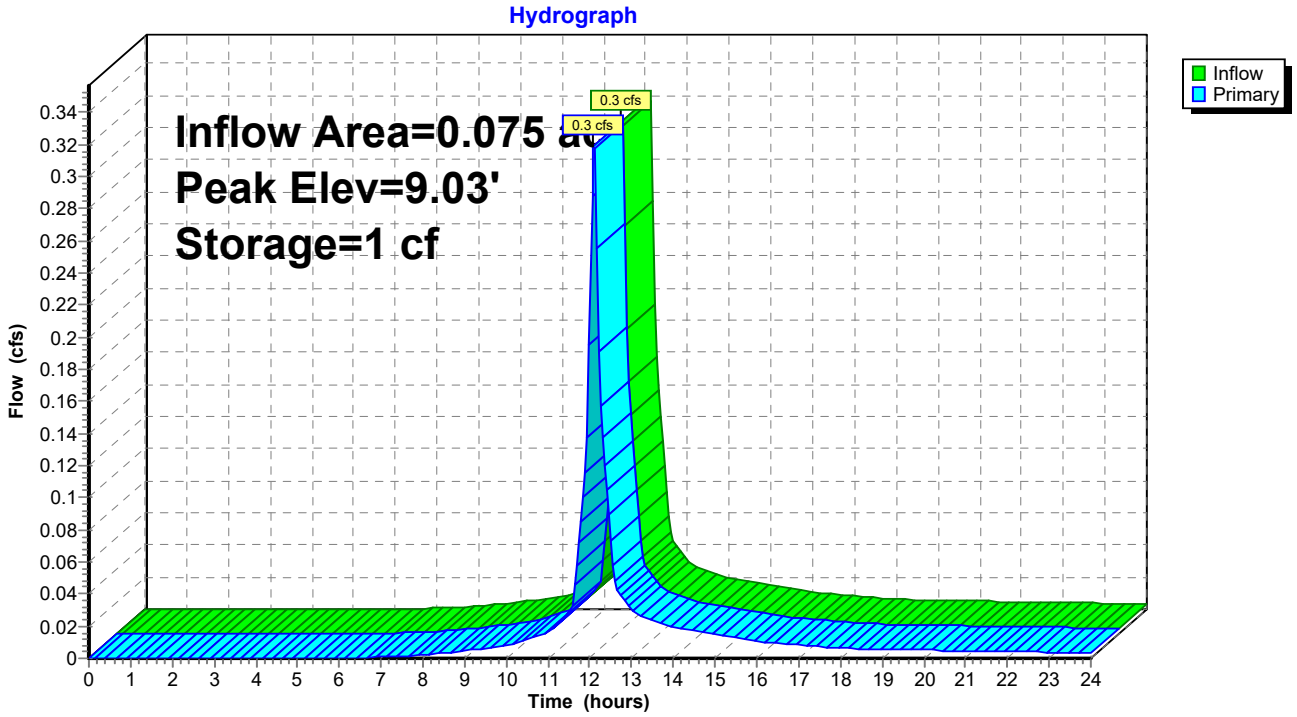
Plug-Flow detention time= 0.0 min calculated for 0.02 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (808.4 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1	9.03'	358 cf	**2.00'W x 68.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.88'	**12.0" Round Culvert** L= 66.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.88' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.03'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.5 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.5 cfs of 4.3 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.5 cfs @ 0.29 fps)

Pond CB-5: 18" NYLOPLAST DRAIN



Summary for Pond CB-6: 18" NYLOPLAST DRAIN

Inflow Area = 0.072 ac, 0.00% Impervious, Inflow Depth > 3.42" for 25-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Outflow = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 12.09 hrs, Volume= 0.02 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.91' @ 12.09 hrs Surf.Area= 212 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 845 sf Storage= 491 cf

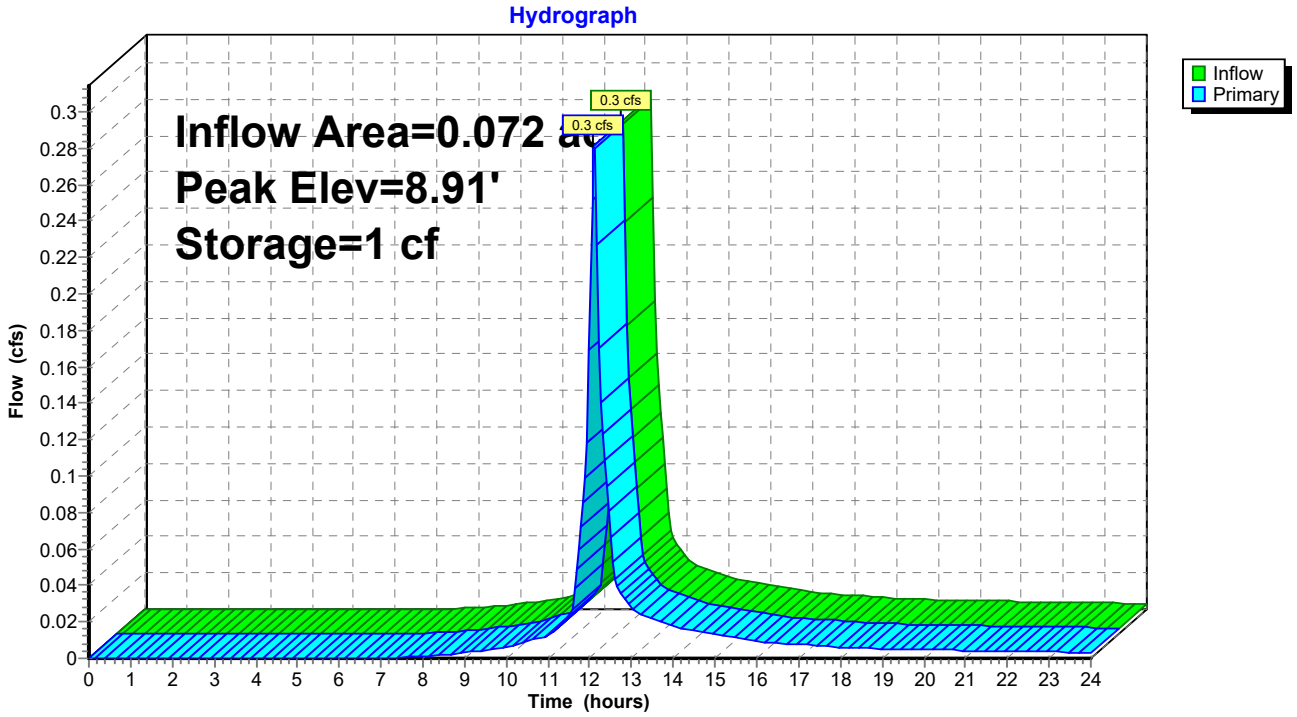
Plug-Flow detention time= 0.0 min calculated for 0.02 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (816.5 - 816.4)

Volume	Invert	Avail.Storage	Storage Description
#1	8.91'	543 cf	**2.00'W x 105.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.76'	**12.0" Round Culvert** L= 42.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.76' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.91'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.5 cfs @ 12.09 hrs HW=8.91' (Free Discharge)
└─**1=Culvert** (Passes 0.5 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.5 cfs @ 0.27 fps)

Pond CB-6: 18" NYLOPLAST DRAIN



Summary for Pond CB-7: 18" NYLOPLAST DRAIN

Inflow Area = 0.451 ac, 0.00% Impervious, Inflow Depth > 4.67" for 25-Year event
Inflow = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af
Outflow = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.2 min
Primary = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.72' @ 12.09 hrs Surf.Area= 183 sf Storage= 12 cf
Flood Elev= 9.85' Surf.Area= 648 sf Storage= 393 cf

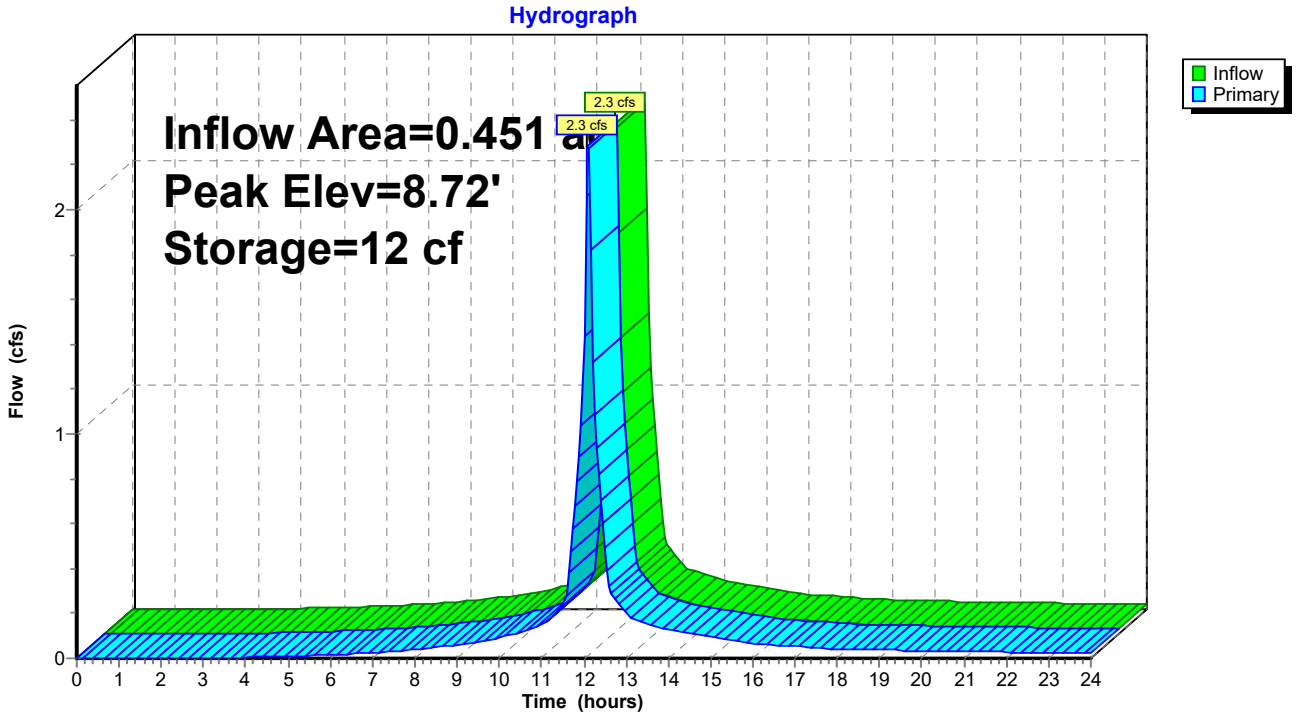
Plug-Flow detention time= 0.0 min calculated for 0.18 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (778.8 - 778.8)

Volume	Invert	Avail.Storage	Storage Description
#1	8.65'	393 cf	**2.00'W x 75.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.50'	**12.0" Round Culvert** L= 49.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.50' / 6.25' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.65'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.2 cfs @ 12.09 hrs HW=8.72' (Free Discharge)
└─**1=Culvert** (Passes 2.2 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.2 cfs @ 1.26 fps)

Pond CB-7: 18" NYLOPLAST DRAIN



Summary for Pond CB-8: 18" NYLOPLAST DRAIN

Inflow Area = 0.682 ac, 0.00% Impervious, Inflow Depth > 4.56" for 25-Year event
Inflow = 3.4 cfs @ 12.09 hrs, Volume= 0.26 af
Outflow = 3.4 cfs @ 12.09 hrs, Volume= 0.26 af, Atten= 0%, Lag= 0.4 min
Primary = 3.4 cfs @ 12.09 hrs, Volume= 0.26 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.69' @ 12.09 hrs Surf.Area= 259 sf Storage= 34 cf
Flood Elev= 9.85' Surf.Area= 744 sf Storage= 453 cf

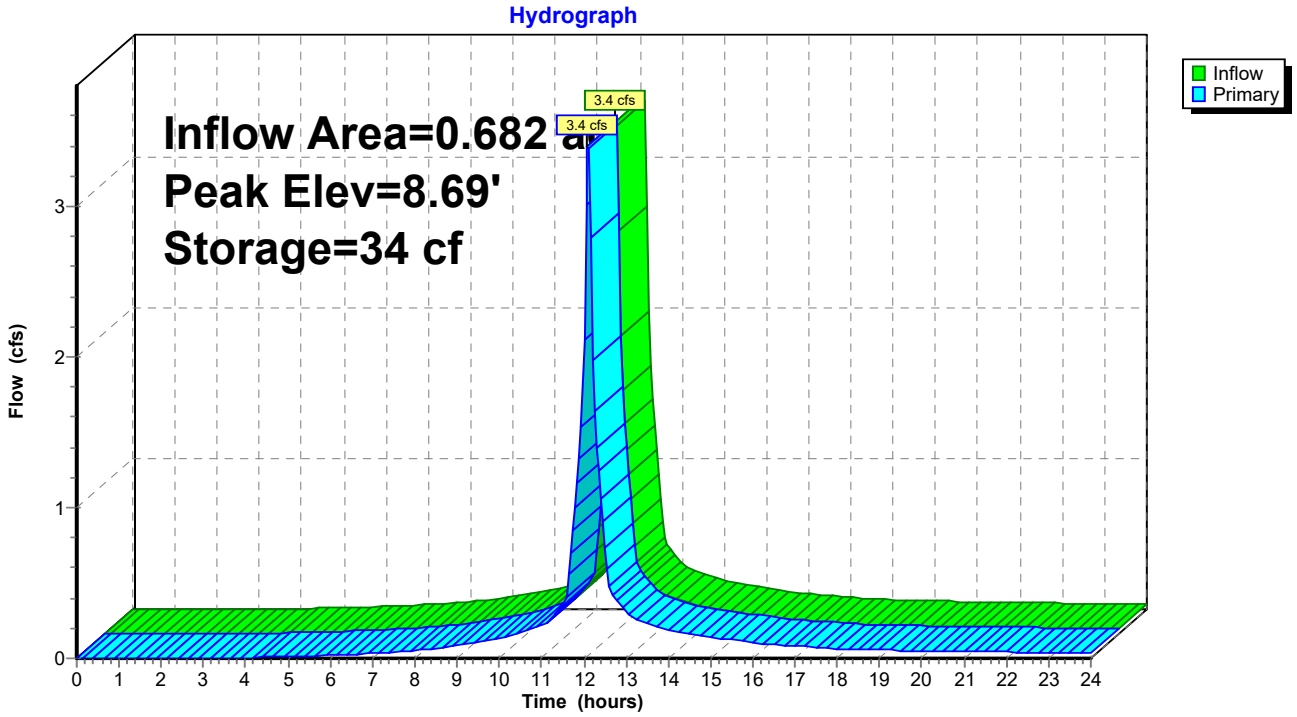
Plug-Flow detention time= 0.1 min calculated for 0.26 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (782.8 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.53'	453 cf	**2.00'W x 87.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.38'	**12.0" Round Culvert** L= 26.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.38' / 6.25' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.53'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=3.3 cfs @ 12.09 hrs HW=8.68' (Free Discharge)
└─**1=Culvert** (Passes 3.3 cfs of 5.1 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 3.3 cfs @ 1.89 fps)

Pond CB-8: 18" NYLOPLAST DRAIN



Summary for Pond CB-9: 18" NYLOPLAST DRAIN

Inflow Area = 1.111 ac, 5.88% Impervious, Inflow Depth > 4.90" for 25-Year event
Inflow = 5.8 cfs @ 12.09 hrs, Volume= 0.45 af
Outflow = 5.8 cfs @ 12.09 hrs, Volume= 0.45 af, Atten= 0%, Lag= 0.2 min
Primary = 5.8 cfs @ 12.09 hrs, Volume= 0.45 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.06' @ 12.09 hrs Surf.Area= 201 sf Storage= 25 cf
Flood Elev= 9.18' Surf.Area= 600 sf Storage= 363 cf

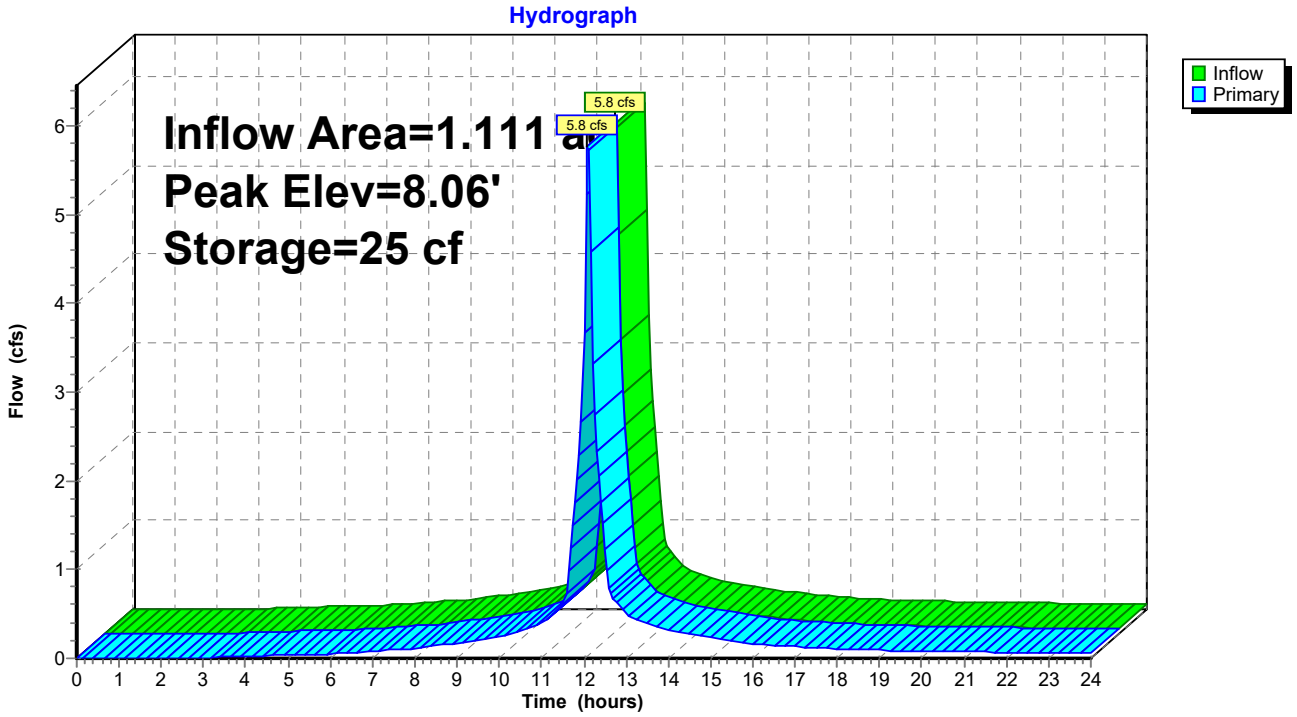
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (769.9 - 769.9)

Volume	Invert	Avail.Storage	Storage Description
#1	7.92'	363 cf	**2.00'W x 69.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.78'	**18.0" Round Culvert** L= 65.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.78' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	7.92'	**24.0" Horiz. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.6 cfs @ 12.09 hrs HW=8.06' (Free Discharge)
└─**1=Culvert** (Passes 5.6 cfs of 9.4 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 5.6 cfs @ 1.79 fps)

Pond CB-9: 18" NYLOPLAST DRAIN



Summary for Pond WQU-1: STORMCEPTOR STC-900

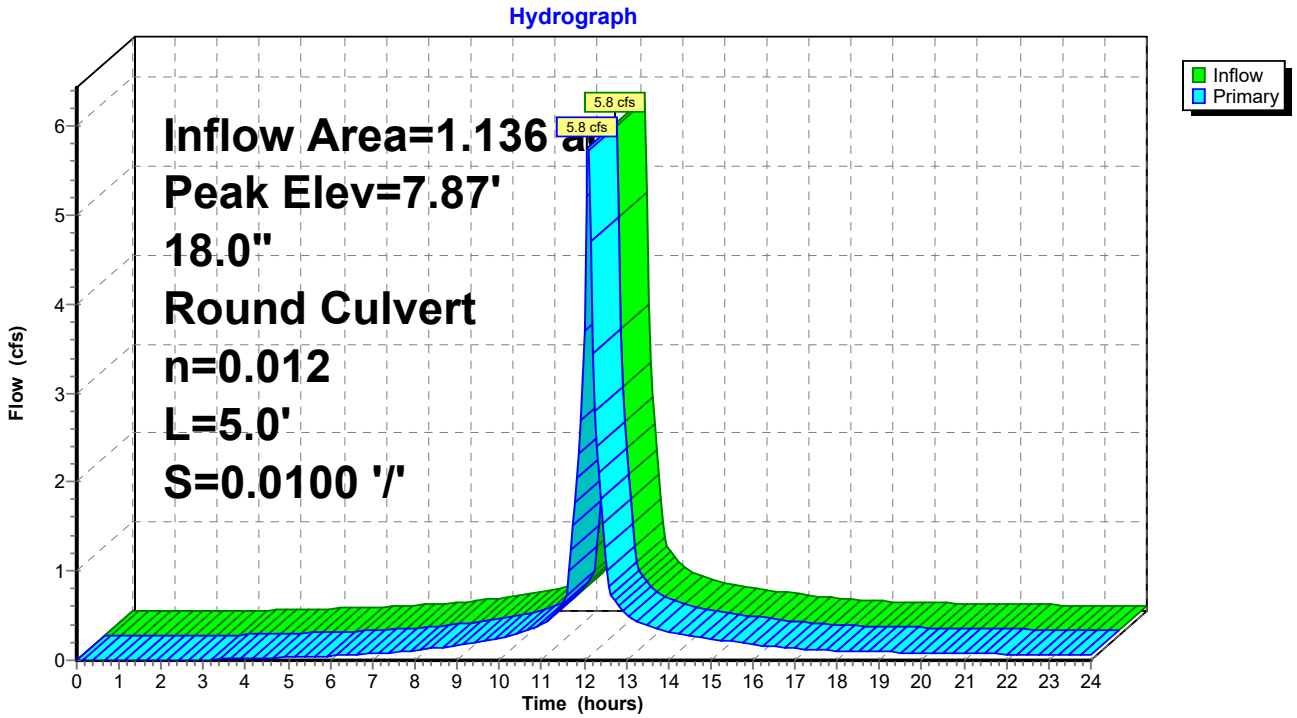
Inflow Area = 1.136 ac, 0.00% Impervious, Inflow Depth > 4.85" for 25-Year event
Inflow = 5.8 cfs @ 12.09 hrs, Volume= 0.46 af
Outflow = 5.8 cfs @ 12.09 hrs, Volume= 0.46 af, Atten= 0%, Lag= 0.0 min
Primary = 5.8 cfs @ 12.09 hrs, Volume= 0.46 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.87' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.40'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.40' / 6.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.6 cfs @ 12.09 hrs HW=7.85' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 5.6 cfs @ 4.12 fps)

Pond WQU-1: STORMCEPTOR STC-900



Summary for Pond WQU-2: STORMCEPTOR STC-900

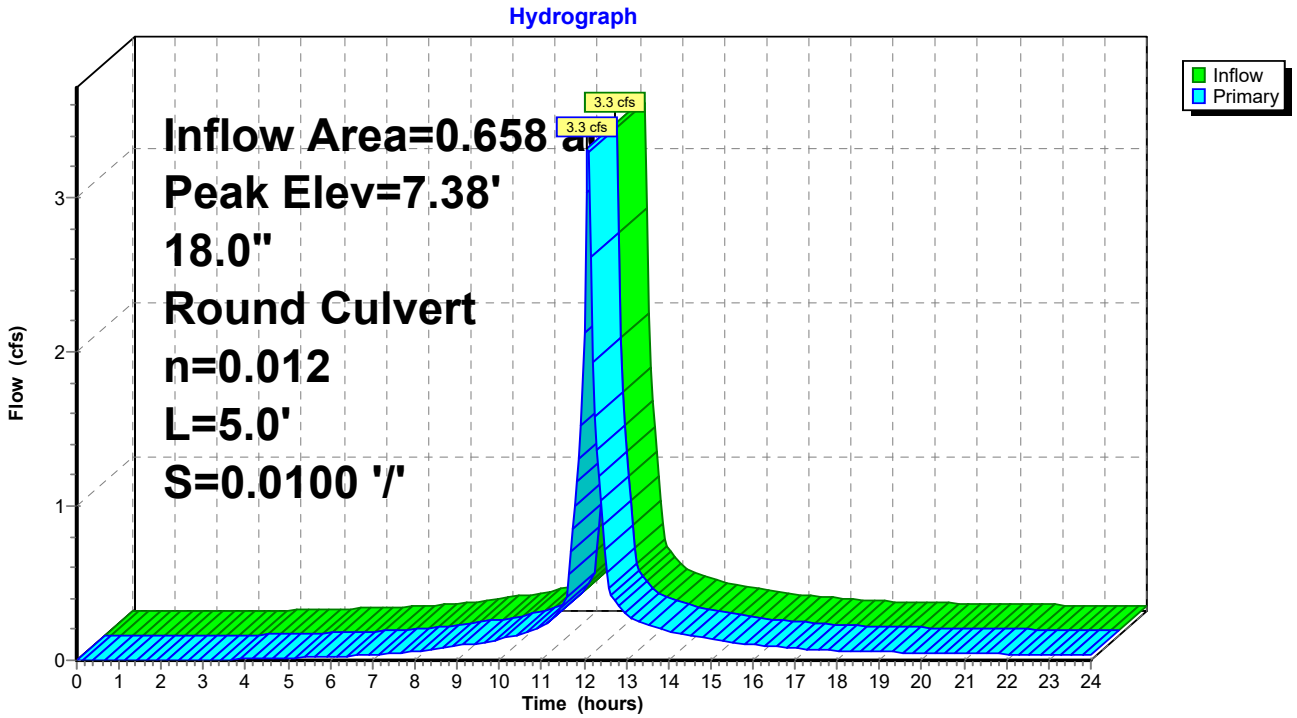
Inflow Area = 0.658 ac, 0.00% Impervious, Inflow Depth > 4.69" for 25-Year event
Inflow = 3.3 cfs @ 12.09 hrs, Volume= 0.26 af
Outflow = 3.3 cfs @ 12.09 hrs, Volume= 0.26 af, Atten= 0%, Lag= 0.0 min
Primary = 3.3 cfs @ 12.09 hrs, Volume= 0.26 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.38' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.34'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.34' / 6.29' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.2 cfs @ 12.09 hrs HW=7.37' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 3.2 cfs @ 3.54 fps)

Pond WQU-2: STORMCEPTOR STC-900



Summary for Pond WQU-3: STORMCEPTOR STC-900

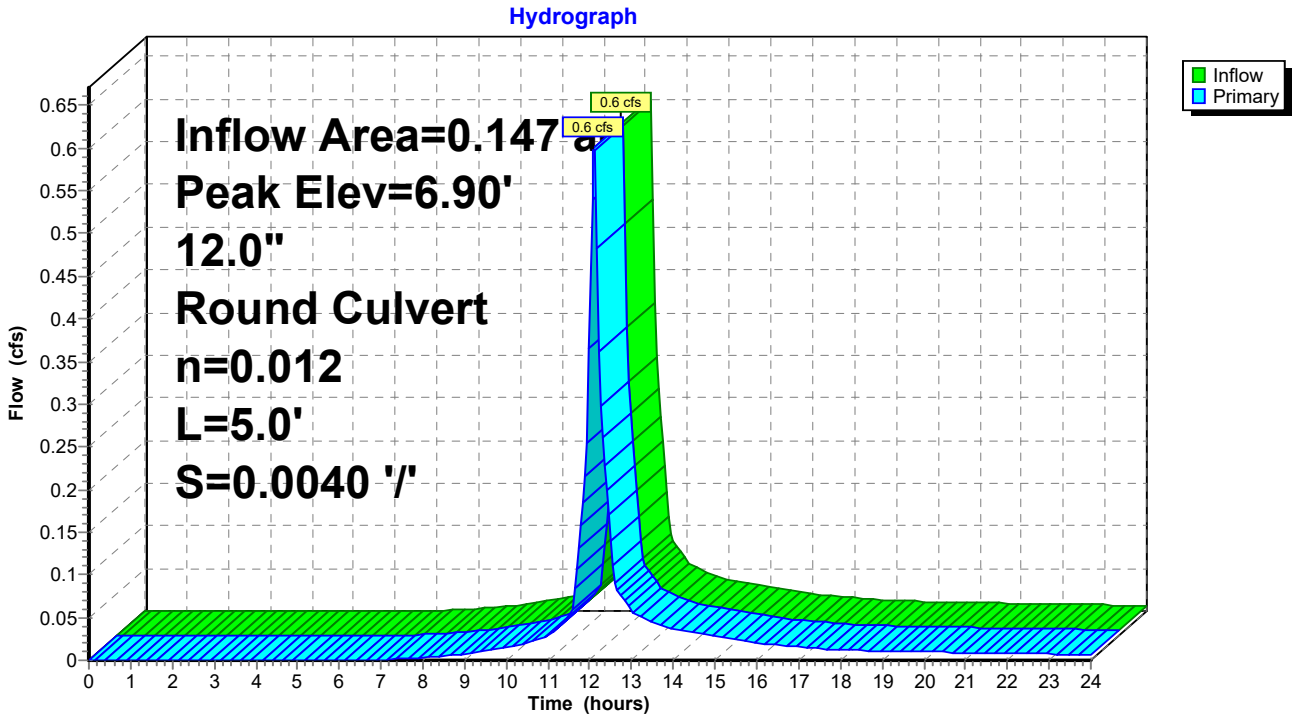
Inflow Area = 0.147 ac, 0.00% Impervious, Inflow Depth > 3.57" for 25-Year event
Inflow = 0.6 cfs @ 12.09 hrs, Volume= 0.04 af
Outflow = 0.6 cfs @ 12.09 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min
Primary = 0.6 cfs @ 12.09 hrs, Volume= 0.04 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.90' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.42'	**12.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.42' / 6.40' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.6 cfs @ 12.09 hrs HW=6.90' (Free Discharge)
└─**1=Outlet to Pond** (Barrel Controls 0.6 cfs @ 2.31 fps)

Pond WQU-3: STORMCEPTOR STC-900



Summary for Pond WQU-4: STORMCEPTOR STC-900

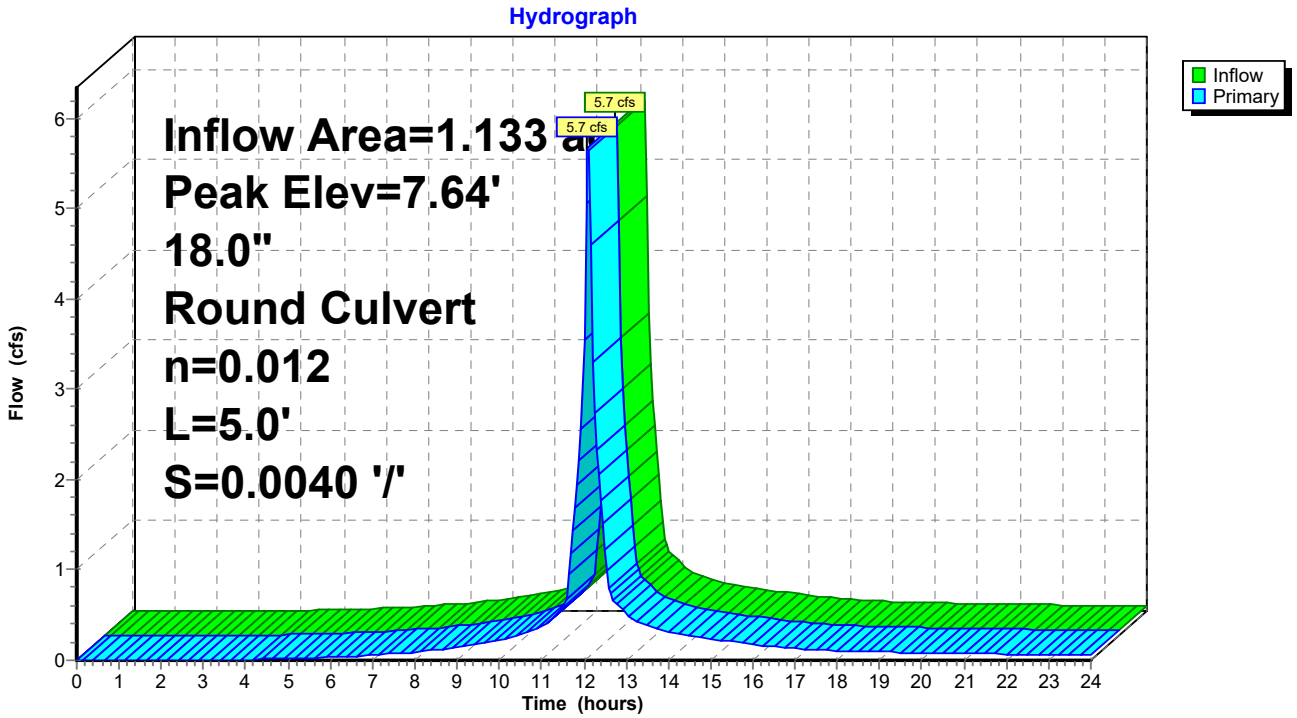
Inflow Area = 1.133 ac, 0.00% Impervious, Inflow Depth > 4.61" for 25-Year event
Inflow = 5.7 cfs @ 12.09 hrs, Volume= 0.43 af
Outflow = 5.7 cfs @ 12.09 hrs, Volume= 0.43 af, Atten= 0%, Lag= 0.0 min
Primary = 5.7 cfs @ 12.09 hrs, Volume= 0.43 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.64' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.15'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.15' / 6.13' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.6 cfs @ 12.09 hrs HW=7.62' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 5.6 cfs @ 4.00 fps)

Pond WQU-4: STORMCEPTOR STC-900



Summary for Pond WQU-5: STORMCEPTOR STC-900

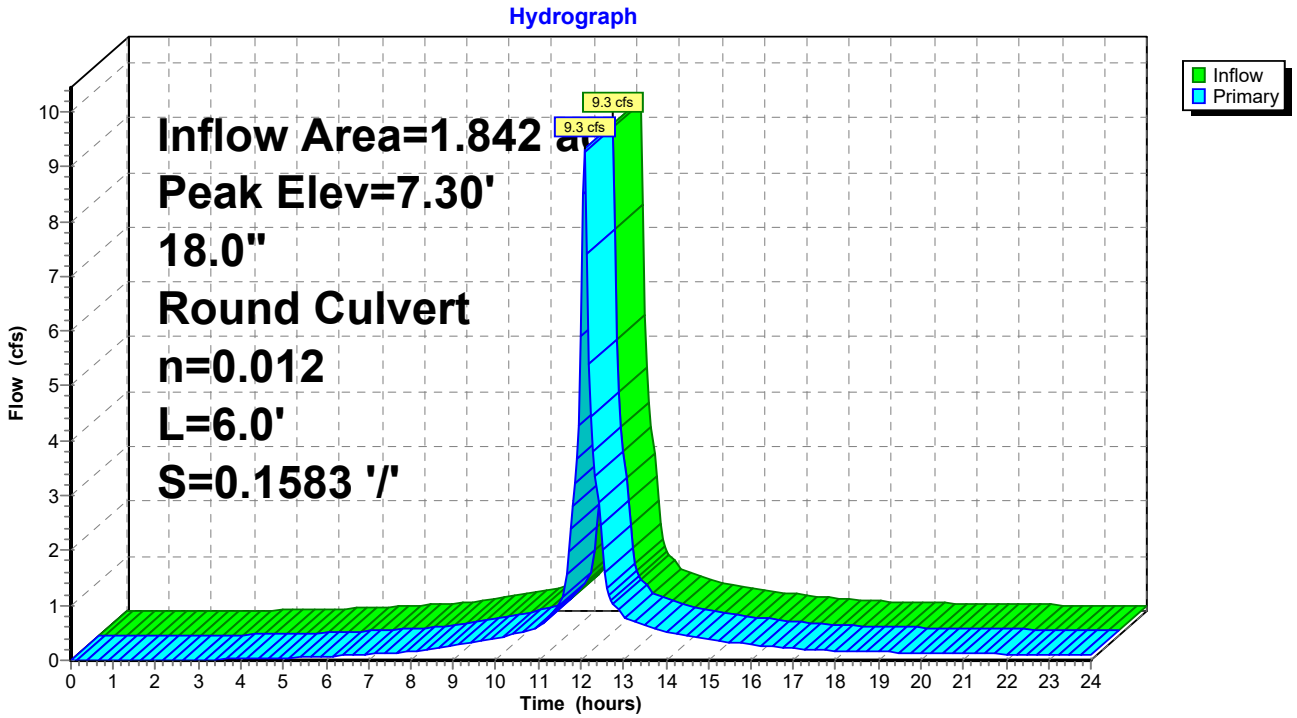
Inflow Area = 1.842 ac, 3.55% Impervious, Inflow Depth > 4.72" for 25-Year event
Inflow = 9.3 cfs @ 12.09 hrs, Volume= 0.72 af
Outflow = 9.3 cfs @ 12.09 hrs, Volume= 0.72 af, Atten= 0%, Lag= 0.0 min
Primary = 9.3 cfs @ 12.09 hrs, Volume= 0.72 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.1 cfs @ 12.09 hrs HW=7.25' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 9.1 cfs @ 5.16 fps)

Pond WQU-5: STORMCEPTOR STC-900



Summary for Pond WQU-6: STORMCEPTOR STC-900

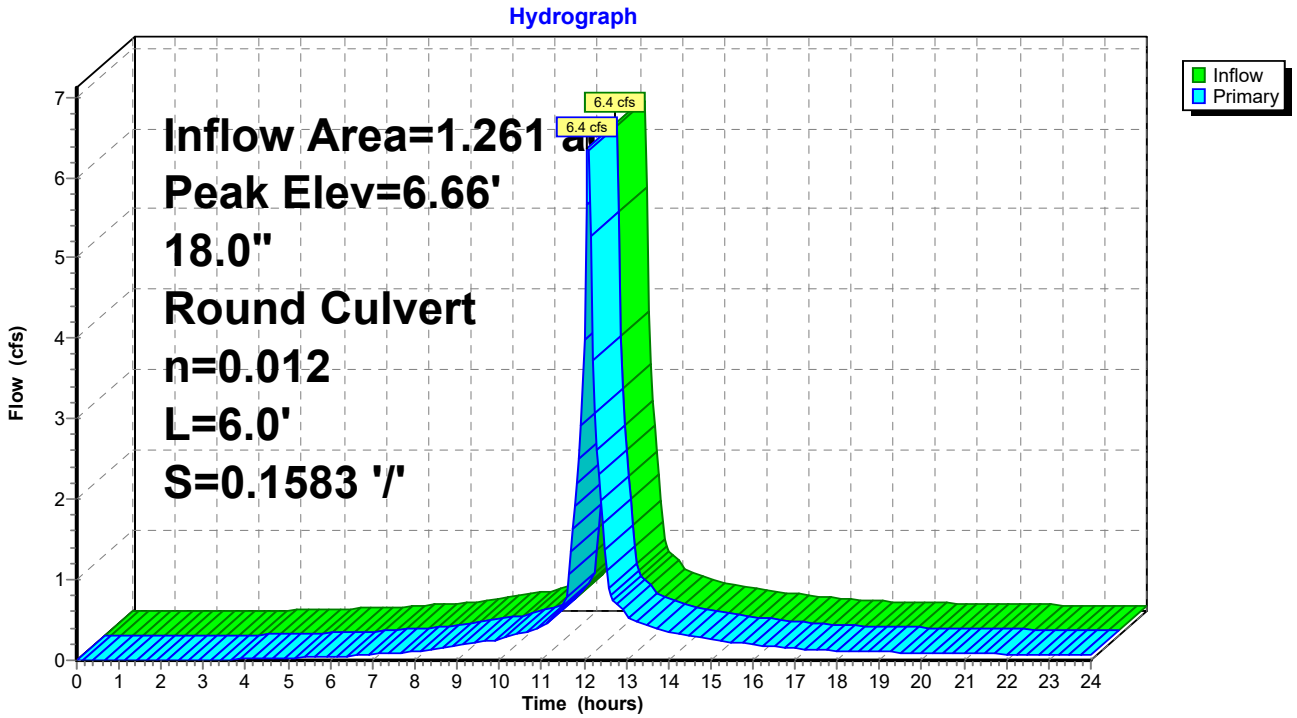
Inflow Area = 1.261 ac, 0.00% Impervious, Inflow Depth > 4.71" for 25-Year event
Inflow = 6.4 cfs @ 12.09 hrs, Volume= 0.49 af
Outflow = 6.4 cfs @ 12.09 hrs, Volume= 0.49 af, Atten= 0%, Lag= 0.0 min
Primary = 6.4 cfs @ 12.09 hrs, Volume= 0.49 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.66' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.3 cfs @ 12.09 hrs HW=6.64' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 6.3 cfs @ 3.87 fps)

Pond WQU-6: STORMCEPTOR STC-900

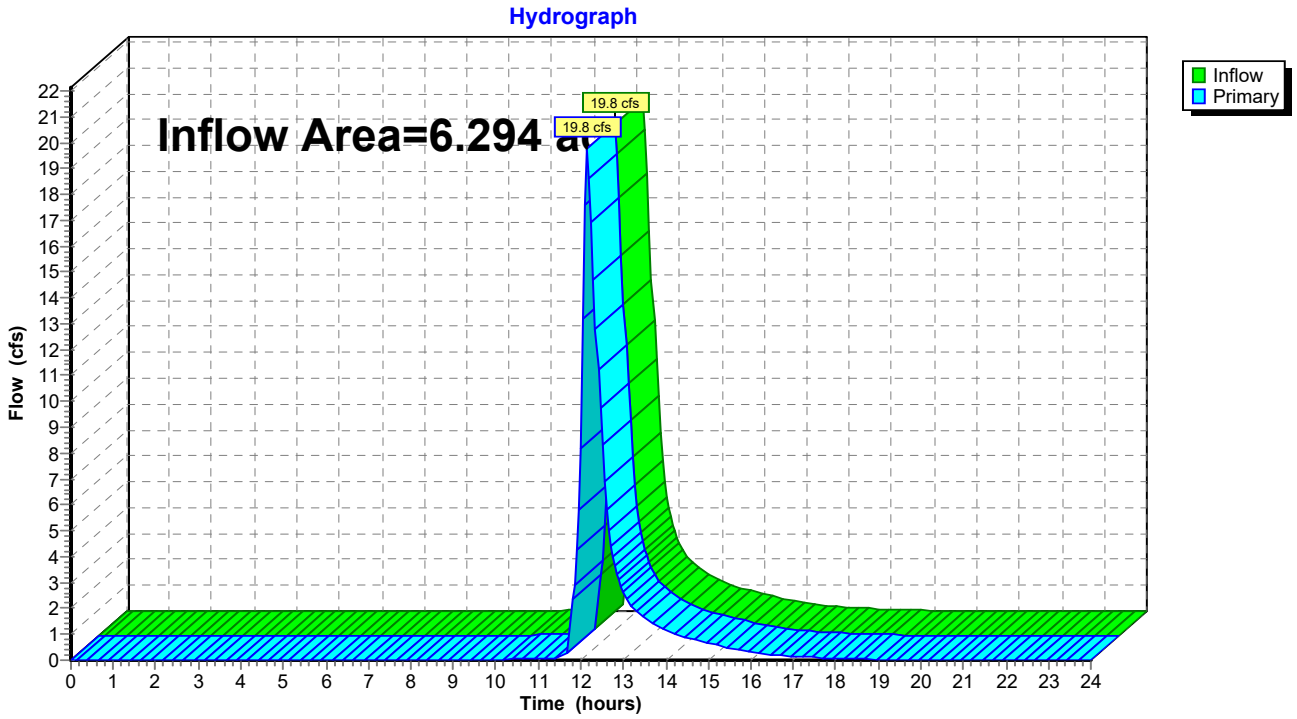


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 6.294 ac, 2.92% Impervious, Inflow Depth > 2.22" for 25-Year event
Inflow = 19.8 cfs @ 12.16 hrs, Volume= 1.16 af
Primary = 19.8 cfs @ 12.16 hrs, Volume= 1.16 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

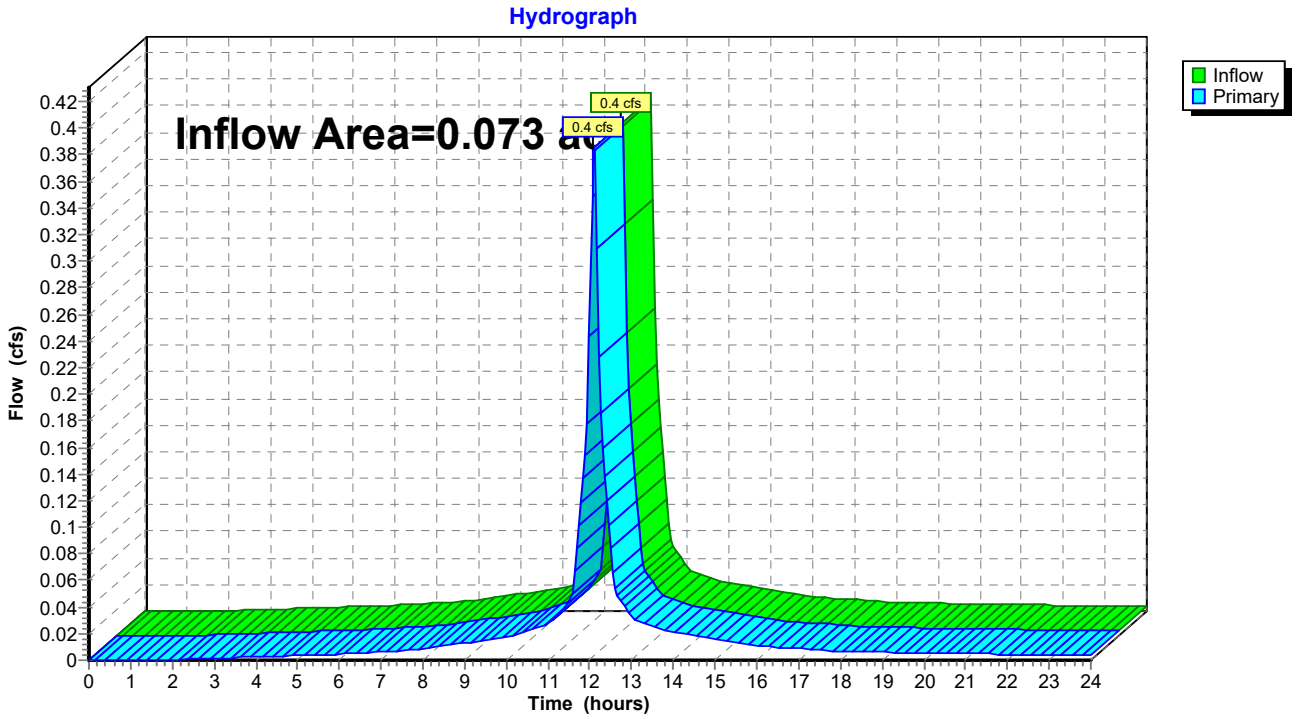


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 0.073 ac, 0.00% Impervious, Inflow Depth > 5.13" for 25-Year event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Primary = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2A-PR: SUBCATCHMENT Runoff Area=5,164 sf 100.00% Impervious Runoff Depth>6.76"
Tc=6.0 min CN=98 Runoff=0.8 cfs 0.07 af

Subcatchment2B-PR: SUBCATCHMENT Runoff Area=7,746 sf 0.00% Impervious Runoff Depth>5.93"
Flow Length=320' Tc=6.0 min CN=91 Runoff=1.1 cfs 0.09 af

Subcatchment2C-PR: SUBCATCHMENT Runoff Area=41,736 sf 0.00% Impervious Runoff Depth>6.28"
Flow Length=378' Tc=6.0 min CN=94 Runoff=6.3 cfs 0.50 af

Subcatchment2D-PR: SUBCATCHMENT Runoff Area=16,382 sf 0.00% Impervious Runoff Depth>6.17"
Flow Length=380' Tc=6.0 min CN=93 Runoff=2.4 cfs 0.19 af

Subcatchment2E-PR: SUBCATCHMENT Runoff Area=12,269 sf 0.00% Impervious Runoff Depth>5.93"
Flow Length=161' Tc=6.0 min CN=91 Runoff=1.8 cfs 0.14 af

Subcatchment2F-PR: SUBCATCHMENT Runoff Area=3,277 sf 0.00% Impervious Runoff Depth>5.02"
Flow Length=137' Tc=6.0 min CN=83 Runoff=0.4 cfs 0.03 af

Subcatchment2G-PR: SUBCATCHMENT Runoff Area=3,117 sf 0.00% Impervious Runoff Depth>4.69"
Flow Length=258' Tc=6.0 min CN=80 Runoff=0.4 cfs 0.03 af

Subcatchment2H-PR: SUBCATCHMENT Runoff Area=19,639 sf 0.00% Impervious Runoff Depth>6.05"
Flow Length=320' Tc=6.0 min CN=92 Runoff=2.9 cfs 0.23 af

Subcatchment2I-PR: SUBCATCHMENT Runoff Area=29,698 sf 0.00% Impervious Runoff Depth>5.93"
Flow Length=385' Tc=6.0 min CN=91 Runoff=4.3 cfs 0.34 af

Subcatchment2J-PR: SUBCATCHMENT Runoff Area=48,397 sf 5.88% Impervious Runoff Depth>6.28"
Flow Length=340' Tc=6.0 min CN=94 Runoff=7.3 cfs 0.58 af

Subcatchment2K-PR: SUBCATCHMENT Runoff Area=16,131 sf 0.00% Impervious Runoff Depth>5.82"
Flow Length=340' Tc=6.0 min CN=90 Runoff=2.3 cfs 0.18 af

Subcatchment2L-PR: SUBCATCHMENT Runoff Area=15,693 sf 0.00% Impervious Runoff Depth>5.82"
Flow Length=340' Tc=6.0 min CN=90 Runoff=2.3 cfs 0.17 af

Subcatchment2M-PR: SUBCATCHMENT Runoff Area=19,164 sf 0.00% Impervious Runoff Depth>5.93"
Flow Length=275' Tc=6.0 min CN=91 Runoff=2.8 cfs 0.22 af

Subcatchment2N-PR: SUBCATCHMENT Runoff Area=35,765 sf 0.00% Impervious Runoff Depth>6.17"
Flow Length=370' Tc=6.0 min CN=93 Runoff=5.3 cfs 0.42 af

Subcatchment3A-PR: SUBCATCHMENT Runoff Area=3,190 sf 0.00% Impervious Runoff Depth>6.52"
Flow Length=1,325' Tc=6.3 min CN=96 Runoff=0.5 cfs 0.04 af

Subcatchment3B-PR: SUBCATCHMENT Runoff Area=2,795 sf 100.00% Impervious Runoff Depth>6.76"
Tc=6.0 min CN=98 Runoff=0.4 cfs 0.04 af

Pond 1P: FERGUSON R-TANK CHAMBER Peak Elev=7.97' Storage=0.12 af Inflow=11.1 cfs 0.92 af
Discarded=0.1 cfs 0.20 af Primary=11.4 cfs 0.62 af Outflow=11.5 cfs 0.83 af

Pond 2P: FERGUSON R-TANK CHAMBER Peak Elev=8.25' Storage=0.10 af Inflow=8.0 cfs 0.62 af
Discarded=0.1 cfs 0.18 af Primary=7.5 cfs 0.38 af Outflow=7.6 cfs 0.56 af

Pond 3P: FERGUSON R-TANK / INFILTRATION Peak Elev=7.44' Storage=0.38 af Inflow=19.8 cfs 1.58 af
Discarded=0.5 cfs 0.79 af Primary=17.4 cfs 0.71 af Outflow=17.9 cfs 1.49 af

Pond 5P: DRAINAGE MANHOLE Peak Elev=7.49' Inflow=18.7 cfs 1.00 af
30.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=18.7 cfs 1.00 af

Pond CB-1: 18" NYLOPLAST DRAIN Peak Elev=9.04' Storage=1 cf Inflow=1.1 cfs 0.09 af
Outflow=1.1 cfs 0.09 af

Pond CB-10: 18" NYLOPLAST DRAIN Peak Elev=7.96' Storage=11 cf Inflow=2.3 cfs 0.18 af
Outflow=2.3 cfs 0.18 af

Pond CB-11: 18" NYLOPLAST DRAIN Peak Elev=7.91' Storage=10 cf Inflow=2.3 cfs 0.17 af
Outflow=2.2 cfs 0.17 af

Pond CB-12: 18" NYLOPLAST DRAIN Peak Elev=7.97' Storage=17 cf Inflow=2.8 cfs 0.22 af
Outflow=2.8 cfs 0.22 af

Pond CB-13: 18" NYLOPLAST DRAIN Peak Elev=8.21' Storage=120 cf Inflow=5.3 cfs 0.42 af
Outflow=5.2 cfs 0.42 af

Pond CB-2: 18" NYLOPLAST DRAIN Peak Elev=9.42' Storage=158 cf Inflow=6.3 cfs 0.50 af
Outflow=5.8 cfs 0.50 af

Pond CB-3: 18" NYLOPLAST DRAIN Peak Elev=8.83' Storage=0.00 af Inflow=2.4 cfs 0.19 af
Outflow=2.4 cfs 0.19 af

Pond CB-4: 18" NYLOPLAST DRAIN Peak Elev=9.00' Storage=7 cf Inflow=1.8 cfs 0.14 af
Outflow=1.8 cfs 0.14 af

Pond CB-5: 18" NYLOPLAST DRAIN Peak Elev=9.04' Storage=1 cf Inflow=0.4 cfs 0.03 af
Outflow=0.4 cfs 0.03 af

Pond CB-6: 18" NYLOPLAST DRAIN Peak Elev=8.91' Storage=1 cf Inflow=0.4 cfs 0.03 af
Outflow=0.4 cfs 0.03 af

Pond CB-7: 18" NYLOPLAST DRAIN Peak Elev=8.77' Storage=21 cf Inflow=2.9 cfs 0.23 af
Outflow=2.9 cfs 0.23 af

Pond CB-8: 18" NYLOPLAST DRAIN Peak Elev=8.79' Storage=63 cf Inflow=4.3 cfs 0.34 af
Outflow=4.3 cfs 0.34 af

Pond CB-9: 18" NYLOPLAST DRAIN Peak Elev=8.15' Storage=44 cf Inflow=7.3 cfs 0.58 af
Outflow=7.3 cfs 0.58 af

Pond WQU-1: STORMCEPTORSTC-900 Peak Elev=8.06' Inflow=6.9 cfs 0.59 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=6.9 cfs 0.59 af

Pond WQU-2: STORMCEPTORSTC-900 Peak Elev=7.54' Inflow=4.2 cfs 0.33 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=4.2 cfs 0.33 af

Pond WQU-3: STORMCEPTORSTC-900 Peak Elev=6.99' Inflow=0.8 cfs 0.06 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=0.8 cfs 0.06 af

Pond WQU-4: STORMCEPTORSTC-900 Peak Elev=7.92' Inflow=7.2 cfs 0.56 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0040 '/' Outflow=7.2 cfs 0.56 af

Pond WQU-5: STORMCEPTORSTC-900 Peak Elev=8.04' Inflow=11.9 cfs 0.94 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=11.9 cfs 0.94 af

Pond WQU-6: STORMCEPTORSTC-900 Peak Elev=6.98' Inflow=8.0 cfs 0.64 af
18.0" Round Culvert n=0.012 L=6.0' S=0.1583 '/' Outflow=8.0 cfs 0.64 af

Link 2: 66" DRAIN WRIGHT STREET Inflow=37.4 cfs 1.78 af
Primary=37.4 cfs 1.78 af

Link 3: 72" DRAIN MAIN TERMINAL Inflow=0.5 cfs 0.04 af
Primary=0.5 cfs 0.04 af

Total Runoff Area = 6.432 ac Runoff Volume = 3.26 af Average Runoff Depth = 6.09"
96.14% Pervious = 6.184 ac 3.86% Impervious = 0.248 ac

Summary for Subcatchment 2A-PR: SUBCATCHMENT 2A-PR

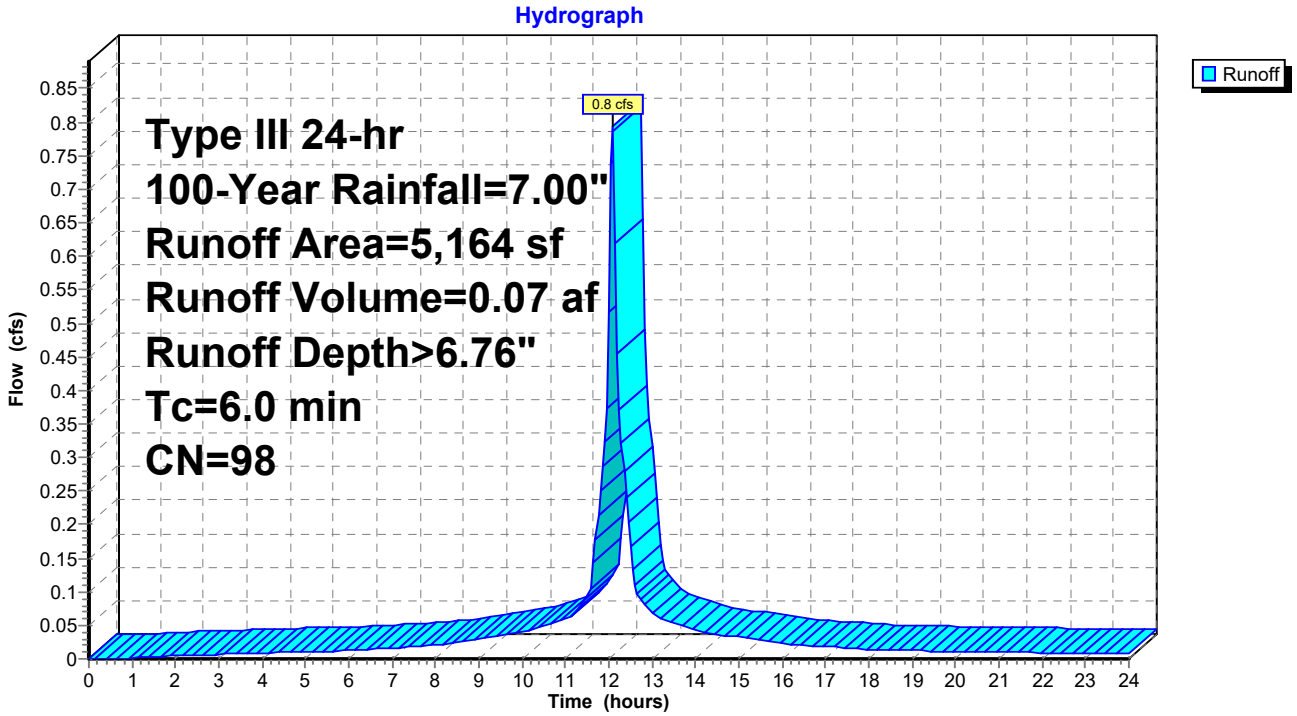
Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.07 af, Depth> 6.76"
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
5,164	98	Paved parking, HSG A
5,164		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 2A-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2B-PR: SUBCATCHMENT 2A-PR

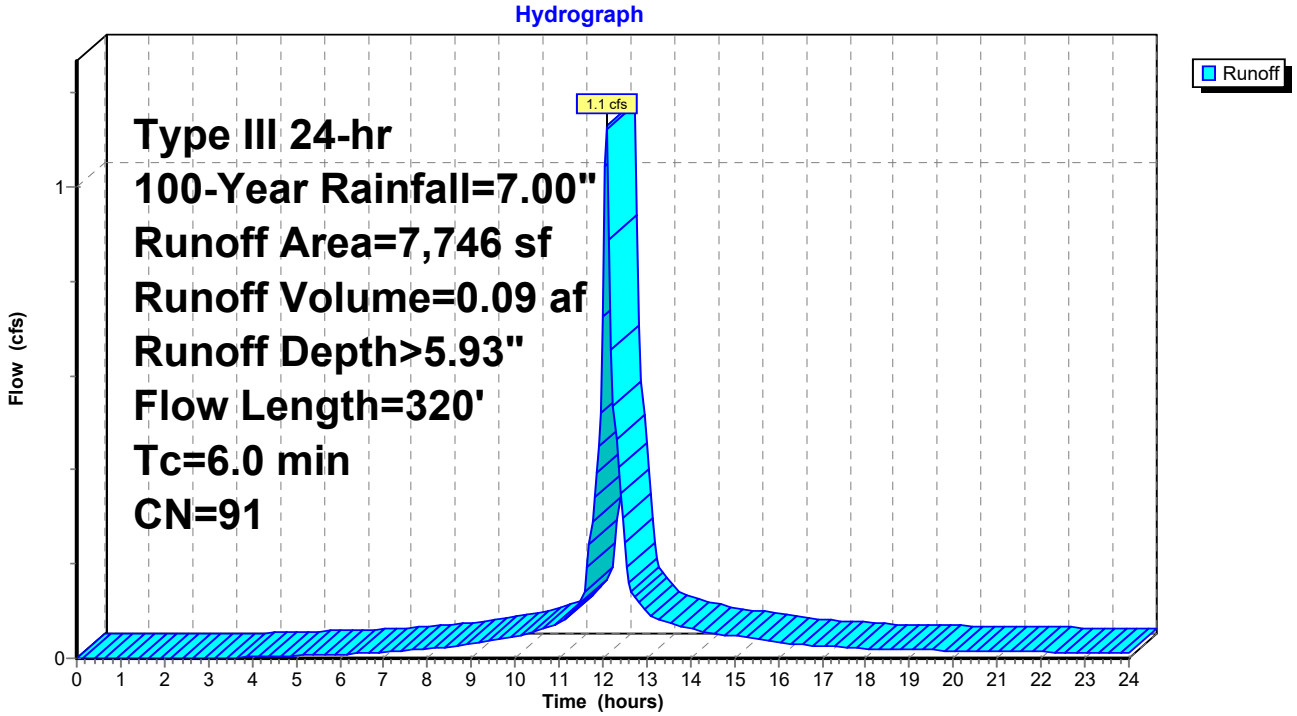
Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.09 af, Depth> 5.93"
Routed to Pond CB-1 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	693	39	Landscaped area >75% Grass cover, Good, HSG A
*	7,053	96	Heavy lift Gravel surface, HSG A
	7,746	91	Weighted Average
	7,746		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	260	0.0053	1.17		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	60	0.0100	3.53	17.63	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
4.0	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2B-PR: SUBCATCHMENT 2A-PR



Summary for Subcatchment 2C-PR: SUBCATCHMENT 2C-PR

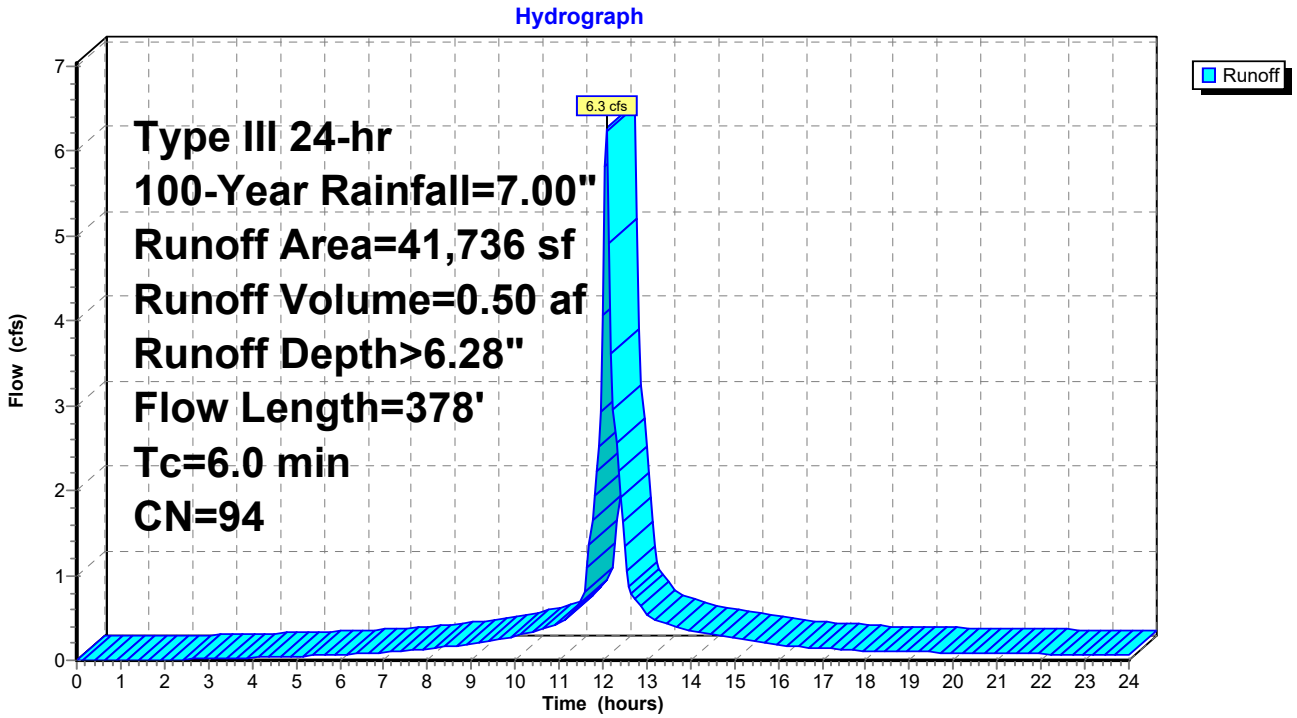
Runoff = 6.3 cfs @ 12.09 hrs, Volume= 0.50 af, Depth> 6.28"
Routed to Pond CB-2 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	1,298	39	Landscaped area >75% Grass cover, Good, HSG A
*	40,438	96	Heavy lift Gravel surface, HSG A
	41,736	94	Weighted Average
	41,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	328	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
5.1	378	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2C-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2D-PR: SUBCATCHMENT 2D-PR

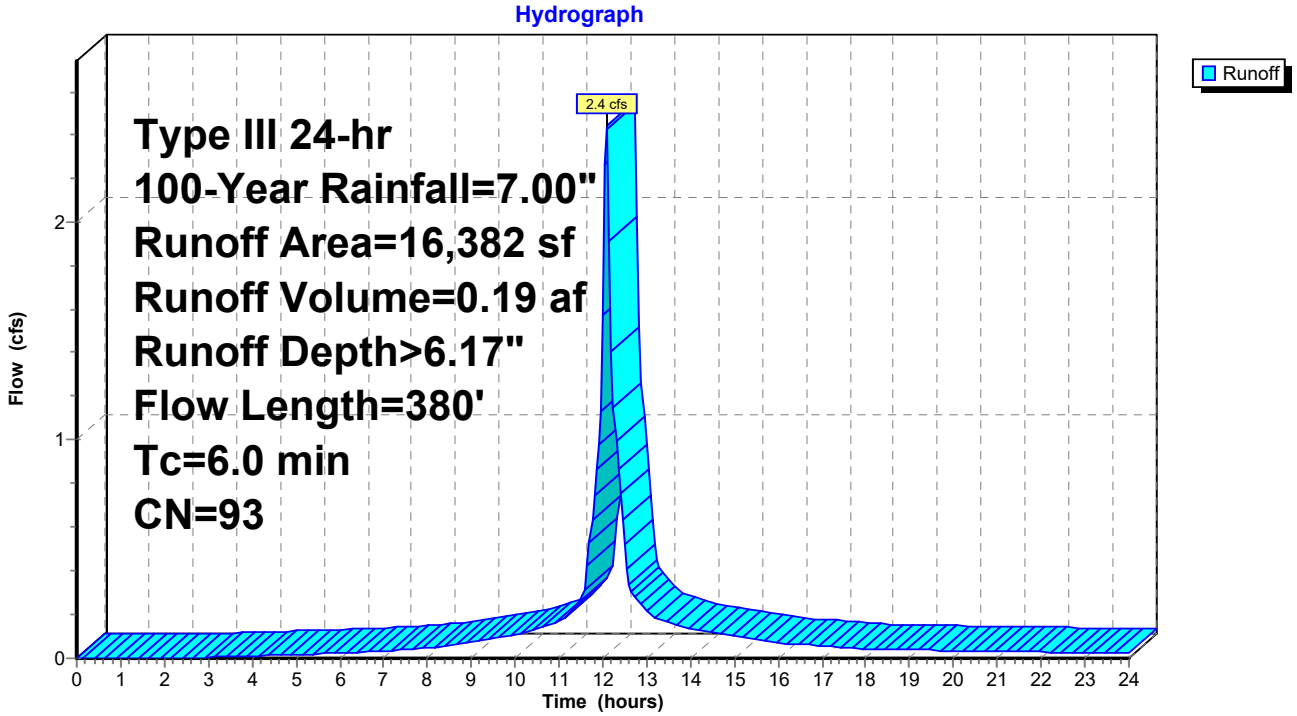
Runoff = 2.4 cfs @ 12.09 hrs, Volume= 0.19 af, Depth> 6.17"
Routed to Pond CB-3 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	962	39	Landscaped area >75% Grass cover, Good, HSG A
*	15,420	96	Heavy lift Gravel surface, HSG A
	16,382	93	Weighted Average
	16,382		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	335	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.8	380	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2D-PR: SUBCATCHMENT 2D-PR



Summary for Subcatchment 2E-PR: SUBCATCHMENT 2C-PR

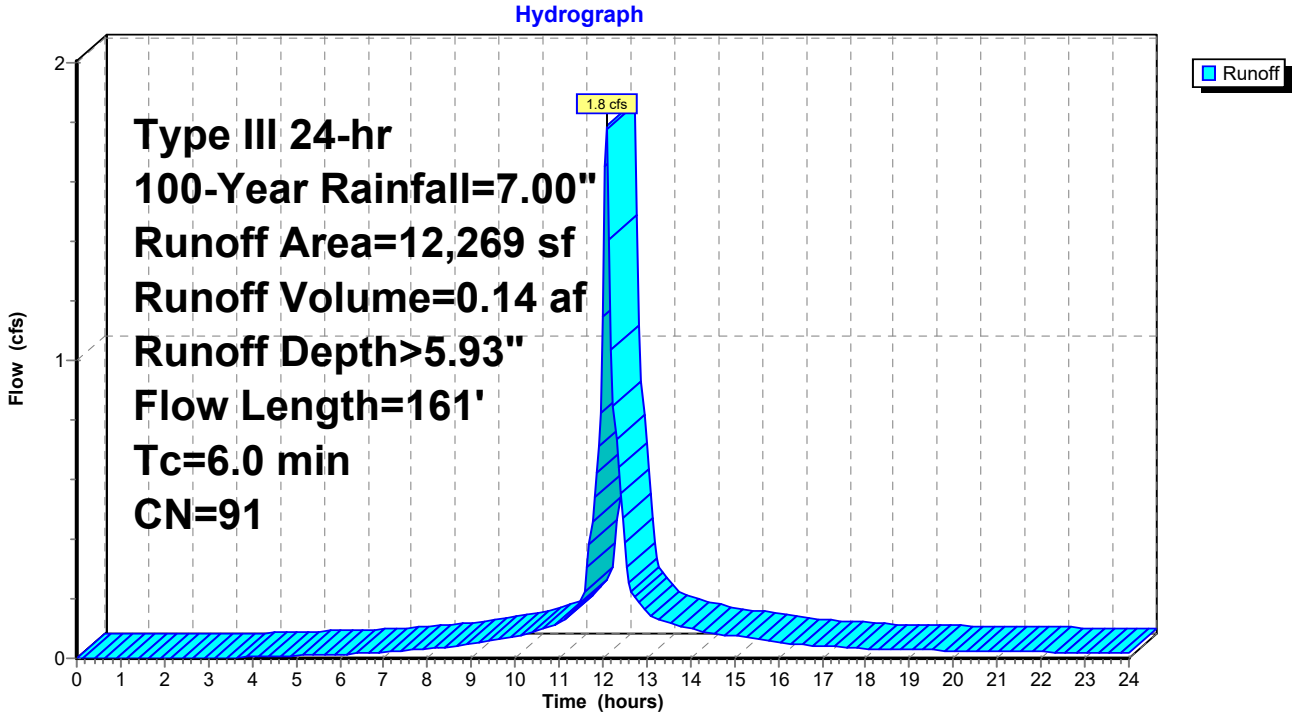
Runoff = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af, Depth> 5.93"
Routed to Pond CB-4 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	1,043	39	Landscaped area >75% Grass cover, Good, HSG A
*	11,226	96	Heavy lift Gravel surface, HSG A
	12,269	91	Weighted Average
	12,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	116	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	45	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.8	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2E-PR: SUBCATCHMENT 2C-PR



Summary for Subcatchment 2F-PR: SUBCATCHMENT 2F-PR

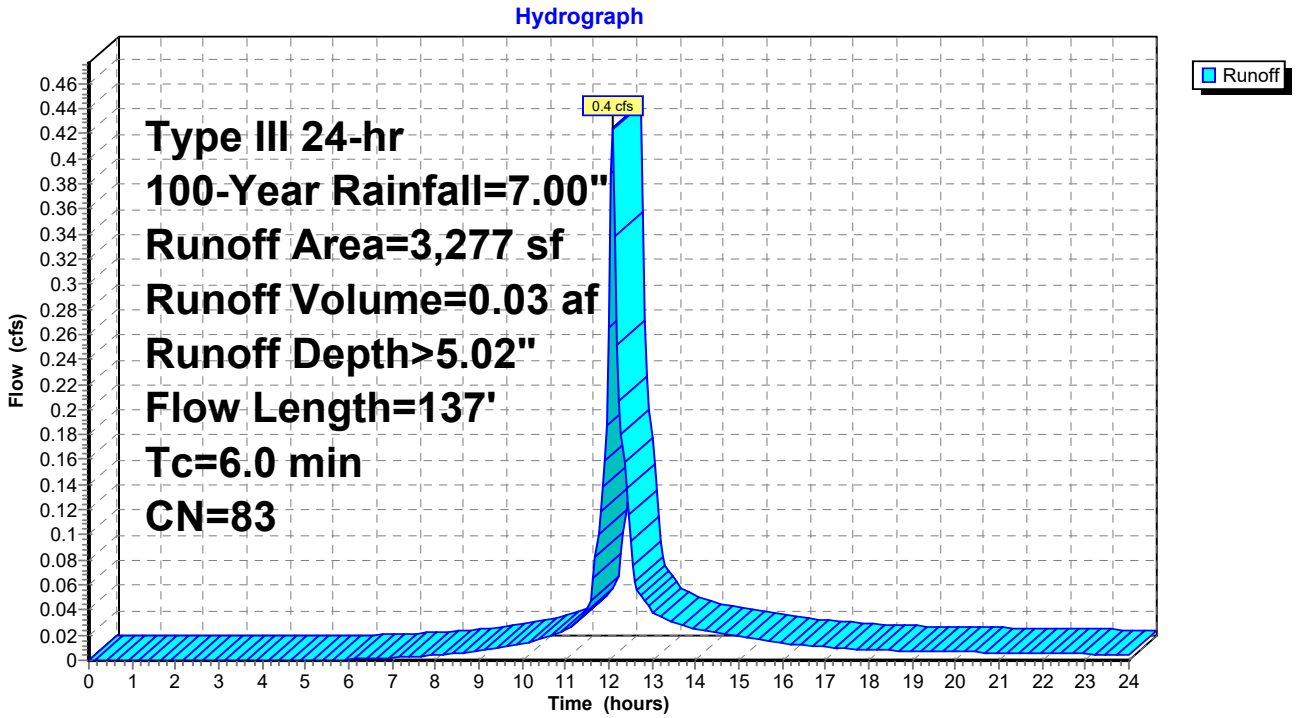
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 5.02"
Routed to Pond CB-5 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	751	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,526	96	Heavy lift Gravel surface, HSG A
	3,277	83	Weighted Average
	3,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0056	1.20		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.2	37	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
1.6	137	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2F-PR: SUBCATCHMENT 2F-PR



Summary for Subcatchment 2G-PR: SUBCATCHMENT 2G-PR

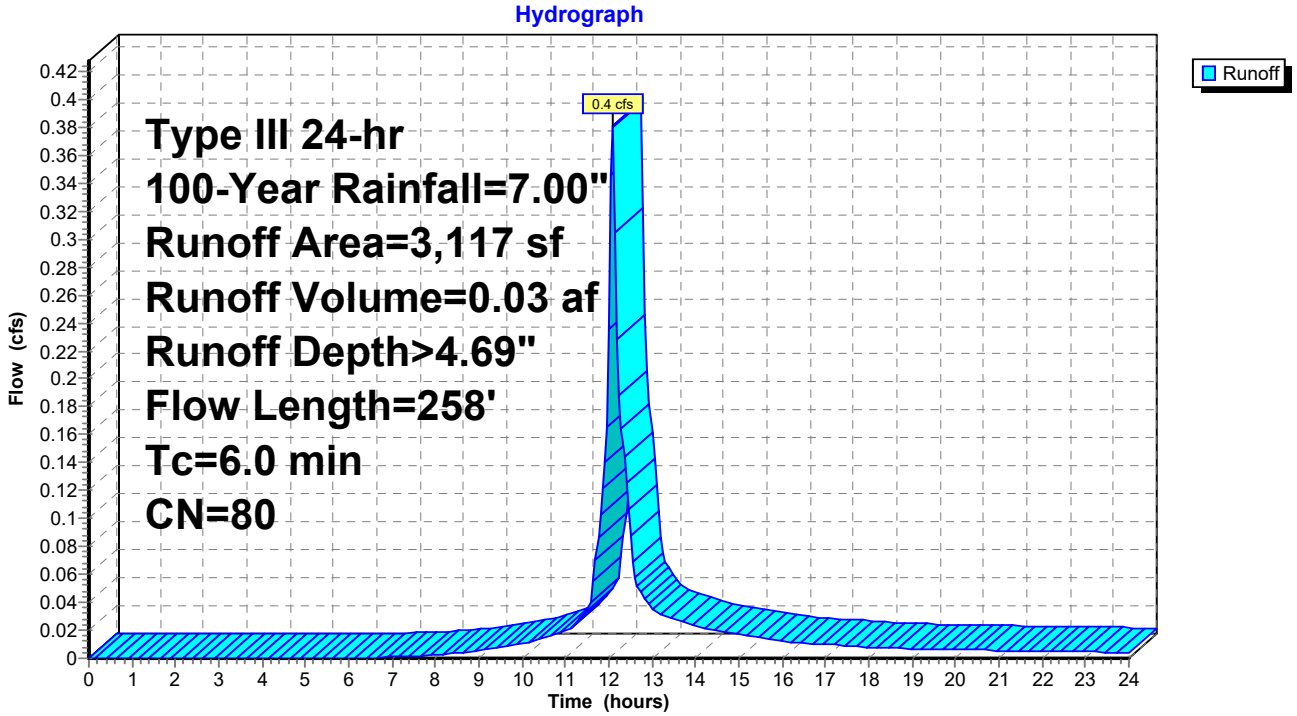
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 4.69"
Routed to Pond CB-6 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	902	39	Landscaped area >75% Grass cover, Good, HSG A
*	2,215	96	Heavy lift Gravel surface, HSG A
	3,117	80	Weighted Average
	3,117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	208	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
3.3	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2G-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2H-PR: SUBCATCHMENT 2G-PR

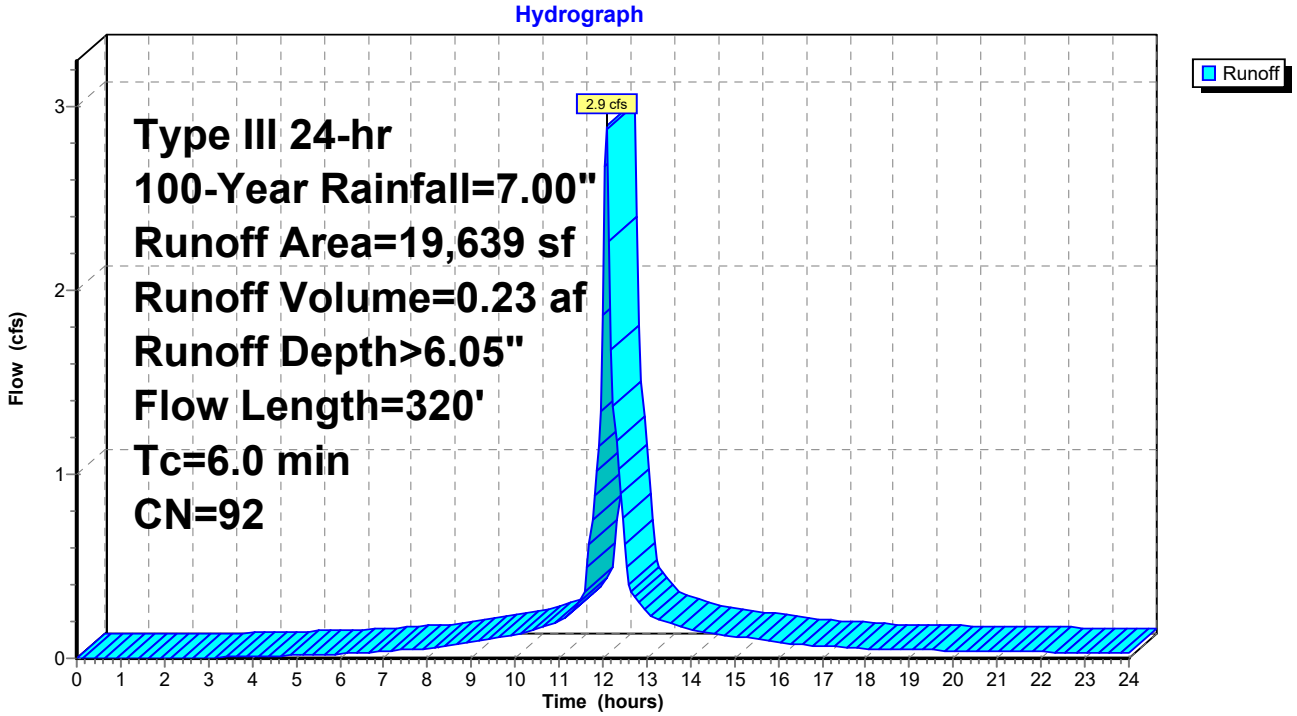
Runoff = 2.9 cfs @ 12.09 hrs, Volume= 0.23 af, Depth> 6.05"
Routed to Pond CB-7 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	1,347	39	Landscaped area >75% Grass cover, Good, HSG A
*	18,292	96	Heavy lift Gravel surface, HSG A
	19,639	92	Weighted Average
	19,639		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	270	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift** Unpaved Kv= 16.1 fps
0.3	50	0.0100	3.31	13.24	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.030 Earth, grassed & winding
4.3	320	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2H-PR: SUBCATCHMENT 2G-PR



Summary for Subcatchment 2I-PR: SUBCATCHMENT 2H-PR

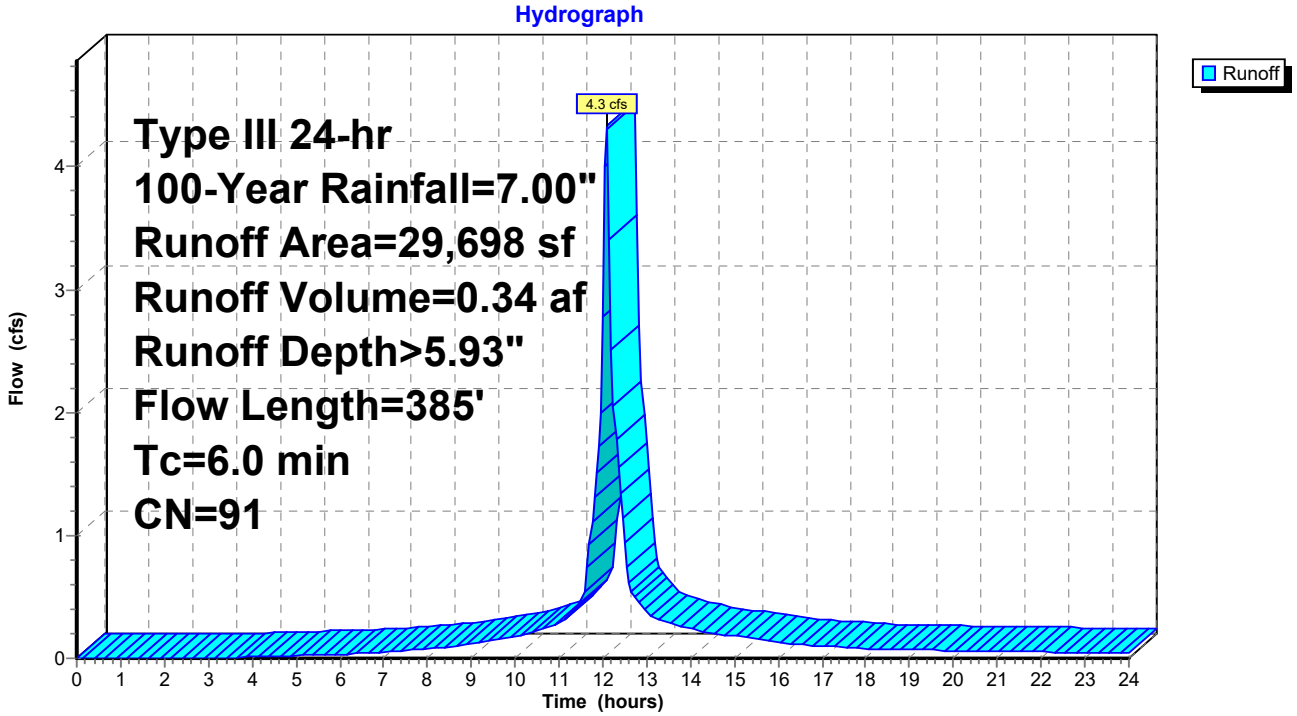
Runoff = 4.3 cfs @ 12.09 hrs, Volume= 0.34 af, Depth> 5.93"
Routed to Pond CB-8 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	2,542	39	Landscaped area >75% Grass cover, Good, HSG A
*	27,156	96	Heavy lift Gravel surface, HSG A
	29,698	91	Weighted Average
	29,698		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	335	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.6	385	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2I-PR: SUBCATCHMENT 2H-PR



Summary for Subcatchment 2J-PR: SUBCATCHMENT 2I-PR

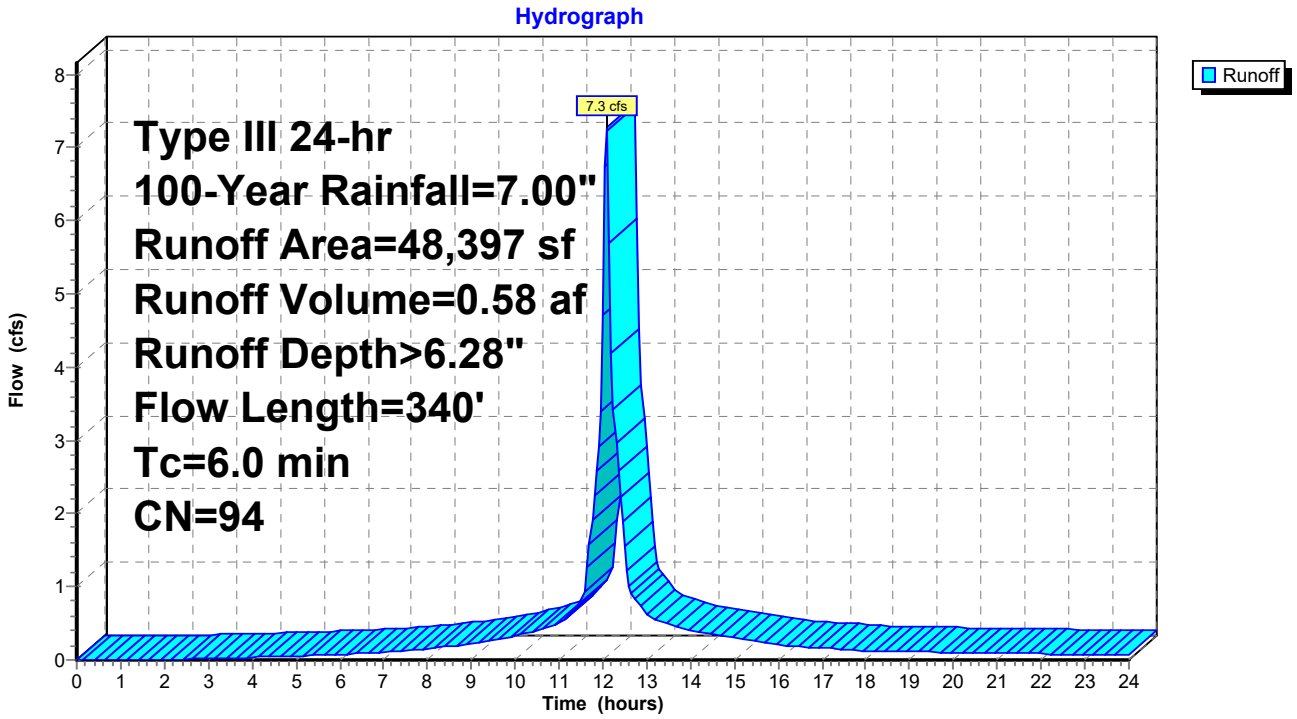
Runoff = 7.3 cfs @ 12.09 hrs, Volume= 0.58 af, Depth> 6.28"
Routed to Pond CB-9 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	2,106	39	Landscaped area >75% Grass cover, Good, HSG A
*	43,443	96	Heavy lift Gravel surface, HSG A
	2,848	98	Paved parking, HSG A
	48,397	94	Weighted Average
	45,549		94.12% Pervious Area
	2,848		5.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2J-PR: SUBCATCHMENT 2I-PR



Summary for Subcatchment 2K-PR: SUBCATCHMENT 2J-PR

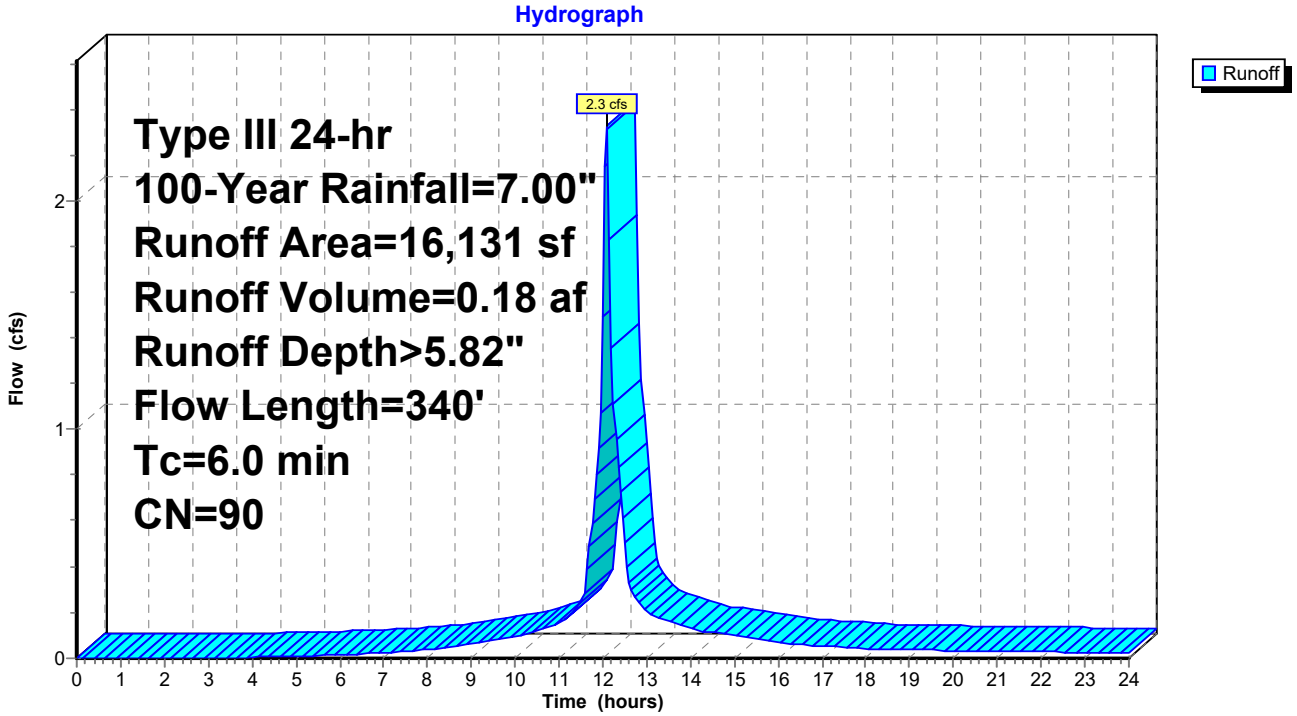
Runoff = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af, Depth> 5.82"
Routed to Pond CB-10 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	1,634	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,497	96	Heavy lift Gravel surface, HSG A
	16,131	90	Weighted Average
	16,131		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2K-PR: SUBCATCHMENT 2J-PR



Summary for Subcatchment 2L-PR: SUBCATCHMENT 2K-PR

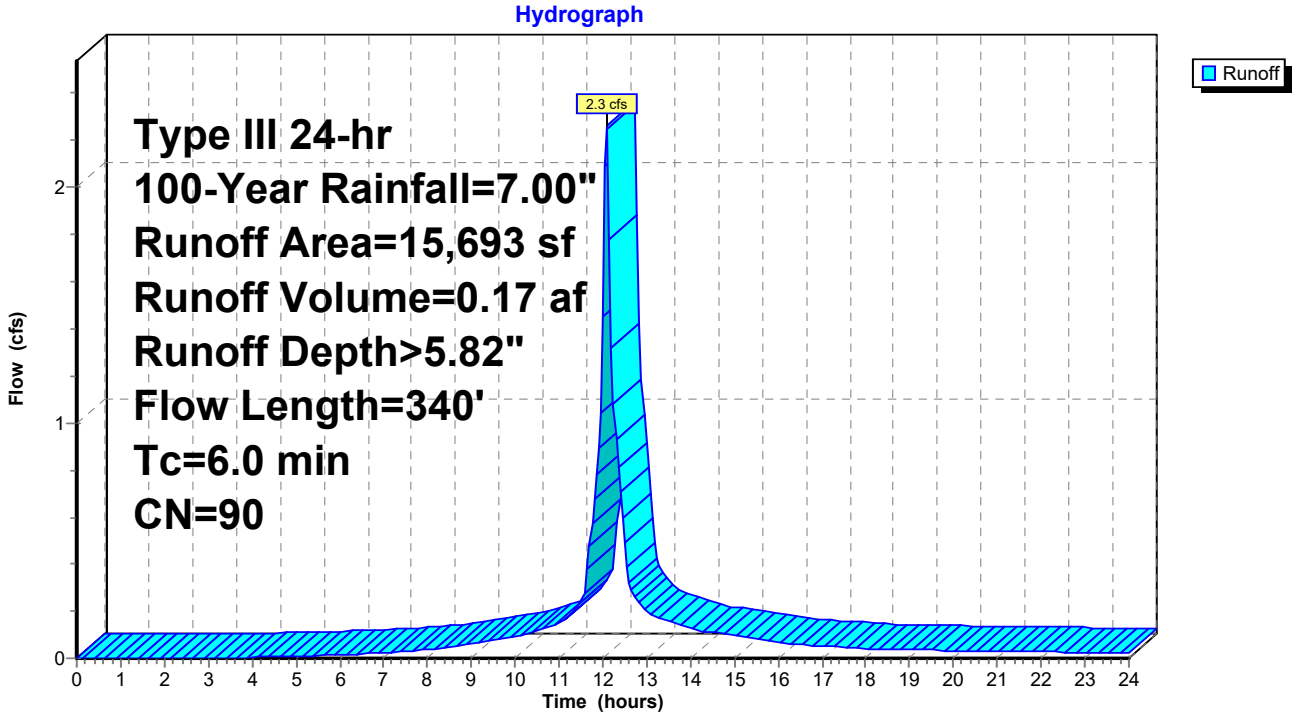
Runoff = 2.3 cfs @ 12.09 hrs, Volume= 0.17 af, Depth> 5.82"
Routed to Pond CB-11 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	1,630	39	Landscaped area >75% Grass cover, Good, HSG A
*	14,063	96	Heavy lift Gravel surface, HSG A
	15,693	90	Weighted Average
	15,693		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	290	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.9	340	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2L-PR: SUBCATCHMENT 2K-PR



Summary for Subcatchment 2M-PR: SUBCATCHMENT 2L-PR

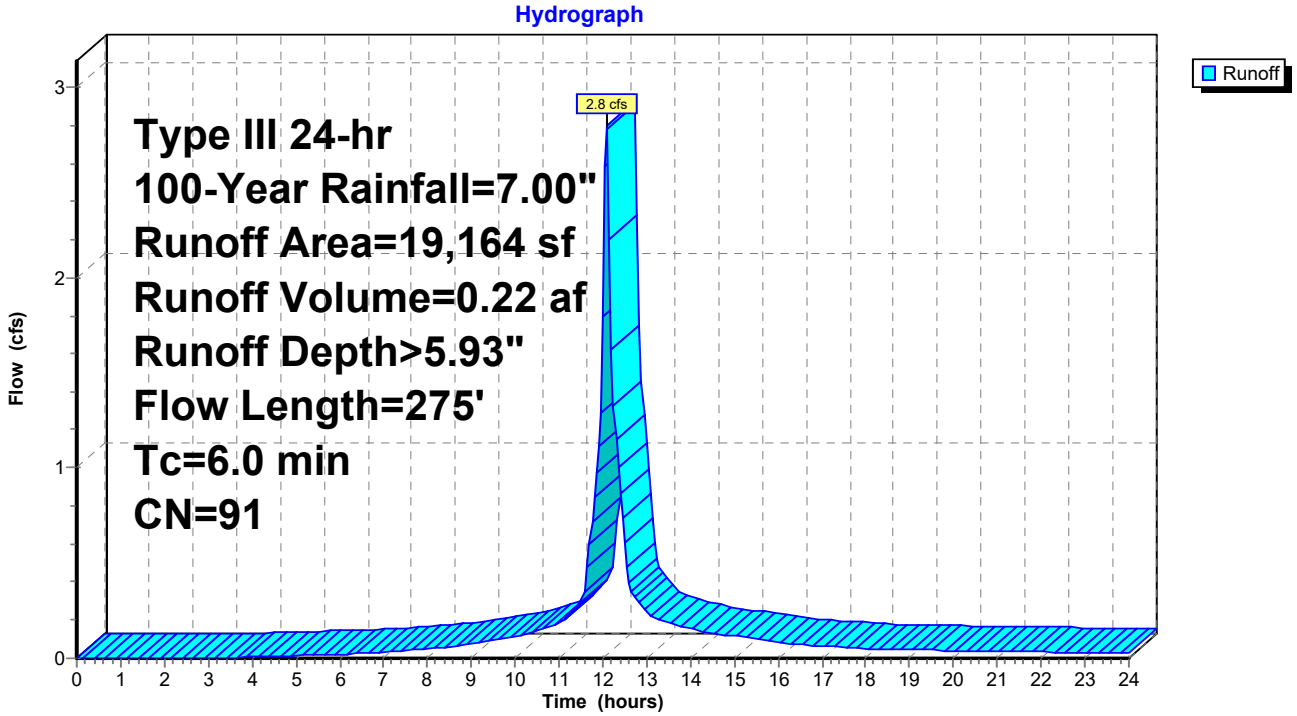
Runoff = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af, Depth> 5.93"
Routed to Pond CB-12 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	1,629	39	Landscaped area >75% Grass cover, Good, HSG A
*	17,535	96	Heavy lift Gravel surface, HSG A
	19,164	91	Weighted Average
	19,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	225	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
4.0	275	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2M-PR: SUBCATCHMENT 2L-PR



Summary for Subcatchment 2N-PR: SUBCATCHMENT 2M-PR

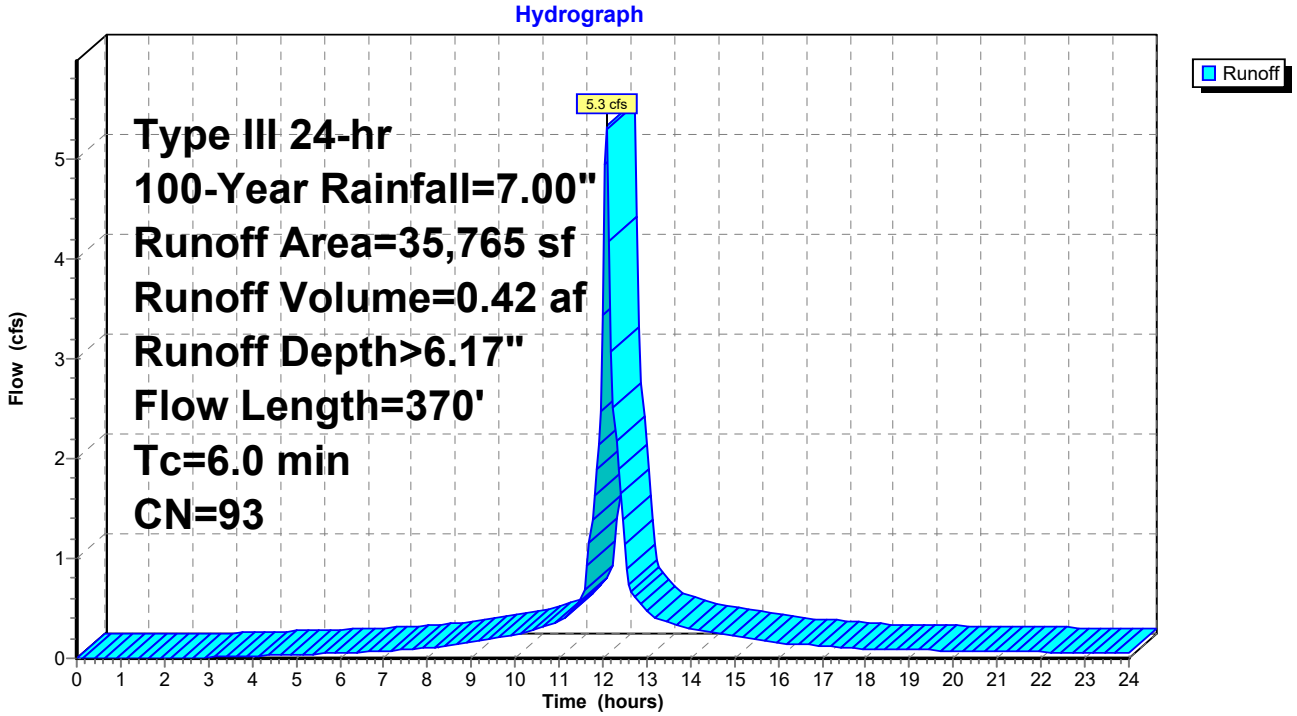
Runoff = 5.3 cfs @ 12.09 hrs, Volume= 0.42 af, Depth> 6.17"
Routed to Pond CB-13 : 18" NYLOPLAST DRAIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	2,016	39	15' Landscaped area >75% Grass cover, Good, HSG A
*	33,749	96	Heavy lift Gravel surface, HSG A
	35,765	93	Weighted Average
	35,765		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	320	0.0050	1.14		**Shallow Concentrated Flow, Heavy lift area** Unpaved Kv= 16.1 fps
0.7	50	0.0010	1.26	5.02	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
5.4	370	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2N-PR: SUBCATCHMENT 2M-PR



Summary for Subcatchment 3A-PR: SUBCATCHMENT 3A-PR

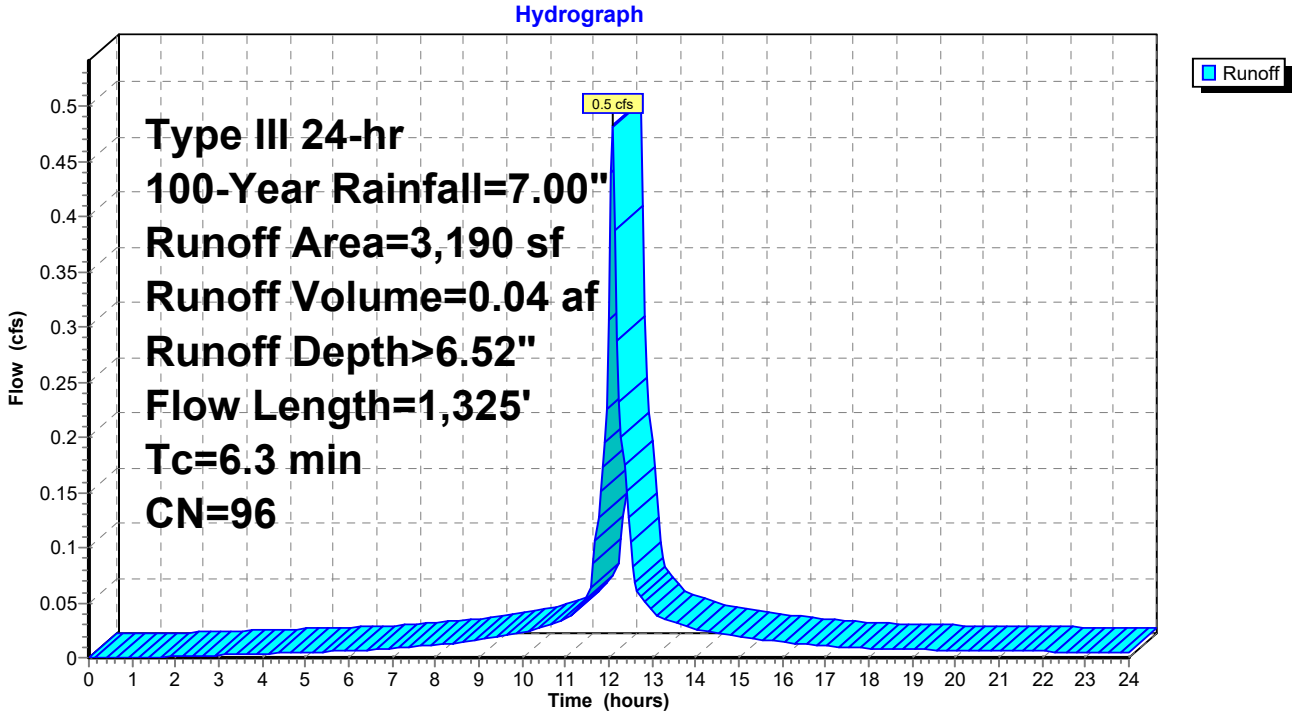
Runoff = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af, Depth> 6.52"
Routed to Link 3 : 72" DRAIN MAIN TERMINAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

	Area (sf)	CN	Description
*	3,190	96	Heavy lift Gravel surface, HSG A
	3,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	50	0.0050	0.54		**Sheet Flow, Gravel surface** Smooth surfaces n= 0.011 P2= 2.00"
3.5	740	0.0050	3.47	2.73	**Pipe Channel, Infiltration trench** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
1.3	535	0.0020	6.70	189.40	**Pipe Channel, 72" RCP drain** 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013 Concrete pipe, bends & connections
6.3	1,325	Total			

Subcatchment 3A-PR: SUBCATCHMENT 3A-PR



Summary for Subcatchment 3B-PR: SUBCATCHMENT 3B-PR

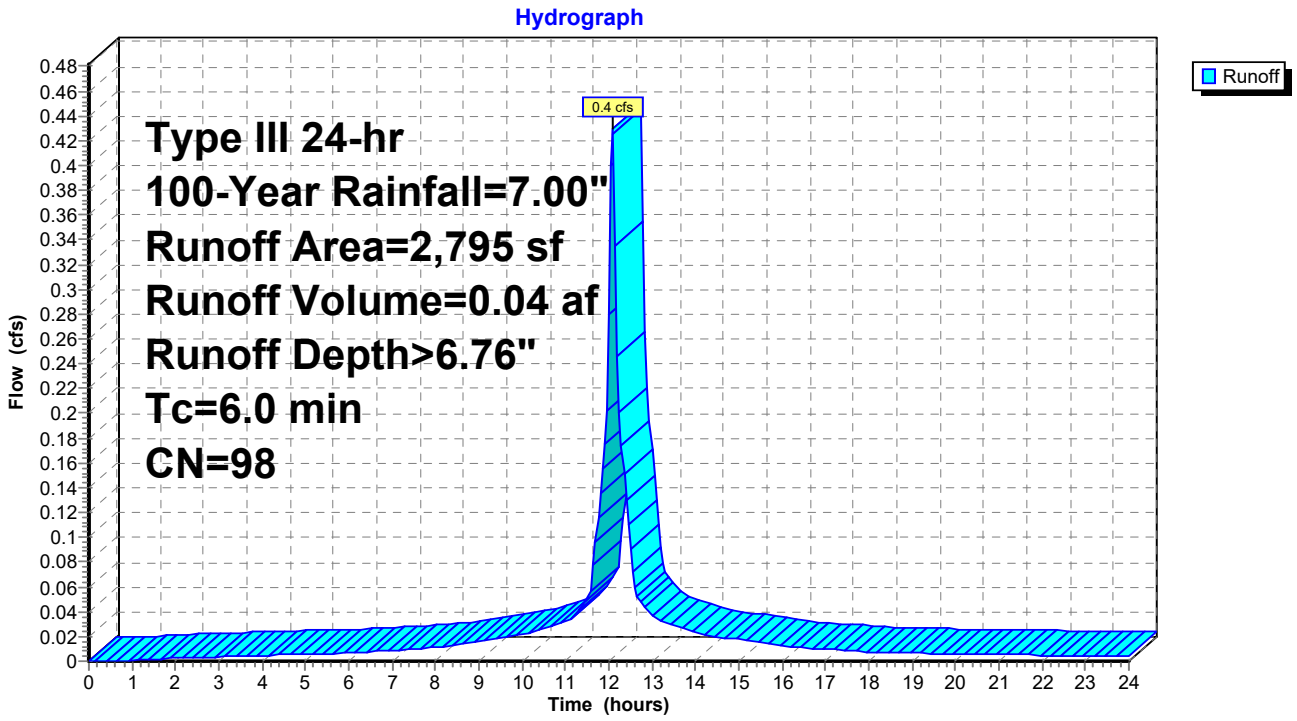
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.04 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
2,795	98	Water Surface, HSG A
2,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3B-PR: SUBCATCHMENT 3B-PR



Summary for Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.794 ac, 0.00% Impervious, Inflow Depth > 6.17" for 100-Year event
Inflow = 11.1 cfs @ 12.09 hrs, Volume= 0.92 af
Outflow = 11.5 cfs @ 12.09 hrs, Volume= 0.83 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.1 cfs @ 6.50 hrs, Volume= 0.20 af
Primary = 11.4 cfs @ 12.09 hrs, Volume= 0.62 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.97' @ 12.09 hrs Surf.Area= 0.052 ac Storage= 0.12 af

Plug-Flow detention time= 74.0 min calculated for 0.83 af (90% of inflow)
Center-of-Mass det. time= 24.5 min (792.5 - 768.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	3.50'	0.06 af	**11.25'W x 201.05'L x 4.07'H Field A** 0.21 af Overall - 0.07 af Embedded = 0.14 af x 40.0% Voids
#2A	3.75'	0.06 af	**Ferguson R-Tank HD 2** x 336 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 336 Chambers in 4 Rows
		0.12 af	Total Available Storage

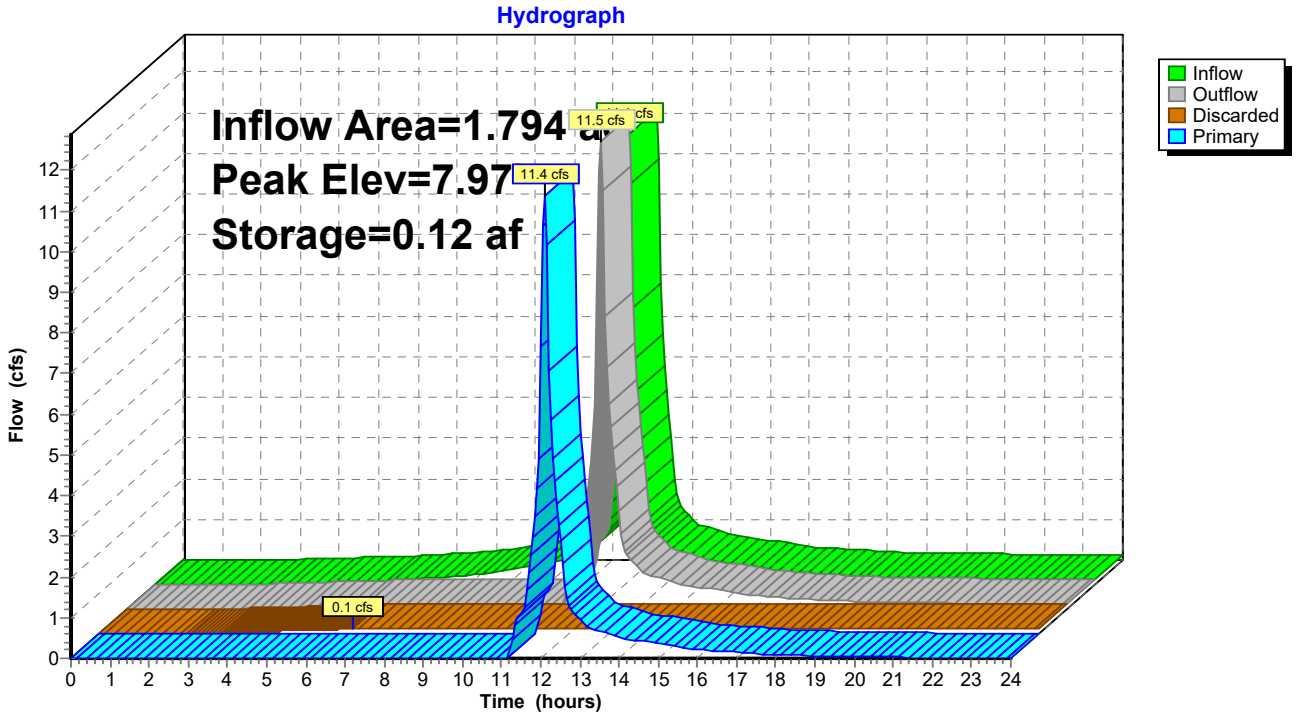
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	3.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-1 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.35' S= 0.0233 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.35'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.80'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 6.50 hrs HW=3.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=11.3 cfs @ 12.09 hrs HW=7.96' (Free Discharge)
└─**2=OCS-1 Outlet** (Passes 11.3 cfs of 14.6 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.9 cfs @ 2.42 fps)
  └─**4=Orifice/Grate** (Orifice Controls 5.3 cfs @ 4.80 fps)

Pond 1P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM

Inflow Area = 1.279 ac, 0.00% Impervious, Inflow Depth > 5.85" for 100-Year event
Inflow = 8.0 cfs @ 12.09 hrs, Volume= 0.62 af
Outflow = 7.6 cfs @ 12.12 hrs, Volume= 0.56 af, Atten= 5%, Lag= 1.5 min
Discarded = 0.1 cfs @ 7.80 hrs, Volume= 0.18 af
Primary = 7.5 cfs @ 12.12 hrs, Volume= 0.38 af
Routed to Pond 5P : DRAINAGE MANHOLE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.25' @ 12.12 hrs Surf.Area= 0.050 ac Storage= 0.10 af

Plug-Flow detention time= 79.5 min calculated for 0.56 af (90% of inflow)
Center-of-Mass det. time= 30.6 min (807.9 - 777.3)

Volume	Invert	Avail.Storage	Storage Description
#1C	4.90'	0.04 af	**10.56'W x 205.74'L x 3.42'H Field C** 0.17 af Overall - 0.07 af Embedded = 0.10 af x 40.0% Voids
#2C	5.15'	0.06 af	**Ferguson R-Tank HD 1.5** x 430 Inside #1 Inside= 15.7"W x 26.0"H => 2.70 sf x 2.35'L = 6.3 cf Outside= 15.7"W x 26.0"H => 2.84 sf x 2.35'L = 6.7 cf 430 Chambers in 5 Rows
		0.10 af	Total Available Storage

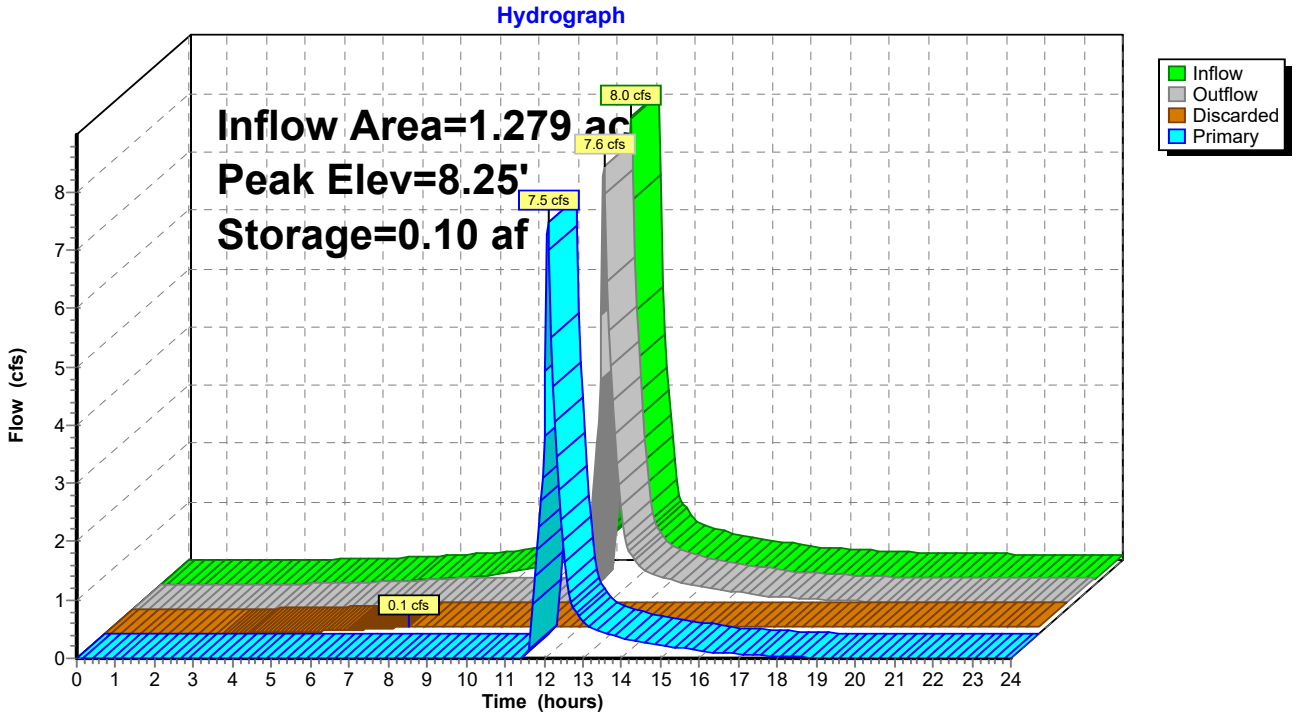
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	6.05'	**24.0" Round OCS-2 Outlet** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.05' / 5.85' S= 0.0067 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 3.14 sf
#3	Device 2	7.95'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	6.95'	**40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 7.80 hrs HW=4.93' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=7.2 cfs @ 12.12 hrs HW=8.22' (Free Discharge)
└─**2=OCS-2 Outlet** (Passes 7.2 cfs of 13.8 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 1.6 cfs @ 1.47 fps)
  └─**4=Orifice/Grate** (Orifice Controls 5.6 cfs @ 5.05 fps)

Pond 2P: FERGUSON R-TANK CHAMBER SYSTEM



Summary for Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH

Inflow Area = 3.103 ac, 2.11% Impervious, Inflow Depth > 6.09" for 100-Year event
Inflow = 19.8 cfs @ 12.09 hrs, Volume= 1.58 af
Outflow = 17.9 cfs @ 12.13 hrs, Volume= 1.49 af, Atten= 10%, Lag= 2.0 min
Discarded = 0.5 cfs @ 8.90 hrs, Volume= 0.79 af
Primary = 17.4 cfs @ 12.13 hrs, Volume= 0.71 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 7.44' @ 12.13 hrs Surf.Area= 0.226 ac Storage= 0.38 af

Plug-Flow detention time= 102.8 min calculated for 1.49 af (95% of inflow)
Center-of-Mass det. time= 73.9 min (844.3 - 770.4)

Volume	Invert	Avail.Storage	Storage Description
#1G	3.90'	0.05 af	**27.62'W x 107.22'L x 4.07'H Field G** 0.28 af Overall - 0.16 af Embedded = 0.12 af x 40.0% Voids
#2G	4.15'	0.15 af	**Ferguson R-Tank HD 2** x 792 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 792 Chambers in 18 Rows
#3	3.90'	0.18 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 0.47 af Overall - 0.02 af Embedded = 0.45 af x 40.0% Voids
#4	4.40'	0.01 af	**12.0" Round 12" Perforated HDPE** x 2 Inside #3 L= 320.0' 0.02 af Overall - 1.5" Wall Thickness = 0.01 af
#5H	3.90'	0.00 af	**2.62'W x 27.46'L x 4.07'H Field H** 0.01 af Overall - 0.00 af Embedded = 0.00 af x 40.0% Voids
#6H	4.15'	0.00 af	**Ferguson R-Tank HD 2** x 20 Inside #5 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 20 Chambers in 2 Rows
		0.39 af	Total Available Storage

Storage Group G created with Chamber Wizard
Storage Group H created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
3.90	0.156	0.00	0.00
6.90	0.156	0.47	0.47

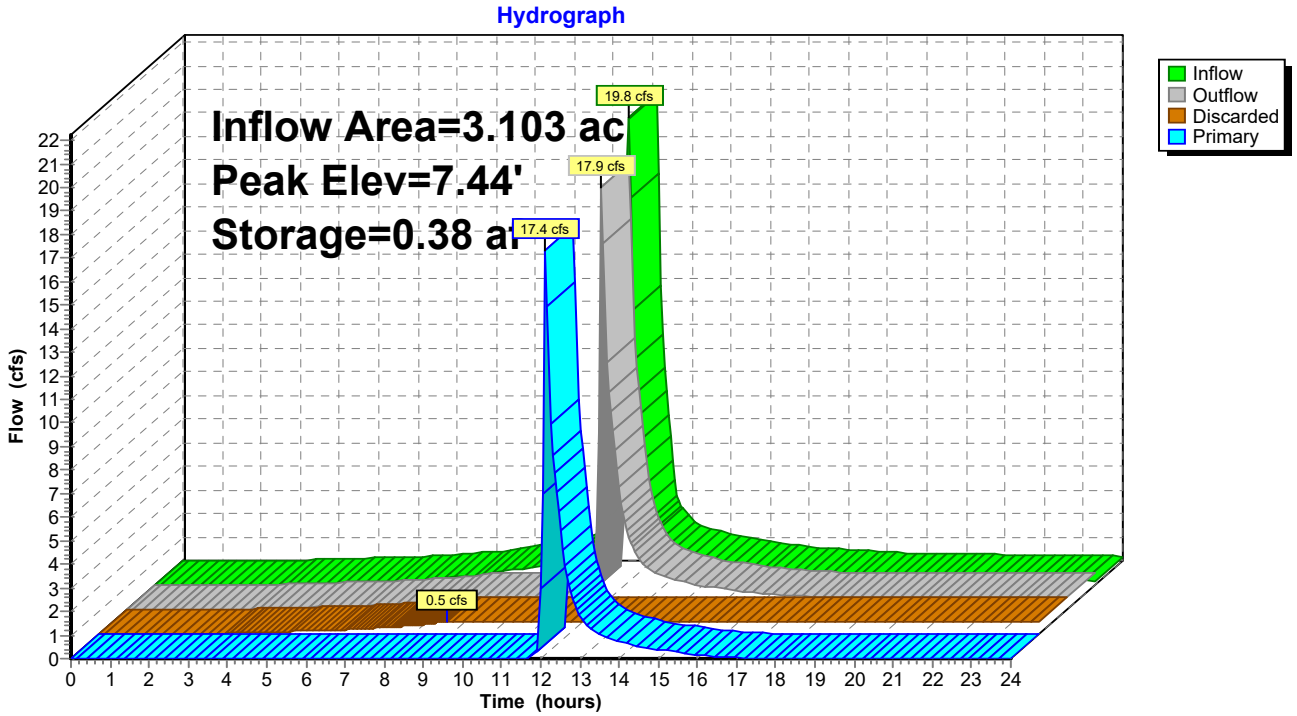
Device	Routing	Invert	Outlet Devices
#1	Discarded	3.90'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	5.80'	**30.0" Round OCS-3 Outlet** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.80' / 5.50' S= 0.0500 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf
#3	Primary	7.40'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00

Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4 Primary 6.60' **40.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Discarded OutFlow Max=0.5 cfs @ 8.90 hrs HW=3.94' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.5 cfs)

Primary OutFlow Max=16.9 cfs @ 12.13 hrs HW=7.41' (Free Discharge)
├─**2=OCS-3 Outlet** (Barrel Controls 12.6 cfs @ 5.36 fps)
├─**3=Broad-Crested Rectangular Weir**(Weir Controls 0.0 cfs @ 0.27 fps)
└─**4=Orifice/Grate** (Orifice Controls 4.3 cfs @ 3.85 fps)

Pond 3P: FERGUSON R-TANK / INFILTRATION TRENCH



Summary for Pond 5P: DRAINAGE MANHOLE

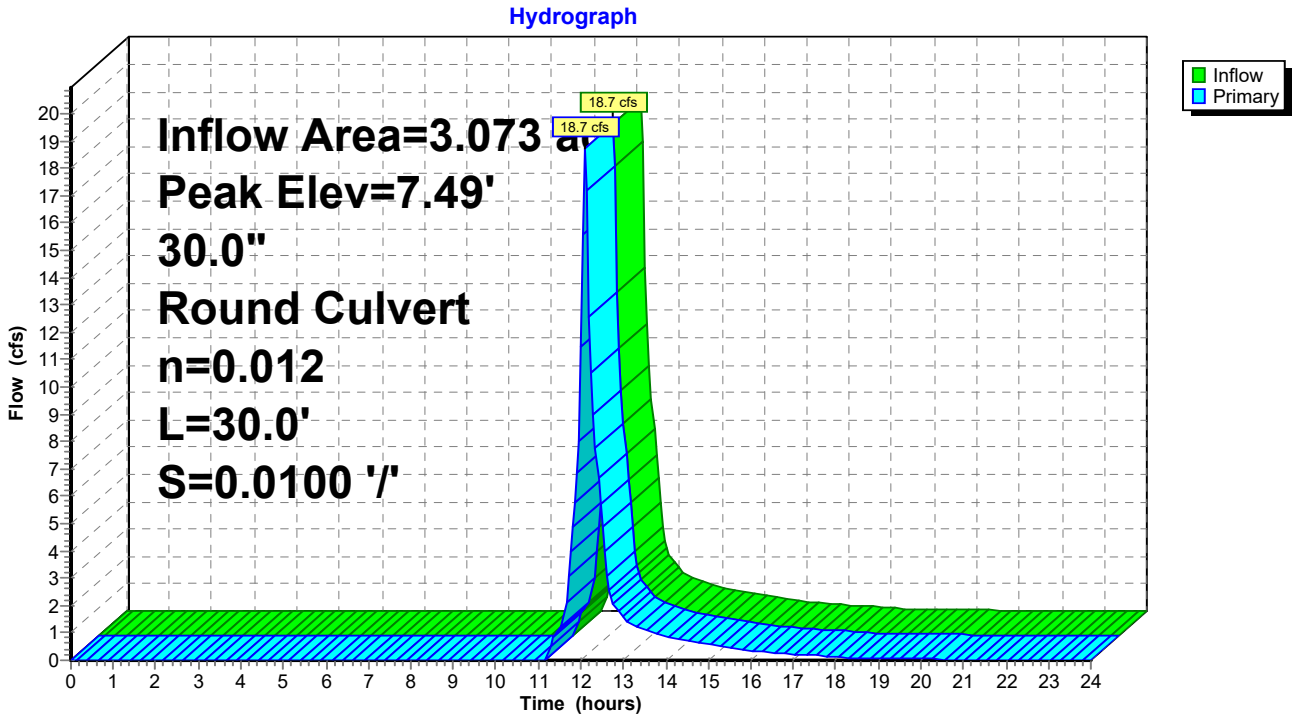
Inflow Area = 3.073 ac, 0.00% Impervious, Inflow Depth = 3.92" for 100-Year event
Inflow = 18.7 cfs @ 12.11 hrs, Volume= 1.00 af
Outflow = 18.7 cfs @ 12.11 hrs, Volume= 1.00 af, Atten= 0%, Lag= 0.0 min
Primary = 18.7 cfs @ 12.11 hrs, Volume= 1.00 af
Routed to Link 2 : 66" DRAIN WRIGHT STREET

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.49' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**30.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 5.05' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=18.4 cfs @ 12.11 hrs HW=7.46' (Free Discharge)
└**1=Culvert** (Barrel Controls 18.4 cfs @ 5.60 fps)

Pond 5P: DRAINAGE MANHOLE



Summary for Pond CB-1: 18" NYLOPLAST DRAIN

Inflow Area = 0.178 ac, 0.00% Impervious, Inflow Depth > 5.93" for 100-Year event
Inflow = 1.1 cfs @ 12.09 hrs, Volume= 0.09 af
Outflow = 1.1 cfs @ 12.09 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min
Primary = 1.1 cfs @ 12.09 hrs, Volume= 0.09 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.04' @ 12.09 hrs Surf.Area= 53 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 209 sf Storage= 104 cf

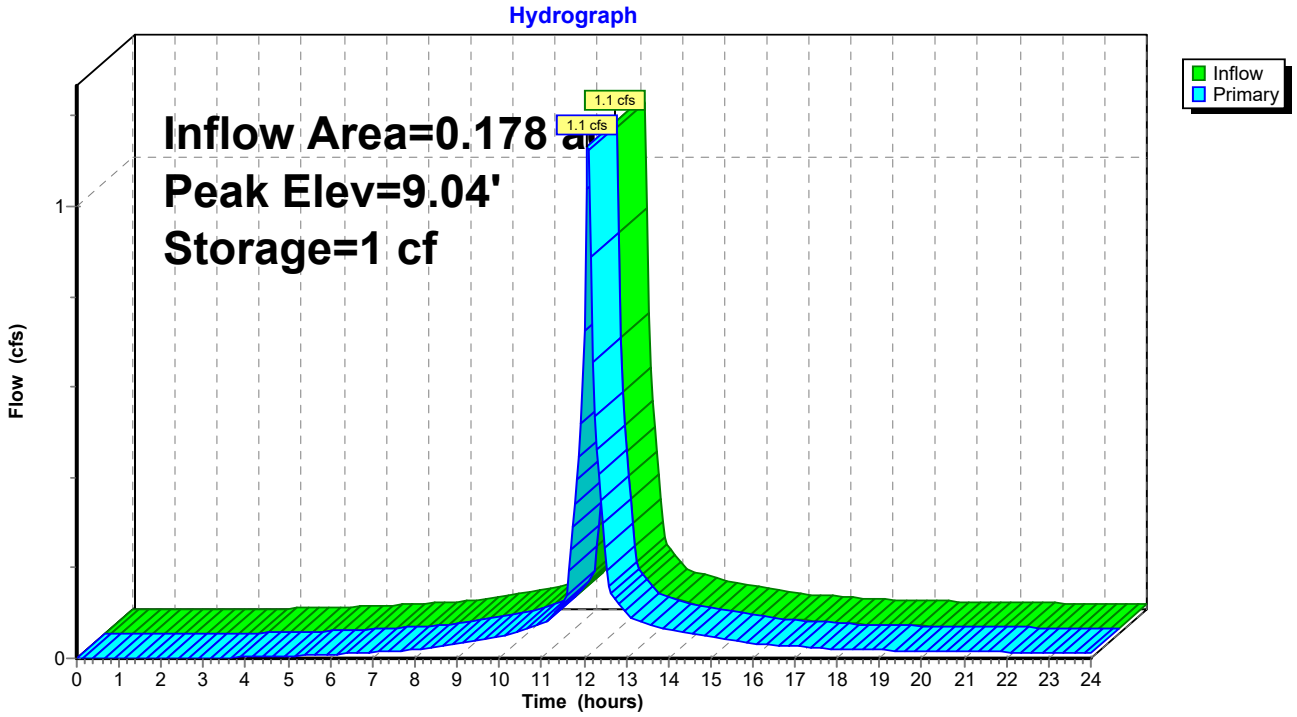
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (776.0 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	9.02'	143 cf	**2.00'W x 25.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.87'	**12.0" Round Culvert** L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.87' / 6.53' S= 0.0113 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.02'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.1 cfs @ 12.09 hrs HW=9.04' (Free Discharge)
└─**1=Culvert** (Passes 1.1 cfs of 4.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.1 cfs @ 0.63 fps)

Pond CB-1: 18" NYLOPLAST DRAIN



Summary for Pond CB-10: 18" NYLOPLAST DRAIN

Inflow Area = 0.370 ac, 0.00% Impervious, Inflow Depth > 5.82" for 100-Year event
Inflow = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af
Outflow = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.2 min
Primary = 2.3 cfs @ 12.09 hrs, Volume= 0.18 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.96' @ 12.09 hrs Surf.Area= 163 sf Storage= 11 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

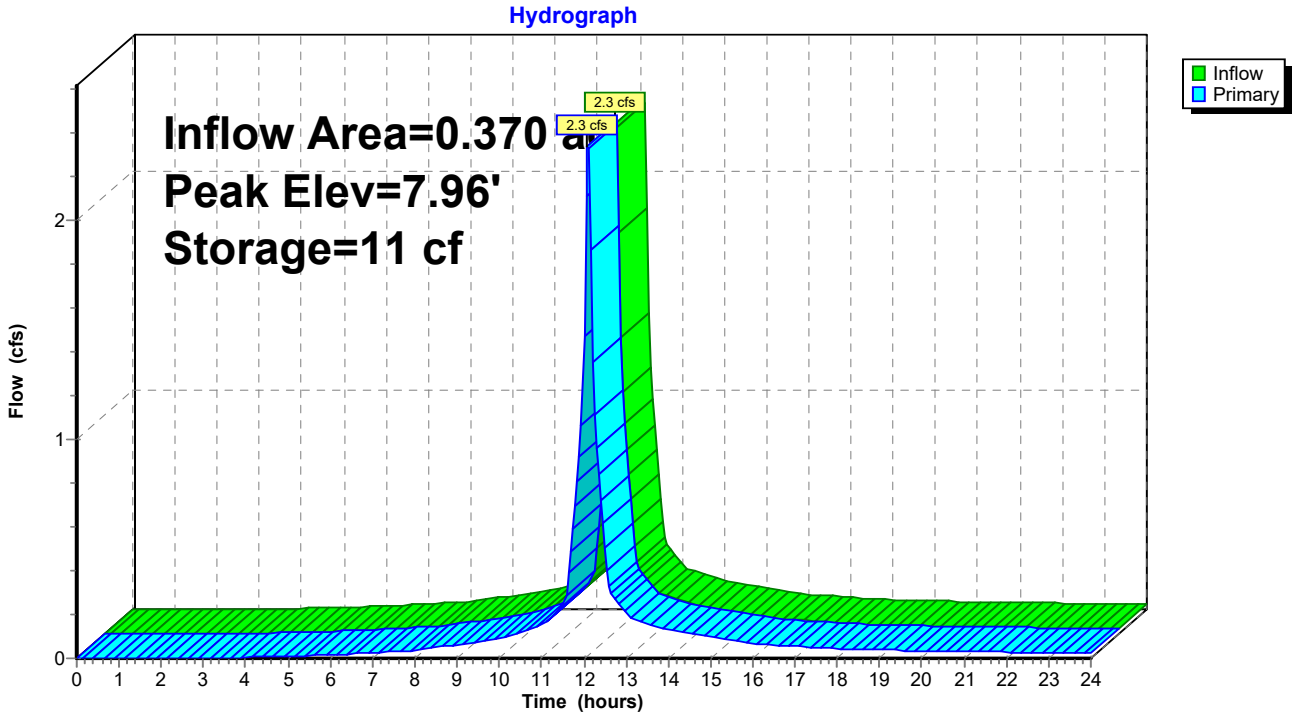
Plug-Flow detention time= 0.0 min calculated for 0.18 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (779.5 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	7.88'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.73'	**12.0" Round Culvert** L= 21.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.73' / 5.45' S= 0.0133 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.88'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.3 cfs @ 12.09 hrs HW=7.95' (Free Discharge)
└─**1=Culvert** (Passes 2.3 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.3 cfs @ 1.29 fps)

Pond CB-10: 18" NYLOPLAST DRAIN



Summary for Pond CB-11: 18" NYLOPLAST DRAIN

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth > 5.82" for 100-Year event
Inflow = 2.3 cfs @ 12.09 hrs, Volume= 0.17 af
Outflow = 2.2 cfs @ 12.09 hrs, Volume= 0.17 af, Atten= 1%, Lag= 0.1 min
Primary = 2.2 cfs @ 12.09 hrs, Volume= 0.17 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 7.91' @ 12.09 hrs Surf.Area= 161 sf Storage= 10 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

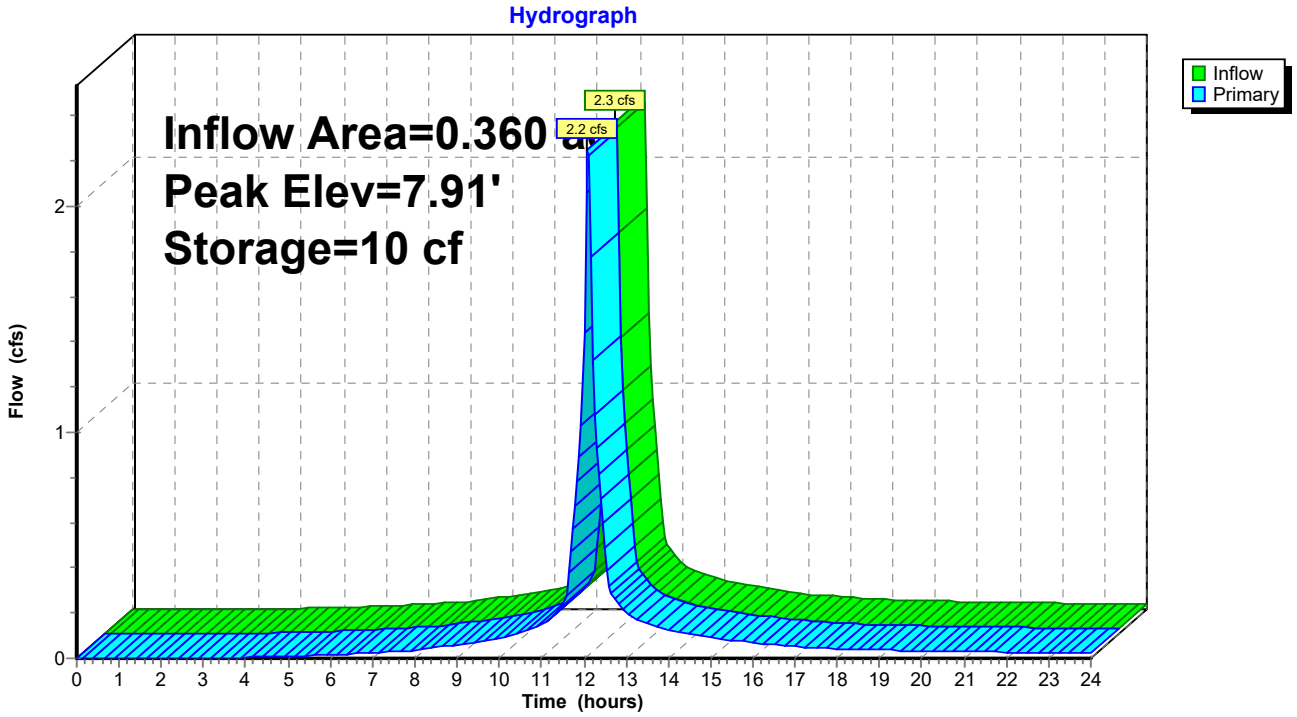
Plug-Flow detention time= 0.6 min calculated for 0.17 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (779.5 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	7.84'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.89'	**12.0" Round Culvert** L= 87.3' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.89' / 5.45' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.84'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.2 cfs @ 12.09 hrs HW=7.91' (Free Discharge)
└─**1=Culvert** (Passes 2.2 cfs of 3.9 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.2 cfs @ 1.24 fps)

Pond CB-11: 18" NYLOPLAST DRAIN



Summary for Pond CB-12: 18" NYLOPLAST DRAIN

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 5.93" for 100-Year event
Inflow = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af
Outflow = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af, Atten= 0%, Lag= 0.2 min
Primary = 2.8 cfs @ 12.09 hrs, Volume= 0.22 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.97' @ 12.09 hrs Surf.Area= 177 sf Storage= 17 cf
Flood Elev= 9.18' Surf.Area= 576 sf Storage= 348 cf

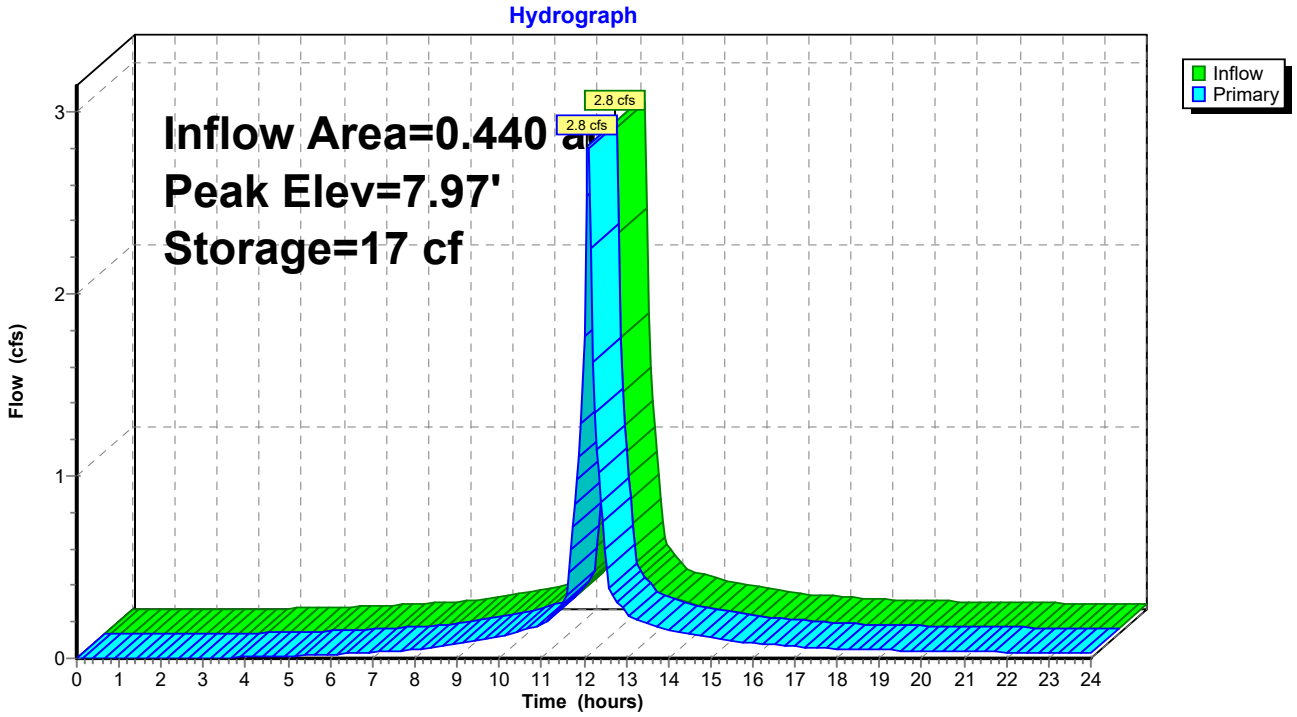
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (776.0 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	7.86'	348 cf	**2.00'W x 66.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.71'	**12.0" Round Culvert** L= 51.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.71' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.86'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.7 cfs @ 12.09 hrs HW=7.96' (Free Discharge)
└─**1=Culvert** (Passes 2.7 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.7 cfs @ 1.56 fps)

Pond CB-12: 18" NYLOPLAST DRAIN



Summary for Pond CB-13: 18" NYLOPLAST DRAIN

Inflow Area = 0.821 ac, 0.00% Impervious, Inflow Depth > 6.17" for 100-Year event
Inflow = 5.3 cfs @ 12.09 hrs, Volume= 0.42 af
Outflow = 5.2 cfs @ 12.10 hrs, Volume= 0.42 af, Atten= 3%, Lag= 0.9 min
Primary = 5.2 cfs @ 12.10 hrs, Volume= 0.42 af
Routed to Pond WQU-6 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.21' @ 12.10 hrs Surf.Area= 424 sf Storage= 120 cf
Flood Elev= 9.18' Surf.Area= 810 sf Storage= 494 cf

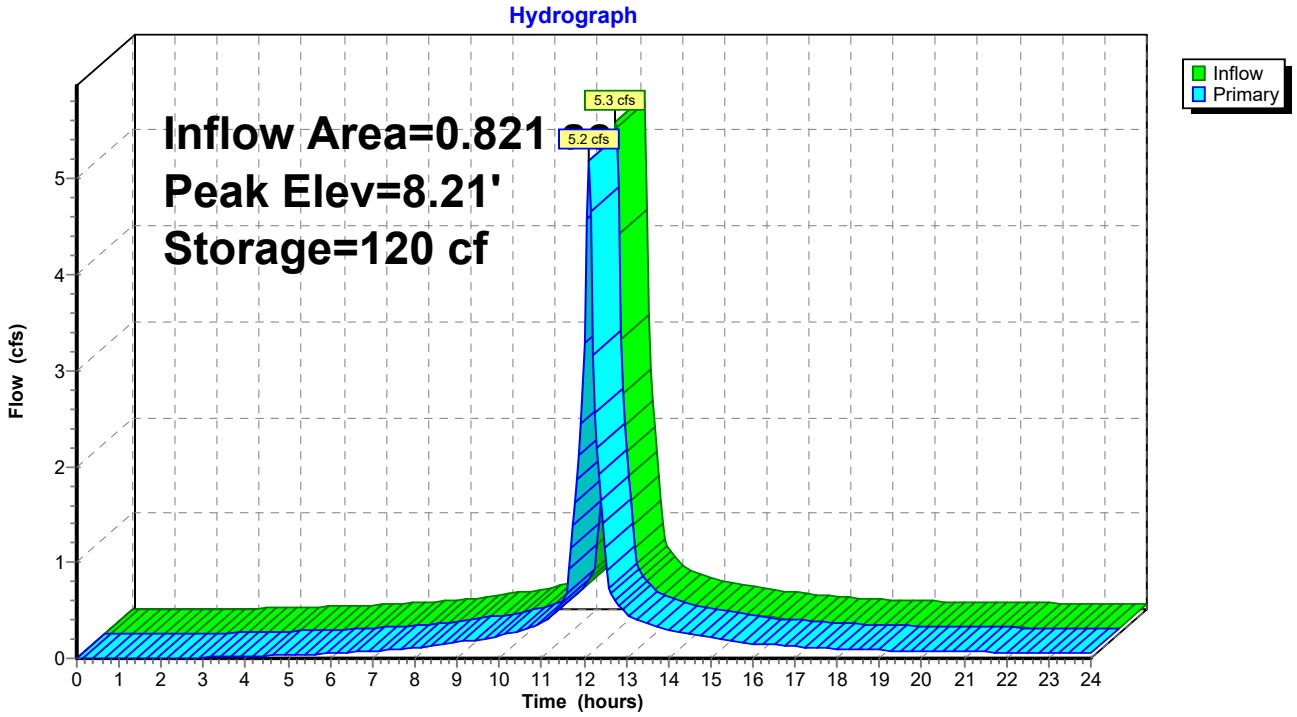
Plug-Flow detention time= 0.1 min calculated for 0.42 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (768.5 - 768.4)

Volume	Invert	Avail.Storage	Storage Description
#1	7.82'	494 cf	**2.00'W x 95.20'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.66'	**12.0" Round Culvert** L= 41.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.66' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	7.82'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=5.2 cfs @ 12.10 hrs HW=8.21' (Free Discharge)
└─**1=Culvert** (Barrel Controls 5.2 cfs @ 6.60 fps)
└─**2=Landscape Drain** (Passes 5.2 cfs of 5.3 cfs potential flow)

Pond CB-13: 18" NYLOPLAST DRAIN



Summary for Pond CB-2: 18" NYLOPLAST DRAIN

Inflow Area = 0.958 ac, 0.00% Impervious, Inflow Depth > 6.28" for 100-Year event
Inflow = 6.3 cfs @ 12.09 hrs, Volume= 0.50 af
Outflow = 5.8 cfs @ 12.11 hrs, Volume= 0.50 af, Atten= 8%, Lag= 1.5 min
Primary = 5.8 cfs @ 12.11 hrs, Volume= 0.50 af
Routed to Pond WQU-1 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 9.42' @ 12.11 hrs Surf.Area= 375 sf Storage= 158 cf
Flood Elev= 9.85' Surf.Area= 528 sf Storage= 318 cf

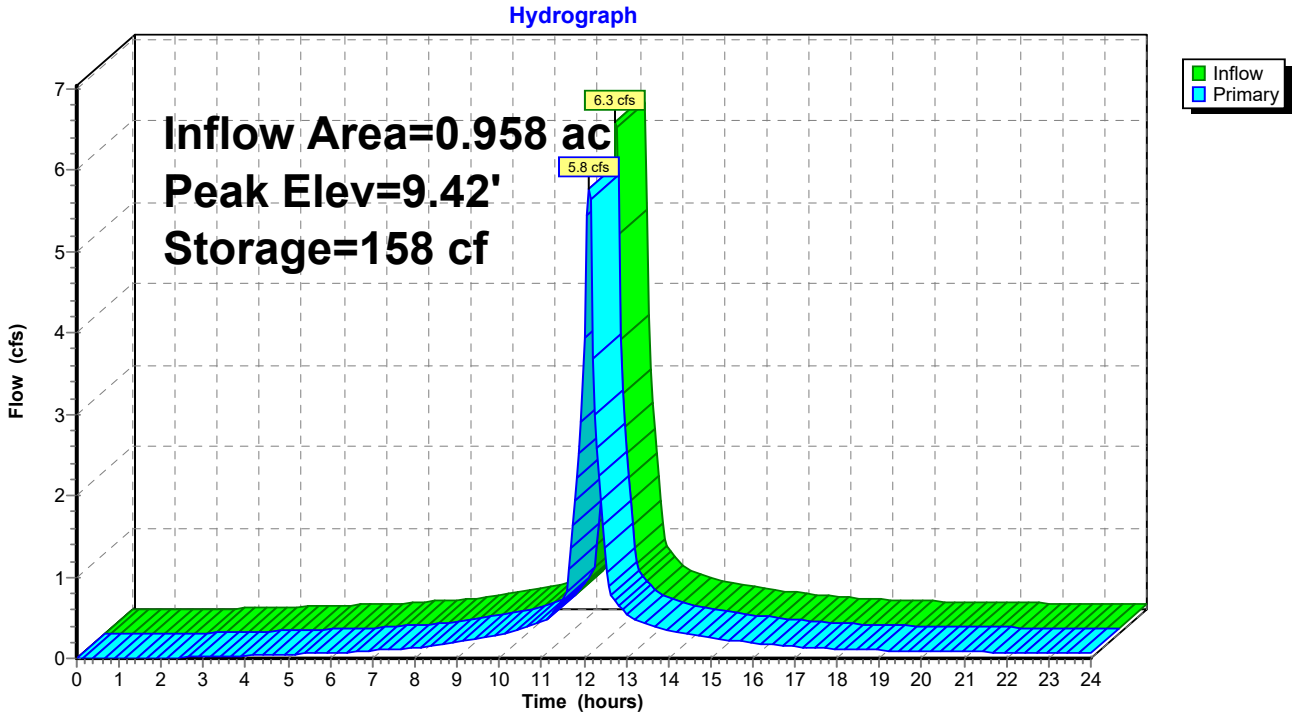
Plug-Flow detention time= 0.4 min calculated for 0.50 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (764.2 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	8.78'	318 cf	**2.00'W x 60.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.60'	**12.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.60' / 6.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.78'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=5.7 cfs @ 12.11 hrs HW=9.40' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.7 cfs @ 7.30 fps)
└─**2=Landscape Drain** (Passes 5.7 cfs of 6.7 cfs potential flow)

Pond CB-2: 18" NYLOPLAST DRAIN



Summary for Pond CB-3: 18" NYLOPLAST DRAIN

Inflow Area = 0.376 ac, 0.00% Impervious, Inflow Depth > 6.17" for 100-Year event
Inflow = 2.4 cfs @ 12.09 hrs, Volume= 0.19 af
Outflow = 2.4 cfs @ 12.09 hrs, Volume= 0.19 af, Atten= 1%, Lag= 0.1 min
Primary = 2.4 cfs @ 12.09 hrs, Volume= 0.19 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.83' @ 12.09 hrs Surf.Area= 0.004 ac Storage= 0.00 af
Flood Elev= 9.85' Surf.Area= 0.014 ac Storage= 0.01 af

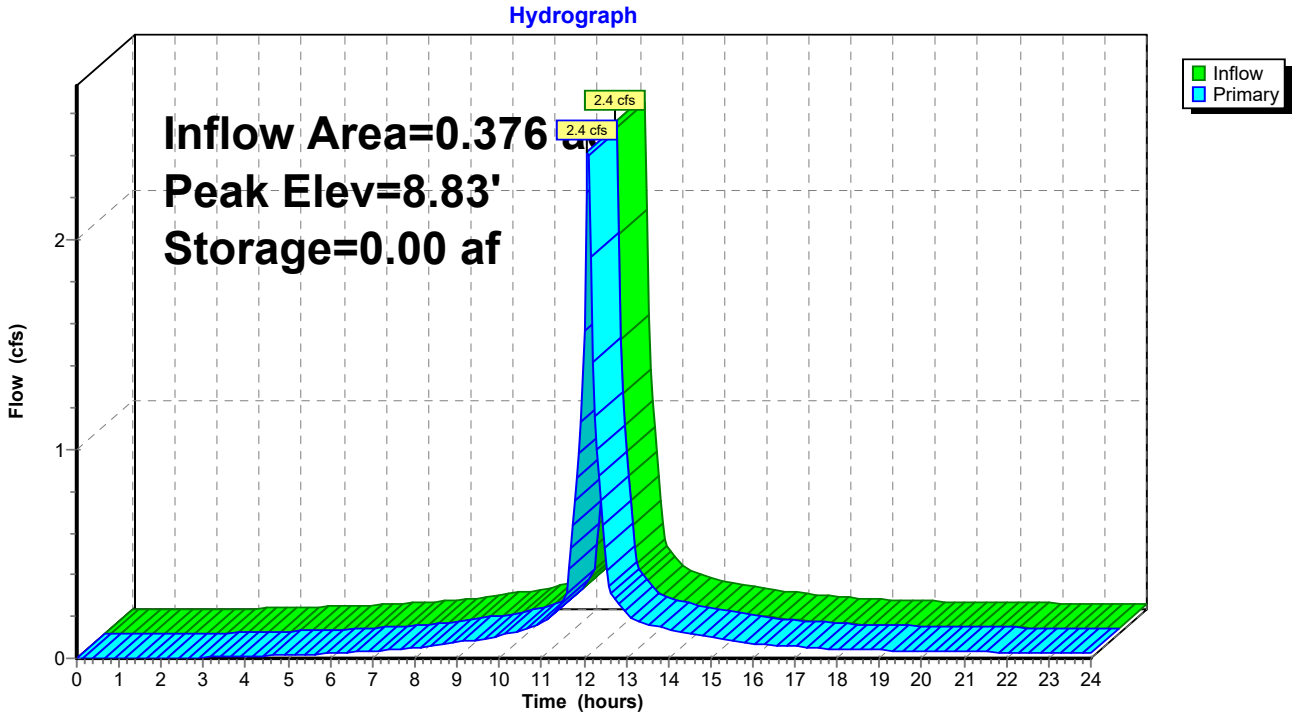
Plug-Flow detention time= 0.5 min calculated for 0.19 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (768.4 - 768.4)

Volume	Invert	Avail.Storage	Storage Description
#1	8.75'	0.01 af	**2.00'W x 71.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.55'	**12.0" Round Culvert** L= 23.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.55' / 6.43' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.75'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.4 cfs @ 12.09 hrs HW=8.83' (Free Discharge)
└─**1=Culvert** (Passes 2.4 cfs of 5.0 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.4 cfs @ 1.34 fps)

Pond CB-3: 18" NYLOPLAST DRAIN



Summary for Pond CB-4: 18" NYLOPLAST DRAIN

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth > 5.93" for 100-Year event
Inflow = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af
Outflow = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.1 min
Primary = 1.8 cfs @ 12.09 hrs, Volume= 0.14 af
Routed to Pond WQU-2 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.00' @ 12.09 hrs Surf.Area= 159 sf Storage= 7 cf
Flood Elev= 9.85' Surf.Area= 553 sf Storage= 304 cf

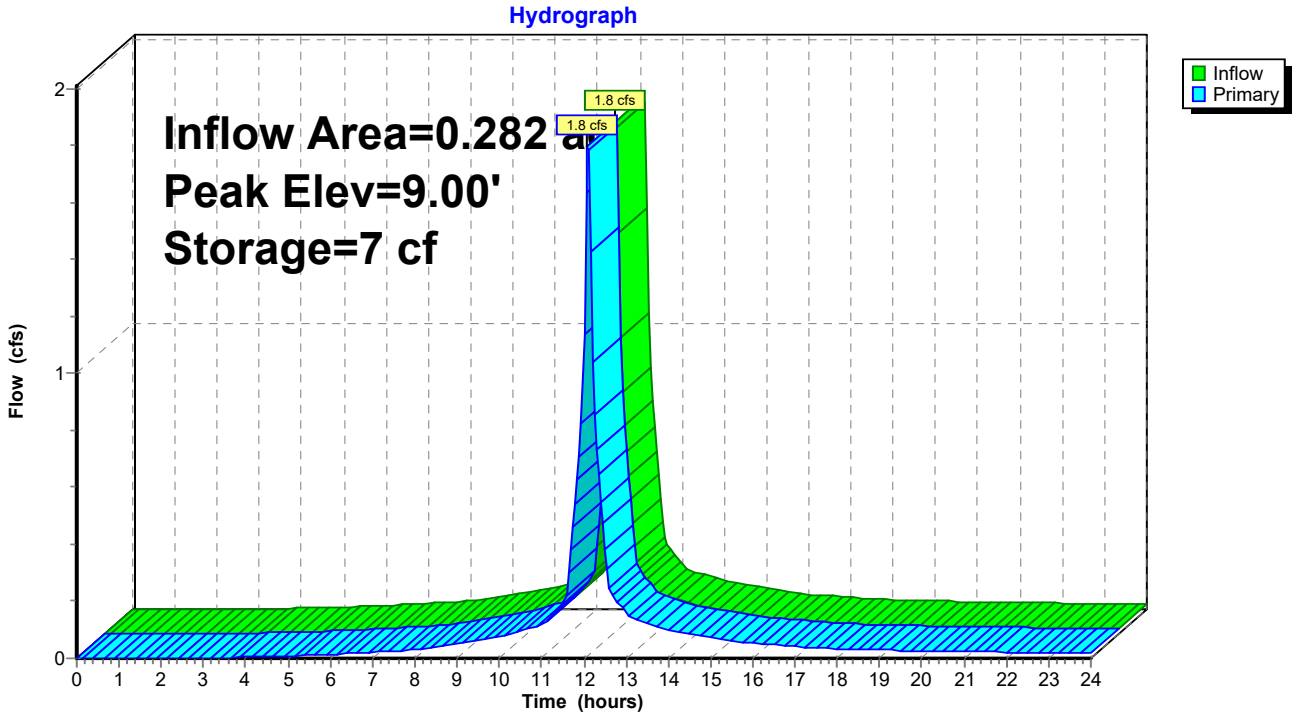
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (776.0 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	8.96'	368 cf	**2.00'W x 70.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.70'	**12.0" Round Culvert** L= 53.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.70' / 6.43' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.96'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=1.8 cfs @ 12.09 hrs HW=9.00' (Free Discharge)
└─**1=Culvert** (Passes 1.8 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 1.8 cfs @ 0.99 fps)

Pond CB-4: 18" NYLOPLAST DRAIN



Summary for Pond CB-5: 18" NYLOPLAST DRAIN

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth > 5.02" for 100-Year event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 9.04' @ 12.09 hrs Surf.Area= 138 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 505 sf Storage= 259 cf

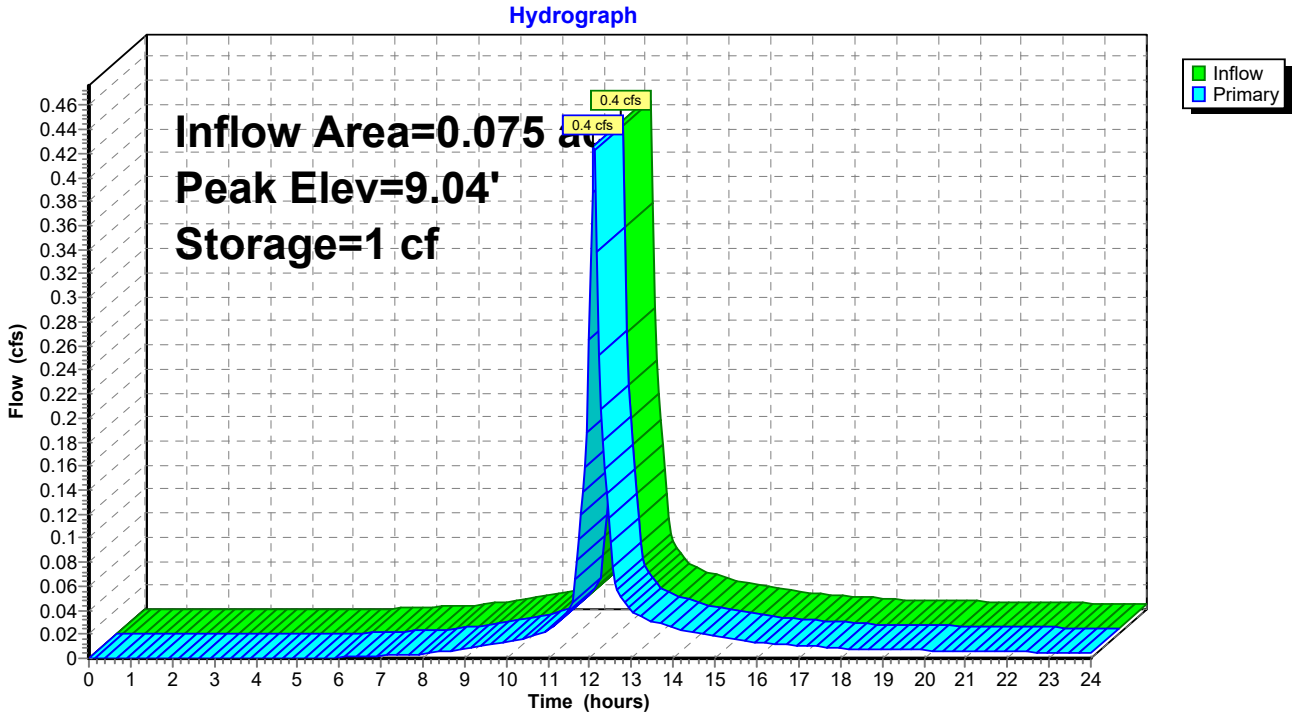
Plug-Flow detention time= 0.0 min calculated for 0.03 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (800.0 - 800.0)

Volume	Invert	Avail.Storage	Storage Description
#1	9.03'	358 cf	**2.00'W x 68.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.88'	**12.0" Round Culvert** L= 66.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.88' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	9.03'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.6 cfs @ 12.09 hrs HW=9.03' (Free Discharge)
└─**1=Culvert** (Passes 0.6 cfs of 4.3 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.6 cfs @ 0.34 fps)

Pond CB-5: 18" NYLOPLAST DRAIN



Summary for Pond CB-6: 18" NYLOPLAST DRAIN

Inflow Area = 0.072 ac, 0.00% Impervious, Inflow Depth > 4.69" for 100-Year event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Routed to Pond WQU-3 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.91' @ 12.09 hrs Surf.Area= 213 sf Storage= 1 cf
Flood Elev= 9.85' Surf.Area= 845 sf Storage= 491 cf

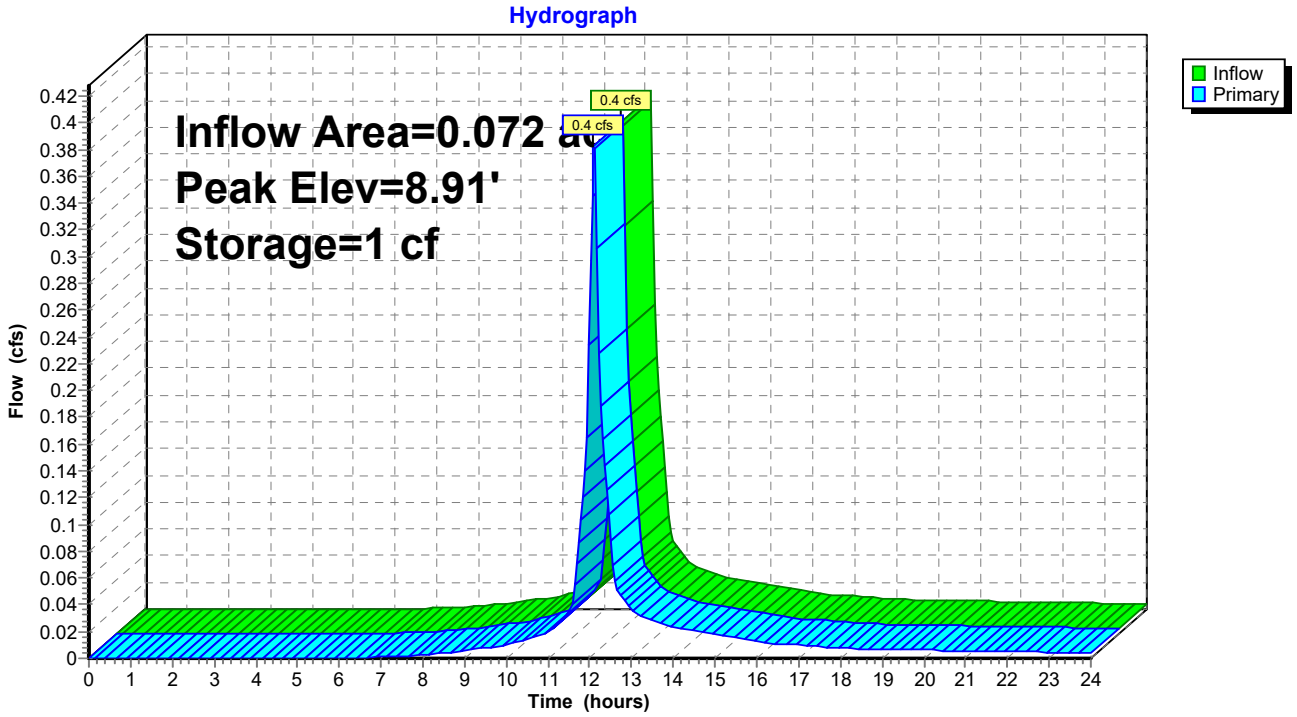
Plug-Flow detention time= 0.0 min calculated for 0.03 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (807.5 - 807.5)

Volume	Invert	Avail.Storage	Storage Description
#1	8.91'	543 cf	**2.00'W x 105.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.76'	**12.0" Round Culvert** L= 42.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.76' / 6.54' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.91'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=0.6 cfs @ 12.09 hrs HW=8.91' (Free Discharge)
└─**1=Culvert** (Passes 0.6 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 0.6 cfs @ 0.32 fps)

Pond CB-6: 18" NYLOPLAST DRAIN



Summary for Pond CB-7: 18" NYLOPLAST DRAIN

Inflow Area = 0.451 ac, 0.00% Impervious, Inflow Depth > 6.05" for 100-Year event
Inflow = 2.9 cfs @ 12.09 hrs, Volume= 0.23 af
Outflow = 2.9 cfs @ 12.09 hrs, Volume= 0.23 af, Atten= 0%, Lag= 0.3 min
Primary = 2.9 cfs @ 12.09 hrs, Volume= 0.23 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.77' @ 12.09 hrs Surf.Area= 204 sf Storage= 21 cf
Flood Elev= 9.85' Surf.Area= 648 sf Storage= 393 cf

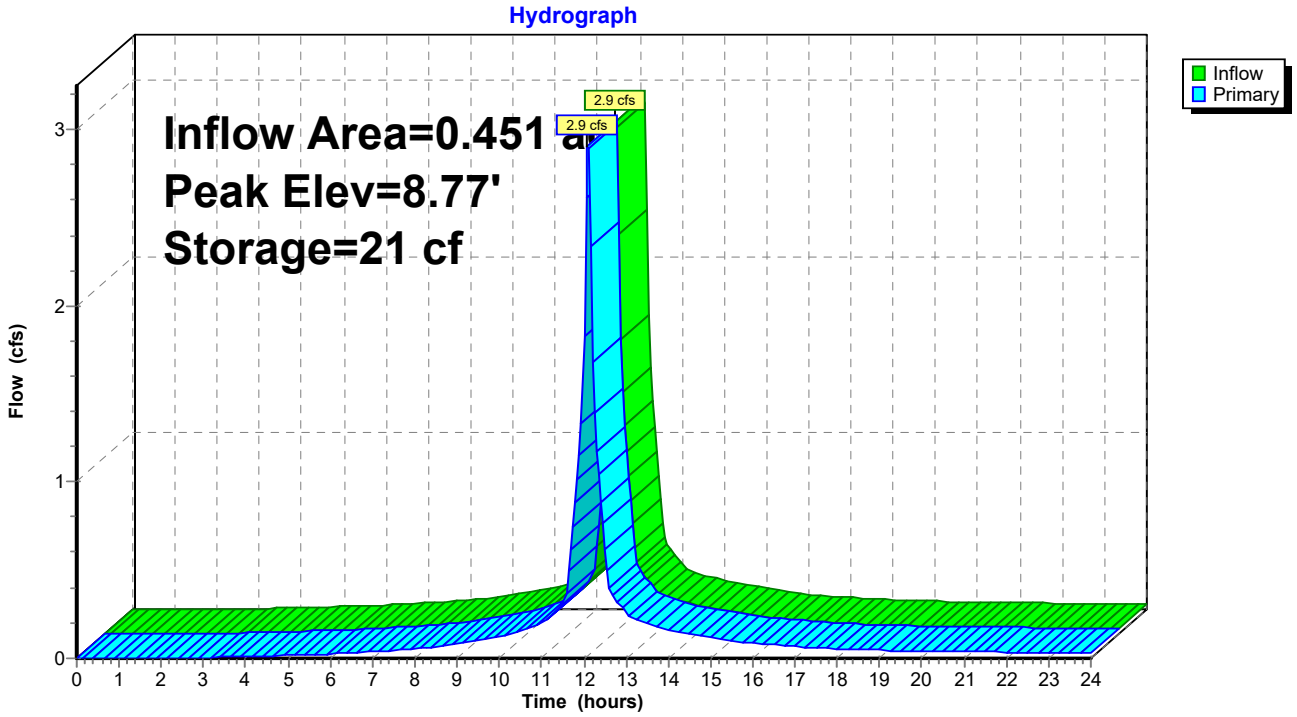
Plug-Flow detention time= 0.0 min calculated for 0.23 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (772.3 - 772.3)

Volume	Invert	Avail.Storage	Storage Description
#1	8.65'	393 cf	**2.00'W x 75.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.50'	**12.0" Round Culvert** L= 49.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.50' / 6.25' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.65'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=2.8 cfs @ 12.09 hrs HW=8.76' (Free Discharge)
└─**1=Culvert** (Passes 2.8 cfs of 4.6 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 2.8 cfs @ 1.61 fps)

Pond CB-7: 18" NYLOPLAST DRAIN



Summary for Pond CB-8: 18" NYLOPLAST DRAIN

Inflow Area = 0.682 ac, 0.00% Impervious, Inflow Depth > 5.93" for 100-Year event
Inflow = 4.3 cfs @ 12.09 hrs, Volume= 0.34 af
Outflow = 4.3 cfs @ 12.10 hrs, Volume= 0.34 af, Atten= 1%, Lag= 0.5 min
Primary = 4.3 cfs @ 12.10 hrs, Volume= 0.34 af
Routed to Pond WQU-4 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.79' @ 12.10 hrs Surf.Area= 314 sf Storage= 63 cf
Flood Elev= 9.85' Surf.Area= 744 sf Storage= 453 cf

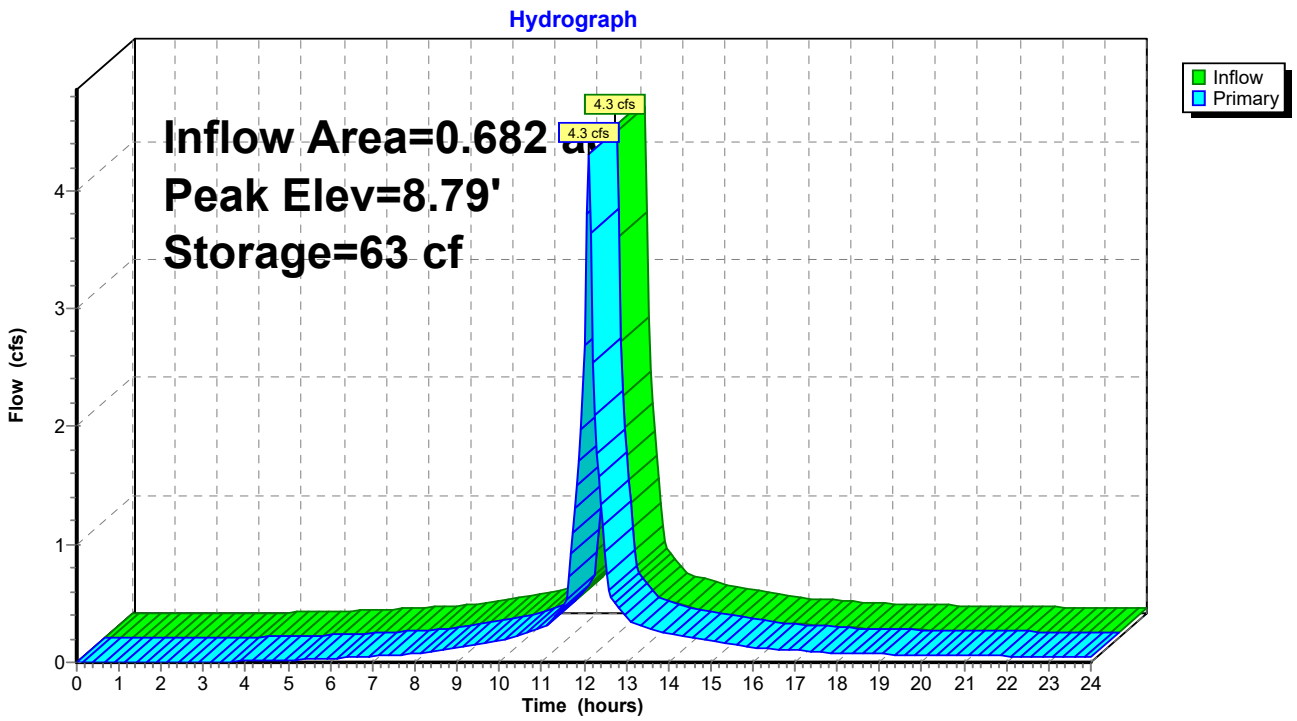
Plug-Flow detention time= 0.1 min calculated for 0.34 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (776.0 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	8.53'	453 cf	**2.00'W x 87.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	6.38'	**12.0" Round Culvert** L= 26.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.38' / 6.25' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	8.53'	**18.0" Horiz. Landscape Drain** C= 0.600

Primary OutFlow Max=4.3 cfs @ 12.10 hrs HW=8.78' (Free Discharge)
└─**1=Culvert** (Passes 4.3 cfs of 5.2 cfs potential flow)
└─**2=Landscape Drain** (Orifice Controls 4.3 cfs @ 2.42 fps)

Pond CB-8: 18" NYLOPLAST DRAIN



Summary for Pond CB-9: 18" NYLOPLAST DRAIN

Inflow Area = 1.111 ac, 5.88% Impervious, Inflow Depth > 6.28" for 100-Year event
Inflow = 7.3 cfs @ 12.09 hrs, Volume= 0.58 af
Outflow = 7.3 cfs @ 12.09 hrs, Volume= 0.58 af, Atten= 0%, Lag= 0.2 min
Primary = 7.3 cfs @ 12.09 hrs, Volume= 0.58 af
Routed to Pond WQU-5 : STORMCEPTOR STC-900

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.15' @ 12.09 hrs Surf.Area= 239 sf Storage= 44 cf
Flood Elev= 9.18' Surf.Area= 600 sf Storage= 363 cf

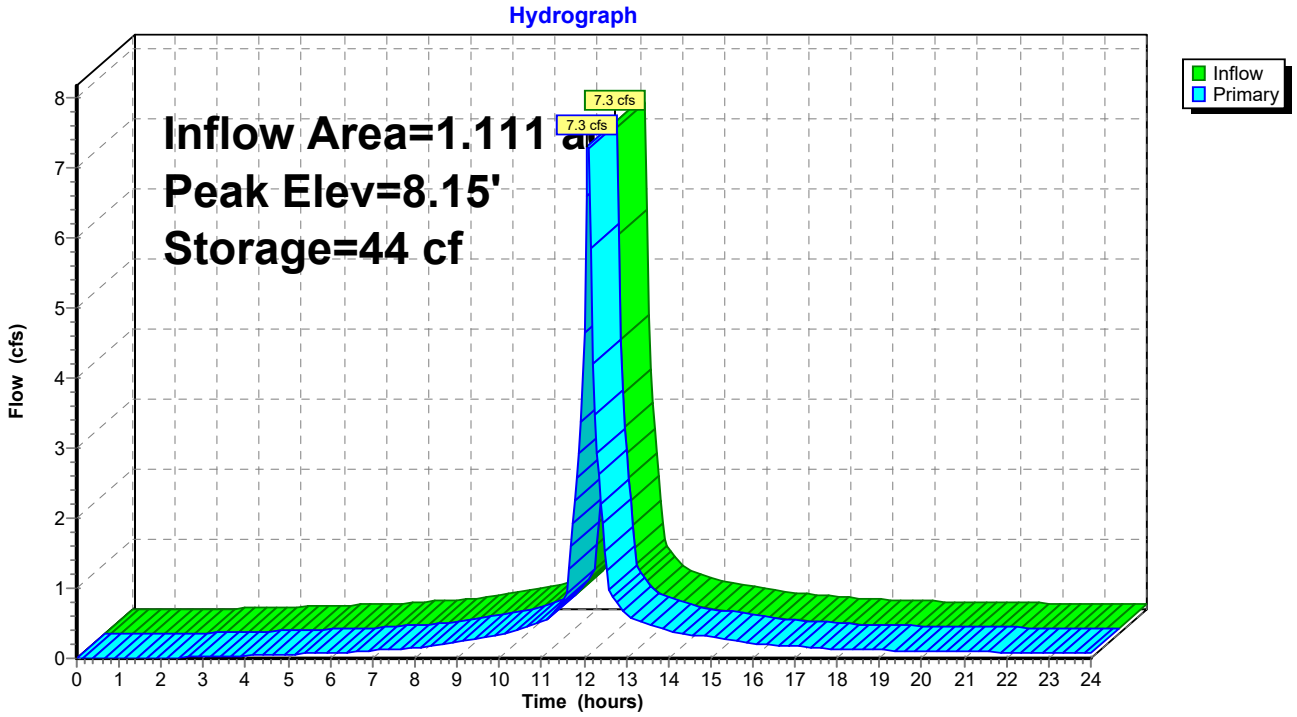
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (764.2 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	7.92'	363 cf	**2.00'W x 69.00'L x 1.00'H Swale Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	5.78'	**18.0" Round Culvert** L= 65.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.78' / 5.45' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	7.92'	**24.0" Horiz. Orifice/Grate** C= 0.600

Primary OutFlow Max=7.1 cfs @ 12.09 hrs HW=8.14' (Free Discharge)
└─**1=Culvert** (Passes 7.1 cfs of 9.8 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 7.1 cfs @ 2.27 fps)

Pond CB-9: 18" NYLOPLAST DRAIN



Summary for Pond WQU-1: STORMCEPTOR STC-900

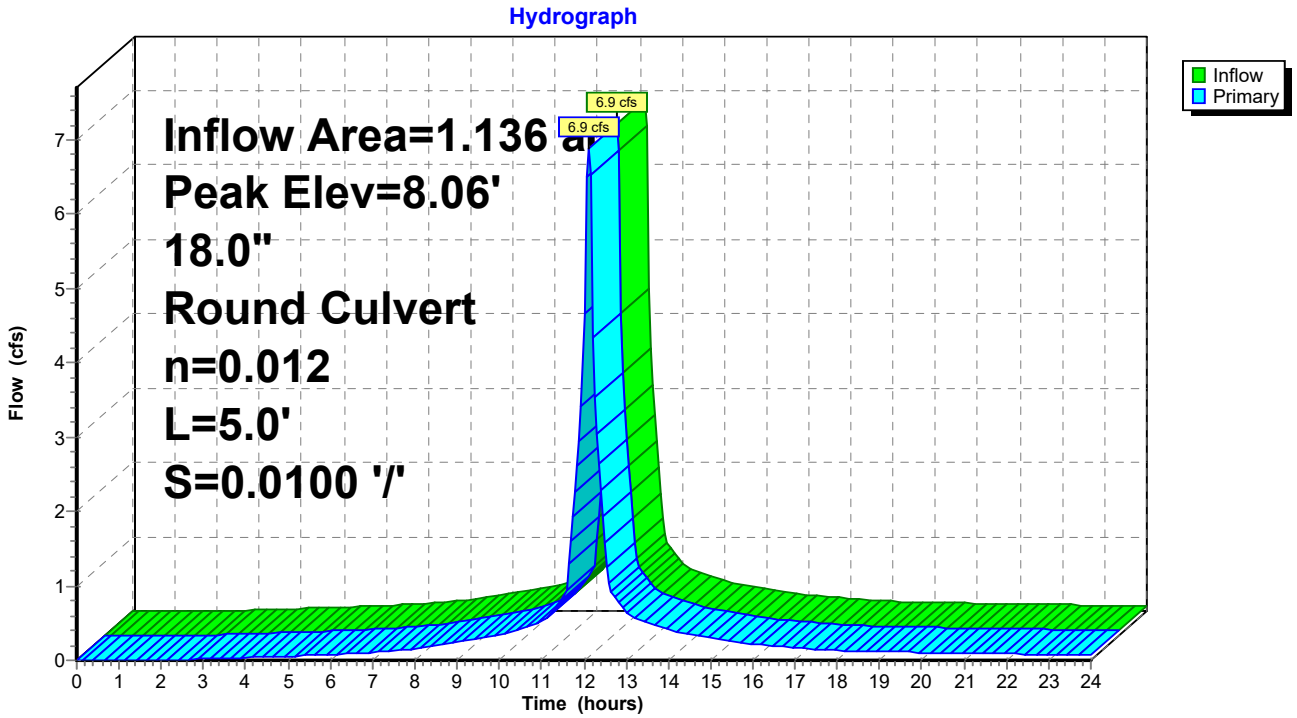
Inflow Area = 1.136 ac, 0.00% Impervious, Inflow Depth > 6.23" for 100-Year event
Inflow = 6.9 cfs @ 12.10 hrs, Volume= 0.59 af
Outflow = 6.9 cfs @ 12.10 hrs, Volume= 0.59 af, Atten= 0%, Lag= 0.0 min
Primary = 6.9 cfs @ 12.10 hrs, Volume= 0.59 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.06' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.40'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.40' / 6.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.9 cfs @ 12.10 hrs HW=8.06' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 6.9 cfs @ 4.38 fps)

Pond WQU-1: STORMCEPTOR STC-900



Summary for Pond WQU-2: STORMCEPTOR STC-900

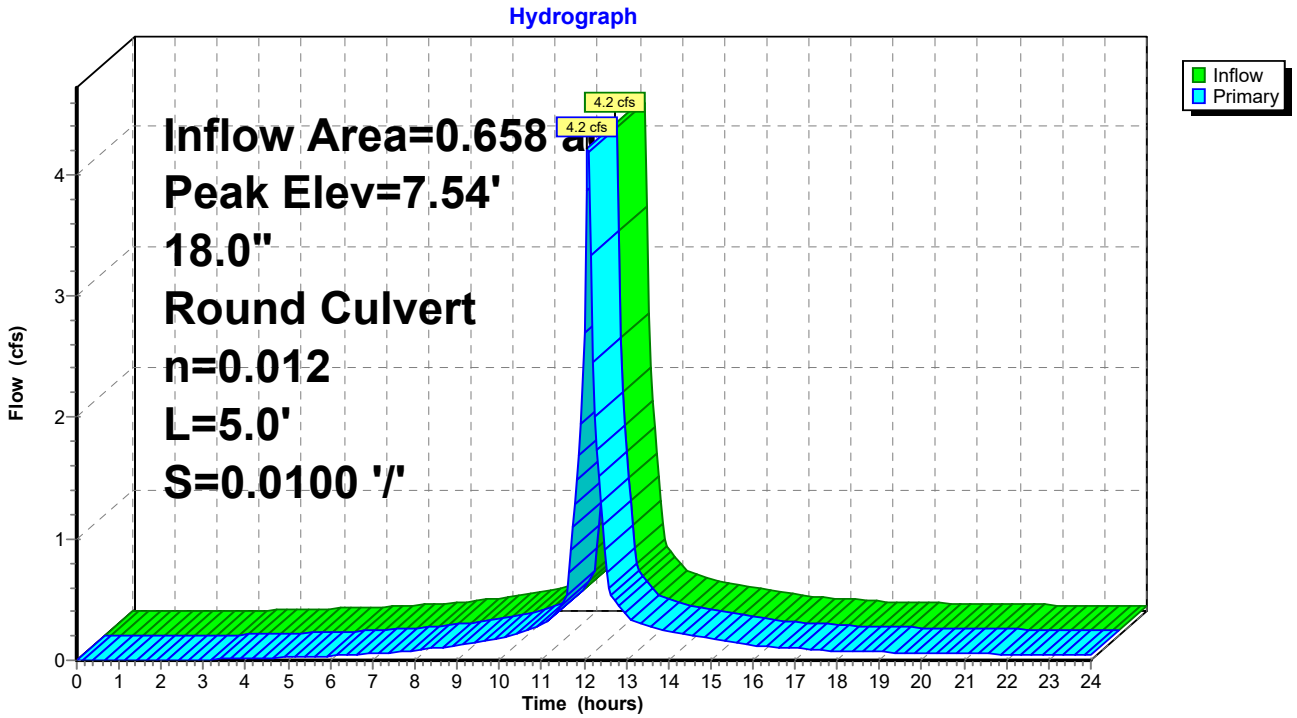
Inflow Area = 0.658 ac, 0.00% Impervious, Inflow Depth > 6.07" for 100-Year event
Inflow = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af
Outflow = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af, Atten= 0%, Lag= 0.0 min
Primary = 4.2 cfs @ 12.09 hrs, Volume= 0.33 af
Routed to Pond 1P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.54' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.34'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.34' / 6.29' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.1 cfs @ 12.09 hrs HW=7.53' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 4.1 cfs @ 3.77 fps)

Pond WQU-2: STORMCEPTOR STC-900



Summary for Pond WQU-3: STORMCEPTOR STC-900

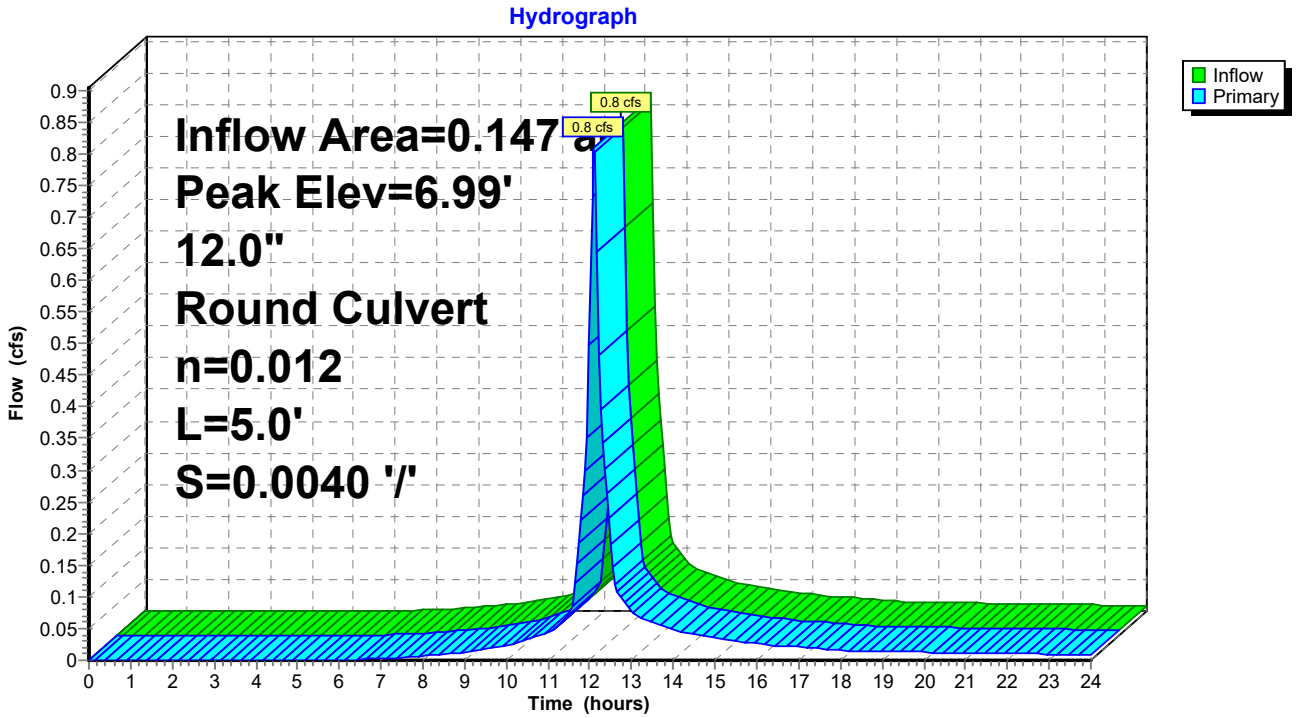
Inflow Area = 0.147 ac, 0.00% Impervious, Inflow Depth > 4.86" for 100-Year event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af
Outflow = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min
Primary = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.99' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.42'	**12.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.42' / 6.40' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.8 cfs @ 12.09 hrs HW=6.98' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 0.8 cfs @ 2.50 fps)

Pond WQU-3: STORMCEPTOR STC-900



Summary for Pond WQU-4: STORMCEPTOR STC-900

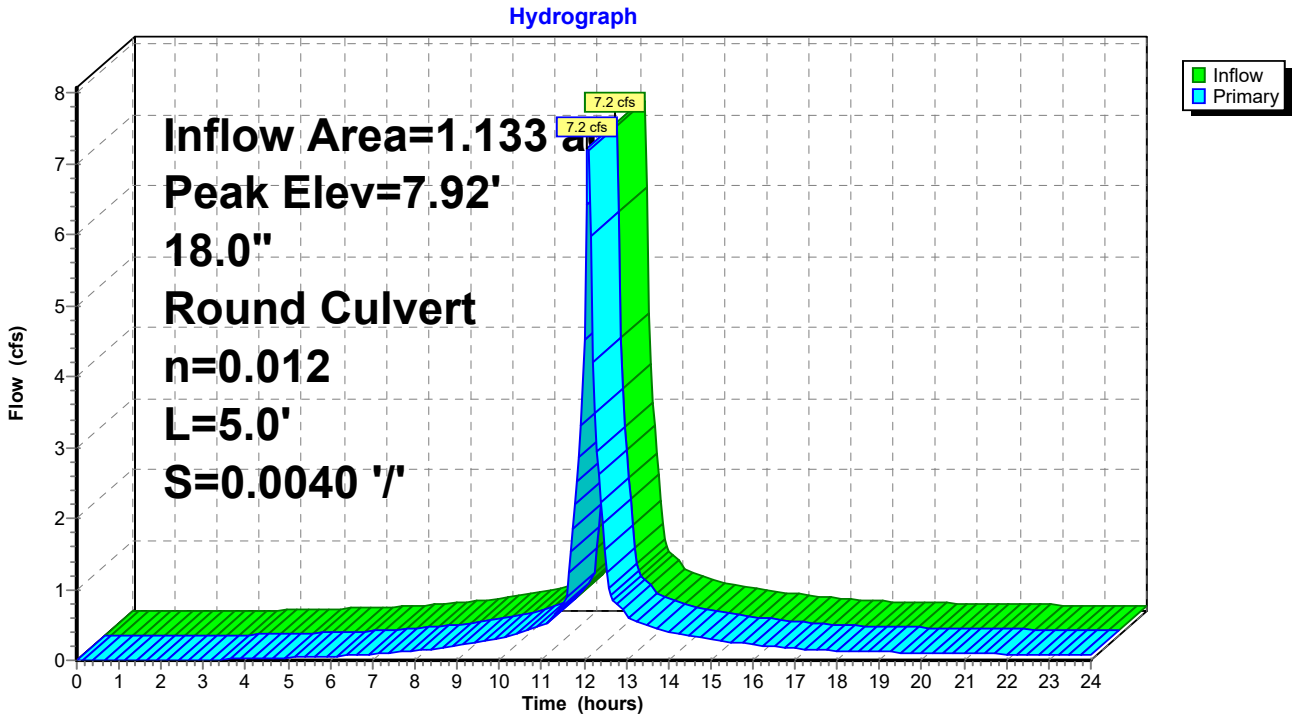
Inflow Area = 1.133 ac, 0.00% Impervious, Inflow Depth > 5.98" for 100-Year event
Inflow = 7.2 cfs @ 12.09 hrs, Volume= 0.56 af
Outflow = 7.2 cfs @ 12.09 hrs, Volume= 0.56 af, Atten= 0%, Lag= 0.0 min
Primary = 7.2 cfs @ 12.09 hrs, Volume= 0.56 af
Routed to Pond 2P : FERGUSON R-TANK CHAMBER SYSTEM

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.92' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	6.15'	**18.0" Round Outlet to Pond** L= 5.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 6.15' / 6.13' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.1 cfs @ 12.09 hrs HW=7.90' (Free Discharge)
└**1=Outlet to Pond** (Barrel Controls 7.1 cfs @ 4.34 fps)

Pond WQU-4: STORMCEPTOR STC-900



Summary for Pond WQU-5: STORMCEPTOR STC-900

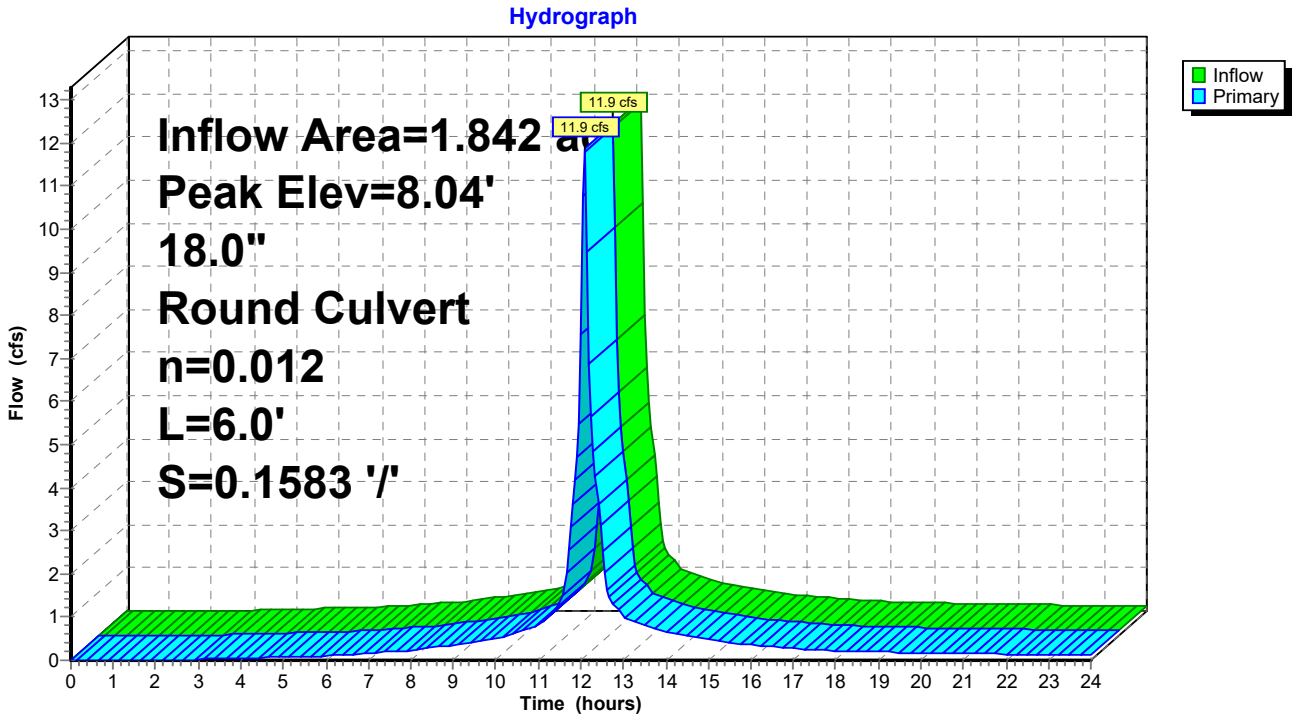
Inflow Area = 1.842 ac, 3.55% Impervious, Inflow Depth > 6.10" for 100-Year event
Inflow = 11.9 cfs @ 12.09 hrs, Volume= 0.94 af
Outflow = 11.9 cfs @ 12.09 hrs, Volume= 0.94 af, Atten= 0%, Lag= 0.0 min
Primary = 11.9 cfs @ 12.09 hrs, Volume= 0.94 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 8.04' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=11.6 cfs @ 12.09 hrs HW=7.96' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 11.6 cfs @ 6.58 fps)

Pond WQU-5: STORMCEPTOR STC-900



Summary for Pond WQU-6: STORMCEPTOR STC-900

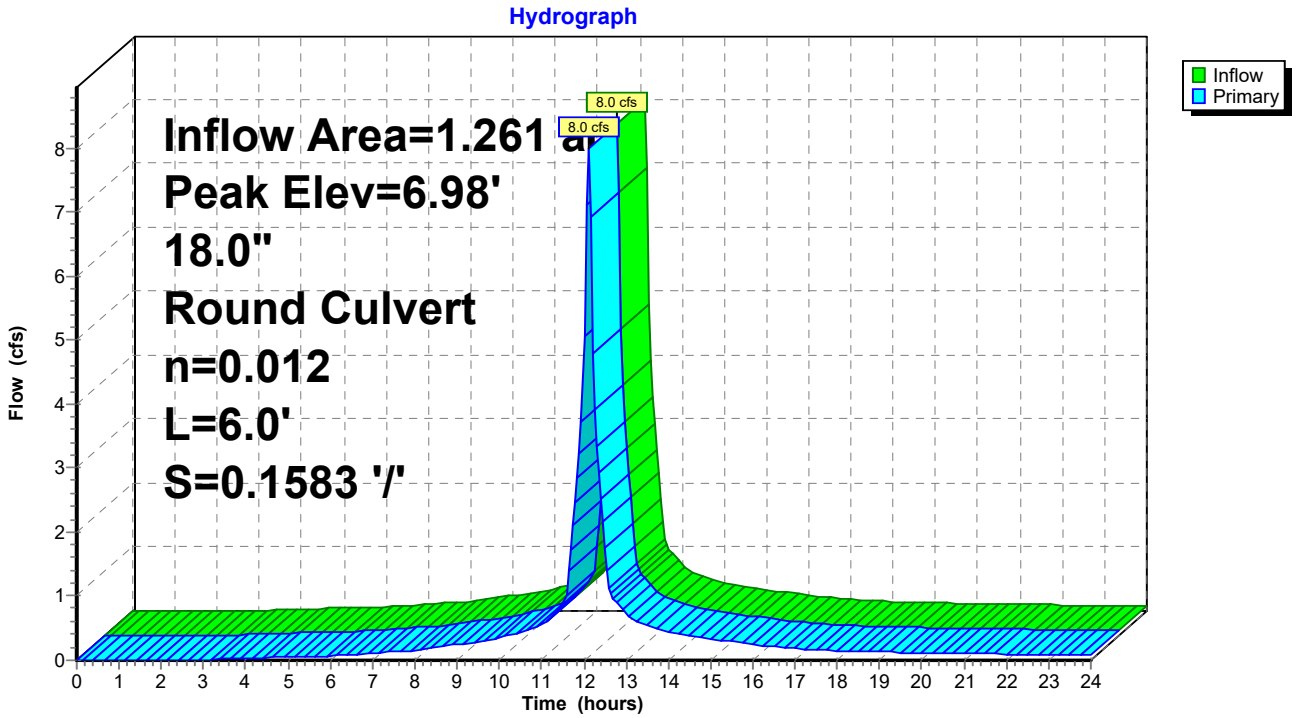
Inflow Area = 1.261 ac, 0.00% Impervious, Inflow Depth > 6.09" for 100-Year event
Inflow = 8.0 cfs @ 12.10 hrs, Volume= 0.64 af
Outflow = 8.0 cfs @ 12.10 hrs, Volume= 0.64 af, Atten= 0%, Lag= 0.0 min
Primary = 8.0 cfs @ 12.10 hrs, Volume= 0.64 af
Routed to Pond 3P : FERGUSON R-TANK / INFILTRATION TRENCH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.98' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	5.35'	**18.0" Round Outlet to Pond** L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 5.35' / 4.40' S= 0.1583 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.9 cfs @ 12.10 hrs HW=6.97' (Free Discharge)
└**1=Outlet to Pond** (Inlet Controls 7.9 cfs @ 4.49 fps)

Pond WQU-6: STORMCEPTOR STC-900

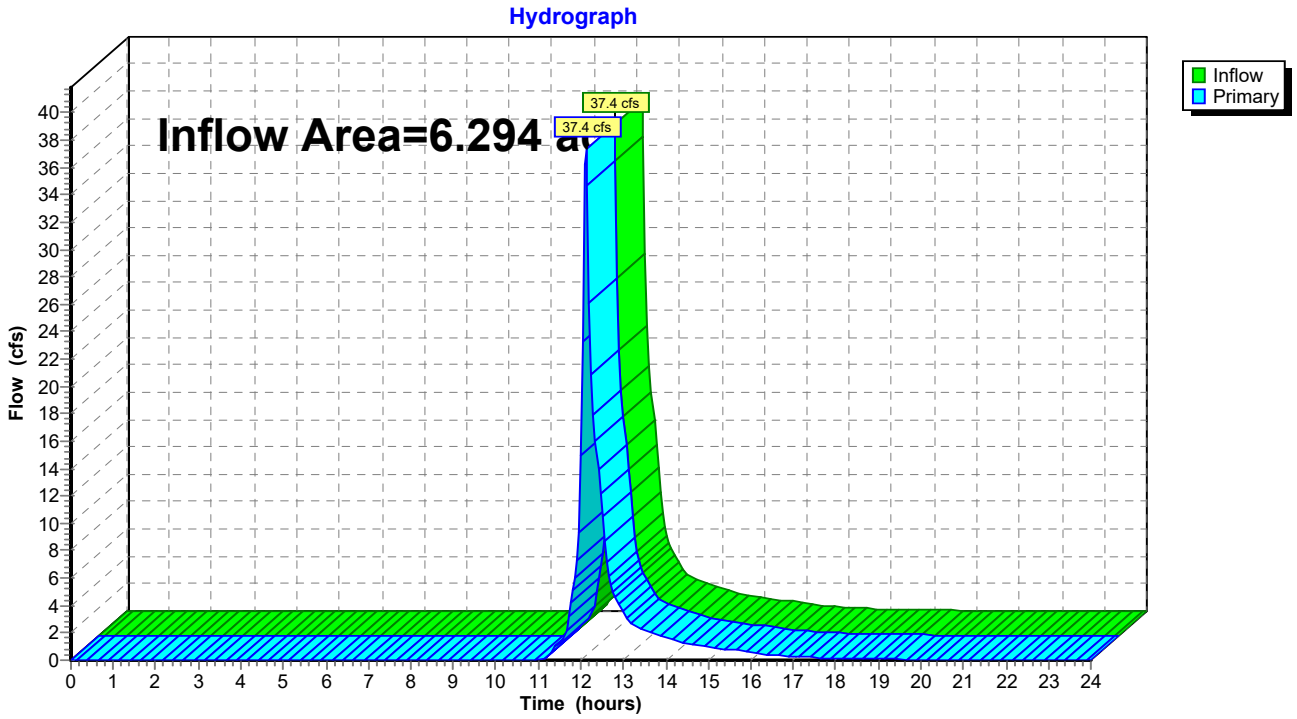


Summary for Link 2: 66" DRAIN WRIGHT STREET

Inflow Area = 6.294 ac, 2.92% Impervious, Inflow Depth > 3.39" for 100-Year event
Inflow = 37.4 cfs @ 12.12 hrs, Volume= 1.78 af
Primary = 37.4 cfs @ 12.12 hrs, Volume= 1.78 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 2: 66" DRAIN WRIGHT STREET

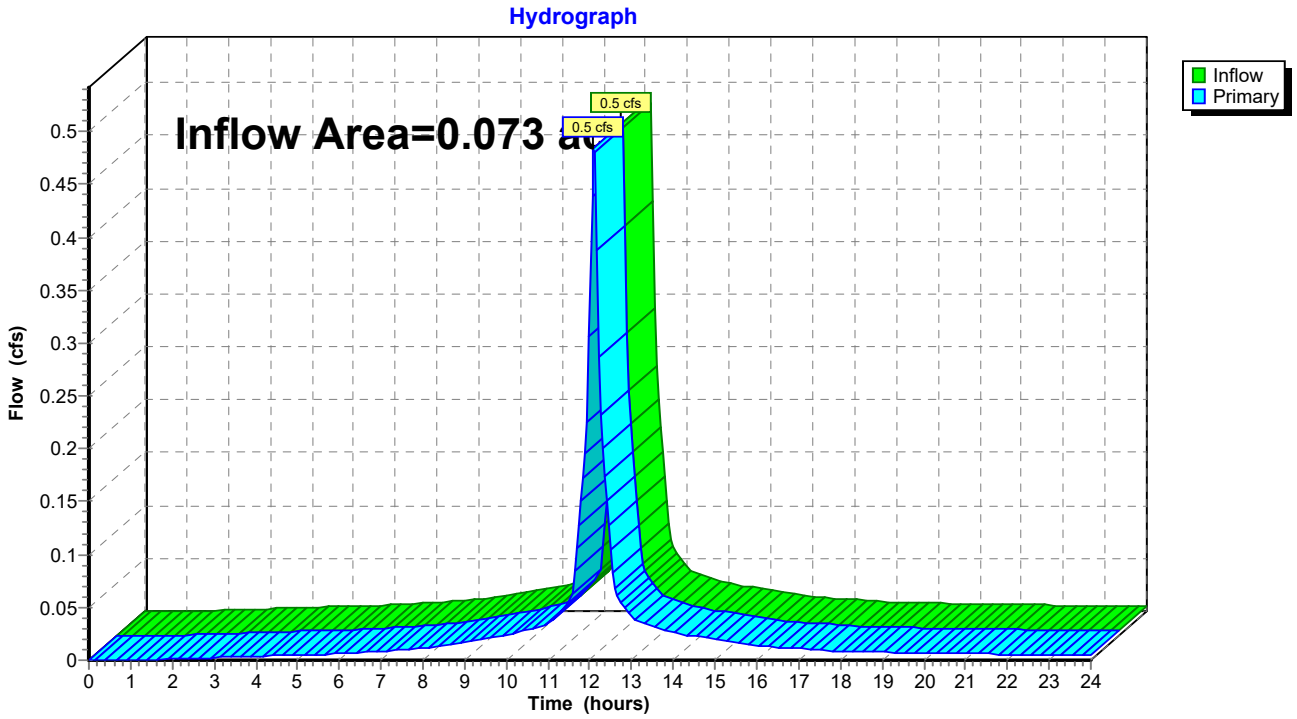


Summary for Link 3: 72" DRAIN MAIN TERMINAL

Inflow Area = 0.073 ac, 0.00% Impervious, Inflow Depth > 6.52" for 100-Year event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af
Primary = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 3: 72" DRAIN MAIN TERMINAL



Water Quality Volume Flow Rate Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Structure Name:	WQU-1	Description:	Stormceptor STC-900	
Subcatchment:	2B-PR, 2C-PR			
		Total Drainage Area:	49,482	sq ft
			1.14	ac
		Total Impervious Area:	47,491	sq ft
			1.09	ac

** Roof Areas are considred clean and are not subject to pre-treatment requirement*

Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**3,958**	**cf**
	0.091	ac ft

FLOW RATE CONVERSION

Q = (qu)(A)(WQV)

Where:

Q = flow rate associated with the depth of runoff, in cfs
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area, in square miles
WQV = water quality volume in watershed inches

Given:

1-acre =	0.0015625	mi^2
6 minute =	0.01	hours
qu (**1**-inch) =	**774**	csm/in

Calculation:

qu=	**774**	
A=	1.09	ac
WQV=	1.0	in

Required Water Quality Flow Rate:	**1.32**	**cfs**

Stormceptor STC-900 will provide a minimum of 82% TSS Removal Efficiency up to 1.32 CFS

(Based on Manufacturer's sizing. See attached documentation.)

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Water Quality Volume Flow Rate Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Structure Name:	WQU-2	Description:	Stormceptor STC-900	
Subcatchment:	2D-PR, 2E-PR			
		Total Drainage Area:	28,651	sq ft
			0.66	ac
		Total Impervious Area:	26,646	sq ft
			0.61	ac

** Roof Areas are considred clean and are not subject to pre-treatment requirement*

Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**2,388**	**cf**
	0.055	ac ft

FLOW RATE CONVERSION

Q = (qu)(A)(WQV)

Where:

Q = flow rate associated with the depth of runoff, in cfs
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area, in square miles
WQV = water quality volume in watershed inches

Given:

1-acre =	0.0015625	mi^2
6 minute =	0.01	hours
qu (**1**-inch) =	**774**	csm/in

Calculation:

qu=	**774**	
A=	0.61	ac
WQV=	1.0	in

Required Water Quality Flow Rate:	**0.74**	**cfs**

Stormceptor STC-900 will provide a minimum of 87% TSS Removal Efficiency up to 0.74 CFS

(Based on Manufacturer's sizing. See attached documentation.)

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Water Quality Volume Flow Rate Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Structure Name:	WQU-3	Description:	Stormceptor STC-900	
Subcatchment:	2F-PR, 2G-PR			
		Total Drainage Area:	6,394	sq ft
			0.15	ac
		Total Impervious Area:	4,741	sq ft
			0.11	ac

** Roof Areas are considred clean and are not subject to pre-treatment requirement*

Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**395**	**cf**
	0.009	ac ft

FLOW RATE CONVERSION

Q = (qu)(A)(WQV)

Where:

Q = flow rate associated with the depth of runoff, in cfs
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area, in square miles
WQV = water quality volume in watershed inches

Given:

1-acre =	0.0015625	mi^2
6 minute =	0.01	hours
qu (**1**-inch) =	**774**	csm/in

Calculation:

qu=	**774**	
A=	0.11	ac
WQV=	1.0	in

Required Water Quality Flow Rate:	**0.13**	**cfs**

Stormceptor STC-900 will provide a minimum of 96% TSS Removal Efficiency up to 0.13 CFS

(Based on Manufacturer's sizing. See attached documentation.)

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Water Quality Volume Flow Rate Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Structure Name:	WQU-4	Description:	Stormceptor STC-900	
Subcatchment:	2H-PR, 2I-PR			
		Total Drainage Area:	49,337	sq ft
			1.13	ac
		Total Impervious Area:	45,448	sq ft
			1.04	ac

** Roof Areas are considred clean and are not subject to pre-treatment requirement*

Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**3,787**	**cf**
	0.087	ac ft

FLOW RATE CONVERSION

Q = (qu)(A)(WQV)

Where:

Q = flow rate associated with the depth of runoff, in cfs
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area, in square miles
WQV = water quality volume in watershed inches

Given:

1-acre =	0.0015625	mi^2
6 minute =	0.01	hours
qu (**1**-inch) =	**774**	csm/in

Calculation:

qu=	**774**	
A=	1.04	ac
WQV=	1.0	in

Required Water Quality Flow Rate:	**1.26**	**cfs**

Stormceptor STC-900 will provide a minimum of 83% TSS Removal Efficiency up to 1.26 CFS

(Based on Manufacturer's sizing. See attached documentation.)

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Water Quality Volume Flow Rate Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Structure Name:	WQU-5	Description:	Stormceptor STC-900	
Subcatchment:	2J-PR, 2K-PR, 2L-PR			
		Total Drainage Area:	80,221	sq ft
			1.84	ac
		Total Impervious Area:	74,851	sq ft
			1.72	ac

** Roof Areas are considred clean and are not subject to pre-treatment requirement*

Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**6,238**	**cf**
	0.143	ac ft

FLOW RATE CONVERSION

Q = (qu)(A)(WQV)

Where:

Q = flow rate associated with the depth of runoff, in cfs
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area, in square miles
WQV = water quality volume in watershed inches

Given:

1-acre =	0.0015625	mi^2
6 minute =	0.01	hours
qu (**1**-inch) =	**774**	csm/in

Calculation:

qu=	**774**	
A=	1.72	ac
WQV=	1.0	in

Required Water Quality Flow Rate:	**2.08**	**cfs**

Stormceptor STC-900 will provide a minimum of 78% TSS Removal Efficiency up to 2.08 CFS

(Based on Manufacturer's sizing. See attached documentation.)

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Water Quality Volume Flow Rate Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Structure Name:	WQU-6	Description:	Stormceptor STC-900	
Subcatchment:	2M-PR, 2N-PR			
		Total Drainage Area:	54,929	sq ft
			1.26	ac
		Total Impervious Area:	51,284	sq ft
			1.18	ac

** Roof Areas are considred clean and are not subject to pre-treatment requirement*

Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**4,274**	**cf**
	0.098	ac ft

FLOW RATE CONVERSION

Q = (qu)(A)(WQV)

Where:

Q = flow rate associated with the depth of runoff, in cfs
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area, in square miles
WQV = water quality volume in watershed inches

Given:

1-acre =	0.0015625	mi^2
6 minute =	0.01	hours
qu (**1**-inch) =	**774**	csm/in

Calculation:

qu=	**774**	
A=	1.18	ac
WQV=	1.0	in

Required Water Quality Flow Rate:	**1.42**	**cfs**

Stormceptor STC-900 will provide a minimum of 81% TSS Removal Efficiency up to 1.42 CFS

(Based on Manufacturer's sizing. See attached documentation.)

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Water Quality Volume Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Pond Name: 1P

Description: Ferguson R-Tank infiltration chambers

Subcatchments: 2B, 2C, 2D, 2E [Subcatchments that drain to 1P]

Total Drainage Area:	78,133	sq ft
	1.79	ac
Total Impervious Area:	74,137	sq ft
	1.70	ac
Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**6,178**	**cf**
	0.14	ac ft

Water Quality Volume Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Pond Name: 2P

Description: Ferguson R-Tank infiltration chambers

Subcatchments: 2F, 2G, 2H, 2I [Subcatchments that drain to pond 2P]

Total Drainage Area:	55,731	sq ft
	1.28	ac
Total Impervious Area:	50,189	sq ft
	1.15	ac
Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**4,182**	**cf**
	0.10	ac ft

Water Quality Volume Calculations

Project Name:	MassCEC Terminal Expansion	Date:	1/28/2025
Project Location:	New Bedford, MA	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Pond Name: 3P

Description: Ferguson R-Tank infiltration chambers / Stone infiltration trench

Subcatchments: 2J, 2K, 2L, 2M, 2N [Subcatchments that drain to pond 3P]

Total Drainage Area:	135,150	sq ft
	3.10	ac
Total Impervious Area:	129,325	sq ft
	2.97	ac
Runoff Depth to be Treated:	1.0	inches

Required Water Quality Volume:	**10,777**	**cf**
	0.247	ac ft

Groundwater Recharge Calculations

Project Name:	MassCEC	Date:	4/4/2025
Project Location:	New Bedford Marine Commerce Terminal	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Existing Conditions Impervious Area

Hydrologic Soil Group	Area (sq ft)	Area (acres)	Recharge Depth (in)	Volume (cu ft)
A	176,509	4.05	1.00	14709
B	0	0.00	1.00	0.0
C	0	0.00	1.00	0.0
D	0	0.00	1.00	0.0
TOTAL	**176,509**	**4.05**		**14,709**

Proposed Conditions Impervious Area

Hydrologic Soil Group	Area (sq ft)	Area (acres)	Recharge Depth (in)	Volume (cu ft)
A	261,589	6.01	1.00	21799
B	0	0.00	1.00	0.0
C	0	0.00	1.00	0.0
D	0	0.00	1.00	0.0
TOTAL	**261,589**	**6.01**		**21,799**

Net Required Recharge Volume: 21,799 cu ft

Capture Area Adjustment

* Impervious Area to Recharge Facility:	5.94	ac	* (includes Subcatchments Subcatchment 3B-PR)
Total Site Impervious Area:	6.01	ac	
** Impervious Ratio:	1.01		** (Total Site Impervious / Impervious Area to Recharge Facility)

Adjusted Required 22,035 cu ft

Provided Recharge Volume

Pond 1P		4,792 cf	*Ferguson R-tank*
Pond 2P		3,049 cf	*Ferguson R-tank*
Pond 3P		14,375 cf	*Ferguson R-tank & Stone Infiltration Trench*
	TOTAL	22,216 cf	

Total Provided 22,216 cu ft

Groundwater Recharge Calculations

Project Name:	MassCEC	Date:	4/4/2025
Project Location:	New Bedford Marine Commerce Terminal	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Stormwater BMP: Pond 1P

Description: Ferguson R-tank

Provided Recharge Volume

Bottom of Stone:	3.50	ft	
Overflow Outlet Elevation:	6.80	ft	
*** Volume Provided:	0.11	ac ft	
	4,792	cu ft	*** (See Site Plans)
			=

Total Provided Recharge Volume:	**4,792**	**cu ft**

72-hour Drawdown Calculation

Provided Recharge Volume:	4,792	cu ft
Saturated Hydraulic Conductivity:	2.41	in / hr
Bottom Area:	3,298	sq ft
Drawdown Time:	**7.2**	**hours**

(Stormwater infiltration system was previously designed, permitted and installed based on presumed future impervious area on the Site. However, proposed impervious area is greater than previous assumptions. A conservative Rawls Rate for Loam (HSG B) was used to demonstrate regardless of previous assumptions, the infiltration system will drawdown within 72 hours while using the most restrictive infiltration rate permitted for infiltration systems.)

Groundwater Recharge Calculations

Project Name:	MassCEC	Date:	4/4/2025
Project Location:	New Bedford Marine Commerce Terminal	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Stormwater BMP: Pond 2P

Description: Ferguson R-tank

Provided Recharge Volume

Bottom of Stone:	4.90	ft	
Overflow Outlet Elevation:	6.95	ft	
*** Volume Provided:	0.07	ac ft	
	3,049	cu ft	*** (See Site Plans)
			=
Total Provided Recharge Volume:	**3,049**	**cu ft**	

72-hour Drawdown Calculation

Provided Recharge Volume:	3,049	cu ft
Saturated Hydraulic Conductivity:	2.41	in / hr
Bottom Area:	3,447	sq ft
Drawdown Time:	**4.4**	**hours**

(Stormwater infiltration system was previously designed, permitted and installed based on presumed future impervious area on the Site. However, proposed impervious area is greater than previous assumptions. A conservative Rawls Rate for Loam (HSG B) was used to demonstrate regardless of previous assumptions, the infiltration system will drawdown within 72 hours while using the most restrictive infiltration rate permitted for infiltration systems.)

Groundwater Recharge Calculations

Project Name:	MassCEC	Date:	4/4/2025
Project Location:	New Bedford Marine Commerce Terminal	Calculated By:	ITB
Project Number:	332-344	Checked By:	DSK

Stormwater BMP: Pond 3P

Description: Ferguson R-tank & Stone Infiltration Trench

Provided Recharge Volume

Bottom of Stone:	3.90	ft	
Overflow Outlet Elevation:	6.60	ft	
*** Volume Provided:	0.33	ac ft	
	14,375	cu ft	*** (See Site Plans)
			=
Total Provided Recharge Volume:	**14,375**	**cu ft**	

72-hour Drawdown Calculation

Provided Recharge Volume:	14,375	cu ft
Saturated Hydraulic Conductivity:	2.41	in / hr
Bottom Area:	8,582	sq ft
Drawdown Time:	**8.3**	**hours**

(Stormwater infiltration system was previously designed, permitted and installed based on presumed future impervious area on the Site. However, proposed impervious area is greater than previous assumptions. A conservative Rawls Rate for Loam (HSG B) was used to demonstrate regardless of previous assumptions, the infiltration system will drawdown within 72 hours while using the most restrictive infiltration rate permitted for infiltration systems.)

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: WQU-1 to Pond 1P

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Stormceptor STC-900 WQU-1	**0.82**	**1.00**	**0.82**	**0.18**
Subsurface Infiltration Structure	**0.80**	**0.18**	**0.14**	**0.04**

Total TSS Removal = 96%

Project: **MassCEC Terminal Expansion**

Prepared By: **ITB**

Date: **1/28/2025**

*Equals remaining load from previous BMP (E) which enters the BMP

** Bioretention Areas conservatively excluded from TSS removal calculation*

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: WQU-2 to Pond 1P

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Stormceptor STC-900 WQU-2	**0.87**	**1.00**	**0.87**	**0.13**
Subsurface Infiltration Structure	**0.80**	**0.13**	**0.10**	**0.03**

Total TSS Removal = 97%

Project: **MassCEC Terminal Expansion**

Prepared By: **ITB**

Date: **1/28/2025**

*Equals remaining load from previous BMP (E) which enters the BMP

** Bioretention Areas conservatively excluded from TSS removal calculation*

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: WQU-3 to Pond 2P

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Stormceptor STC-900 WQU-3	**0.96**	**1.00**	**0.96**	**0.04**
Subsurface Infiltration Structure	**0.80**	**0.04**	**0.03**	**0.01**

Total TSS Removal = 99%

Project: **MassCEC Terminal Expansion**

Prepared By: **ITB**

Date: **1/28/2025**

*Equals remaining load from previous BMP (E) which enters the BMP

** Bioretention Areas conservatively excluded from TSS removal calculation*

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: WQU-4 to Pond 2P

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Stormceptor STC-900 WQU-4	**0.83**	**1.00**	**0.83**	**0.17**
Subsurface Infiltration Structure	**0.80**	**0.17**	**0.14**	**0.03**

Total TSS Removal = **97%**

Project: **MassCEC Terminal Expansion**

Prepared By: **ITB**

Date: **1/28/2025**

*Equals remaining load from previous BMP (E) which enters the BMP

** Bioretention Areas conservatively excluded from TSS removal calculation*

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: WQU-5 to Pond 3P

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Stormceptor STC-900 WQU-5	**0.78**	**1.00**	**0.78**	**0.22**
Infiltration Trench	**0.80**	**0.22**	**0.18**	**0.04**

Total TSS Removal = **96%**

Project: **MassCEC Terminal Expansion**

Prepared By: **ITB**

Date: **1/28/2025**

*Equals remaining load from previous BMP (E) which enters the BMP

** Bioretention Areas conservatively excluded from TSS removal calculation*

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: WQU-6 to Pond 3P

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Stormceptor STC-900 WQU-6	**0.81**	**1.00**	**0.81**	**0.19**
Infiltration Trench	**0.80**	**0.19**	**0.15**	**0.04**

Total TSS Removal = 96%

Project: **MassCEC Terminal Expansion**

Prepared By: **ITB**

Date: **1/28/2025**

*Equals remaining load from previous BMP (E) which enters the BMP

** Bioretention Areas conservatively excluded from TSS removal calculation*

Detailed Stormceptor Sizing Report – 2B-PR, 2C-PR

Project Information & Location			
Project Name	WQU-1	**Project Number**	332344
City	New Bedford	**State/ Province**	Massachusetts
Country	United States of America	**Date**	12/10/2024
Designer Information		**EOR Information (optional)**	
Name		**Name**	
Company	CEC	**Company**	
Phone #	351-201-2210	**Phone #**	
Email	iberl@cecinc.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	2B-PR, 2C-PR
Recommended Stormceptor Model	STC 900
Target TSS Removal (%)	82.0
TSS Removal (%) Provided	82
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	74
STC 900	82
STC 1200	82
STC 1800	82
STC 2400	86
STC 3600	86
STC 4800	89
STC 6000	89
STC 7200	91
STC 11000	94
STC 13000	94
STC 16000	95

Stormceptor
The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology
Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:
• Site parameters
• Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
• Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
• TSS load
• Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Massachusetts	**Total Number of Rainfall Events**	1268
Rainfall Station Name	HYANNIS	**Total Rainfall (in)**	531.6
Station ID #	3821	**Average Annual Rainfall (in)**	33.2
Coordinates	41°24'0"N, 70°10'47"W	**Total Evaporation (in)**	30.6
Elevation (ft)	50	**Total Infiltration (in)**	21.0
Years of Rainfall Data	14	**Total Rainfall that is Runoff (in)**	480.0

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	1.14
Imperviousness %	96.0

Water Quality Objective	
TSS Removal (%)	82.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	1.32

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	
Stormceptor Outlet Invert Elev (ft)	
Stormceptor Rim Elev (ft)	
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	2B-PR, 2C-PR

Site Details

Drainage Area

Total Area (acres)	1.14
Imperviousness %	96.0

Surface Characteristics

Width (ft)	446.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

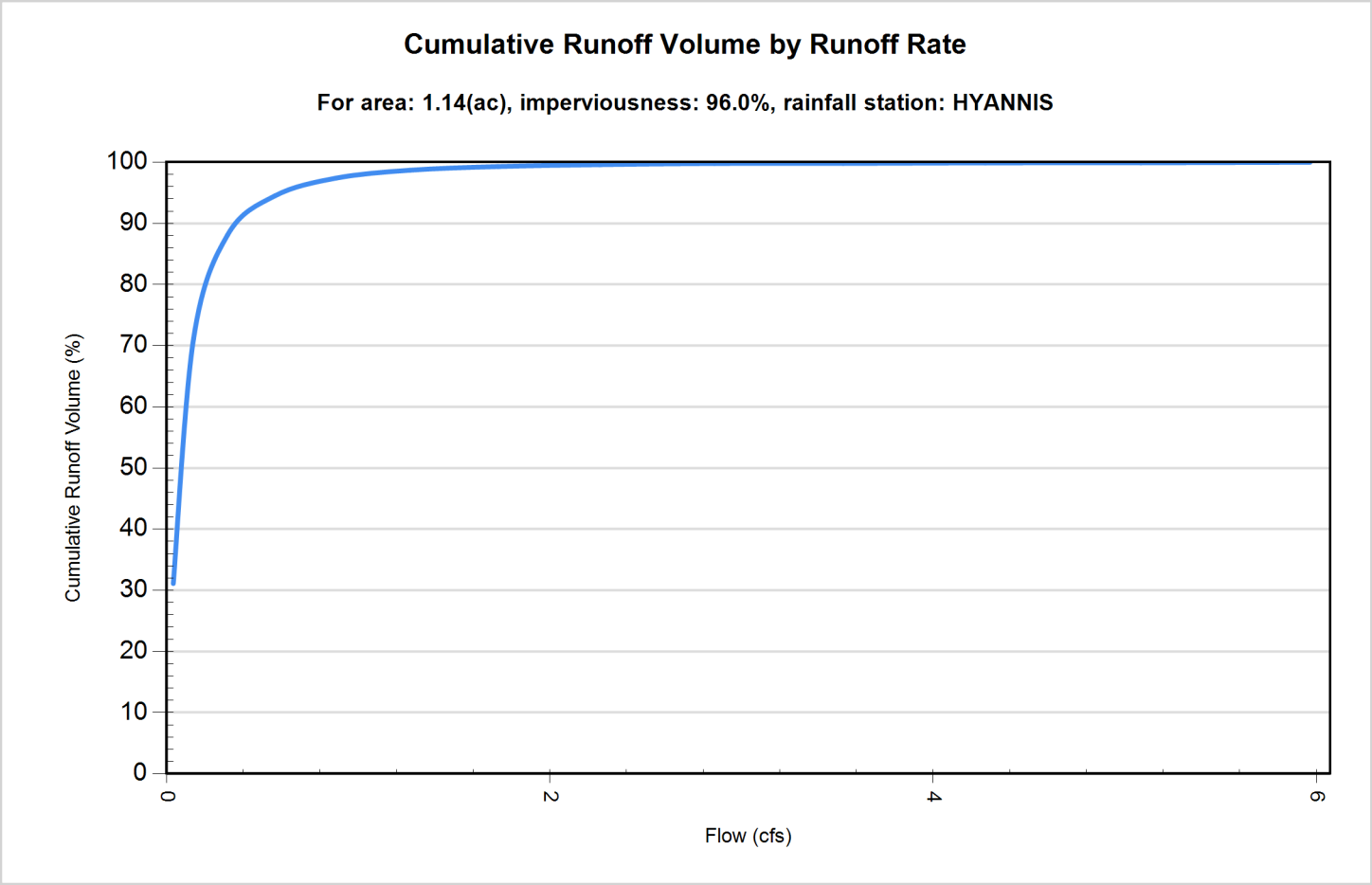
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

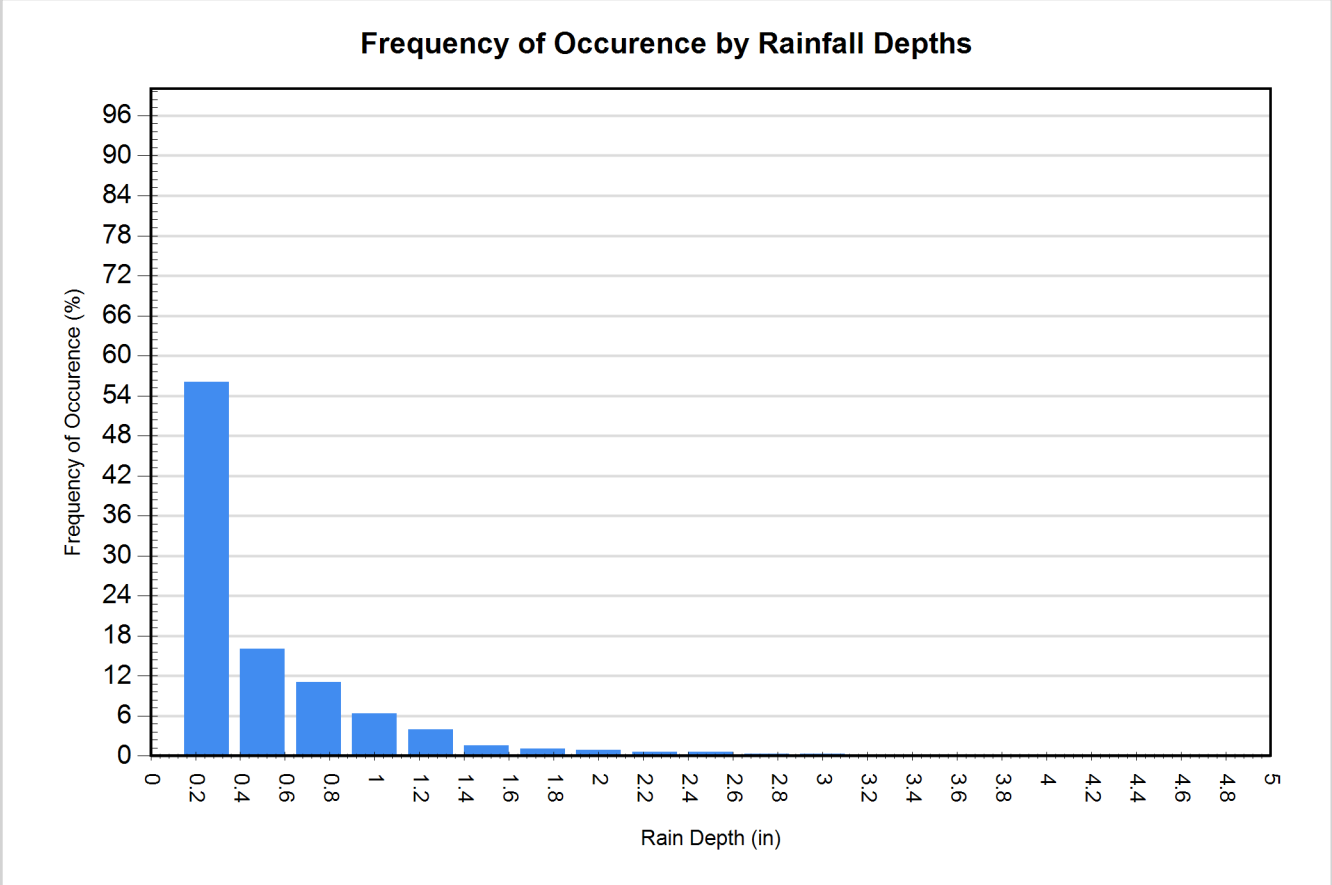
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	620540	1375793	31.1
0.141	1421101	575218	71.2
0.318	1759395	236907	88.1
0.565	1885973	110326	94.5
0.883	1943398	52902	97.4
1.271	1970987	25310	98.7
1.730	1982856	13441	99.3
2.260	1988698	7598	99.6
2.860	1991877	4418	99.8
3.531	1993280	3015	99.8
4.273	1994019	2276	99.9
5.085	1994750	1545	99.9
5.968	1995544	751	100.0



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0



Detailed Stormceptor Sizing Report – Subcatchment 2D-PR, 2E-PR

Project Information & Location			
Project Name	WQU-2	**Project Number**	332344
City	New Bedford	**State/ Province**	Massachusetts
Country	United States of America	**Date**	12/18/2024
Designer Information		**EOR Information (optional)**	
Name		**Name**	
Company	CEC	**Company**	
Phone #	351-201-2210	**Phone #**	
Email	iberl@cecinc.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Subcatchment 2D-PR, 2E-PR
Recommended Stormceptor Model	STC 900
Target TSS Removal (%)	87.0
TSS Removal (%) Provided	87
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	80
STC 900	87
STC 1200	87
STC 1800	88
STC 2400	90
STC 3600	91
STC 4800	93
STC 6000	93
STC 7200	94
STC 11000	96
STC 13000	96
STC 16000	97

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour).
Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Massachusetts	**Total Number of Rainfall Events**	1268
Rainfall Station Name	HYANNIS	**Total Rainfall (in)**	531.6
Station ID #	3821	**Average Annual Rainfall (in)**	33.2
Coordinates	41°24'0"N, 70°10'47"W	**Total Evaporation (in)**	28.6
Elevation (ft)	50	**Total Infiltration (in)**	42.1
Years of Rainfall Data	14	**Total Rainfall that is Runoff (in)**	460.9

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.66
Imperviousness %	92.0

Water Quality Objective	
TSS Removal (%)	87.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	0.80

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	
Stormceptor Outlet Invert Elev (ft)	
Stormceptor Rim Elev (ft)	
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	Subcatchment 2D-PR, 2E-PR

Site Details

Drainage Area

Total Area (acres)	0.66
Imperviousness %	92.0

Surface Characteristics

Width (ft)	339.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

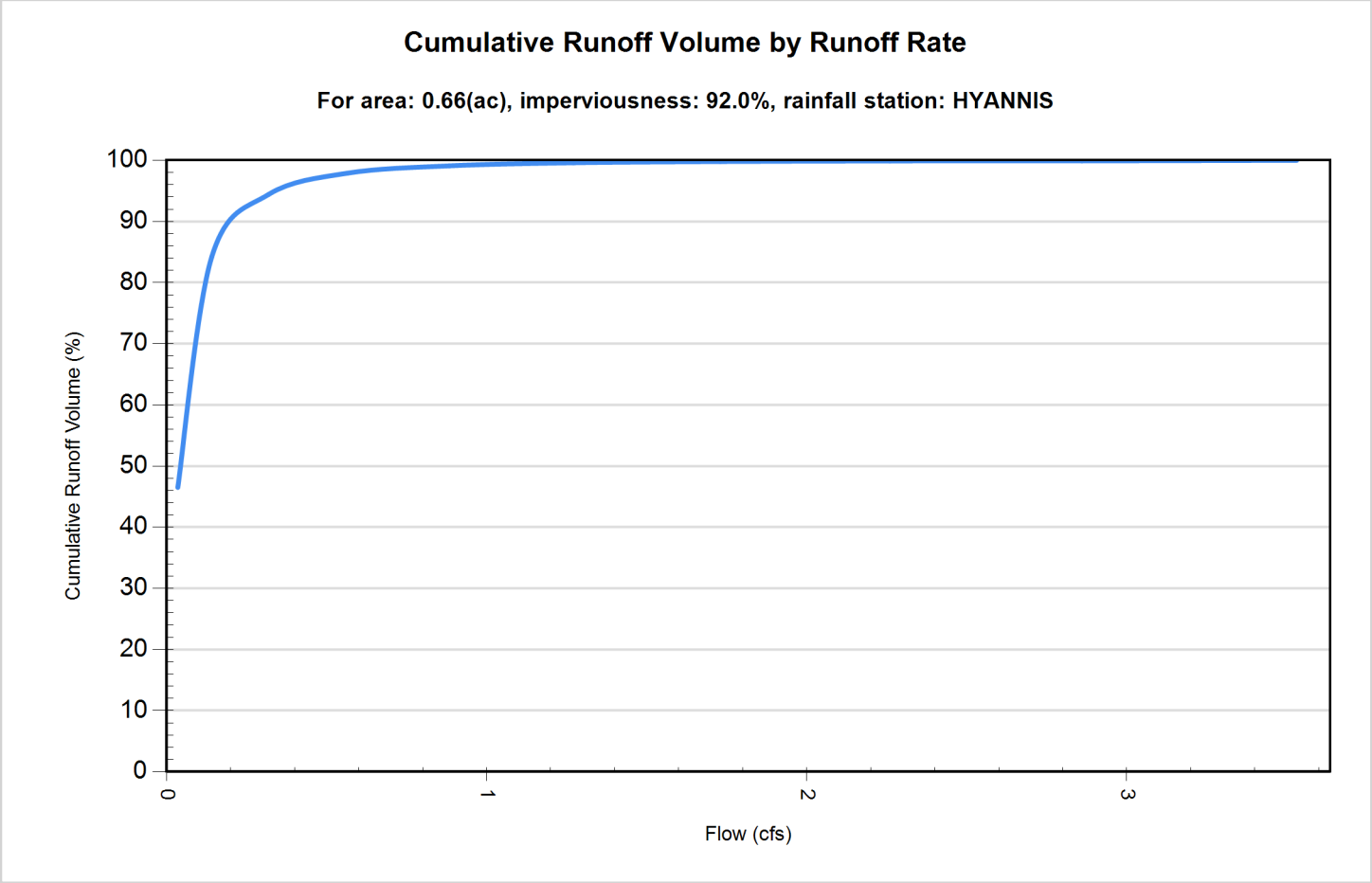
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

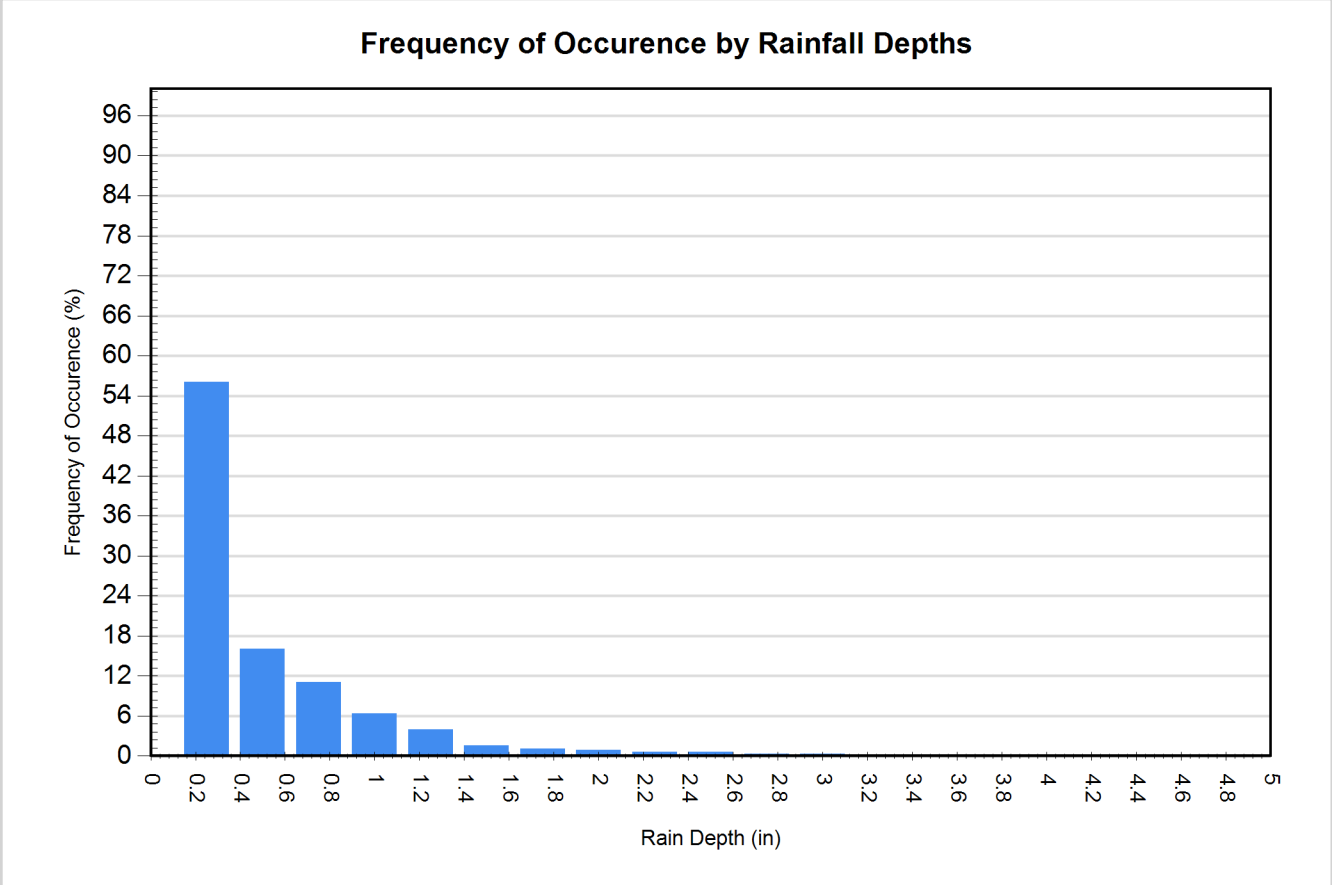
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	516098	594682	46.5
0.141	934851	175953	84.2
0.318	1048477	62319	94.4
0.565	1087227	23567	97.9
0.883	1101350	9444	99.1
1.271	1106384	4410	99.6
1.730	1108542	2252	99.8
2.260	1109305	1489	99.9
2.860	1109846	949	99.9
3.531	1110450	345	100.0



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0



Detailed Stormceptor Sizing Report – Subcatchment 2F-PR, 2G-PR

Project Information & Location			
Project Name	WQU-3	**Project Number**	332344
City	New Bedford	**State/ Province**	Massachusetts
Country	United States of America	**Date**	12/16/2024
Designer Information		**EOR Information (optional)**	
Name		**Name**	
Company	CEC	**Company**	
Phone #	351-201-2210	**Phone #**	
Email	iberl@cecinc.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Subcatchment 2F-PR, 2G-PR
Recommended Stormceptor Model	STC 900
Target TSS Removal (%)	96.0
TSS Removal (%) Provided	96
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	93
STC 900	96
STC 1200	96
STC 1800	96
STC 2400	97
STC 3600	98
STC 4800	98
STC 6000	98
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	99

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour).
Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Massachusetts	**Total Number of Rainfall Events**	1268
Rainfall Station Name	HYANNIS	**Total Rainfall (in)**	531.6
Station ID #	3821	**Average Annual Rainfall (in)**	33.2
Coordinates	41°24'0"N, 70°10'47"W	**Total Evaporation (in)**	21.3
Elevation (ft)	50	**Total Infiltration (in)**	141.9
Years of Rainfall Data	14	**Total Rainfall that is Runoff (in)**	368.4

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.15
Imperviousness %	73.0

Water Quality Objective	
TSS Removal (%)	96.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	0.13

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	
Stormceptor Outlet Invert Elev (ft)	
Stormceptor Rim Elev (ft)	
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	Subcatchment 2F-PR, 2G-PR

Site Details

Drainage Area

Total Area (acres)	0.15
Imperviousness %	73.0

Surface Characteristics

Width (ft)	162.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

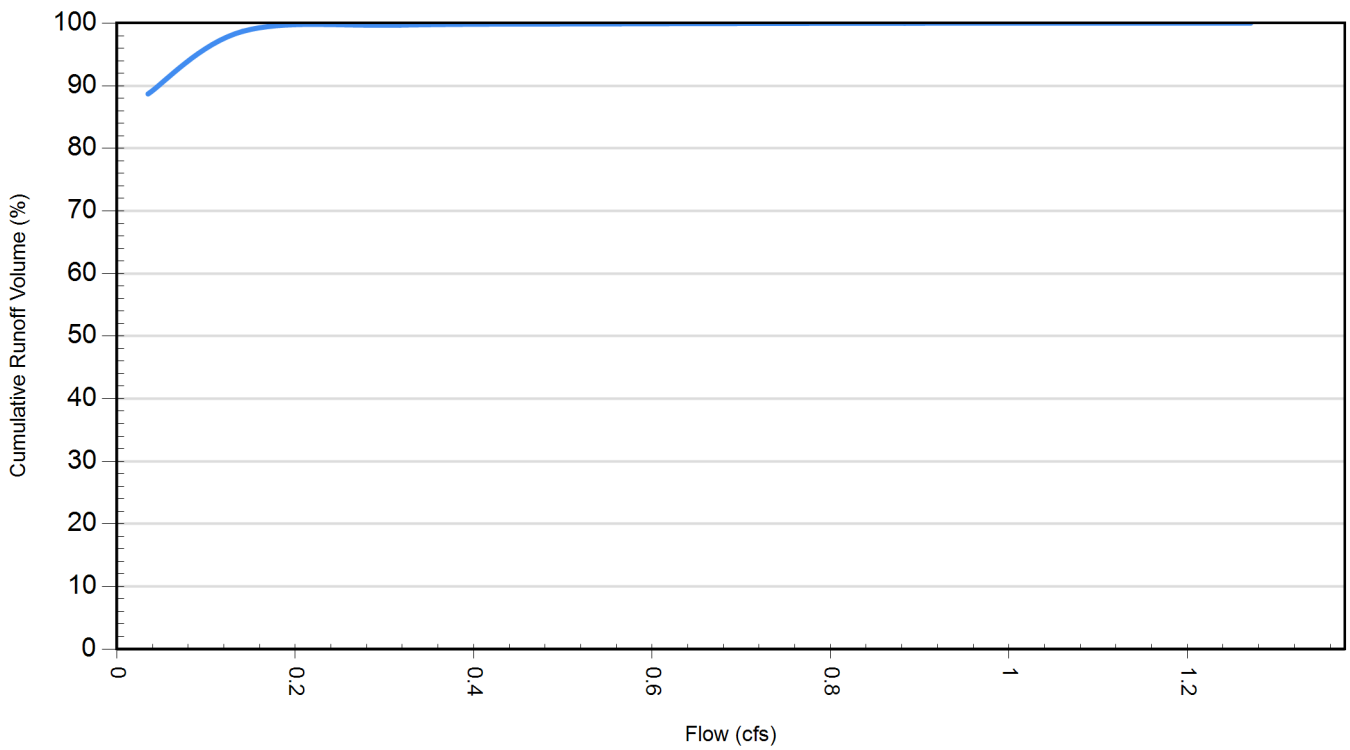
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

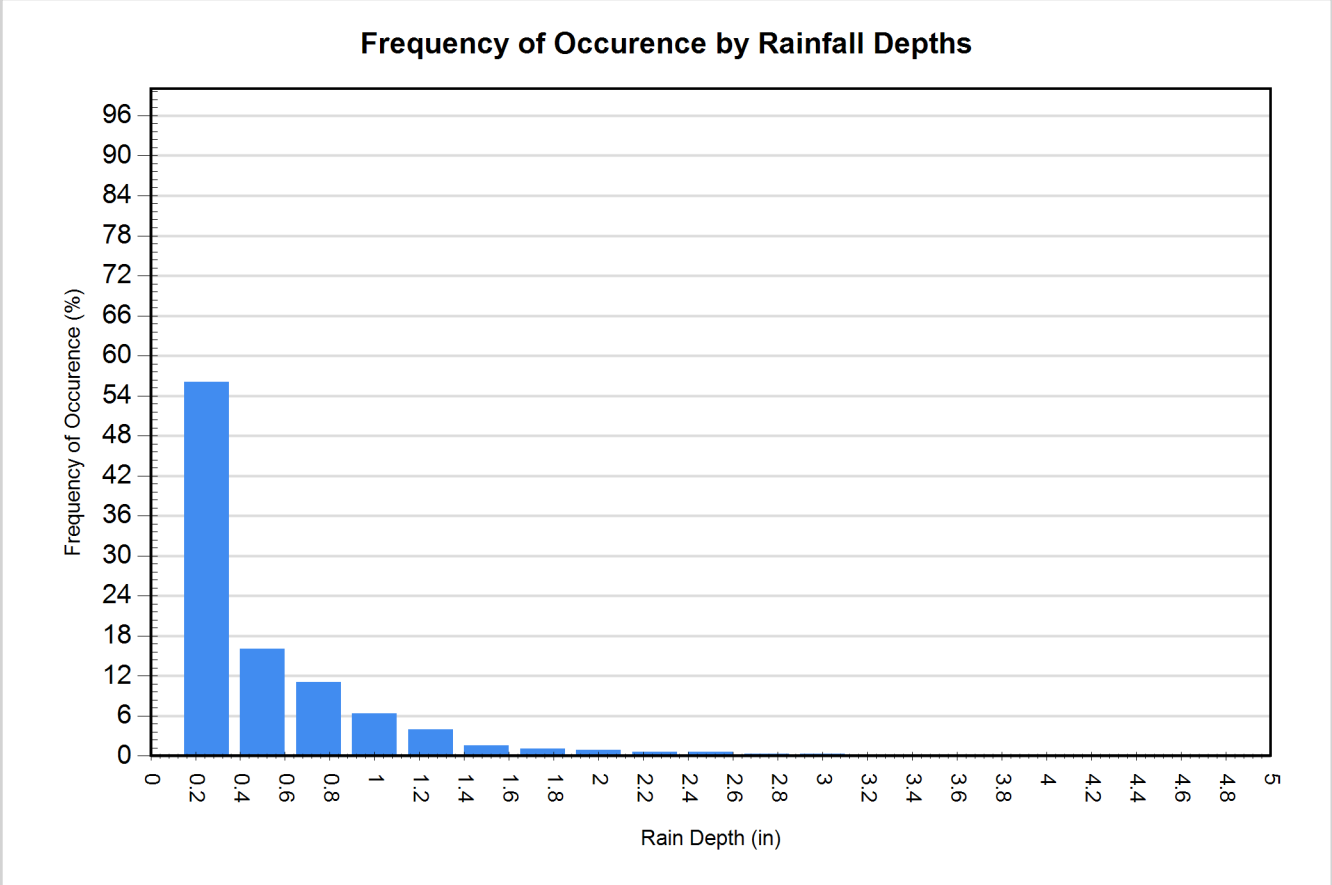
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	179376	22745	88.7
0.141	199498	2624	98.7
0.318	201550	571	99.7
0.565	201868	254	99.9
0.883	202122	0	100.0
1.271	202122	0	100.0



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0



Detailed Stormceptor Sizing Report – Subcatchment 2H-PR, 2I-PR

Project Information & Location			
Project Name	WQU-4	**Project Number**	332344
City	New Bedford	**State/ Province**	Massachusetts
Country	United States of America	**Date**	1/29/2025
Designer Information		**EOR Information (optional)**	
Name		**Name**	
Company	CEC	**Company**	
Phone #	351-201-2210	**Phone #**	
Email	iberl@cecinc.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Subcatchment 2H-PR, 2I-PR
Recommended Stormceptor Model	STC 900
Target TSS Removal (%)	83.0
TSS Removal (%) Provided	83
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	75
STC 900	83
STC 1200	83
STC 1800	83
STC 2400	87
STC 3600	87
STC 4800	90
STC 6000	90
STC 7200	92
STC 11000	94
STC 13000	94
STC 16000	95

Stormceptor
The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology
Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:
• Site parameters
• Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
• Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
• TSS load
• Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Massachusetts	**Total Number of Rainfall Events**	1268
Rainfall Station Name	HYANNIS	**Total Rainfall (in)**	531.6
Station ID #	3821	**Average Annual Rainfall (in)**	33.2
Coordinates	41°24'0"N, 70°10'47"W	**Total Evaporation (in)**	29.3
Elevation (ft)	50	**Total Infiltration (in)**	42.1
Years of Rainfall Data	14	**Total Rainfall that is Runoff (in)**	460.2

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	1.13
Imperviousness %	92.0

Water Quality Objective	
TSS Removal (%)	83.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	1.26

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	
Stormceptor Outlet Invert Elev (ft)	
Stormceptor Rim Elev (ft)	
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	Subcatchment 2H-PR, 2I-PR

Site Details

Drainage Area

Total Area (acres)	1.13
Imperviousness %	92.0

Surface Characteristics

Width (ft)	444.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

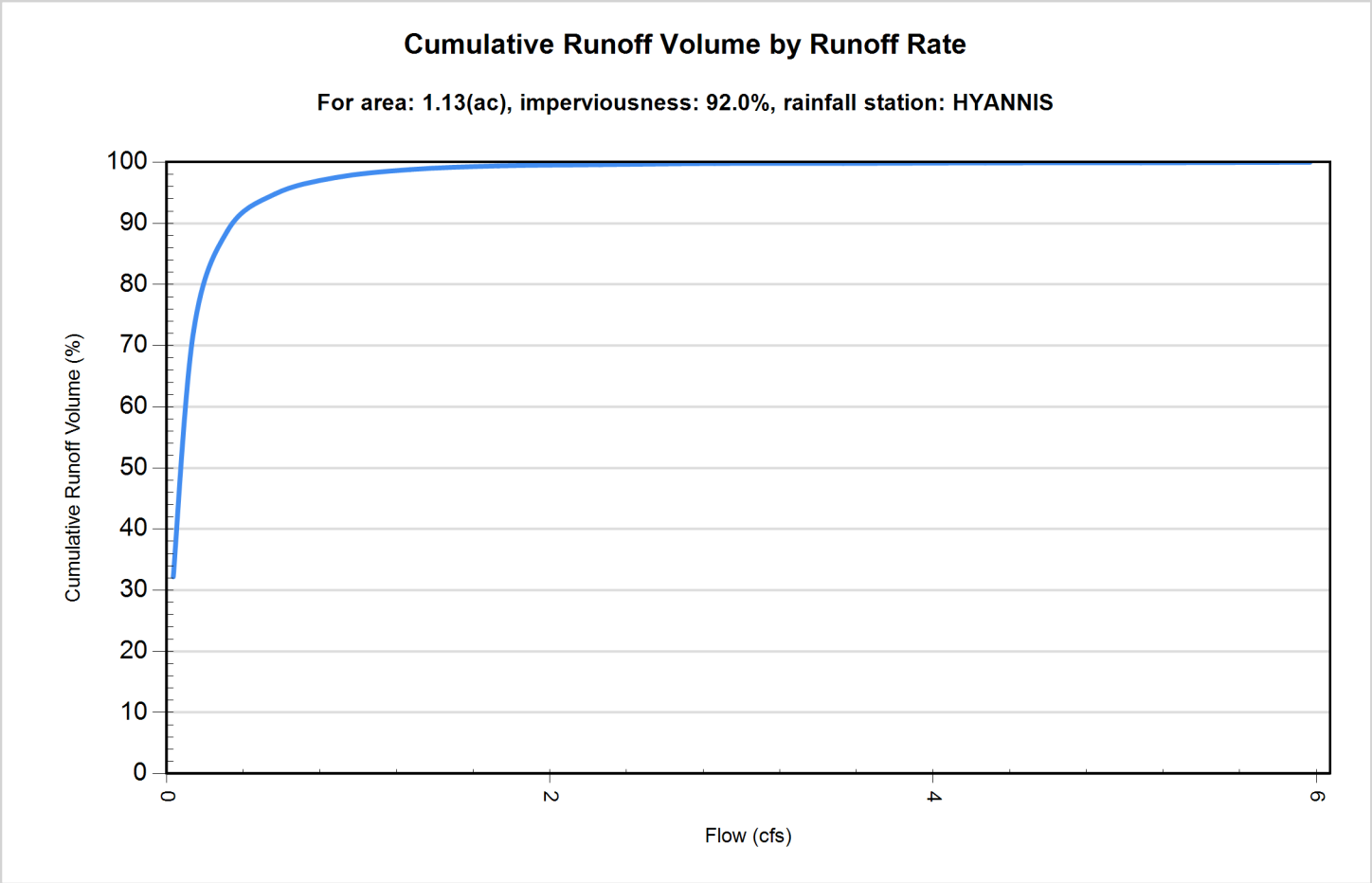
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

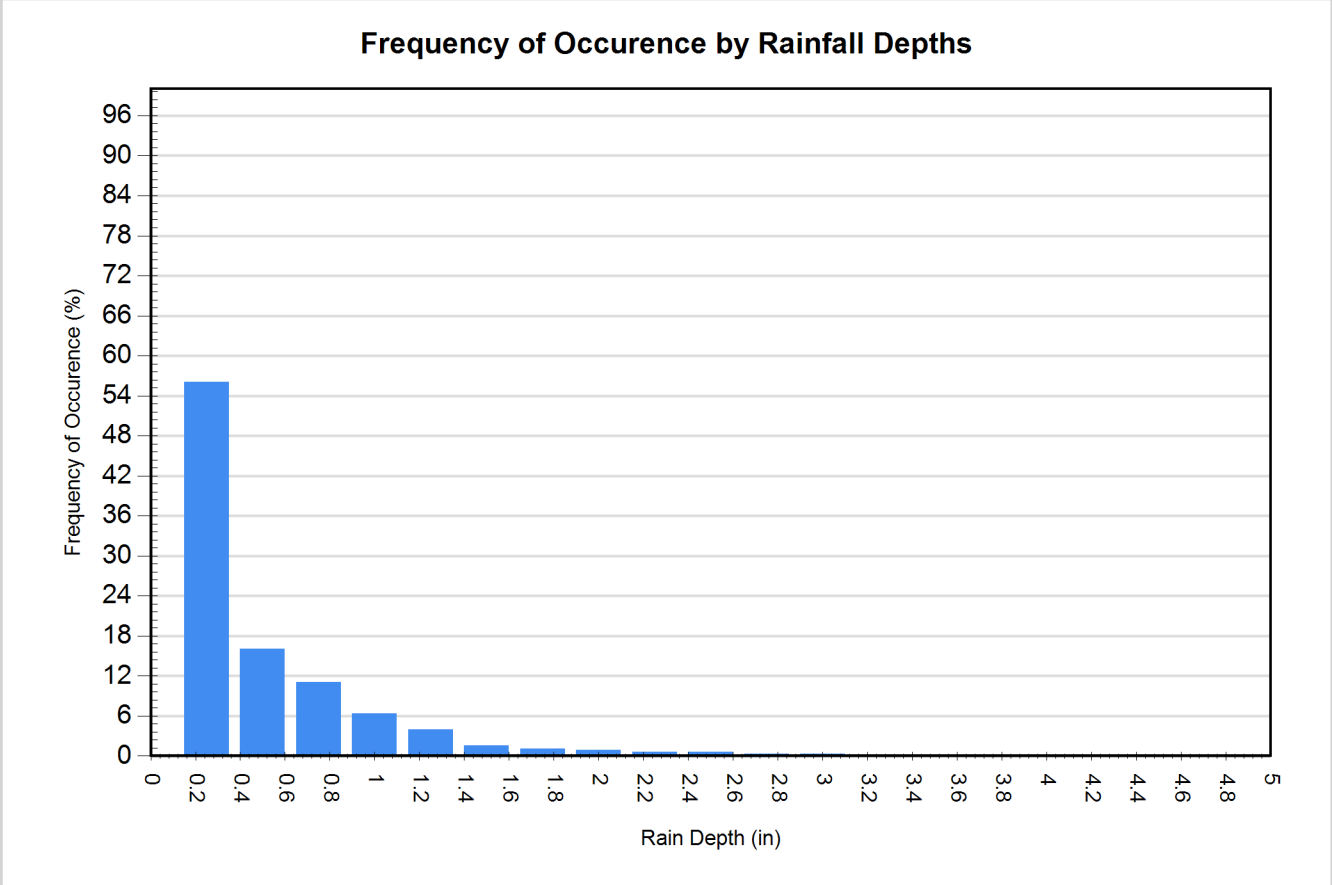
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	611724	1286317	32.2
0.141	1373610	524416	72.4
0.318	1685155	212884	88.8
0.565	1799422	98626	94.8
0.883	1851395	46657	97.5
1.271	1875778	22273	98.8
1.730	1886090	11961	99.4
2.260	1891237	6814	99.6
2.860	1894018	4034	99.8
3.531	1895188	2863	99.8
4.273	1895886	2165	99.9
5.085	1896617	1434	99.9
5.968	1897412	640	100.0



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0



Detailed Stormceptor Sizing Report – Subcatchment 2J-PR, 2K-PR, 2L-PR

Project Information & Location			
Project Name	WQU-5	**Project Number**	332344
City	New Bedford	**State/ Province**	Massachusetts
Country	United States of America	**Date**	1/29/2025
Designer Information		**EOR Information (optional)**	
Name		**Name**	
Company	CEC	**Company**	
Phone #	351-201-2210	**Phone #**	
Email	iberl@cecinc.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Subcatchment 2J-PR, 2K-PR, 2L-PR
Recommended Stormceptor Model	STC 900
Target TSS Removal (%)	78.0
TSS Removal (%) Provided	78
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	68
STC 900	78
STC 1200	78
STC 1800	78
STC 2400	82
STC 3600	83
STC 4800	86
STC 6000	86
STC 7200	88
STC 11000	91
STC 13000	91
STC 16000	93

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour).
Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Massachusetts	**Total Number of Rainfall Events**	1268
Rainfall Station Name	HYANNIS	**Total Rainfall (in)**	531.6
Station ID #	3821	**Average Annual Rainfall (in)**	33.2
Coordinates	41°24'0"N, 70°10'47"W	**Total Evaporation (in)**	30.2
Elevation (ft)	50	**Total Infiltration (in)**	36.8
Years of Rainfall Data	14	**Total Rainfall that is Runoff (in)**	464.6

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	1.84
Imperviousness %	93.0

Water Quality Objective	
TSS Removal (%)	78.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	2.08

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	
Stormceptor Outlet Invert Elev (ft)	
Stormceptor Rim Elev (ft)	
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	Subcatchment 2J-PR, 2K-PR, 2L-PR

Site Details

Drainage Area

Total Area (acres)	1.84
Imperviousness %	93.0

Surface Characteristics

Width (ft)	566.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

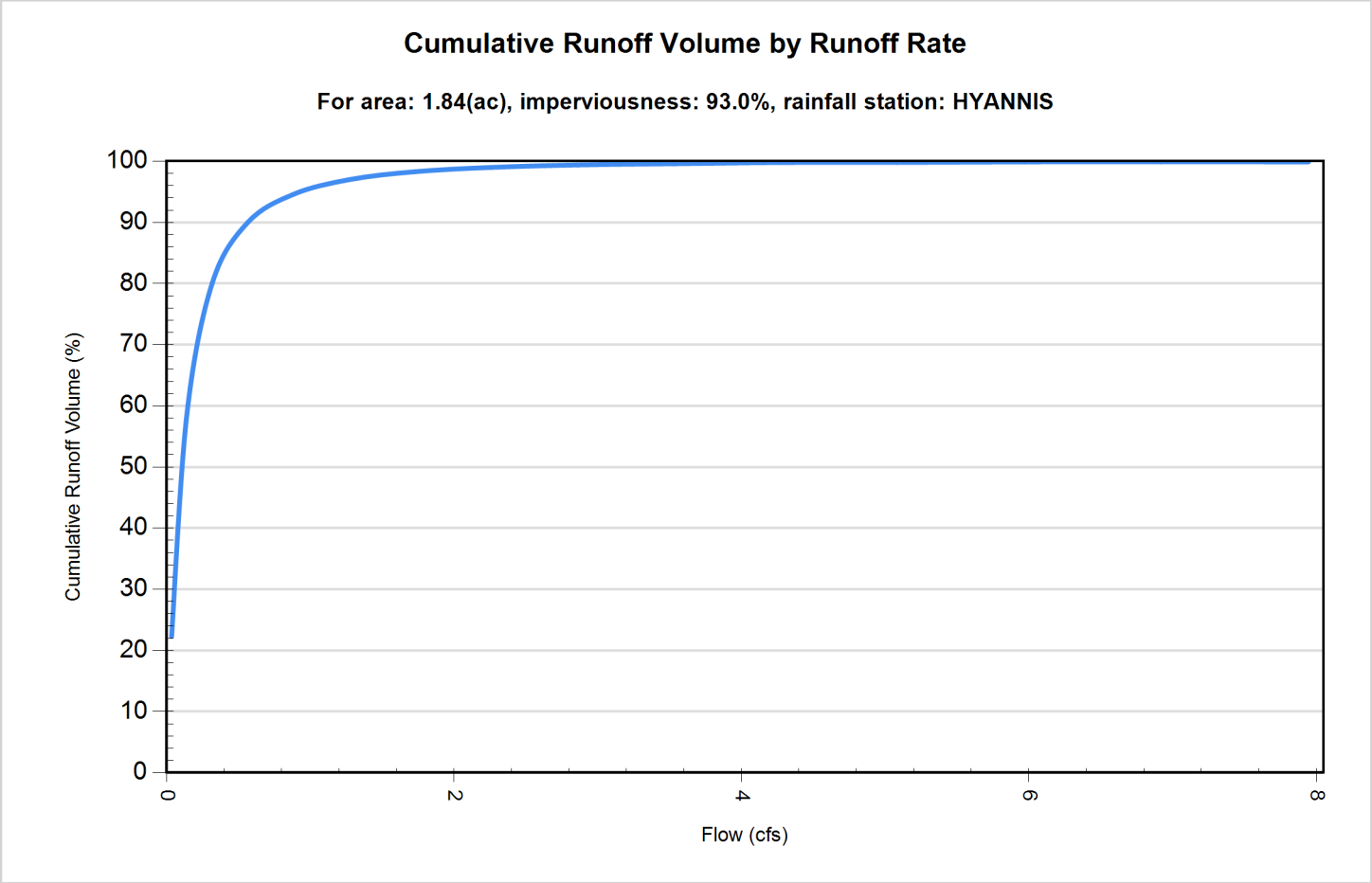
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

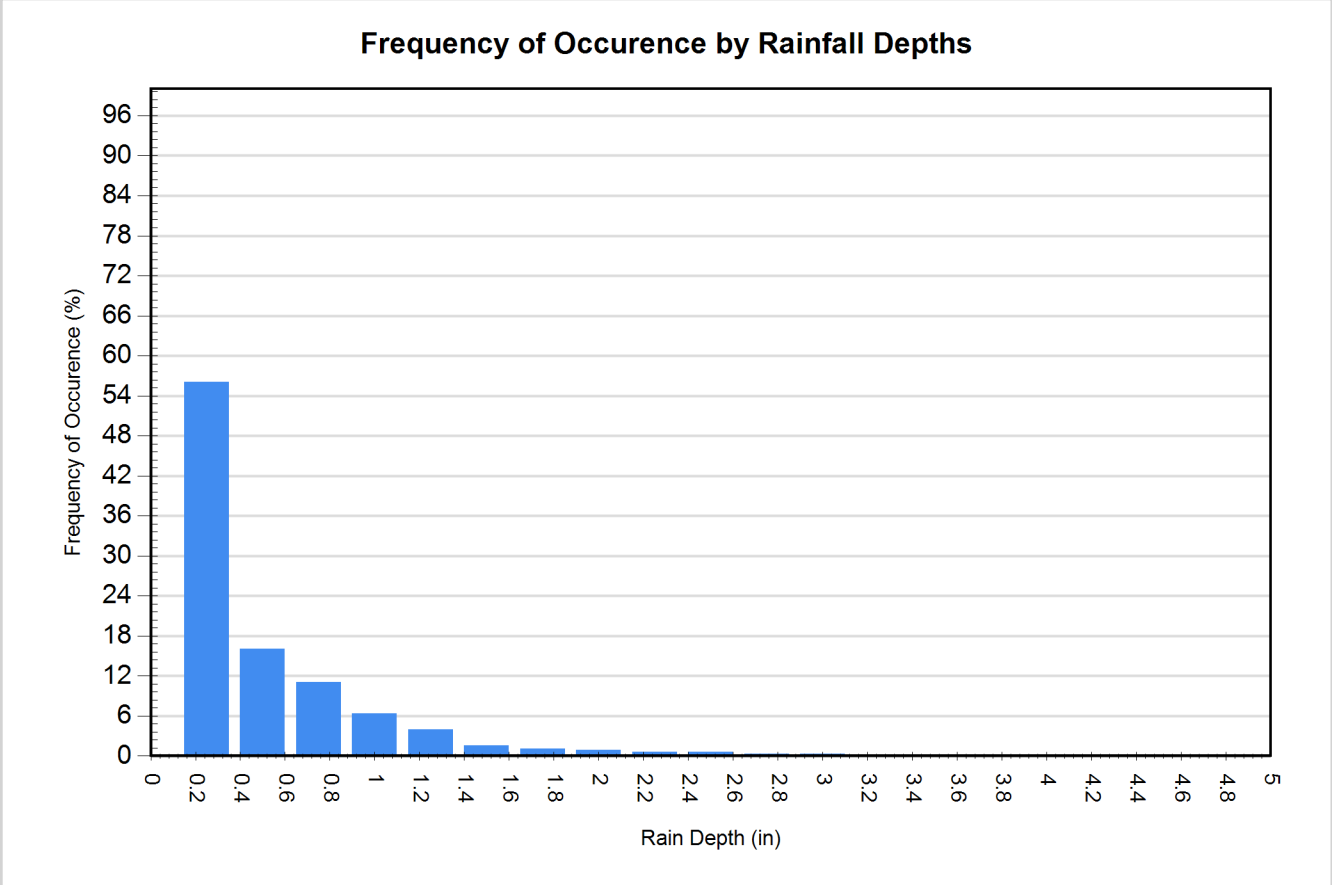
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	694403	2423229	22.3
0.141	1827667	1289966	58.6
0.318	2496312	621390	80.1
0.565	2807095	310570	90.0
0.883	2947789	169896	94.6
1.271	3023424	94236	97.0
1.730	3065262	52401	98.3
2.260	3087558	30089	99.0
2.860	3098865	18785	99.4
3.531	3105603	12046	99.6
4.273	3109943	7706	99.8
5.085	3112016	5632	99.8
5.968	3113255	4393	99.9
6.922	3114113	3535	99.9
7.946	3115035	2613	99.9



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0



Detailed Stormceptor Sizing Report – Subcatchment 2M-PR, 2N-PR

Project Information & Location			
Project Name	WQU-6	**Project Number**	332344
City	New Bedford	**State/ Province**	Massachusetts
Country	United States of America	**Date**	1/29/2025
Designer Information		**EOR Information (optional)**	
Name		**Name**	
Company	CEC	**Company**	
Phone #	351-201-2210	**Phone #**	
Email	iberl@cecinc.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Subcatchment 2M-PR, 2N-PR
Recommended Stormceptor Model	STC 900
Target TSS Removal (%)	81.0
TSS Removal (%) Provided	81
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	73
STC 900	81
STC 1200	81
STC 1800	82
STC 2400	85
STC 3600	86
STC 4800	88
STC 6000	89
STC 7200	91
STC 11000	93
STC 13000	93
STC 16000	95

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Massachusetts	**Total Number of Rainfall Events**	1268
Rainfall Station Name	HYANNIS	**Total Rainfall (in)**	531.6
Station ID #	3821	**Average Annual Rainfall (in)**	33.2
Coordinates	41°24'0"N, 70°10'47"W	**Total Evaporation (in)**	30.0
Elevation (ft)	50	**Total Infiltration (in)**	31.5
Years of Rainfall Data	14	**Total Rainfall that is Runoff (in)**	470.1

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	1.26
Imperviousness %	94.0

Water Quality Objective	
TSS Removal (%)	81.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	1.42

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	
Stormceptor Outlet Invert Elev (ft)	
Stormceptor Rim Elev (ft)	
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	Subcatchment 2M-PR, 2N-PR

Site Details

Drainage Area

Total Area (acres)	1.26
Imperviousness %	94.0

Surface Characteristics

Width (ft)	469.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
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0.141	1494647	665992	69.2
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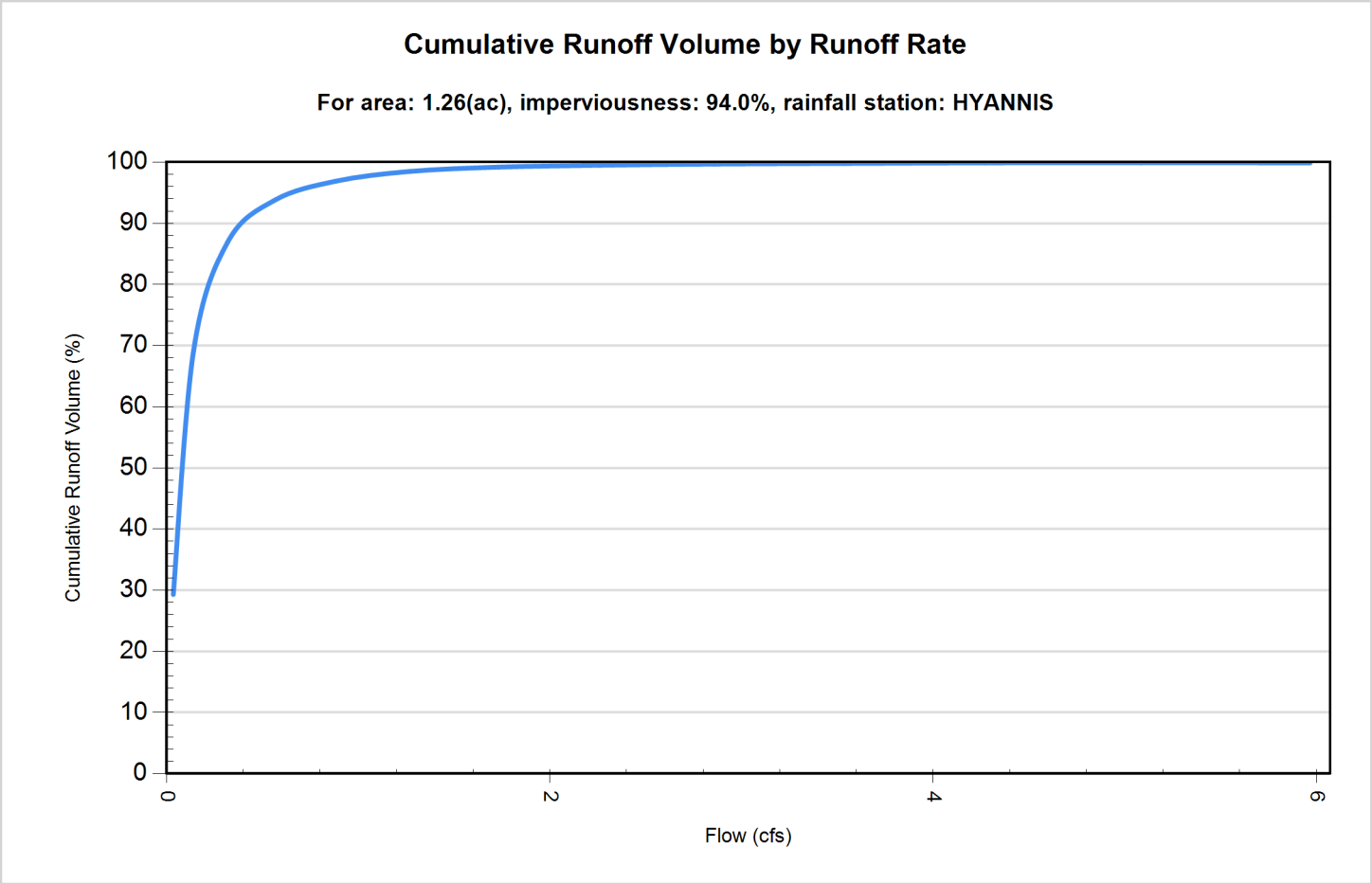
0.883	2094435	66196	96.9
1.271	2127979	32654	98.5
1.730	2143338	17295	99.2
2.260	2150689	9944	99.5
2.860	2154819	5814	99.7
3.531	2156790	3843	99.8
4.273	2157747	2885	99.9
5.085	2158478	2154	99.9
5.968	2159273	1360	99.9



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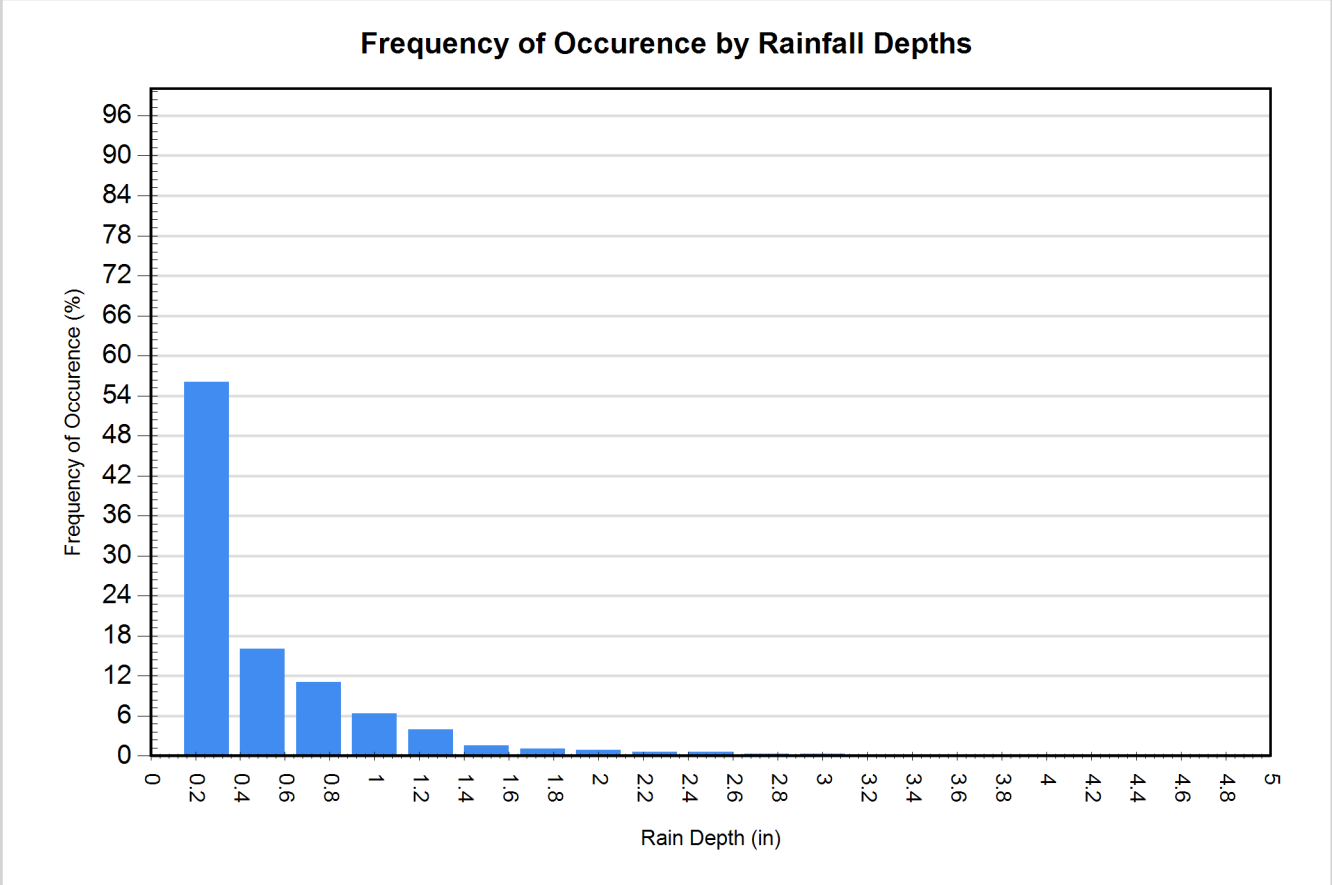
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0



ILLICIT DISCHARGE COMPLIANCE STATEMENT

I VERIFY THAT NO ILLICIT DISCHARGES EXIST FROM THE PROPOSED MASSCEC TERMINAL EXPANSION PROJECT AT 54, 18, & 4 WRIGHT STREET NEW BEDFORD, MASSACHUSETTS. THROUGH THE IMPLEMENTATION OF THE *CONSTRUCTION PERIOD POLLUTION PREVENTION AND SEDIMENTATION AND EROSION CONTROL PLAN* AS WELL AS THE *OPERATION AND MAINTENANCE PLAN*, MEASURES ARE SET FORTH TO PREVENT ILLICIT DISCHARGES FROM ENTERING THE STORMWATER MANAGEMENT DRAINAGE SYSTEM.

	BRIAN POTVIN	
SIGNATURE	**PRINT NAME**	**DATE**

PRINCIPAL	Civil and Environmental Consultants, Inc.
TITLE	**COMPANY**

SIGNATURE	**PRINT NAME**	**DATE**

TITLE	**COMPANY**

NOTE: THIS CERTIFICATION MUST BE SIGNED BEFORE STORMWATER IS CONVEYED TO THE PROPOSED STORMWATER DRAINAGE SYSTEM IN ACCORDANCE WITH STANDARD 10 OF THE MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS.

APPENDIX D

STORMWATER MANAGEMENT OPERATIONS & MAINTENANCE PLAN

STORMWATER MANAGEMENT
OPERATIONS AND MAINTENANCE (O&M) PLAN

NEW BEDFORD MARINE COMMERCE TERMINAL
MASSACHUSETTS CLEAN ENERGY CENTER
NEW BEDFORD, MASSACHUSETTS

Prepared For:

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
15 CREEK ROAD, MARION, MA 02738

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
31 BELLOWS ROAD, RAYNHAM, MASSACHUSETTS, 02767

CEC Project 332-344

January 2025

Revised April 2025

OPERATIONS AND MAINTENANCE (O&M) PLAN

GENERAL

This report was prepared by Civil & Environmental Consultants, Inc. (CEC) for Foth Infrastructure & Environment, LLC (Foth), as retained by Massachusetts Clean Energy Center (MassCEC).

Stormwater management systems with multiple components, such as the ones proposed for the Project, assure the cleanest possible discharges of stormwater to the environment. However, these systems must be routinely maintained to keep them in good working order. This Operations and Maintenance Plan ("O&M Plan" or "the plan") identifies potential sources of pollution that may affect the quality of stormwater discharges and describes the implementation of Long-Term Pollution Prevention practices to reduce potential pollutants in stormwater discharges. The party identified below will be responsible for the operation and maintenance of the stormwater management systems and the Site. Schedules and procedures for inspection and maintenance of the existing and proposed stormwater management system components are provided in the following sections.

Responsible Party for Plan Compliance:
Massachusetts Clean Energy Center
4 Wright Street
New Bedford, MA 02740

Tim Griffin, Terminal Director		1 April 2025
Contact Name	Signature	Date

Upon a transfer of ownership, the future owner shall assume the responsibilities for compliance with this O&M Plan.

Emergency Contact Information:
Civil & Environmental Consultants, Inc.
(774) 501-2176

Estimated O&M Budget

It is estimated that an annual budget of $5,000 should be allocated to performing routine inspections and maintenance identified in this O&M Plan.

LOCATION OF OPERATIONS AND MAINTENANCE PLAN

Copies of the O&M Plan are kept on file at the following location:

- Maintenance Manager's Office

EMPLOYEE TRAINING

Training of personnel is essential to achieving proper operation and maintenance of the stormwater management system. Therefore, those personnel who are responsible for operation and maintenance will be trained on the following subjects:

- Environmental laws and regulations relating to stormwater,
- The components and goals of the current Operations and Maintenance Plan,
- Site specific permit conditions and requirements,
- General Site spill response procedures,
- General good housekeeping procedures, and
- General material management procedures.

Refresher training sessions will be held once a year following the completion of the Site Compliance Evaluation.

RECORDKEEPING

Records of inspections and maintenance shall be up to date and available for review and inspection, if requested by the City's officials.

STORMWATER BEST MANAGEMENT PRACTICES (BMP) PLAN

ROUTINE INSPECTIONS

Inspections of the stormwater management system, and of the individual components of the system, will be carried out on a routine basis in accordance with the schedule identified below. Components to be inspected include the extents noted below. Each will be inspected for sediment buildup, presence of oil, color, and structural damage. The results of each inspection will be entered into an inspection log. Refer to Attachment 1 for the inspection log form.

MAINTENANCE PLAN

The Responsible Party will incorporate a routine maintenance program to assure proper operation of the stormwater management system. Maintenance will be performed based on the results of inspections in accordance with the schedules identified in Attachment 1. The program will include the following maintenance activities:

Water Quality Structures

- See the attached Manufacturer's instructions on operation and maintenance requirements and methodology.
- Inspect and clean twice per year or as required by manufacturer.
- Remove sediment and other trapped pollutants at the frequency or level specified by the manufacturer.

Subsurface Infiltration Chambers / Systems

- See the attached Manufacturer's instructions on operation and maintenance requirements and methodology.
- Perform routine inspections on a monthly basis for the first three months after installation. Then, at a minimum, the treatment structure is to be inspected twice annually, and the infiltrating structure is to be inspected annually.
- The subsurface infiltration system will be inspected twice during for the first year and annually thereafter by removing the manhole/access port covers and determining the thickness of sediment that has accumulated.
- If sediment is more than two inches deep, it must be suspended via flushing with clean water and removed using a Vactor truck.

Subsurface Stone Infiltration Trench

- Perform routine inspections on a monthly basis for the first three months after installation. Then, at a minimum, the trench is to be inspected twice annually, and the infiltrating capability is to be inspected annually.

Landscape Drainage Inlets (Nyloplast Yard Drains)

- All drainage inlets shall be inspected a minimum of at least four times per year.
- Sediment and/or floatable pollutants shall be removed from the inlets and disposed of at an approved offsite facility in accordance with all applicable regulations.
- Any structural damage or other indication of malfunction will be reported to the site manager and repaired, as necessary.
- During colder periods, the catch basin grates must be kept free of snow and ice.
- During warmer periods, the catch basin grates must be kept free of leaves, litter, sand, and debris.

Vegetated Areas and Grassed Swales

- Inspect twice per year, typically in the spring and fall.
- Remove sediment, debris, and invasive vegetation. Clear outlets

LONG TERM POLLUTION PREVENTION MAINTENANCE

The Responsible Party will incorporate a routine maintenance program to ensure the continued effectiveness of the structural water quality controls. Maintenance will be performed based on the results of inspections in accordance with the schedules identified below. The program will include the following maintenance activities:

Maintenance of Pavement and Dense Graded Gravel Systems

Regular maintenance of pavement surfaces will prevent pollutants such as oil and grease, trash, and sediments from entering the stormwater management system. The following practices should be performed:

- Sweep or vacuum asphalt pavement areas a minimum of twice per year, typically between March and November, with a commercial cleaning unit and dispose of removed material.
- Routinely pick up and remove litter from the parking areas, islands, and perimeter landscaping.

Maintenance of Vegetated Areas

Proper maintenance of vegetated areas can prevent the pollution of stormwater runoff by controlling the source of pollutants such as suspended sediments, excess nutrients, and chemicals from landscape care products. Practices that should be followed under the regular maintenance of the vegetated landscape include:

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas: install appropriate erosion control measures when native soil is exposed, or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- Grass vegetation should not be cut to a height less than four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow-release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas but should not be applied on a regular basis unless necessary.

SPILL RESPONSE PLAN

INTRODUCTION

This Spill Response Plan has been prepared to prevent the discharge of oil into or upon the adjacent wetland areas. All personnel share the responsibility for the initial control and reporting of the oil and other substance spill, especially the personnel that first discover the spill. They will also be responsible for determining the necessary safety equipment and for establishing safety practices to be followed during the clean-up operations. All personnel will be trained in the use of and location of this equipment.

RELEASE NOTIFICATION

Any size release (i.e., one that creates a sheen, emulsion, or sludge) that affects or threatens to affect receiving water must be reported immediately to the National Response Center (800-424-8802) and within two hours to Massachusetts Department of Environmental Protection (MADEP) (888-304-1133). The National Response Center is staffed 24 hours a day.

Additionally, a release of ten (10) gallons or more of oil to land over a maximum time period of 24-hours must also be reported to the MADEP within two hours.

In addition to the above reporting, 40 CFR 112.4 requires that information be submitted to the United States Environmental Protection Agency (USEPA) Region I Regional Administrator (RA) whenever the facility releases:

a) More than 1,000 gallons of oil in a single event, or release; or
b) More than forty-two (42) gallons of oil in each of two release incidents within a 12-month period.

MOBILE AND PORTABLE CONTAINERS

As proposed, the facility is not anticipated to require mobile or portable oil storage containers. In the event these are required to be added to the facility, the property owner will coordinate with all applicable regulatory authorities for the required permitting and modify the spill response plan accordingly.

CONTAINMENT AND DIVERSIONARY STRUCTURES

Appropriate containment and/or diversionary structures or equipment to prevent and control discharge for this facility.

Methods of containment at this facility include a combination of drainage systems (e.g., Stormceptor water quality units, nyloplast yard drains, outlet control structures), and land-based spill response materials (e.g., sorbents) to prevent oil from reaching navigable waters and adjoining wetlands.

The following prevention systems are used at this facility:

- Absorbent materials
- Drainage Systems
- Training

An outside contractor would be contacted to control, and clean-up spills as deemed necessary by site personnel.

PERSONNEL TRAINING

Upon beginning employment, new oil handling personnel are instructed by management to the general contents of the facility Spill Response Plan. Existing employees will receive training within three months of the issuance of an amended Plan.

The Building Tenant, once occupied, is responsible for spill prevention training at this facility and will ensure this training will be provided to personnel annually. This training will highlight any past spill events or failures and recently developed precautionary measures. Records of spill prevention training will be kept for at least three years.

Topics discussed during training sessions will include the following topics:

- Operation and maintenance of equipment to prevent oil discharges
- Discharge procedure protocols
- Applicable pollution control laws, rules, and regulations
- General facility operations
- Contents of the Spill Response Plan
- Spill Response Plan procedures
- Locations of spill and fire control equipment
- Inspection and record keeping procedures

RESPONSE AND CLEANUP PROCEDURES

Upon discovery of an oil spill, the person making the discovery should immediately notify the Maintenance Manager and Environmental Protection Manager. Any response equipment and manpower at the facility's disposal will be used as needed to contain the spill and prevent oil from discharging offsite. Personnel will consult with the Maintenance Manager or his designee to

determine if outside spill response contractors are required. If management determines that outside resources are necessary, Spill Response Contractors and Licensed Site Professionals may be utilized.

Any discharge will be contained and cleaned up using appropriate spill response equipment which may include shovels, pumps, and absorbent materials (pads, booms, oil-dry, etc.). Spill response materials (i.e., spill kits) are located in the Maintenance Room of each building. The locations where spill response equipment is maintained will be identified to all facility personnel upon employment and during Spill Response Plan training. The supply of response equipment will be replenished, as needed.

The facility responds immediately to spills of oil. The facility personnel are properly trained to respond to spills and only trained personnel perform clean-up activities. Spill response contractors will be responsible for clean-up activities when the facility does not have the necessary training, equipment, or materials to manage the spill.

The Facility's standard approach toward a release is as follows:

1. Assess hazards
    - Assess the quantity of substance spilled and integrity of containment.
    - Cease operations, as necessary.
    - Secure the area.
    - Determine if the spill could potentially impact waterways or leave the site.
2. Close valves and deactivate pumps contributing to the discharge.
3. If available, close downstream storm water control valves and deactivate pumps that could potentially cause further migration.
4. Notify supervisory personnel (person responsible for spill prevention).
5. Use equipment and manpower to minimize the amount of oil discharged and to prevent it from entering any infiltration systems or wetlands.
6. Ensure proper personal protective equipment (PPE) is used during cleanup activities.
7. Once the discharge is stopped and contained, use absorbent materials to absorb the spilled oil. The oil-soaked material must be disposed of according to federal, state, and local regulations.
8. If a spill is reportable, immediately notify authorities.
9. In the event a spill reaches a waterway, notify National Response Center (800-424-8802).

A Massachusetts Licensed Site Professional (LSP) will be on call for supervising the cleanup of spills and releases occurring at the Site and will be either a LSP or his/her designee/representative reporting all activities directly to the LSP. If the LSP determines that the cleanup operations are

beyond the capacity of the personnel, assistance shall be requested from an emergency response agency.

Spills less than 10 gallons that impact the environment (soil, water, drainage system, etc.) or human health and safety may meet MassDEP reporting criteria. In the event that a spill may affect these, a Licensed Site Professional will be consulted.

LOCATION OF OIL SPILL RESPONSE EQUIPMENT AND MATERIALS

Spill kits are strategically located at strategic locations throughout the facility in each building's mechanical room. Bulk storage of absorbents is located within each building's mechanical room. Additional spill response equipment is available through spill response contractors as needed.

WASTE DISPOSAL

Spilled material will be recovered into appropriate containers such as 55-gallon drums, or if the size of the spill warrants, into a roll-off container. When containers are filled, they will be secured and the container appropriately labeled identifying the substance(s), the date of the spill/clean up, and the location, as warranted. Waste material generated during clean-up activities will be characterized in accordance with federal and state regulations, as required. The spill residual will be disposed of by a licensed waste handler or disposed of on-site, if appropriate.

ATTACHMENT 1

STORMWATER O&M LOG

Stormwater Operations and Maintenance Log

Project Name: MassCEC Terminal Expansion
Project Location: New Bedford, MA
Project Number: 332-344

Date: 1/7/2025
Prepared By: ITB
Approved By: BEP

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning or Repair Needed (List Items if Required)	Date of Cleaning or Repair	Performed by
Pavement Sweeping	Sweep a minimum of twice per year, typically between March and November.			Paved areas will be swept annually at a minumum, and as otherwise needed. Remove residual sand from winter sanding each spring.			
Deep Sump and Hooded Catch Basins	Inspect four times per year. Clean four times per year, in the spring and fall, or whenever sediment buildup exceeds two (2) feet in depth.			Remove trash and deposits. During cleanings, confirm the oil/debris trap (hood) is installed properly, is free of clogs, and is functional. Reinstall or replace as needed. Take care not to damage the oil/debris trap (hood) during cleaning.			
Water Quality Structure	Inspect twice per year or as required by the manufacturer.			Clean twice per year or as required by the manufacturer. Remove sediment and other trapped pollutants at the frequency or level specified by the manufacturer. No use of clamshell buckets without prior approval. Increase inspection frequency, as needed, based on observed sediment loading.			
Roof Drain Leaders	Inspect twice per year, typically in the spring and fall.			Inspect for blockage and remove debris if required.			
Stormwater Outfall	Inspect once per year, typically in the spring.			Inspect for washouts and repair if necessary. Remove vegetation and debris from blocking outfall.			
Subsurface Infiltration System	Inspect monthly for the first three months. Then, at a minimum, the treatment structure is to be inspected twice annually and the infiltrating structure is to be inspected annually as required by the manufacturer.			Remove sediment once per year or when buildup exceeds two (2) inches in depth.			
Dry Wells	Inspect after every major storm in the first few months after construction. Then once per year.			Remove trash and deposits.			
Vegetated Areas	Inspect twice per year, typically in the spring and fall.			Perform maintenance on a regular basis during the growing season. Mow grassed areas on a regular basis to maintain growth. Plant alternative mixture of grass species in the event of unsuccessful establishment. Grass vegetation should not be cut to a height less than six inches. Maintain planted areas adjacent to pavement to prevent soil washout and immediately clean any soil deposited on pavement. Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming. Remove trash, sediment debris and invasive vegetation.			
Low Flow Level Spreader	Inspect after the first several rainfall events and after any major storm events within the first year. After the first year, inspect regularly on an annual basis.			Remove any sediment, trash, debris, leaves and grass clippings. Remove any tree seedlings before they become firmly established. Note and repair any erosion or low spots in the level spreader.			

Stormwater Supervisor Contact Information:_____

ATTACHMENT 2

MANUFACTURER'S O&M PROCEDURES

R-TANK® OPERATION, INSPECTION AND MAINTENANCE

Operation

Your R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspections should be done every six months for the first year of operation, and at least yearly thereafter. Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment most inspections and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you must follow all local, regional, and OSHA requirements.

All maintenance features of your system can be accessed through a covering at the surface. With the lid removed, you can visually inspect each component to identify sediment, trash, and other contaminants within the structure. Check you construction plans to identify the maintenance features engineered into your R-Tank system, which may include:

Upstream Pipes, Inlets, and Manholes

- Working from the structures adjacent the R-Tank toward those farther away, check for debris and sediment in both the structures and the pipes. Be sure to Include all structures that contain pre- treatment systems. Some structures may include a sump.

Maintenance Ports

- Located near the inlet and outlet connections and throughout the system, check sediment depth at each port.

Inspection Ports

- Less common, inspection ports are primarily located within the Treatment Row of an R-Tank System. These should be used to check for sediment deposits but are typically too small to access for backflushing.

Treatment Row

- On installations in 2018 or later, inlet pipes may connect to a row of modules with 12” diameter access holes running horizontally through the module that can be jet vacuumed. Check these rows for accumulation of sediment and debris.

All observations and measurements should be recorded on an Inspection Log kept on file. We’ve included a form you can use at the end of this guide.

Maintenance

For modules taller than 40” the R-Tank System should be back-flushed once sediment accumulation has reached 6”. For modules less than 40” tall, perform maintenance when sediment depths are greater than 15% of the total system height.

If your system includes a Treatment Row with linear access through the modules from the inlet pipe, backflush this area when sediment depths reach 6”.

BEFORE ANY MAINTENANCE IS PERFORMED ON YOUR SYSTEM -
PLUG THE OUTLET PIPE TO PREVENT CONTAMINATION OF THE DOWNSTREAM SYSTEMS.

Begin by cleaning all upstream structures, pipes, and pre-treatment systems containing sediment and/ or debris. If your system includes a Treatment Row, this portion of the system should be cleaned with traditional jet-vac equipment. Add a centralizer to the jet for easiest access through the modules.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out. If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

STEP BY STEP INSTRUCTIONS FOR INSPECTION AND MAINTENANCE CAN BE FOUND ON THE NEXT PAGE, WITH A MAINTENANCE LOG ON THE LAST PAGE.

INSPECTION

1. Upstream Structures
    a. Remove cover
    b. Use flashlight to detect sediment deposits If present, measure sediment depth
    c. Inspect pipes connecting to R-Tank
        i. If inlet pipes connect to Treatment Row, check sediment depth within these modules
        ii. If access for measurement inside the Treatment Row is difficult, sediment depth can be estimated based on the coverage of the round, 12" opening of the module
    d. Inspect pre-treatment systems (if present)
    e. Record results on Maintenance Log
    f. Replace cover
    g. Repeat for <u>ALL</u> Manholes upstream of R-Tank until no sedimentation is observed and all pre- treatment systems have been checked
2. Maintenance Ports
    a. Remove cap
    b. Use flashlight to detect sediment deposits
    c. If present, measure sediment depth with stadia rod
    d. Record results on maintenance log
    e. Replace cap
    f. Repeat for <u>ALL</u> Maintenance Ports
3. Inspection Port
    a. Remove cap
    b. Use flashlight to detect sediment deposits
    c. If present, measure sediment depth with stadia rod
    d. Record results on Maintenance Log
    e. Replace cap

MAINTENANCE

1. Plug system outlet to prevent discharge of back-flush water
2. Vacuum all upstream structures, inlet pipes, and stormwater pre-treatment systems
3. If a Treatment Row is present, vacuum this row of modules
4. Determine best location to pump out back-flush water. Typically, the outlet structure will work best, but sometimes the Maintenance Ports must be used.
5. Remove cap from Maintenance Port and pump water as rapidly as possible into system through port to suspend sediments, pumping dirty water out of the system from the outlet or nearby Maintenance Port
6. Repeat at all Maintenance Ports until sediment levels are reduced to a satisfactory level
7. Sediment-laden water shall be disposed of per local regulations
8. Replace any remaining caps or covers and remove outlet plug
9. Record the back-flushing event in your Maintenance Log with any relevant specifics

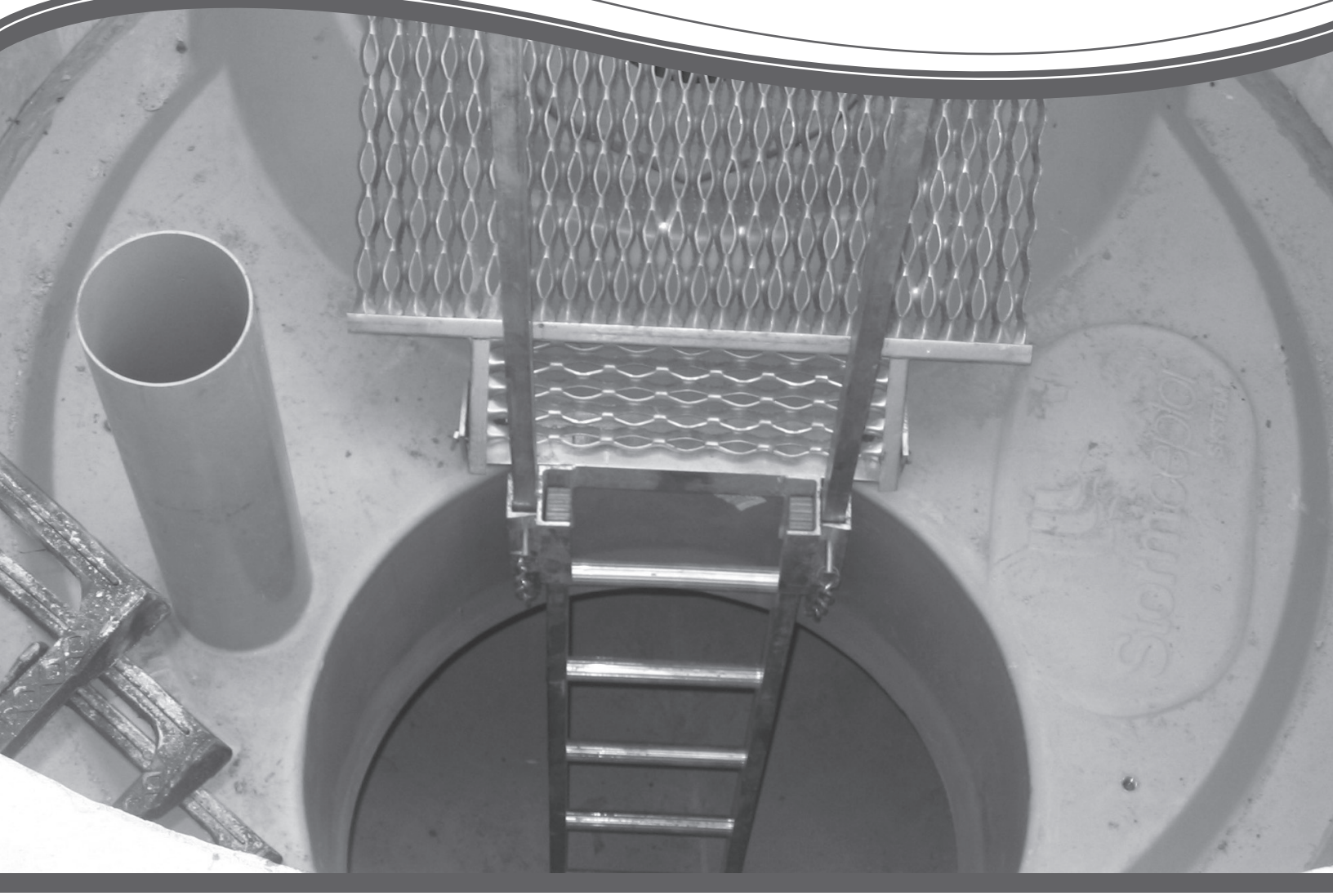
R-Tank® Maintenance Log

Site Name:		Company:	
Location:		Contact:	
City and State:		Phone:	
System Owner:		Email:	

Date	Location	Sediment Depth	Observations / Notes	Initials

CONTECH®
ENGINEERED SOLUTIONS

Stormceptor® STC
Operation and Maintenance Guide



Stormceptor® STC

Stormceptor Design Notes

- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.

Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences			
Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in. (75 mm)	1 in. (25 mm)	3 in. (75 mm)
Multiple inlet pipes	3 in. (75 mm)	3 in. (75 mm)	Only one inlet pipe.

Maximum inlet and outlet pipe diameters:

Inlet/Outlet Configuration	Inlet Unit STC 450i	In-Line Unit STC 900 to STC 7200	Series* STC 11000 to STC 16000
Straight Through	24 inch (600 mm)	42 inch (1050 mm)	60 inch (1500 mm)
Bend (90 degrees)	18 inch (450 mm)	33 inch (825 mm)	33 inch (825 mm)

- The inlet and in-line Stormceptor units can accommodate turns to a maximum of 90 degrees.
- Minimum distance from top of grade to crown is 2 feet (0.6 m)
- Submerged conditions. A unit is submerged when the standing water elevation at the proposed location of the Stormceptor unit is greater than the outlet invert elevation during zero flow conditions. In these cases, please contact your local Stormceptor representative and provide the following information:
- Top of grade elevation
- Stormceptor inlet and outlet pipe diameters and invert elevations
- Standing water elevation
- Stormceptor head loss, K = 1.3 (for submerged condition, K = 4)

OPERATION AND MAINTENANCE GUIDE
Table of Content

1. About Stormceptor 4
2. Stormceptor Design Overview 4
3. Key Operation Features 6
4. Stormceptor Product Line 7
5. Sizing the Stormceptor System 10
6. Spill Controls 12
7. Stormceptor Options 14
8. Comparing Technologies 17
9. Testing 18
10. Installation 18
11. Stormceptor Construction Sequence 18
12. Maintenance 19

1. About Stormceptor

The Stormceptor® STC (Standard Treatment Cell) was developed by Imbrium™ Systems to address the growing need to remove and isolate pollution from the storm drain system before it enters the environment. The Stormceptor STC targets hydrocarbons and total suspended solids (TSS) in stormwater runoff. It improves water quality by removing contaminants through the gravitational settling of fine sediments and floatation of hydrocarbons while preventing the re-suspension or scour of previously captured pollutants.

The development of the Stormceptor STC revolutionized stormwater treatment, and created an entirely new category of environmental technology. Protecting thousands of waterways around the world, the Stormceptor System has set the standard for effective stormwater treatment.

1.1. Patent Information

The Stormceptor technology is protected by the following patents:

- Australia Patent No. 693,164 • 693,164 • 707,133 • 729,096 • 779401
- Austrian Patent No. 289647
- Canadian Patent No 2,009,208 •2,137,942 • 2,175,277 • 2,180,305 • 2,180,383 • 2,206,338 • 2,327,768 (Pending)
- China Patent No 1168439
- Denmark DK 711879
- German DE 69534021
- Indonesian Patent No 16688
- Japan Patent No 9-11476 (Pending)
- Korea 10-2000-0026101 (Pending)
- Malaysia Patent No PI9701737 (Pending)
- New Zealand Patent No 314646
- United States Patent No 4,985,148 • 5,498,331 • 5,725,760 • 5,753,115 • 5,849,181 • 6,068,765 • 6,371,690
- Stormceptor OSR Patent Pending • Stormceptor LCS Patent Pending

2. Stormceptor Design Overview

2.1. Design Philosophy

The patented Stormceptor System has been designed to focus on the environmental objective of providing long-term pollution control. The unique and innovative Stormceptor design allows for continuous positive treatment of runoff during all rainfall events, while ensuring that all captured pollutants are retained within the system, even during intense storm events.

An integral part of the Stormceptor design is PCSWMM for Stormceptor - sizing software developed in conjunction with Computational Hydraulics Inc. (CHI) and internationally acclaimed expert, Dr. Bill James. Using local historical rainfall data and continuous simulation modeling, this software allows a Stormceptor unit to be designed for each individual site and the corresponding water quality objectives.

By using PCSWMM for Stormceptor, the Stormceptor System can be designed to remove a wide range of particles (typically from 20 to 2,000 microns), and can also be customized to remove a specific particle size distribution (PSD). The specified PSD should accurately reflect what is in the stormwater runoff to ensure the device is achieving the desired water quality objective. Since stormwater runoff contains small particles (less than 75 microns), it is important to design a treatment system to remove smaller particles in addition to coarse particles.

2.2. Benefits

The Stormceptor System removes free oil and suspended solids from stormwater, preventing spills and non-point source pollution from entering downstream lakes and rivers. The key benefits, capabilities and applications of the Stormceptor System are as follows:

- Provides continuous positive treatment during all rainfall events
- Can be designed to remove over 80% of the annual sediment load
- Removes a wide range of particles
- Can be designed to remove a specific particle size distribution (PSD)
- Captures free oil from stormwater
- Prevents scouring or re-suspension of trapped pollutants
- Pre-treatment to reduce maintenance costs for downstream treatment measures (ponds, swales, detention basins, filters)
- Groundwater recharge protection
- Spills capture and mitigation
- Simple to design and specify
- Designed to your local watershed conditions
- Small footprint to allow for easy retrofit installations
- Easy to maintain (vacuum truck)
- Multiple inlets can connect to a single unit
- Suitable as a bend structure
- Pre-engineered for traffic loading (minimum AASHTO HS-20)
- Minimal elevation drop between inlet and outlet pipes
- Small head loss
- Additional protection provided by an 18" (457 mm) fiberglass skirt below the top of the insert, for the containment of hydrocarbons in the event of a spill.

2.3. Environmental Benefit

Freshwater resources are vital to the health and welfare of their surrounding communities. There is increasing public awareness, government regulations and corporate commitment to reducing the pollution entering our waterways. A major source of this pollution originates from stormwater runoff from urban areas. Rainfall runoff carries oils, sediment and other contaminants from roads and parking lots discharging directly into our streams, lakes and coastal waterways.

The Stormceptor System is designed to isolate contaminants from getting into the natural environment. The Stormceptor technology provides protection for the environment from spills that occur at service stations and vehicle accident sites, while also removing contaminated sediment in runoff that washes from roads and parking lots.

3. Key Operation Features

3.1. Scour Prevention

A key feature of the Stormceptor System is its patented scour prevention technology. This innovation ensures pollutants are captured and retained during all rainfall events, even extreme storms. The Stormceptor System provides continuous positive treatment for all rainfall events, including intense storms. Stormceptor slows incoming runoff, controlling and reducing velocities in the lower chamber to create a non-turbulent environment that promotes free oils and floatable debris to rise and sediment to settle.

The patented scour prevention technology, the fiberglass insert, regulates flows into the lower chamber through a combination of a weir and orifice while diverting high energy flows away through the upper chamber to prevent scouring. Laboratory testing demonstrated no scouring when tested up to 125% of the unit's operating rate, with the unit loaded to 100% sediment capacity (NJDEP, 2005). Second, the depth of the lower chamber ensures the sediment storage zone is adequately separated from the path of flow in the lower chamber to prevent scouring.

3.2. Operational Hydraulic Loading Rate

Designers and regulators need to evaluate the treatment capacity and performance of manufactured stormwater treatment systems. A commonly used parameter is the "operational hydraulic loading rate" which originated as a design methodology for wastewater treatment devices.

Operational hydraulic loading rate may be calculated by dividing the flow rate into a device by its settling area. This represents the critical settling velocity that is the prime determinant to quantify the influent particle size and density captured by the device. PCSWMM for Stormceptor uses a similar parameter that is calculated by dividing the hydraulic detention time in the device by the fall distance of the sediment.

$$v_{SC} = \frac{H}{6_H} = \frac{Q}{A_S}$$

Where:

v_{SC} = critical settling velocity, ft/s (m/s)

H = tank depth, ft (m)

$Ø_H$ = hydraulic detention time, ft/s (m/s)

Q = volumetric flow rate, ft3/s (m3/s)

A_S = surface area, ft^2 (m^2)

(Tchobanoglous, G. and Schroeder, E.D. 1987. Water Quality. Addison Wesley.)

Unlike designing typical wastewater devices, stormwater systems are designed for highly variable flow rates including intense peak flows. PCSWMM for Stormceptor incorporates all of the flows into its calculations, ensuring that the operational hydraulic loading rate is considered not only for one flow rate, but for all flows including extreme events.

3.3. Double Wall Containment

The Stormceptor System was conceived as a pollution identifier to assist with identifying illicit discharges. The fiberglass insert has a continuous skirt that lines the concrete barrel wall for a depth of 18 inches (457 mm) that provides double wall containment for hydrocarbons storage. This protective barrier ensures that toxic floatables do not migrate through the concrete wall into the surrounding soils.

4. Stormceptor Product Line

4.1. Stormceptor Models

A summary of Stormceptor models and capacities are listed in Table 1.

Table 1. Stormceptor Models

Stormceptor Model	Total Storage Volume U.S. Gal (L)	Hydrocarbon Storage Capacity U.S. Gal (L)	Maximum Sediment Capacity ft^3 (L)
STC 450i	470 (1,780)	86 (330)	46 (1,302)
STC 900	952 (3,600)	251 (950)	89 (2,520)
STC 1200	1,234 (4,670)	251 (950)	127 (3,596)
STC 1800	1,833 (6,940)	251 (950)	207 (5,861)
STC 2400	2,462 (9,320)	840 (3,180)	205 (5,805)
STC 3600	3,715 (1,406)	840 (3,180)	373 (10,562)
STC 4800	5,059 (1,950)	909 (3,440)	543 (15,376)
STC 6000	6,136 (23,230)	909 (3,440)	687 (19,453)
STC 7200	7,420 (28,090)	1,059 (4,010)	839 (23,757)
STC 11000	11,194 (42,370)	2,797 (10, 590)	1,086 (30,752)
STC 13000	13,348 (50,530)	2,797 (10, 590)	1,374 (38,907)
STC 16000	15,918 (60,260)	3,055 (11, 560)	1,677 (47,487)

NOTE: Storage volumes may vary slightly from region to region. For detailed information, contact your local Stormceptor representative.

4.2. Inline Stormceptor

The Inline Stormceptor, Figure 1, is the standard design for most stormwater treatment applications. The patented Stormceptor design allows the Inline unit to maintain continuous positive treatment of total suspended solids (TSS) year-round, regardless of flow rate. The Inline Stormceptor is composed of a precast concrete tank with a fiberglass insert situated at the invert of the storm sewer pipe, creating an upper chamber above the insert and a lower chamber below the insert.

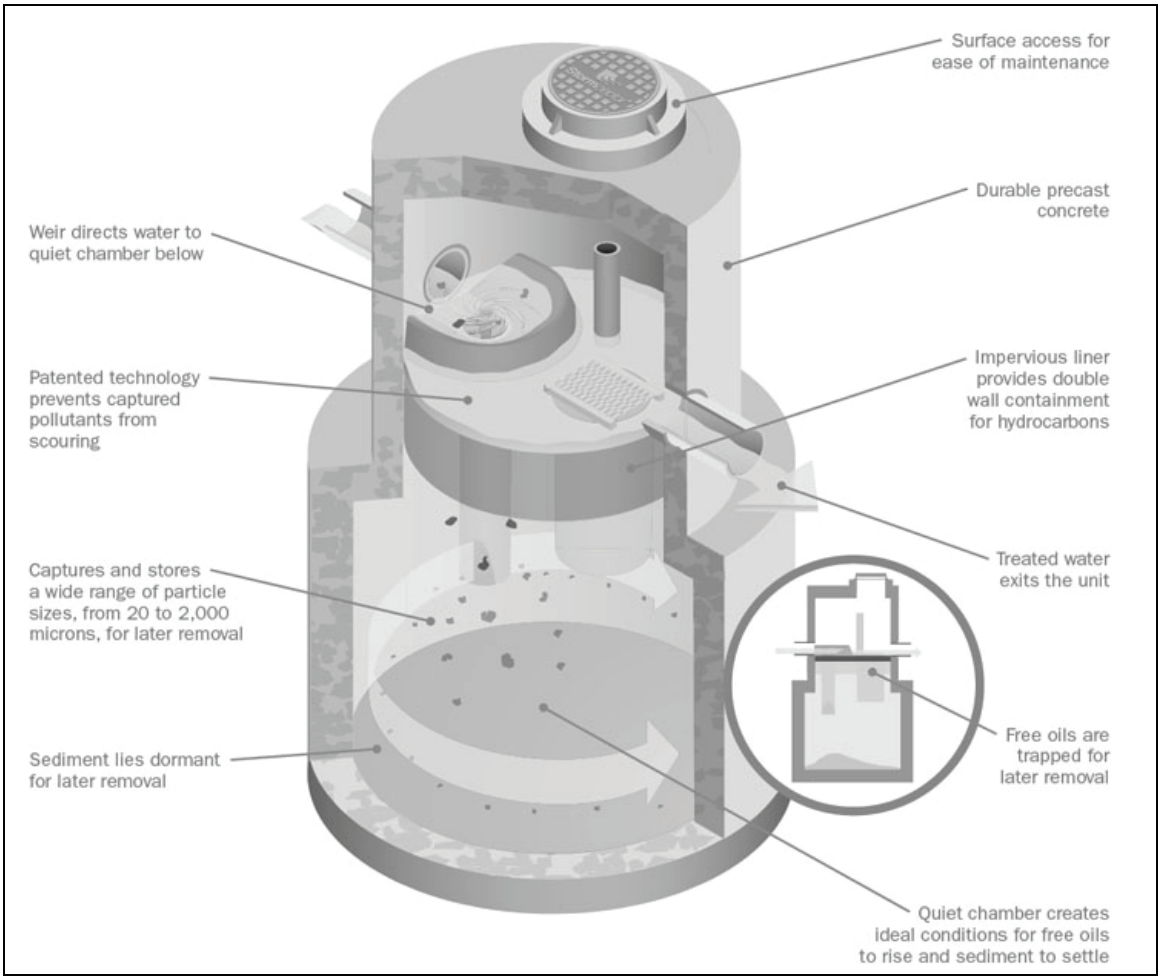


Figure 1. Inline Stormceptor

Operation

As water flows into the Stormceptor unit, it is slowed and directed to the lower chamber by a weir and drop tee. The stormwater enters the lower chamber, a non-turbulent environment, allowing free oils to rise and sediment to settle. The oil is captured underneath the fiberglass insert and shielded from exposure to the concrete walls by a fiberglass skirt. After the pollutants separate, treated water continues up a riser pipe, and exits the lower chamber on the downstream side of the weir before leaving the unit. During high flow events, the Stormceptor System's patented scour prevention technology ensures continuous pollutant removal and prevents re-suspension of previously captured pollutants.

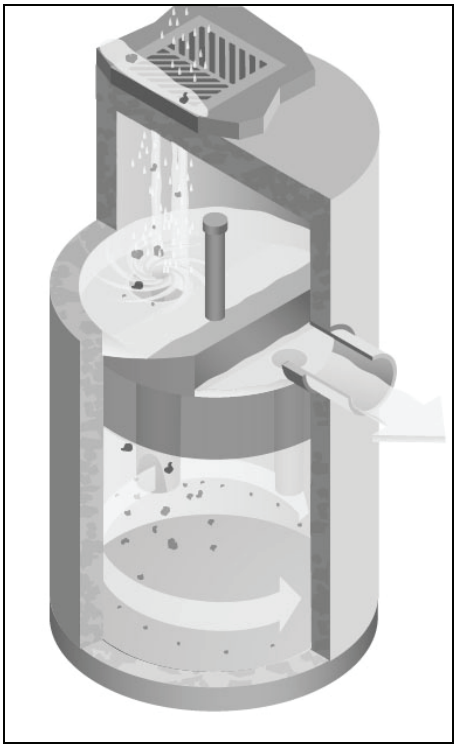


Figure 2. Inlet Stormceptor

4.3. Inlet Stormceptor

The Inlet Stormceptor System, Figure 2, was designed to provide protection for parking lots, loading bays, gas stations and other spill-prone areas. The Inlet Stormceptor is designed to remove sediment from stormwater introduced through a grated inlet, a storm sewer pipe, or both.

The Inlet Stormceptor design operates in the same manner as the Inline unit, providing continuous positive treatment, and ensuring that captured material is not re-suspended.

4.4. Series Stormceptor

Designed to treat larger drainage areas, the Series Stormceptor System, Figure 3, consists of two adjacent Stormceptor models that function in parallel. This design eliminates the need for additional structures and piping to reduce installation costs.

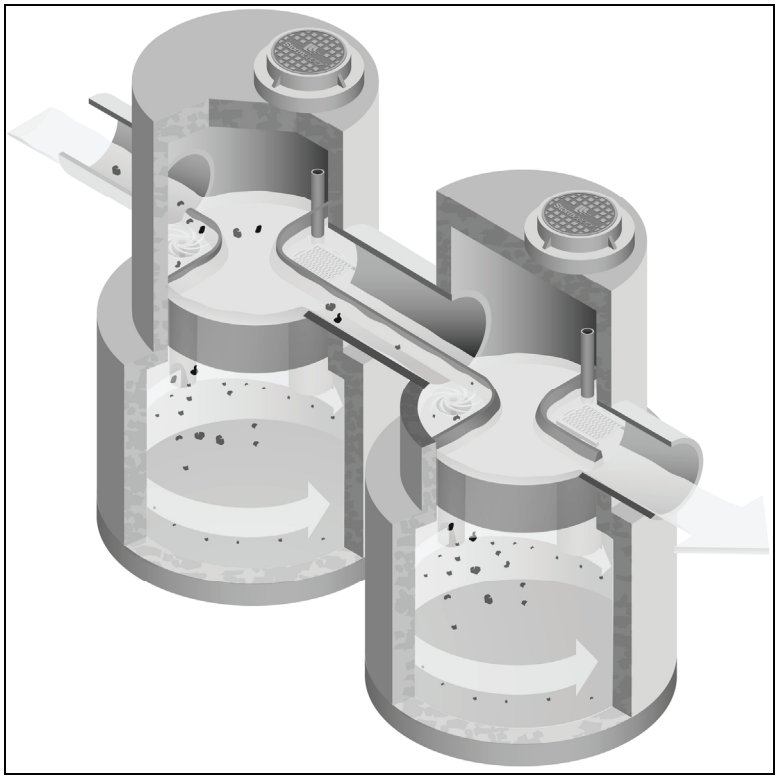


Figure 3. Series System

The Series Stormceptor design operates in the same manner as the Inline unit, providing continuous positive treatment, and ensuring that captured material is not re-suspended.

5. Sizing the Stormceptor System

The Stormceptor System is a versatile product that can be used for many different aspects of water quality improvement. While addressing these needs, there are conditions that the designer needs to be aware of in order to size the Stormceptor model to meet the demands of each individual site in an efficient and cost-effective manner.

PCSWMM for Stormceptor is the support tool used for identifying the appropriate Stormceptor model. In order to size a unit, it is recommended the user follow the seven design steps in the program. The steps are as follows:

STEP 1 – Project Details

The first step prior to sizing the Stormceptor System is to clearly identify the water quality objective for the development. It is recommended that a level of annual sediment (TSS) removal be identified and defined by a particle size distribution.

STEP 2 – Site Details

Identify the site development by the drainage area and the level of imperviousness. It is recommended that imperviousness be calculated based on the actual area of imperviousness based on paved surfaces, sidewalks and rooftops.

STEP 3 – Upstream Attenuation

The Stormceptor System is designed as a water quality device and is sometimes used in conjunction with onsite water quantity control devices such as ponds or underground detention systems. When possible, a greater benefit is typically achieved when installing a Stormceptor unit upstream of a detention facility. By placing the Stormceptor unit upstream of a detention structure, a benefit of less maintenance of the detention facility is realized.

STEP 4 – Particle Size Distribution

It is critical that the PSD be defined as part of the water quality objective. PSD is critical for the design of treatment system for a unit process of gravity settling and governs the size of a treatment system. A range of particle sizes has been provided and it is recommended that clays and silt-sized particles be considered in addition to sand and gravel-sized particles. Options and sample PSDs are provided in PCSWMM for Stormceptor. The default particle size distribution is the Fine Distribution, Table 2, option.

Table 2. Fine Distribution

Particle Size	Distribution	Specific Gravity
20	20%	1.3
60	20%	1.8
150	20%	2.2
400	20%	2.65
2000	20%	2.65

If the objective is the long-term removal of 80% of the total suspended solids on a given site, the PSD should be representative of the expected sediment on the site. For example, a system designed to remove 80% of coarse particles (greater than 75 microns) would provide relatively poor removal efficiency of finer particles that may be naturally prevalent in runoff from the site.

Since the small particle fraction contributes a disproportionately large amount of the total available particle surface area for pollutant adsorption, a system designed primarily for coarse particle capture will compromise water quality objectives.

STEP 5 – Rainfall Records

Local historical rainfall has been acquired from the U.S. National Oceanic and Atmospheric Administration, Environment Canada and regulatory agencies across North America. The rainfall data provided with PCSMM for Stormceptor provides an accurate estimation of small storm hydrology by modeling actual historical storm events including duration, intensities and peaks.

STEP 6 – Summary

At this point, the program may be executed to predict the level of TSS removal from the site. Once the simulation has completed, a table shall be generated identifying the TSS removal of each Stormceptor unit.

STEP 7 – Sizing Summary

Performance estimates of all Stormceptor units for the given site parameters will be displayed in a tabular format. The unit that meets the water quality objective, identified in Step 1, will be highlighted.

5.1. PCSWMM for Stormceptor

The Stormceptor System has been developed in conjunction with PCSWMM for Stormceptor as a technological solution to achieve water quality goals. Together, these two innovations model, simulate, predict and calculate the water quality objectives desired by a design engineer for TSS removal.

PCSWMM for Stormceptor is a proprietary sizing program which uses site specific inputs to a computer model to simulate sediment accumulation, hydrology and long-term total suspended solids removal. The model has been calibrated to field monitoring results from Stormceptor units that have been monitored in North America. The sizing methodology can be described by three processes:

1. Determination of real time hydrology
2. Buildup and wash off of TSS from impervious land areas
3. TSS transport through the Stormceptor (settling and discharge). The use of a calibrated model is the preferred method for sizing stormwater quality structures for the following reasons:
   - The hydrology of the local area is properly and accurately incorporated in the sizing (distribution of flows, flow rate ranges and peaks, back-to-back storms, inter-event times)
   - The distribution of TSS with the hydrology is properly and accurately considered in the sizing
   - Particle size distribution is properly considered in the sizing
   - The sizing can be optimized for TSS removal
   - The cost benefit of alternate TSS removal criteria can be easily assessed
   - The program assesses the performance of all Stormceptor models. Sizing may be selected based on a specific water quality outcome or based on the Maximum Extent Practicable

For more information regarding PCSWMM for Stormceptor, contact your local Stormceptor representative, or visit www.imbriumsystems.com to download a free copy of the program.

5.2. Sediment Loading Characteristics

The way in which sediment is transferred to stormwater can have a considerable effect on which type of system is implemented. On typical impervious surfaces (e.g. parking lots) sediment will build over time and wash off with the next rainfall. When rainfall patterns are examined, a short intense storm will have a higher concentration of sediment than a long slow drizzle. Together with rainfall data representing the site's typical rainfall patterns, sediment loading characteristics play a part in the correct sizing of a stormwater quality device.

Typical Sites

For standard site design of the Stormceptor System, PCSWMM for Stormceptor is utilized to accurately assess the unit's performance. As an integral part of the product's design, the program can be used to meet local requirements for total suspended solid removal. Typical installations of manufactured stormwater treatment devices would occur on areas such as paved parking lots or paved roads. These are considered "stable" surfaces which have non – erodible surfaces.

Unstable Sites

While standard sites consist of stable concrete or asphalt surfaces, sites such as gravel parking lots, or maintenance yards with stockpiles of sediment would be classified as "unstable". These types of sites do not exhibit first flush characteristics, are highly erodible and exhibit atypical sediment loading characteristics and must therefore be sized more carefully. Contact your local Stormceptor representative for assistance in selecting a proper unit sized for such unstable sites.

6. Spill Controls

When considering the removal of total petroleum hydrocarbons (TPH) from a storm sewer system there are two functions of the system: oil removal, and spill capture.

'Oil Removal' describes the capture of the minute volumes of free oil mobilized from impervious surfaces. In this instance relatively low concentrations, volumes and flow rates are considered. While the Stormceptor unit will still provide an appreciable oil removal function during higher flow events and/or with higher TPH concentrations, desired effluent limits may be exceeded under these conditions.

‘Spill Capture’ describes a manner of TPH removal more appropriate to recovery of a relatively high volume of a single phase deleterious liquid that is introduced to the storm sewer system over a relatively short duration. The two design criteria involved when considering this manner of introduction are overall volume and the specific gravity of the material. A standard Stormceptor unit will be able to capture and retain a maximum spill volume and a minimum specific gravity.

For spill characteristics that fall outside these limits, unit modifications are required. Contact your local Stormceptor Representative for more information.

One of the key features of the Stormceptor technology is its ability to capture and retain spills. While the standard Stormceptor System provides excellent protection for spill control, there are additional options to enhance spill protection if desired.

6.1. Oil Level Alarm

The oil level alarm is an electronic monitoring system designed to trigger a visual and audible alarm when a pre-set level of oil is reached within the lower chamber. As a standard, the oil

level alarm is designed to trigger at approximately 85% of the unit’s available depth level for oil capture. The feature acts as a safeguard against spills caused by exceeding the oil storage capacity of the separator and eliminates the need for manual oil level inspection.

The oil level alarm installed on the Stormceptor insert is illustrated in Figure 4.

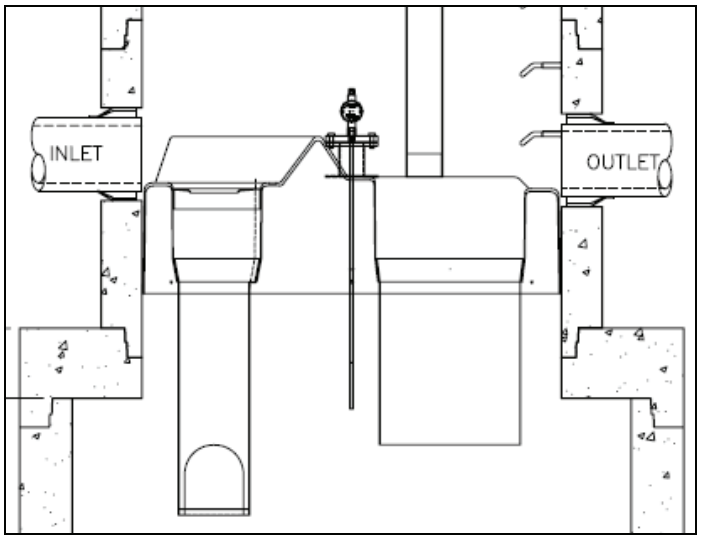


Figure 4. Oil level alarm

6.2. Increased Volume Storage Capacity

The Stormceptor unit may be modified to store a greater spill volume than is typically available. Under such a scenario, instead of installing a larger than required unit, modifications can be made to the recommended Stormceptor model to accommodate larger volumes. Contact your local Stormceptor representative for additional information and assistance for modifications.

7. Stormceptor Options

The Stormceptor System allows flexibility to incorporate to existing and new storm drainage infrastructure. The following section identifies considerations that should be reviewed when installing the system into a drainage network. For conditions that fall outside of the recommendations in this section, please contact your local Stormceptor representative for further guidance.

7.1. Installation Depth Minimum Cover

The minimum distance from the top of grade to the crown of the inlet pipe is 24 inches (600 mm). For situations that have a lower minimum distance, contact your local Stormceptor representative.

7.2. Maximum Inlet and Outlet Pipe Diameters

Maximum inlet and outlet pipe diameters are illustrated in Figure 5. Contact your local Stormceptor representative for larger pipe diameters

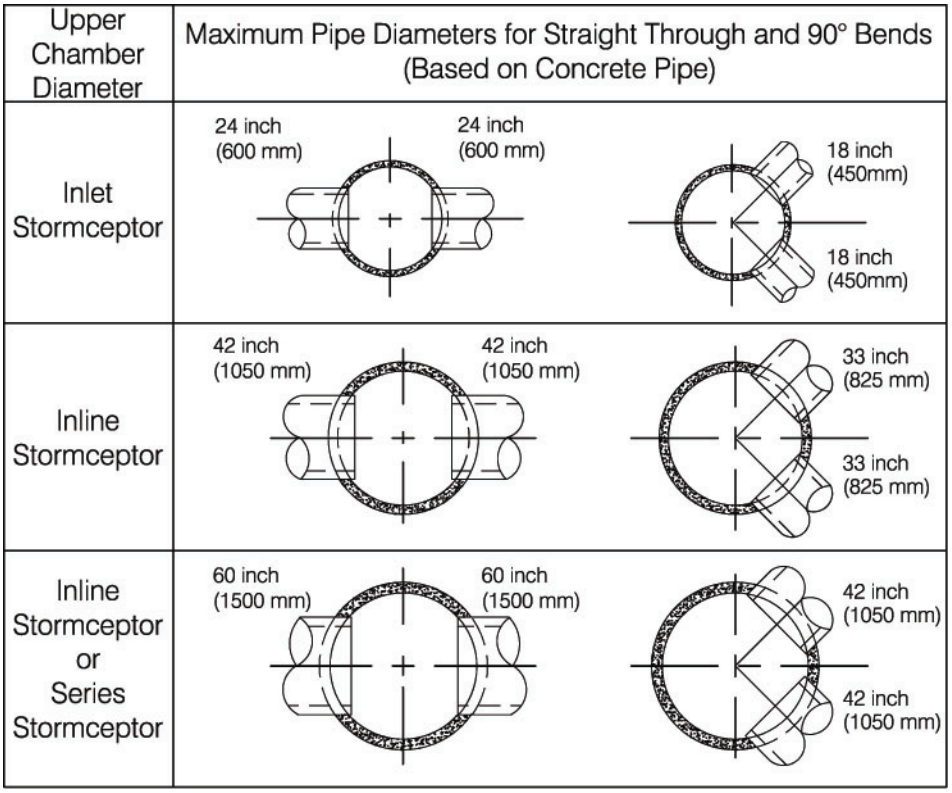


Figure 5. Maximum pipe diameters for straight through and bend applications

*The bend should only be incorporated into the second structure (downstream structure) of the Series Stormceptor System

7.3. Bends

The Stormceptor System can be used to change horizontal alignment in the storm drain network up to a maximum of 90 degrees. Figure 6 illustrates the typical bend situations of the Stormceptor System. Bends should only be applied to the second structure (downstream structure) of the Series Stormceptor System.

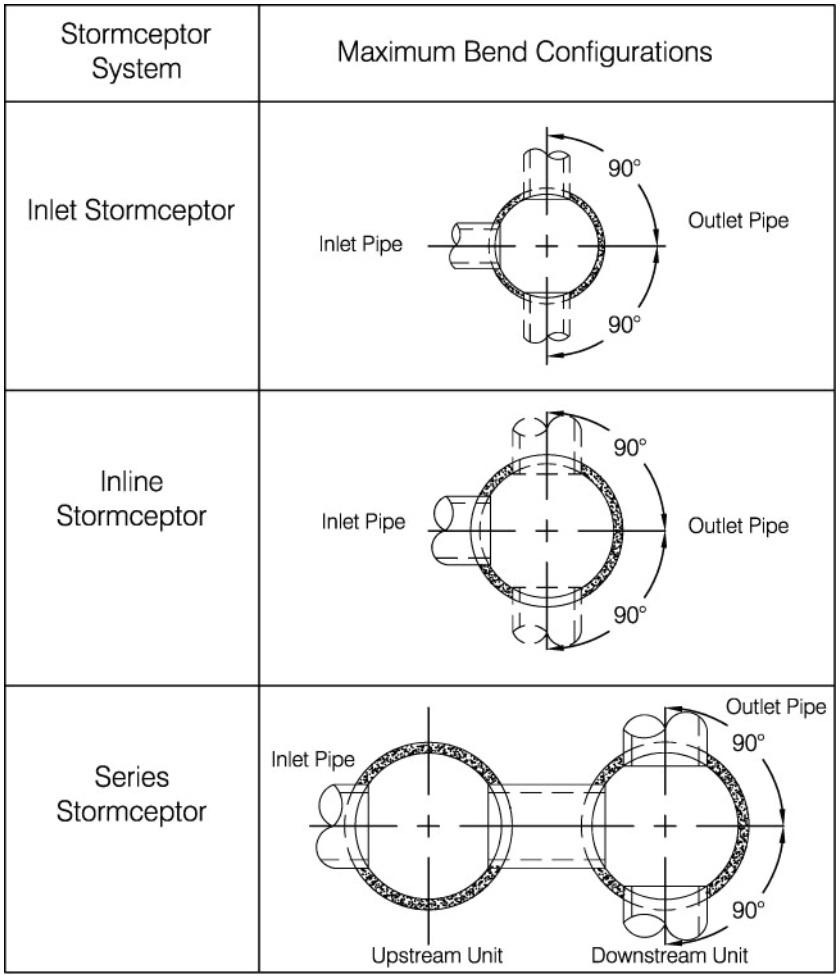


Figure 6. Maximum bend angles

7.4. Multiple Inlet Pipes

The Inlet and Inline Stormceptor System can accommodate two or more inlet pipes. The maximum number of inlet pipes that can be accommodated into a Stormceptor unit is a function of the number, alignment and diameter of the pipes and its effects on the structural integrity of the precast concrete. When multiple inlet pipes are used for new developments, each inlet pipe shall have an invert elevation 3 inches (75 mm) higher than the outlet pipe invert elevation.

7.5. Inlet/Outlet Pipe Invert Elevations

Recommended inlet and outlet pipe invert differences are listed in Table 3.

Table 3. Recommended Drops Between Inlet and Outlet Pipe Inverts

Number of Inlet Pipes	Inlet System	In-Line System	Series System
1	3 inches (75 mm)	1 inch (25 mm)	3 inches (75 mm)
>1	3 inches (75 mm)	3 inches (75 mm)	Not Applicable

7.6. Shallow Stormceptor

In cases where there may be restrictions to the depth of burial of storm sewer systems. In this situation, for selected Stormceptor models, the lower chamber components may be increased in diameter to reduce the overall depth of excavation required.

7.7. Customized Live Load

The Stormceptor system is typically designed for local highway truck loading (AASHTO HS- 20). When the project requires live loads greater than HS-20, the Stormceptor System may be customized structurally for a pre-specified live load. Contact your local Stormceptor representative for customized loading conditions.

7.8. Pre-treatment

The Stormceptor System may be sized to remove sediment and for spills control in conjunction with other stormwater BMPs to meet the water quality objective. For pretreatment applications, the Stormceptor System should be the first unit in a treatment train. The benefits of pre-treatment include the extension of the operational life (extension of maintenance frequency) of large stormwater management facilities, prevention of spills and lower total life- cycle maintenance cost.

7.9. Head loss

The head loss through the Stormceptor System is similar to a 60 degree bend at a manhole. The K value for calculating minor losses is approximately 1.3 (minor loss = k*1.3v2/2g).

However, when a Submerged modification is applied to a Stormceptor unit, the corresponding K value is 4.

7.10. Submerged

The Submerged modification, Figure 7, allows the Stormceptor System to operate in submerged or partially submerged storm sewers. This configuration can be installed on all models of the Stormceptor System by modifying the fiberglass insert. A customized weir height and a secondary drop tee are added.

Submerged instances are defined as standing water in the storm drain system during zero flow conditions. In these instances, the following information is necessary for the proper design and application of submerged modifications:

- Stormceptor top of grade elevation
- Stormceptor outlet pipe invert elevation
- Standing water elevation

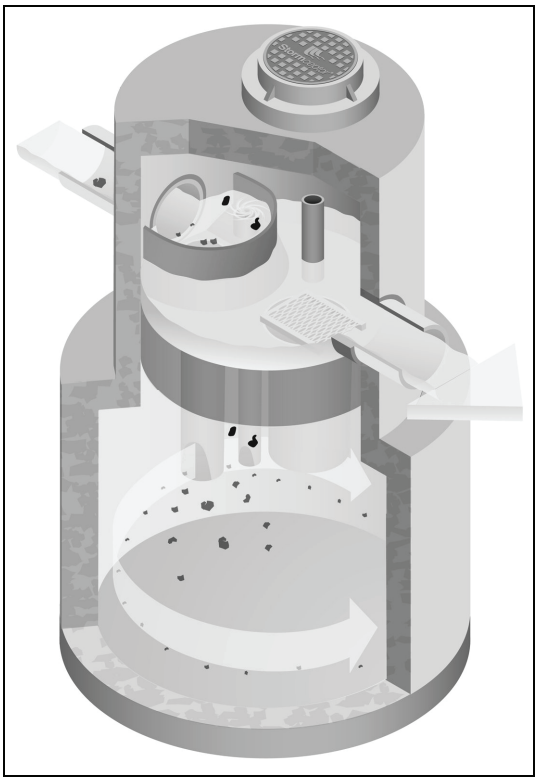


Figure 7. Submerged Stormceptor

8. Comparing Technologies

Designers have many choices available to achieve water quality goals in the treatment of stormwater runoff. Since many alternatives are available for use in stormwater quality treatment it is important to consider how to make an appropriate comparison between "approved alternatives". The following is a guide to assist with the accurate comparison of differing technologies and performance claims.

8.1. Particle Size Distribution (PSD)

The most sensitive parameter to the design of a stormwater quality device is the selection of the design particle size. While it is recommended that the actual particle size distribution (PSD) for sites be measured prior to sizing, alternative values for particle size should be selected to represent what is likely to occur naturally on the site. A reasonable estimate of a particle size distribution likely to be found on parking lots or other impervious surfaces should consist of a wide range of particles such as 20 microns to 2,000 microns (Ontario MOE, 1994).

There is no absolute right particle size distribution or specific gravity and the user is cautioned to review the site location, characteristics, material handling practices and regulatory requirements when selecting a particle size distribution. When comparing technologies, designs using different PSDs will result in incomparable TSS removal efficiencies. The PSD of the TSS removed needs to be standard between two products to allow for an accurate comparison.

8.2. Scour Prevention

In order to accurately predict the performance of a manufactured treatment device, there must be confidence that it will perform under all conditions. Since rainfall patterns cannot be predicted, stormwater quality devices placed in storm sewer systems must be able to withstand extreme events, and ensure that all pollutants previously captured are retained in the system.

In order to have confidence in a system's performance under extreme conditions, independent validation of scour prevention is essential when examining different technologies. Lack of independent verification of scour prevention should make a designer wary of accepting any product's performance claims.

8.3. Hydraulics

Full scale laboratory testing has been used to confirm the hydraulics of the Stormceptor System. Results of lab testing have been used to physically design the Stormceptor System and the sewer pipes entering and leaving the unit. Key benefits of Stormceptor are:

- Low head loss (typical k value of 1.3)
- Minimal inlet/outlet invert elevation drop across the structure
- Use as a bend structure
- Accommodates multiple inlets

The adaptability of the treatment device to the storm sewer design infrastructure can affect the overall performance and cost of the site.

8.4. Hydrology

Stormwater quality treatment technologies need to perform under varying climatic conditions. These can vary from long low intensity rainfall to short duration, high intensity storms. Since a treatment device is expected to perform under all these conditions, it makes sense that any system's design should accommodate those conditions as well.

Long-term continuous simulation evaluates the performance of a technology under the varying conditions expected in the climate of the subject site. Single, peak event design does not provide this information and is not equivalent to long-term simulation. Designers should request long-term simulation performance to ensure the technology can meet the long-term water quality objective.

9. Testing

The Stormceptor System has been the most widely monitored stormwater treatment technology in the world. Performance verification and monitoring programs are completed to the strictest standards and integrity. Since its introduction in 1990, numerous independent field tests and studies detailing the effectiveness of the Stormceptor System have been completed.

- Coventry University, UK – 97% removal of oil, 83% removal of sand and 73% removal of peat
- National Water Research Institute, Canada, - scaled testing for the development of the Stormceptor System identifying both TSS removal and scour prevention.
- New Jersey TARP Program – full scale testing of an STC 900 demonstrating 75% TSS removal of particles from 1 to 1000 microns. Scour testing completed demonstrated that the system does not scour. The New Jersey Department of Environmental Protection was followed.
- City of Indianapolis – full scale testing of an STC 900 demonstrating over 80% TSS removal of particles from 50 microns to 300 microns at 130% of the unit's operating rate. Scour testing completed demonstrated that the system does not scour.
- Westwood Massachusetts (1997), demonstrated >80% TSS removal
- Como Park (1997), demonstrated 76% TSS removal
- Ontario MOE SWAMP Program – 57% removal of 1 to 25 micron particles
- Laval Quebec – 50% removal of 1 to 25 micron particles

10. Installation

The installation of the concrete Stormceptor should conform in general to state highway, or local specifications for the installation of manholes. Selected sections of a general specification that are applicable are summarized in the following sections.

10.1. Excavation

Excavation for the installation of the Stormceptor should conform to state highway, or local specifications. Topsoil removed during the excavation for the Stormceptor should be stockpiled in designated areas and should not be mixed with subsoil or other materials.

Topsoil stockpiles and the general site preparation for the installation of the Stormceptor should conform to state highway or local specifications.

The Stormceptor should not be installed on frozen ground. Excavation should extend a minimum of 12 inches (300 mm) from the precast concrete surfaces plus an allowance for shoring and bracing where required. If the bottom of the excavation provides an unsuitable foundation additional excavation may be required.

In areas with a high water table, continuous dewatering may be required to ensure that the excavation is stable and free of water.

10.2. Backfilling

Backfill material should conform to state highway or local specifications. Backfill material should be placed in uniform layers not exceeding 12 inches (300mm) in depth and compacted to state highway or local specifications.

11. Stormceptor Construction Sequence

The concrete Stormceptor is installed in sections in the following sequence:

1. Aggregate base
2. Base slab
3. Lower chamber sections
4. Upper chamber section with fiberglass insert
5. Connect inlet and outlet pipes
6. Assembly of fiberglass insert components (drop tee, riser pipe, oil cleanout port and orifice plate
7. Remainder of upper chamber
8. Frame and access cover

The precast base should be placed level at the specified grade. The entire base should be in contact with the underlying compacted granular material. Subsequent sections, complete with joint seals, should be installed in accordance with the precast concrete manufacturer's recommendations.

Adjustment of the Stormceptor can be performed by lifting the upper sections free of the excavated area, re-leveling the base and re-installing the sections. Damaged sections and gaskets should be repaired or replaced as necessary. Once the Stormceptor has been constructed, any lift holes must be plugged with mortar.

12. Maintenance

12.1. Health and Safety

The Stormceptor System has been designed considering safety first. It is recommended that confined space entry protocols be followed if entry to the unit is required. In addition, the fiberglass insert has the following health and safety features:

- Designed to withstand the weight of personnel
- A safety grate is located over the 24 inch (600 mm) riser pipe opening
- Ladder rungs can be provided for entry into the unit, if required

12.2. Maintenance Procedures

Maintenance of the Stormceptor system is performed using vacuum trucks. No entry into the unit is required for maintenance (in most cases). The vacuum service industry is a well- established sector of the service industry that cleans underground tanks, sewers and catch basins. Costs to clean a Stormceptor will vary based on the size of unit and transportation distances.

The need for maintenance can be determined easily by inspecting the unit from the surface. The depth of oil in the unit can be determined by inserting a dipstick in the oil inspection/cleanout port.

Similarly, the depth of sediment can be measured from the surface without entry into the Stormceptor via a dipstick tube equipped with a ball valve. This tube would be inserted through the riser pipe. Maintenance should be performed once the sediment depth exceeds the guideline values provided in the Table 4.

Table 4. Sediment Depths Indicating Required Servicing*

Particle Size	Specific Gravity
Model	Sediment Depth inches (mm)
450i	8 (200)
900	8 (200)
1200	10 (250)
1800	15 (381)
2400	12 (300)
3600	17 (430)
4800	15 (380)
6000	18 (460)
7200	15 (381)
11000	17 (380)
13000	20 (500)
16000	17 (380)
* based on 15% of the Stormceptor unit's total storage	

Although annual servicing is recommended, the frequency of maintenance may need to be increased or reduced based on local conditions (i.e. if the unit is filling up with sediment more quickly than projected, maintenance may be required semi-annually; conversely once the site has stabilized maintenance may only be required every two or three years).

Oil is removed through the oil inspection/cleanout port and sediment is removed through the riser pipe. Alternatively oil could be removed from the 24 inches (600 mm) opening if water is removed from the lower chamber to lower the oil level below the drop pipes.

The following procedures should be taken when cleaning out Stormceptor:

1. Check for oil through the oil cleanout port
2. Remove any oil separately using a small portable pump
3. Decant the water from the unit to the sanitary sewer, if permitted by the local regulating authority, or into a separate containment tank
4. Remove the sludge from the bottom of the unit using the vacuum truck
5. Re-fill Stormceptor with water where required by the local jurisdiction

12.3. Submerged Stormceptor

Careful attention should be paid to maintenance of the Submerged Stormceptor System. In cases where the storm drain system is submerged, there is a requirement to plug both the inlet and outlet pipes to economically clean out the unit.

12.4. Hydrocarbon Spills

The Stormceptor is often installed in areas where the potential for spills is great. The Stormceptor System should be cleaned immediately after a spill occurs by a licensed liquid waste hauler.

12.5. Disposal

Requirements for the disposal of material from the Stormceptor System are similar to that of any other stormwater Best Management Practice (BMP) where permitted. Disposal options for the sediment may range from disposal in a sanitary trunk sewer upstream of a sewage treatment plant, to disposal in a sanitary landfill site. Petroleum waste products collected in the Stormceptor (free oil/chemical/fuel spills) should be removed by a licensed waste management company.

12.6. Oil Sheens

With a steady influx of water with high concentrations of oil, a sheen may be noticeable at the Stormceptor outlet. This may occur because a rainbow or sheen can be seen at very small oil concentrations (<10 mg/L). Stormceptor will remove over 98% of all free oil spills from storm sewer systems for dry weather or frequently occurring runoff events.

The appearance of a sheen at the outlet with high influent oil concentrations does not mean the unit is not working to this level of removal. In addition, if the influent oil is emulsified the Stormceptor will not be able to remove it. The Stormceptor is designed for free oil removal and not emulsified conditions.

SUPPORT

Drawings and specifications are available at www.ContechES.com.

Site-specific design support is available from our engineers.

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APPENDIX E

CONSTRUCTION PERIOD POLLUTION PREVENTION & EROSION & SEDIMENT CONTROL PLAN

CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN

NEW BEDFORD MARINE COMMERCE TERMINAL
MASSACHUSETTS CLEAN ENERGY CENTER
NEW BEDFORD, MASSACHUSETTS

Prepared For:

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
15 CREEK ROAD, MARION, MA 02738

Prepared By:
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31 BELLOWS ROAD, RAYNHAM, MASSACHUSETTS, 02767

CEC Project 332-344

April 2025

Civil & Environmental Consultants, Inc.

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CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN

INTRODUCTION

This report was prepared by Civil & Environmental Consultants, Inc. (CEC) for Foth Infrastructure & Environment, LLC (Foth), as retained by Massachusetts Clean Energy Center (MassCEC).

The greatest potential for sediment generation will occur during construction. An extensive erosion and sedimentation control program is proposed and will be diligently implemented during construction of the Project. The erosion control program will minimize erosion and sedimentation that could potentially impact resource areas. Water quality will be maintained by minimizing erosion of exposed soils and siltation. Erosion control barriers will be installed and exposed soil areas revegetated as soon as possible after work in an area is completed.

This Erosion and Sedimentation Control Plan includes preliminary measures and requirements for management and implementation of erosion and sediment controls during construction. A detailed Stormwater Pollution Prevention Plan (SWPPP) will be prepared and a Notice of Intent (NOI) will be filed with the United States Environmental Protection Agency (USEPA) in accordance with USEPA's National Pollutant Discharge Elimination System (NPDES) General Permit program for stormwater discharges from construction sites prior to the commencement of any construction activity. The SWPPP will contain elements from this Erosion and Sediment Control Plan and will include additional and more detailed inspection and maintenance procedures as well as maintenance logs, forms, and additional erosion and sediment control measures.

Responsible Party for Plan Compliance:
Massachusetts Clean Energy Center
4 Wright Street
New Bedford, MA 02740

Emergency Contact Information:
To be determined.

CONSTRUCTION AND WASTE MATERIALS EXPECTED ON-SITE

Construction Materials & Waste

Building / Construction products staged on site are to be protected by measures to minimize the exposure to stormwater or precipitation. Provided measures either can be a cover or similarly effective means to minimize the discharge of pollutants from these areas. Examples of effective means include locating activities away from resource areas and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similar effective controls.

The contractor will utilize and secure dumpsters / roll offs as deemed appropriate for sorting, temporary storage and disposal of waste. Waste disposal will be completed by the Contractor or by a waste disposal firm. Containers will be removed and replaced if appropriate when they are adequately filled or at the end of a specific construction task as deemed necessary by the construction supervisor.

The Contractor shall keep waste container lids closed when not in use and close lids at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either (1) cover (e.g., a tarp, plastic sheeting, temporary roof) to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants(e.g., secondary containment).

On business days, clean up and dispose of waste in designated waste containers. Clean up immediately if containers overflow.

Hazardous Waste

No Hazardous or toxic waste is anticipated to be present on site. If utilized or found to be present, the Plan will be modified. If applicable, any hazardous or toxic waste will be properly stored, managed and removed from the site pursuant to appropriate regulations, manufactures recommendations and Material Safety Data Sheets (MSDS).

Sanitary Waste

Portable sanitary facilities will be utilized at the site and pumped out at a time-frame sufficient to keep odor and material from disturbing personnel at the site or every 4 weeks.

For sanitary waste, position portable toilets so that they are secure and will not be tipped or knocked over and located away from waters of the U.S. and stormwater inlets or conveyances. Units will be inspected at least once per month and emptied regularly and as needed.

EROSION CONTROL MEASURES

The adjacent resource areas will be protected during construction by implementing siltation control measures, including the placement of silt fences, straw bales or silt socks as close as feasible to the downgradient limit of construction activity. A temporary stabilized construction exit with truck wash area will be constructed as well. The project may also implement other stabilization methods such as erosion netting and hydroseeding.

Short and Long-Term Goals and Criteria

Short and long-term goals will include a variety of stabilizing sediment and erosion controls around the limit of work. All construction-phase erosion and sediment controls have been designed to retain sediment on-site to the extent practicable and limit runoff and the discharge of pollutants (sediment) from exposed areas of the Site.

Litter and solid construction debris potentially exposed to the stormwater will be prevented from becoming a pollution source through routine monitoring and the use of laborers to "pick" as necessary.

Inspections

An experienced Construction Monitor or a certified SWPPP Inspector will conduct inspections of construction areas once every 7 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge. Storm event information from a weather station representative of the Site's location may be used to determine if a storm event of 0.25 inches or greater has occurred on the Site. Total rainfall will be measured for any day of rainfall during normal business hours that measures 0.25 inches or greater. Construction areas an experienced Construction Monitor or a certified SWPPP Inspector will inspect include:

- Disturbed areas of the construction Site that have not been finally stabilized,
- Areas used for storage of materials that are exposed to precipitation,
- Structural control measures,
- Locations where vehicles enter or exit the Site, and
- The stormwater management system and discharge outlets.

Disturbed areas and areas used for storage of materials that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system.

Sediment and erosion control measures identified will be observed to ensure that they are operating correctly. The discharge locations or points will be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the Site will be inspected for evidence of offsite sediment tracking.

Based on the results of these routine inspections, the Contractor will correct any deficiencies found as soon as practicable. Results of the inspections, corrective actions taken in response to any deficiencies, and any opportunities for improvement that are identified will be documented in an inspection report.

Stabilization Practices

The construction site activities will include numerous stabilizing practices. Sediment and erosion controls such as erosion netting, mulching and hydro seeding may act as interim practices. Erosion netting material may include single net straw blankets or coconut blankets. Permanent stabilization practices will include the use of a hydro seeding over vegetative support soil where additional exposure threatens stormwater quality. Seeding will be carried out with a seed mixture equal to the "Roadside Slope Mix" included below. All siltation barriers will remain in place until all exposed areas are re-vegetated.

Planting Schedule For Exposed Areas

1. All exposed areas will receive 6 inches of topsoil or compost material.
2. Seed will be equal to "Roadside Slope Mix" as specified by the Mass. Highway Department. Please refer to chart below for specifications. This mixture will be spread at a rate of 5 pounds per 1,000 square feet.

TABLE 5.1
ROADSIDE SLOPE MIX

Common Name	Germination Proportion	Purity Minimum	Minimum
Creeping Red Fescue	50%	85%	95%
Kentucky 3	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

Specific Steep Slope Controls

Erosion Control Blankets	
Description: Erosion control blankets will be used to minimize erosion on slopes of 3:1 or greater.	
Installation	When construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days.
Maintenance Requirements	Inspect for erosion. Re-grade and secure blankets as necessary.
Design Specifications	See Site Plans and Details.

Specific Perimeter Controls

Compost Silt Socks with Silt Fences	
Description: Compost Silt Socks will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Overlapping Silt Socks will be set to overlap at minimum twelve (12) inches. Silt Socks are to be anchored by two (2) inch by two (2) inch by thirty-six (36) inch hard wood stakes set downhill (away from construction) side and driven at least 12 (twelve) inches into the ground. Loose compost may be backfilled along the upslope side. In areas where high runoff velocities or high sediment loads are expected, Compost Silt Socks will be backed up with silt fencing.	
Installation	Prior to commencement of earth disturbance activities.
Maintenance Requirements	Remove sediment before it has accumulated to one-half of effective height of compost silt sock. Routinely inspect silt socks daily for signs of damage or vandalism. Inspection should be conducted within twenty-four (24) hours of a runoff event. Repair or replace as necessary for the duration of the project.
Design Specifications	See Site Plans and Details

Sediment Track-Out Controls

Stone Construction Exit	
Description: A temporary crushed-stone construction exit will be constructed as detailed on the construction drawings. A cross slope will be placed in the entrance to direct runoff to a settling area and conveyance channels. If deemed necessary after construction begins, a wash pad may be included to wash off vehicle wheels before leaving the project site. Vehicle use will be restricted to properly designated exit points.	
Installation	Prior to commencement of earth disturbance activities.
Maintenance Requirements	Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance, storm drain inlet, or water of the U.S.
Design Specifications	See Site Plans and Details

Specific Storm Drain Inlet Controls

Silt Sacks	
Description: Silt Sacks will be installed in all existing catch basins along the project frontage indication on the site plans before commencing work or in paved areas after the binder course is placed and erosion control barriers have been removed.	
Installation	Prior to commencement of earth disturbance activities.
Maintenance Requirements	Routinely inspect silt sacks daily for signs of damage or vandalism. Inspection should be conducted within twenty-four (24) hours of a runoff event. Repair or replace as necessary for the duration of the project until upstream areas have been permanently stabilized.

	Regular maintenance includes lifting the inlet protection and cleaning around and under them as sediment collects.
Design Specifications	See Site Plans and Details.

Stockpile Controls

Compost Silt Socks	
Description: Compost silt socks will be placed to trap sediment along all downgradient perimeter areas of stockpiles. In areas where high runoff velocities or high sediment loads are expected, silt socks will be backed up with silt fencing.	
Installation	Prior to placement of stockpile materials.
Maintenance Requirements	Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. Inspect \daily for signs of damage or vandalism. Repair or replace as necessary for the duration of the project.
Design Specifications	See Site Plans and Details.

NON-STRUCTURAL PRACTICES

Good Housekeeping

Non-structural controls are as effective as structural controls in sediment control. Non-structural controls to be used at the construction Site include:

- Regular sweeping of paved surfaces; and
- Prompt cleanup of any waste or spilled waste materials.

Exposure Minimization

Exposure will be minimized by providing both permanent and temporary soil stabilization (see Section 5.3.2) over areas that have been completely constructed, or areas that will not be revisited within a 30-day period.

Where practicable, industrial materials and activities will be protected from exposure to rain, snow, snowmelt, or runoff.

Preventative Maintenance

A preventative maintenance program includes the timely inspection and maintenance of stormwater management devices. Examples of preventative maintenance include:

- Removal of obstructions, if any, from inlets and outlets.
- Removal of accumulated sediment and vacuuming water from sumps.
- Repairing and re-planting slope areas that experience erosion.

RECORD KEEPING

The following records will be maintained on the Site:

1. Dates when major grading activities occur,
2. Dates when construction activities temporarily or permanently cease on a portion of the Site,
3. Dates when stabilization measures are initiated, and
4. In addition, the following records will also be kept:
    - The Order of Conditions; and any additional permit conditions/approvals,
    - All inspection reports, and
    - Any spill reports.

ATTACHMENT 1

CONSTRUCTION BMP MAINTENANCE LOG

Construction BMPs Maintenance Log

Project Name: MassCEC Terminal Expansion
Project Location: New Bedford, MA
Project Number: 332-344

Date: 1/7/2025
Prepared By: ITB
Approved By: BEP

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning or Repair Needed (List Items if Required)	Date of Cleaning or Repair	Performed by
Pavement Sweeping	To be monitored as needed			Paved areas within the active construction site can be swept on a regular basis to remove larger sediment particles from construction activities. Pavement areas adjacent to the Site will be swept if dirt and debris is tracked from the active construction site.			
Deep Sump Nyloplast Yard Drains (Silt Sack Sediment Trap)	Inspect at least once every 7 calendar days or once every 14 calendar days and within 24 hours of the occurrence of storm event of 0.25 inches or greater.			Inspect for proper operation. If clogged, remove accumulated sediment and properly dispose of to maintain the capacity of the catch basin.			
Catch Basin Inlet Protection (Silt Sack Sediment Trap)	Inspect at least once every 7 calendar days or once every 14 calendar days and within 24 hours of the occurrence of storm event of 0.25 inches or greater.			Inspect for proper operation. If clogged, remove accumulated sediment and properly dispose of to maintain the capacity of the catch basin.			
Erosion Control Barrier (Compost Silt Sock and Silt Fence)	Inspect at least once every 7 calendar days or once every 14 calendar days and within 24 hours of the occurrence of storm event of 0.25 inches or greater.			Inspect for deterioration or failure. Remove sediment when buildup exceeds 6 inches or half the barrier height. The underside of straw bales should be kept in close contact with the earth and reset as necessary.			
Stone Construction Exit	Inspect at least once every 7 calendar days or once every 14 calendar days and within 24 hours of the occurrence of storm event of 0.25 inches or greater.			The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way. The contractor shall sweep or wash pavement at exits which have experienced mud-tracking onto the pavement or traveled way. When wheel washing is required, it shall be done on an area stabilized with aggregate that drains into an approved sediment trapping device. When the construction exit becomes ineffective, the stone shall be removed along with the collected soil material and redistributed on-site in a stable manner. The exit should then be reconstructed. All sediment shall be prevented from entering storm drains, ditches, or waterways.			
Vegetated Slope Stabilization	Inspect at least once every 7 calendar days or once every 14 calendar days and within 24 hours of the occurrence of storm event of 0.25 inches or greater.			Inspect for erosion. Re-grade and re-seed as necessary.			

Stormwater Supervisor Contact Information:_____

ATTACHMENT 8: HEAVY LIFT DESIGN NARRATIVE
(CIVIL & ENVIRONMENTAL CONSULTANTS, INC., MARCH 2025)

1.0 SUMMARY AND PURPOSE

Civil & Environmental Consultants, Inc. (CEC) prepared this Design Narrative for Foth Infrastructure & Environment, LLC (Foth) in support of our design for the proposed heavy lift expansion at 18 & 54 Wright Street in New Bedford, MA. Based on the subsurface conditions at the site and loading criteria, CEC is recommending stabilizing the subgrade with a combination of Tensar NXF geogrid and select aggregate. Refer to Figure 1 in Attachment 1 for a sketch of the proposed heavy lift design section.

CEC recognizes the proposed heavy lift expansion will also extend into the 4 Wright Street parcel. Additional subsurface explorations will be required in this parcel once the existing building is vacated. As such, this calculation package is limited to the proposed expansion at 18 & 54 Wright Street.

The purpose of this design narrative is to provide a detailed description of the analyses performed to support our Heavy Lift design for subgrade stabilization. This narrative includes a summary of subsurface and laboratory data from the site and the results of analyses performed.

2.0 ATTACHMENTS AND REFERENCES

The following attachments are included with this design narrative:

1. Proposed Heavy Lift Section Sketch
2. Subsurface Exploration Location Plan
3. Cone Penetration Test Results
4. Test Boring Logs
5. Laboratory Test Results
6. Multi-Layer Bearing Capacity Calculations
7. Tensar Plus Software Calculations
8. Settle3 Settlement Evaluation
9. Tensar Interax NXF Specification Sheet

References (not included as attachments):

1. Principles of Foundation Engineering, Eight Edition, Das, Braja M., 2012
2. T-Value: A new direction for working platforms – February 2020

3.0 BACKGROUND INFORMATION

3.1 Site Background

The location of the proposed heavy lift expansion discussed in this calculation package is between 18 and 54 Wright Street in New Bedford, MA. Surrounding areas to the west and south of the site are currently utilized as wind turbine equipment storage areas. The subject site will be designed as an

expansion to the current adjacent storage areas. The site is owned by Massachusetts Clean Energy Center (MassCEC) who plan to lease the property once improvements are made. The sites are currently occupied by single-level structures as well as paved and landscape areas. The sites are also relatively flat and generally range from approximate Elevation (El.) 10 to 12. Based on our understanding of the proposed project, the existing structures and pavement/landscape areas will be demolished and a gravel laydown area will be constructed across the footprint of the sites to allow for temporary storage of heavy equipment. Based on discussion with our site civil team, no major grade changes are proposed.

An existing 72-inch diameter Reinforced Concrete Pipe (RCP) culvert exists along the south edge of the proposed heavy lift expansion which will remain in-place. Calculations regarding the structural adequacy of the existing culvert when subjected to the proposed ground surface loads are presented under separate cover. The culvert contains several access brick manholes that extend to grade. We understand that Foth will be designing additional reinforcement around the existing manholes to span the proposed load over the existing brick manholes.

3.2 Proposed Heavy Lift Expansion Area Design Requirements

The proposed heavy lift expansion area is required to support a bearing pressure of 4,100 pounds per square foot (psf). White settlement criteria has not been specified for the expansion, we understand that a total settlement criteria of 2-inches has been used as a basis of design for adjacent existing heavy lift areas. Equipment type and size has not been provided. However, the intended use of the expansion area is anticipated to be similar to the existing terminal facility which is currently used to store wind turbine parts and is subject to heavy equipment loading including modular trailers and crawler cranes.

4.0 SUBSURFACE INVESTIGATIONS AND LABORATORY TESTING

4.1 Subsurface Investigations

A combination of historical data provided to us by Foth and a recent exploration program conducted by CEC provided the subsurface data for the heavy lift design. Approximate locations of the Test Boring and Cone Penetration Test (CPT) explorations utilized as part of our analysis and design are shown on the attached Figure in Attachment 2. Test Boring and CPT logs are included in Attachment 3 and 4 of this calculation package, respectively.

4.1.1 Previous CPTs Performed by Others

Foth provided CEC with several CPT logs from explorations performed adjacent to the site to aid in our analysis. Of the historical data provided, the following CPT logs were utilized in the development of the heavy lift section. In general, CEC utilized historical CPT logs that were within about 200 feet of the proposed heavy lift expansion which are included on the next page:

- CPTs 22-09 through 22-11 – CPTs performed by Conetec of West Berlin, NJ on September 13, 2022.

4.1.2 Recent Test Borings Coordinated by CEC

From November 9th to 10th, 2023, CEC subcontracted Geosearch, Inc. (Geosearch) to drill test borings CEC-1-1 through CEC-5-1 at 54 Wright Street. On December 5th and 6th of 2023, CEC subcontracted Geosearch to drill test borings CEC-1-2 to CEC-8-2 at 18 Wright Street. Approximate locations are shown in Attachment 2.

Geosearch sampled the soil zone using hollow-stem auger and split-spoon sampling methods in general accordance with the standard penetration test (SPT) outlined in ASTM D1586 on all borings performed. Soil samples were collected at approximate 2-foot center-to-center intervals from each test boring. The test borings performed at 54 Wright Street extended approximately 13.5 to 25.5 feet below the existing ground surface (bgs). At 18 Wright Street, the test borings extended about 5.5 to 26 feet bgs.

4.1.3 Recent CPTs Coordinated by CEC

From April 29th to May 3rd, 2024, CEC subcontracted ConeTec, Inc. (ConeTec) of West Berlin, New Jersey to perform CPTs CPT24-A-2 through CPT24-JJ-9 at 18-54 Wright Street. The final depths of the CPTs ranged from 1.8 to 16.32 feet bgs. CPTs advanced until refusal was encountered on either shallow debris, dense soils or rock. Approximate locations are shown in Attachment 2.

4.2 Laboratory Testing

CEC subcontracted Thielsch Engineering, Inc. to perform laboratory material properties testing on select samples from the borings performed at 18 and 54 Wright Street. Laboratory testing included ASTM D2216 (moisture content), ASTM D6913 (particle size distribution), and ASTM D2974 (ash and organic content). Laboratory test results are included in Attachment 5 of this calculation package.

5.0 SUBSURFACE CONDITIONS

Based on the test borings and CPTs performed within and adjacent to 18 and 54 Wright Street, we assessed the subsurface profile to generally consist of existing fill materials underlain in succession by organic soil, glacial outwash, and glacial till.

5.1 Existing Fill

The Existing Fill was encountered in each of the borings and ranged between 5.5 to 13 feet thick. Borings CEC-4-2 through CEC-6-2 and CEC-8-2 terminated in existing fill. Based on visual observation and laboratory testing, the Existing Fill generally consists of silty sand with variable amounts of gravel, organics and debris. SPT N-value ranged from 4 to 91 with an average N value of

18. The organic content ranged from 2.1 to 4.5%. The CPTs performed adjacent to the borings appeared to indicate similar relative density and consistency of the Existing Fill.

5.2 Organic Soil

Organic soil was encountered in borings CEC-1-1, CEC-2-1, CEC-4-1, and CEC-5-1. The thickness of organics ranged between 1.5 to 5.2 feet thick. This layer generally consisted of organic silt with varying amounts of sand and gravel based on visual observation and laboratory testing. SPT N-value ranged from 1 to 4 with an average N-Value of 2. The organic content ranged from 1.9% to 42.4%. The moisture content ranged from 23.5% to 260%. The CPTs performed adjacent to the borings appeared to indicate similar relative density and consistency of the Organic Soil.

5.3 Glacial Outwash

The Glacial Outwash was encountered in most borings except CEC-5-1, CEC-1-2, and CEC-4-2 through CEC-8-2. This layer ranged in thickness from 1.5 to 11 feet thick. Based on visual observation and laboratory testing, the outwash generally consisted of silty sand with variable amounts of gravel. The SPT N-value ranged from 2 to 36 and had an average of 18. The CPTs performed adjacent to the borings appeared to indicate similar relative density and consistency of the Glacial Outwash.

5.4 Glacial Till

The Glacial Till was encountered in most borings except CEC-3-2 through CEC-6-2 and CEC-8-2, most likely due to split spoon refusal. The thickness of Glacial Till ranged from 1.5 to 6 feet. The till generally consisted of silty sand with gravel based on visual observation. SPT N-value ranged from 28 to 102 with an average N-value of 51. The CPTs performed adjacent to the borings appeared to indicate similar relative density and consistency of the Glacial Till.

6.0 METHODOLOGY AND ASSUMPTIONS

As noted in Section 3.2, the proposed heavy lift expansion area is required to support ground bearing pressures of 4,100 psf with an assumed maximum total settlement criteria of 2 inches. Specific equipment types and sizes have not been provided. Heavily loaded equipment platforms utilized for similar sites often consist of an unreinforced gravel section over the existing subgrade (which is present in the existing heavy lift area to the south of the proposed expansion) or a thinner gravel section reinforced with a geosynthetic product such as geogrid or geocell (which is present in the existing heavy lift area to the west of the proposed expansion). Based on our discussion with the project team and discussion with various geosynthetic manufacturers, we understand that significant cost savings may be achieved by reducing the surface gravel layer thickness by reinforcing this layer with a geosynthetic product. Based on cost estimates provided by geosynthetic manufacturers, CEC identified geogrid reinforcement as a cost-effective approach to reinforcing the proposed subgrade and reducing the gravel thickness.

To develop a heavy lift design section, CEC utilized empirical correlations from Reference 1 based on the SPT test results in the test borings and laboratory test results. In addition, CEC utilized CPeT-iT v.3.9.2.21, a CPT interpretation software which provides several correlations based on CPT tip and frictional resistance. The table below includes material parameters developed for each sublayer based on the subsurface explorations, laboratory test results, and our engineering judgment.

Table 1 –Material Strength Parameters

Material Description	Unit Weight (pcf)	Angle of Internal Friction (phi)[1, 2]	Elastic Modulus (ksf)	Compression Ratio ($\frac{C_C}{1+e_0}$)	Recompression Ratio ($\frac{C_R}{1+e_0}$)	Overconsolidation Ratio
Dense Grade Aggregate	140	40	1000	--	--	--
Existing Fill	130	30	400	--	--	--
Organic Soil	100	--	--	0.14	0.024	1.5
Glacial Outwash	120	--	300	--	--	--
Glacial Till	140	--	1000	--	--	--

1. Angle of internal friction was only utilized for multi-layer bearing capacity between Dense Grade Aggregate and existing fill subgrade. The natural soils below the existing fill were utilized in a settlement evaluation but were not considered in the bearing capacity evaluation due to the depth of these layers.
2. Angle of internal friction for Dense Grade Aggregate when utilized in conjunction with Tensar Interax NXF geogrid was assumed to be 45 based on discussion with the manufacturer, based on the increased load distribution and interlock between the gravel and geogrid.

Based on the material properties developed in the above Table 1, CEC designed the heavy lift section using the following steps:

1. First, CEC analyzed a heavy lift section consisting of unreinforced Dense Grade Aggregate. CEC performed a multi-layer bearing capacity analysis (Reference 1) modeling a strong granular material over a weaker granular material, as the subgrade soils at this site primarily consist of granular fill. CEC estimated the thickness of the Dense Grade Aggregate layer such that a Factor of Safety (FS) of at least 3 would be achieved at the ground surface for a bearing pressure of 4,100 psf. Refer to Attachment 6 (Multi-Layer Bearing Capacity Calculations) for additional information and details on the analysis.

2. Then, CEC calculated an approximate equivalent heavy lift section consisting of reinforced Dense Grade Aggregate with Tensar Interax NXF geogrid. Interax NXF geogrid is designed specifically to increase the bearing capacity of working platforms by increasing subgrade stiffness and improving soil interlock between the geogrid and aggregate material. The intent of this calculation was to estimate a heavy lift section with a reduced thickness which would result in a 4,100 psf bearing capacity and similar FS as the unreinforced section described above. CEC utilized the T-value method as discussed in Reference 2 to estimate the load transfer efficiency of the reinforced gravel layer to the underlying subgrade below and develop

an appropriate thickness and geogrid configuration within the reinforced gravel layer. The publicly available Tensar + software was utilized to develop a reinforced gravel section. Refer to Attachment 7 (Tensar + Software Calculations) for additional information and details.

3. In addition to the bearing capacity evaluation, CEC also performed a settlement evaluation based on the subsurface conditions encountered and the proposed 4,100 psf ground loading. CEC utilized the software program Settle3 version 5.018 by RocScience to estimate the anticipated settlement based on 4,100 psf loads of variable size in the absence of specific loading dimensions. CEC modeled a reduced gravel section as determined in Step 2 above, and conservatively omitted the geogrid from the settlement analysis. CEC modeled each subsurface layer as encountered in the borings and CPTs, and imposed each load case on the area with the thickest amount of organics (I.E. near boring CEC-2-1, CPT CC-7 and DD-8). Refer to Attachment 8 (Settle3 Settlement Evaluation) for additional information and details.

In each of the evaluations noted above, assumptions were required to be made regarding the size of the loaded area because both bearing capacity and settlement are not only a function of the subsurface conditions but of the size of the loaded area. CEC recognizes that specific loading details are not yet available. As such, CEC utilized variably sized and shaped (rectangular and square) loads to capture the effect of load size on bearing capacity and settlement.

We understand that variably sized strip and square loads are currently present to the immediate south of the site by the current tenant and we assume similarly sized loads could potentially exist in the future in the proposed expanded area. As such, CEC utilized the following variable load sizes at 4,100 psf to account for the variations in bearing capacity and settlement between strip loads and rectangular loads:

- Rectangular Loads: 3’ x 50’, 5’ x 50’, and 10’ x 50’
- Square Loads: 5’ x 5’, 10’ x 10’, and 50’ x 50’

7.0 RESULTS AND CONCLUSIONS

Based on the above noted loading conditions, CEC estimated the following unreinforced and reinforced gravel sections that would satisfy the minimum required FS of 3. The reinforced gravel section consists of a reduced thickness of Dense Grade Aggregate reinforced with Tensar Interax NXF geogrid.

Table 2 – Bearing Capacity Analysis Results

Load Case	Unreinforced Gravel Thickness (in)	Unreinforced Gravel Factor of Safety	Reinforced Gravel Thickness (in)	Reinforced Gravel Factor of Safety
3' x 50'	36	3.17	18	3.12
5' x 50'		3.83	16	3.11
10' x 50'		5.40	12	3.16
5' x 5'		4.37	12	3.36
10' x 10'		5.22	12	3.43
50' x 50'		13.57	12	6.79

In addition to estimating the FS for each load case and unreinforced/reinforced gravel section, CEC also estimated the settlement for each load case. For the settlement evaluation, CEC conservatively omitted the geogrid in the settlement analysis and placed each load in the area of the site with the thickest layer of organic soil (most compressible soil layer encountered in the subsurface investigations).

Table 3 – Settlement Analysis Results

Load Case	Unreinforced Gravel Thickness (in)	Settlement (in)
3' x 50'	18	0.75
5' x 50'		1.38
10' x 50'		2.42
5' x 5'		0.40
10' x 10'		1.19
50' x 50'		3.83

Based on the results above, CEC presents the following conclusions:

- A reinforced gravel thickness of 18 inches (with two layers of Tensar Interax NXF geogrid) results in a similar bearing capacity FS as 36 inches of unreinforced gravel.
- CEC estimates that up to 4-inches of settlement of the reinforced gravel subgrade could occur based on the load cases analyzed. CEC expects most of this settlement to occur rapidly once the load is applied to the subgrade (i.e. days to weeks). In addition, the above noted settlement estimates can be reduced by about 50% in areas where organic soils are not as prominent (generally in the 18 Wright St. parcel and the southern third of the 54 Wright St. parcel). Options to reduce the settlement to within tolerable limits or to potentially reduce the equipment loading in these areas are currently being discussed with Foth and MassCEC.

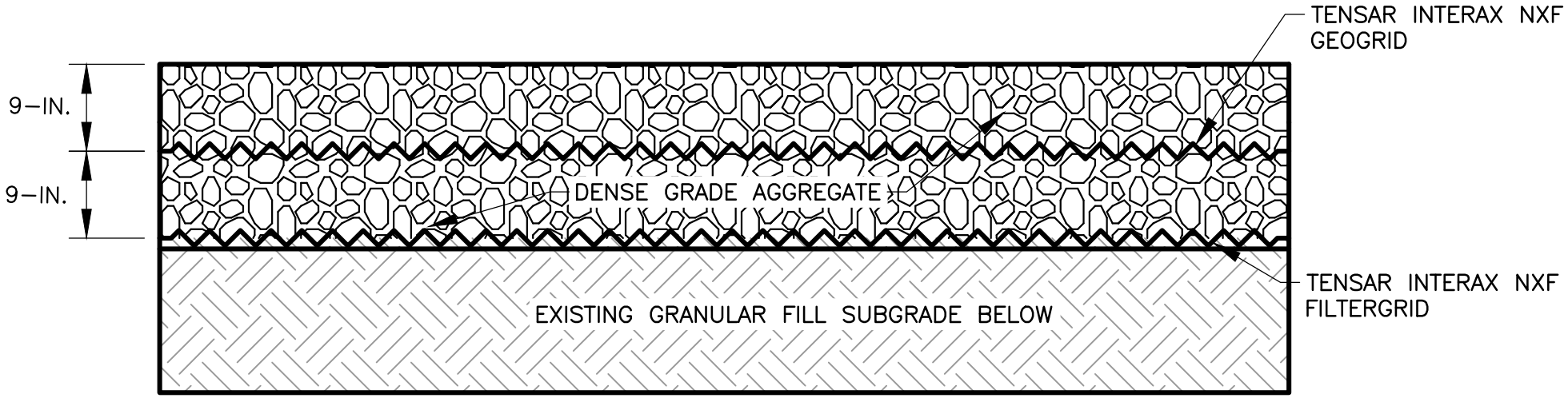
- MassCEC should anticipate periodic maintenance of the heavy lift area in the form of occasional re-grading of locally subsided areas with new gravel. Once specific loading dimensions are provided by the tenant, CEC should review this information to determine if the actual subgrade loading is significantly different than the loading conditions assumed herein.

8.0 LIMITATIONS

This calculation package is for the exclusive use of Foth and is based on the design criteria provided. Bearing capacity is not simply a function of subsurface conditions but also on the size of the loaded area which has only been assumed herein. CEC's design conclusions and recommendations described herein are based on assumed loading conditions and will need to be verified once a tenant for the proposed expansion has been identified and specific equipment loading has been provided. Once this information is provided, CEC must re-evaluate the loading conditions and provide additional recommendations as necessary.

ATTACHMENT 1

PROPOSED HEAVY LIFT SECTION SKETCH



NOTES

1. PRIOR TO GEOGRID PLACEMENT, ALL SURFICIAL ASPHALT AND TOPSOIL SHALL BE REMOVED DOWN TO GRANULAR SUBGRADE SOILS. THE SUBGRADE SHALL BE SCARIFIED IN PLACE AND PROOFROLLED USING HEAVY PNEUMATIC TIRED EQUIPMENT EXERTING A MINIMUM 10-TON AXLE LOAD TO VISUALLY EVALUATE FOR AREAS OF INSTABILITY. AREAS THAT ARE ASSESSED TO BE WEAK OR UNSTABLE DURING PROOFROLLING SHALL BE EXCAVATED DOWN TO FIRM GRANULAR SOIL AND THE RESULTING EXCAVATION SHOULD BE BACKFILLED WITH COMPACTED LIFTS OF GRANULAR FILL. THE GRANULAR FILL SHALL BE PLACED IN MAXIMUM 12-INCH THICK LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY, AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR), AND TO VISUAL NON-MOVEMENT.

2. DENSE GRADE AGGREGATE SHALL MEET GRADATION REQUIREMENTS FOR PROCESSED GRAVEL FOR SUBBASE AS SPECIFIED IN TABLE M1.03.1-1 OF MASSACHUSETTS DOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, 2024 EDITION. SELECT GRAVEL FILL SHALL BE PLACED IN MAXIMUM 12-INCH THICK LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR), AND TO VISUAL NON-MOVEMENT.

3. FOLLOW ALL MANUFACTURER'S INSTRUCTIONS WHEN INSTALLING GEOGRID. MINIMUM OVERLAP OF 2 FEET REQUIRED AT ROLL ENDS.

4. IN THE EVENT OF FUTURE EXCAVATIONS THAT REQUIRE REPAIR OF GEOGRID, THE DAMAGED GEOGRID SHALL BE REMOVED AND REPLACED WITH NEW GEOGRID. THE NEW GEOGRID SHOULD COVER THE DAMAGED AREA AND EXTEND THREE FEET BEYOND IT IN ALL DIRECTIONS.

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Raynham, MA 02767
Ph: 774.501.2176
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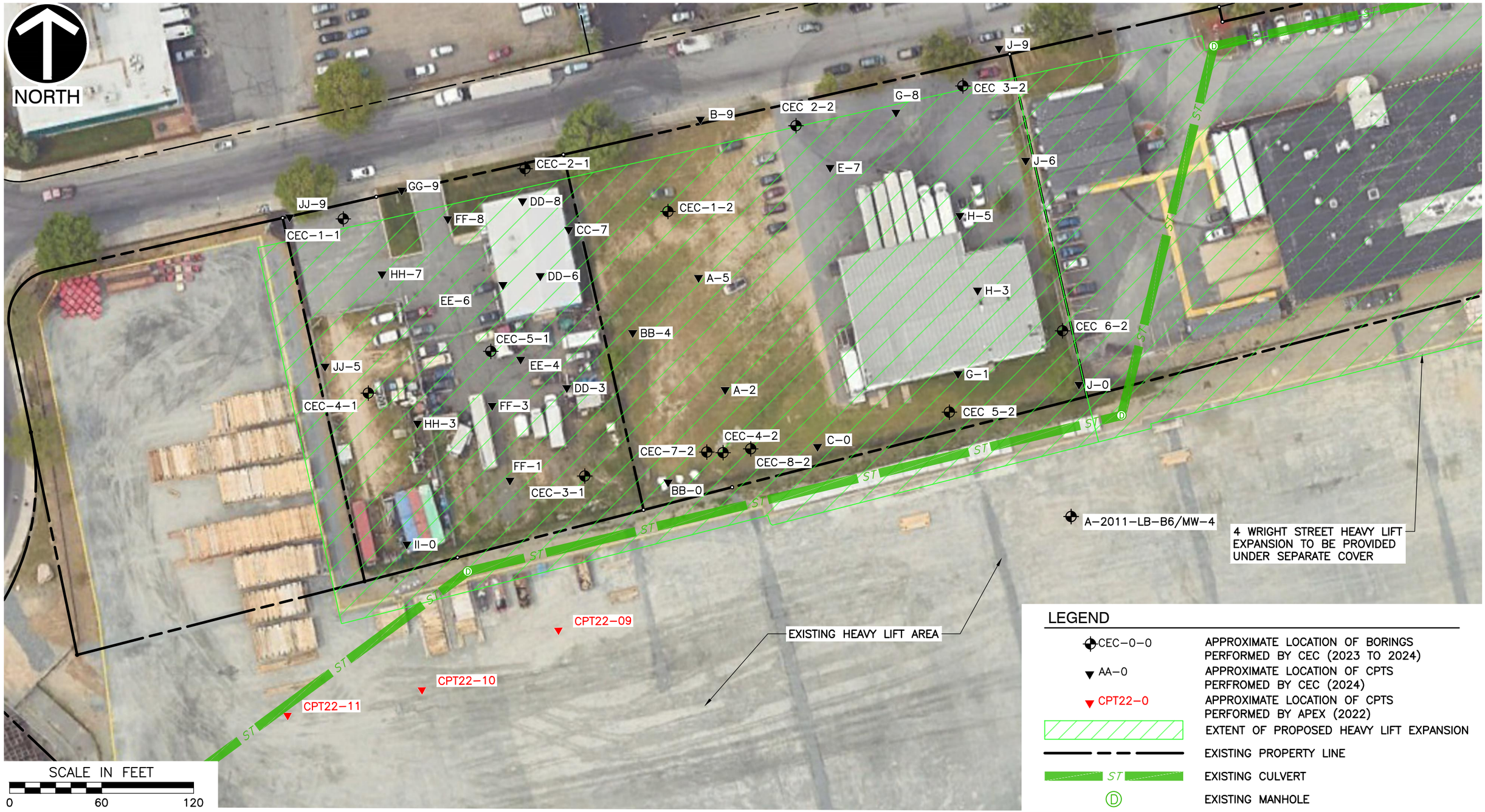
FOTH INFRASTRUCTURE & ENVIRONMENT LLC
MASSCEC EXPANSION
18 & 54 WRIGHT STREET, NEW BEDFORD, MA

PROPOSED HEAVY LIFT SECTION

DRAWN BY:	AMB	CHECKED BY:	TES	APPROVED BY:	MJS	FIGURE NO.:	1
DATE:	MARCH 2025	DWG SCALE:	NOT TO SCALE	PROJECT NO:	332-344		

ATTACHMENT 2

SUBSURFACE EXPLORATION LOCATION PLAN



LEGEND

CEC-0-0	APPROXIMATE LOCATION OF BORINGS PERFORMED BY CEC (2023 TO 2024)
AA-0	APPROXIMATE LOCATION OF CPTS PERFROMED BY CEC (2024)
CPT22-0	APPROXIMATE LOCATION OF CPTS PERFORMED BY APEX (2022)
	EXTENT OF PROPOSED HEAVY LIFT EXPANSION
	EXISTING PROPERTY LINE
ST	EXISTING CULVERT
D	EXISTING MANHOLE

REFERENCE/NOTES

1. AERIAL IMAGERY COURTESY OF GOOGLE EARTH PRO.
2. BORING/CPT LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.
3. ONLY BORINGS AND CPTS THAT WERE UTILIZED AS PART OF THE HEAVY LIFT DESIGN ARE SHOWN ON THIS PLAN.

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MASSCEC EXPANSION
18-54 WRIGHT STRET, NEW BEDFORD, MA

EXPLORATION LOCATION PLAN
HEAVY LIFT EXPANSION AREA

DRAWN BY:	AMB	CHECKED BY:	TES	APPROVED BY:	MJS	FIGURE NO.:	2
DATE:	MARCH 2025	DWG SCALE:	1"=60'	PROJECT NO:	332-344		

P:\330-000\332-344\-CADD\Dwg\GT03 - Site 1 - Heavy Lift Calculations Figures\332344-GT03-Exploration Location Plan.dwg{HEAVY LIFT FIGURE} LS:(2/4/2025 - abucco) - LP: 2/4/2025 11:22 AM

ATTACHMENT 3
CONE PENETRATION TEST RESULTS

Cone Penetration Test (CPTu) Summary and Standard CPTu Plots

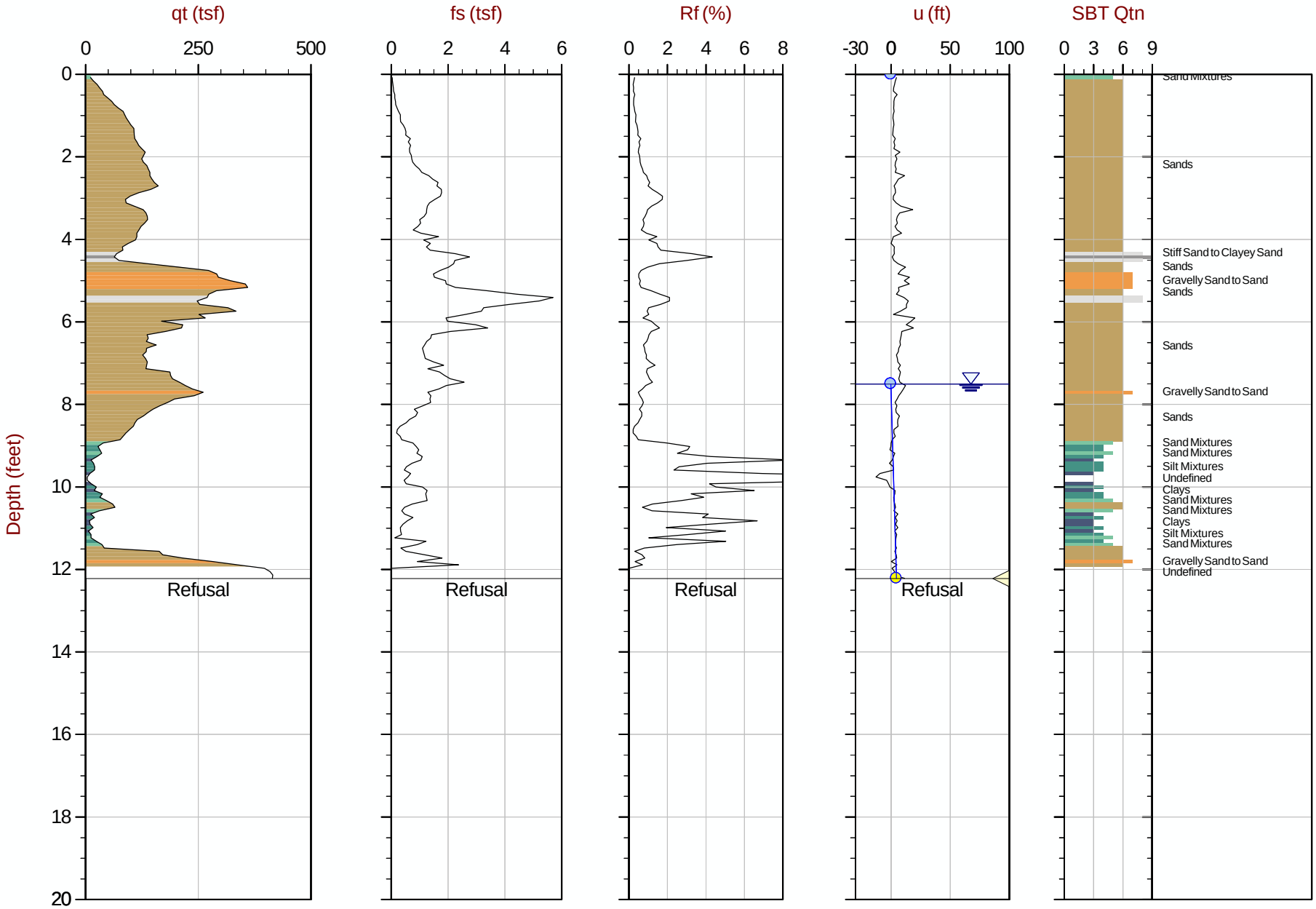
CONETEC

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 09:21
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-A-2
Cone: 652:T1500F15U35



Max Depth: 3.725 m / 12.22 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPA-2.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9175

Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

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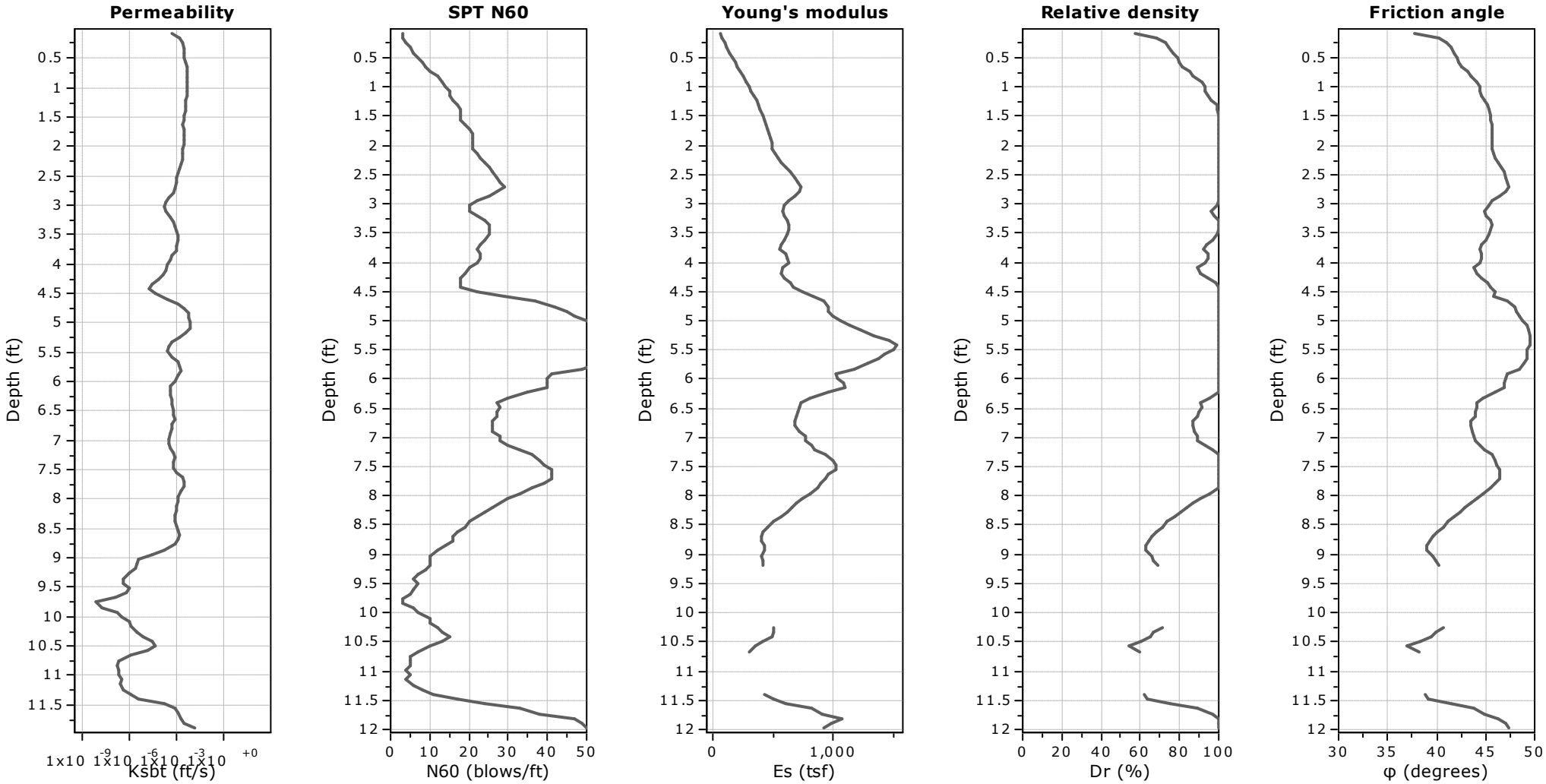
Merarhias 56
http://www.geologismiki.gr

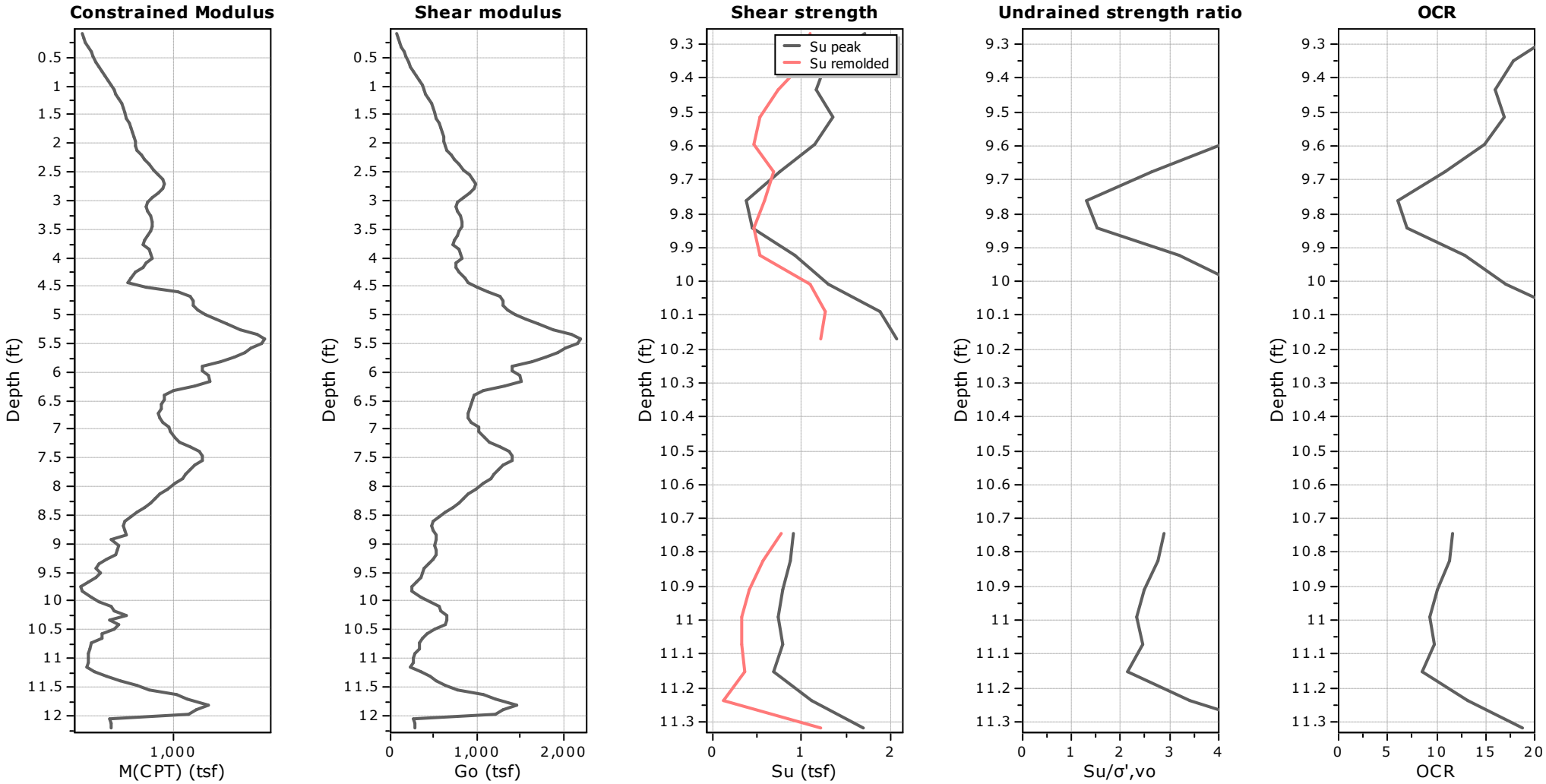
CPT: A-2
Total depth: 12.22 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

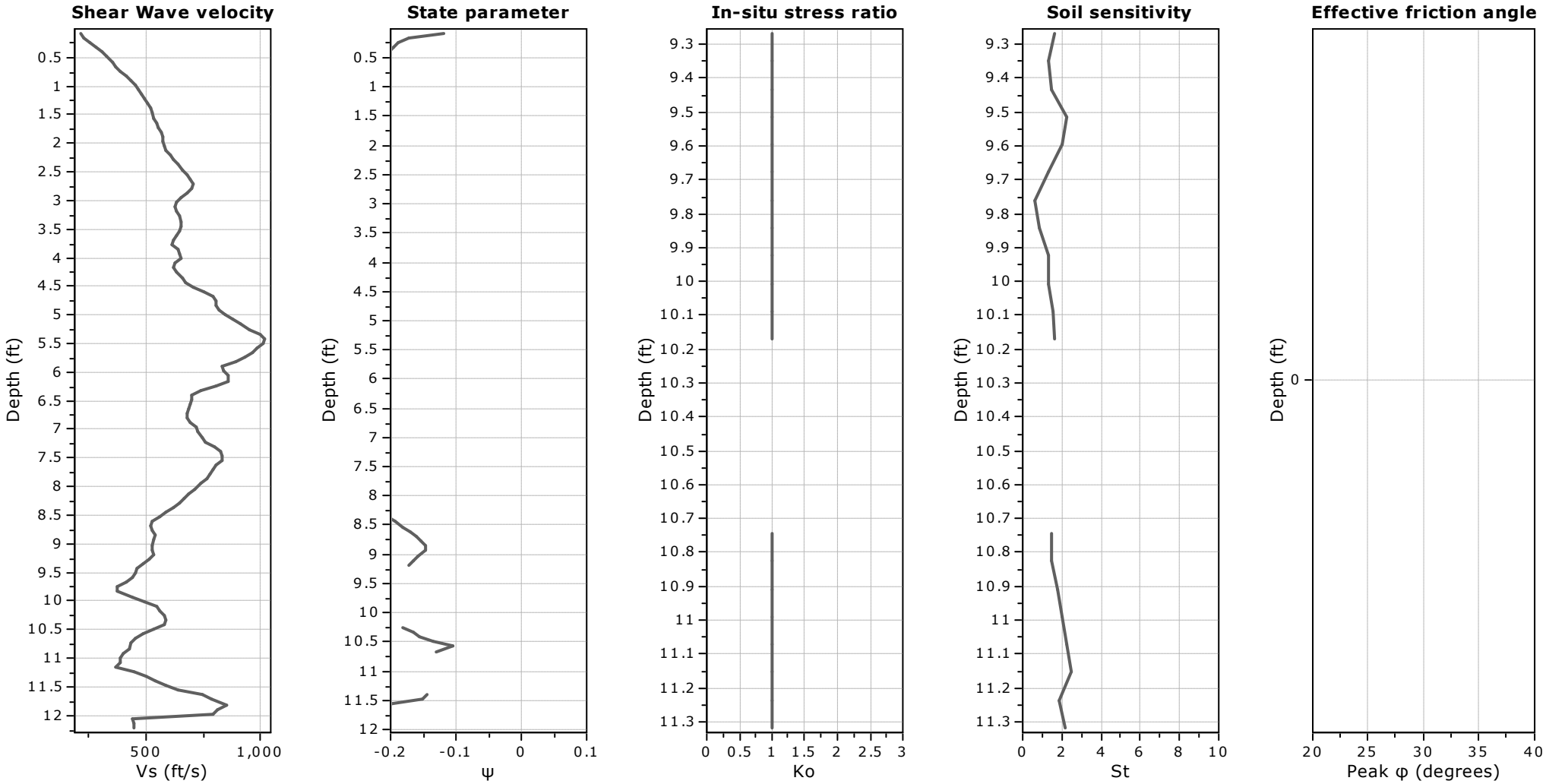
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



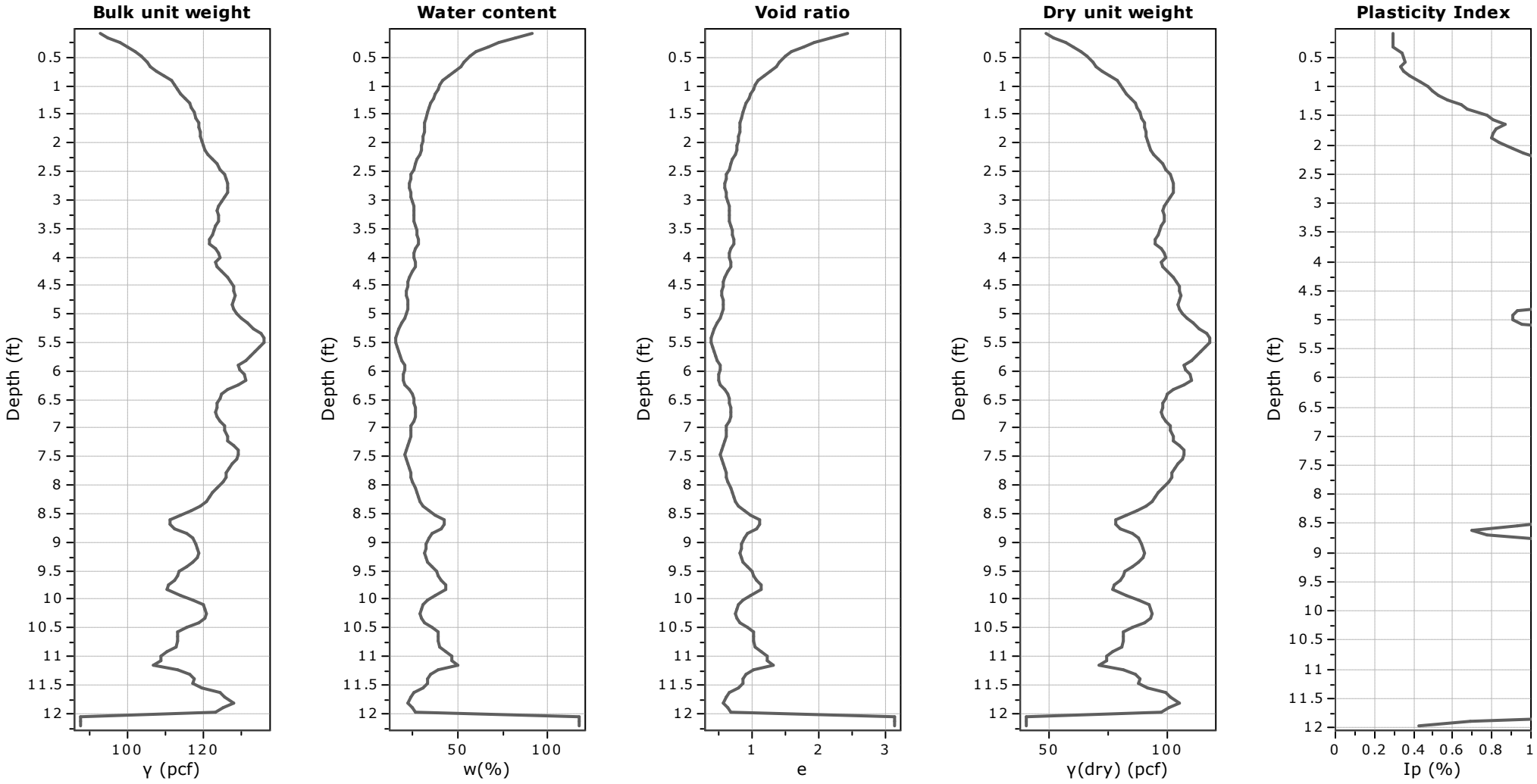
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: A-2
Total depth: 12.22 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

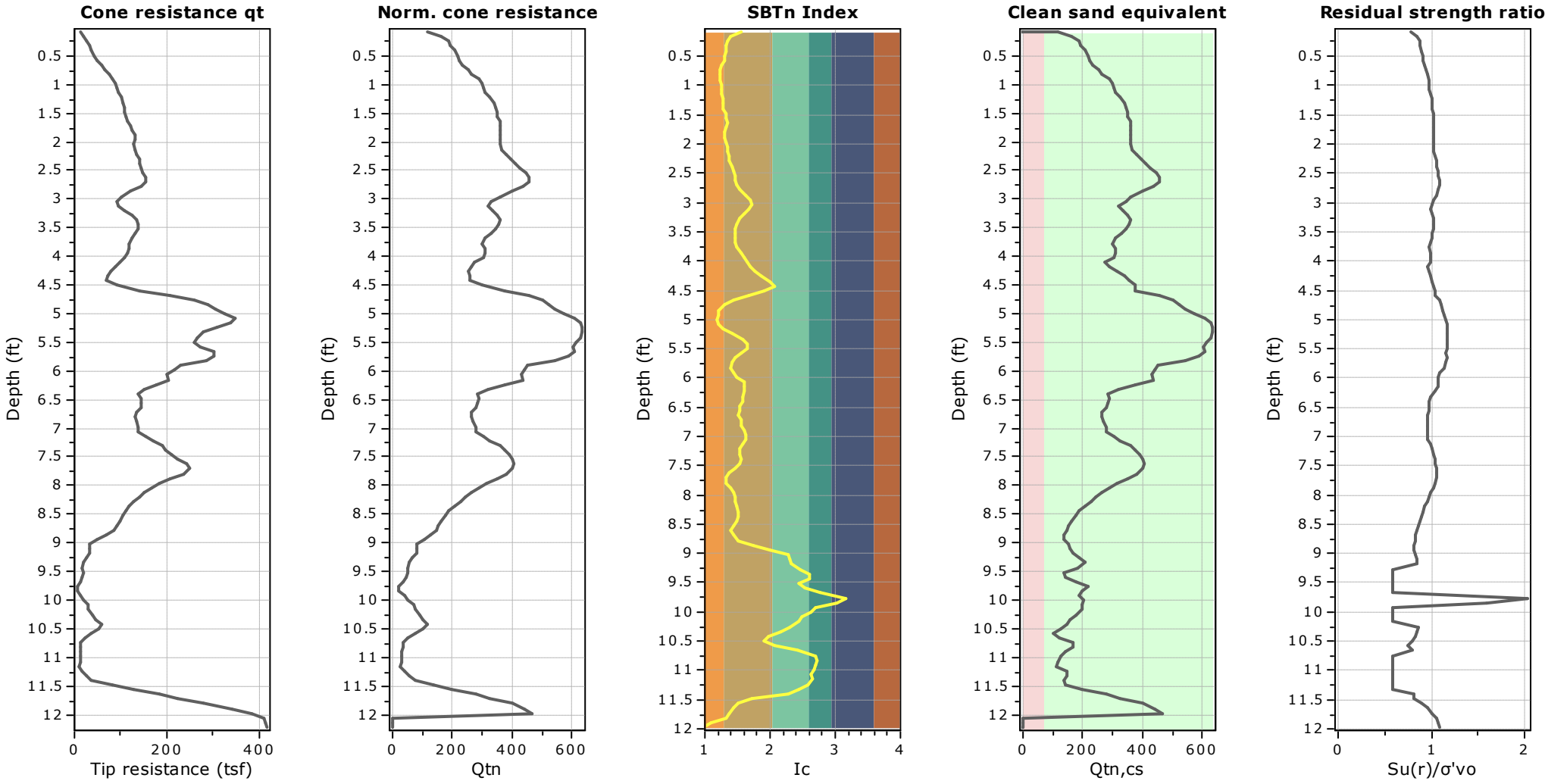
Project:
Location:

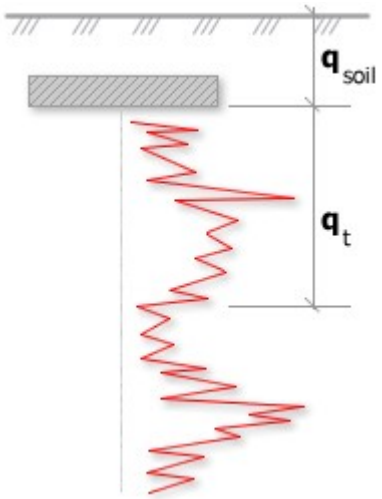


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: A-2
Total depth: 12.22 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

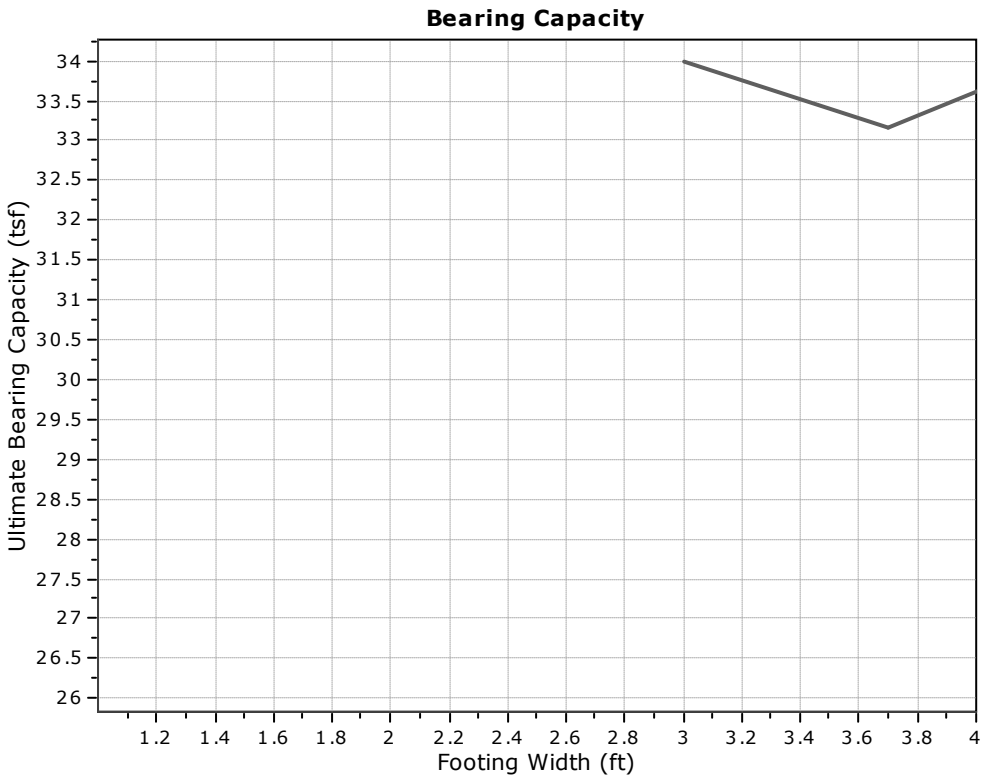




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

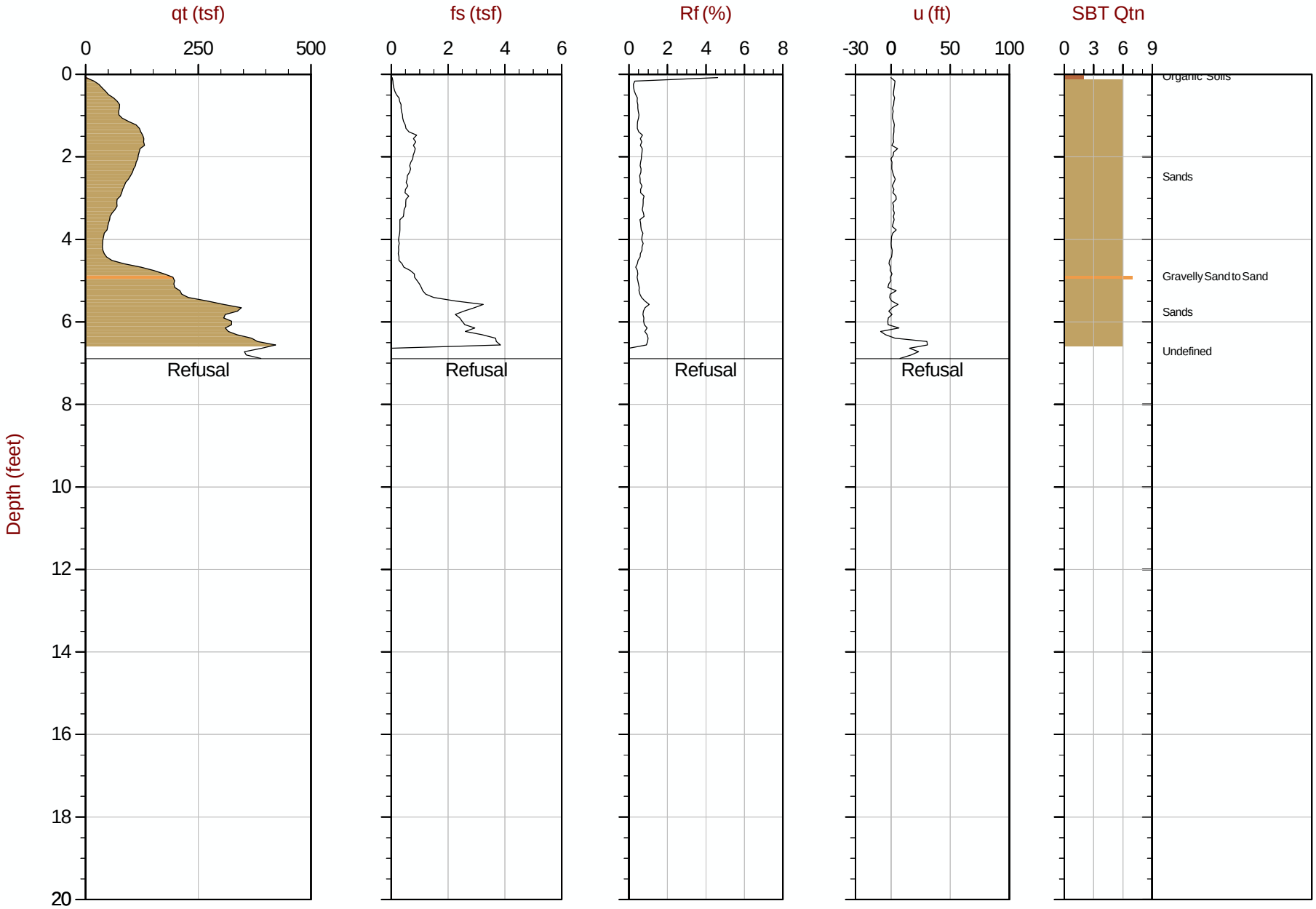
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	169.54	0.20	0.10	34.00
2	3.70	1.60	7.15	165.33	0.20	0.10	33.16
3	4.40	1.60	8.20	170.61	0.20	0.10	34.22
4	5.10	1.60	9.25	158.50	0.20	0.10	31.80
5	5.80	1.60	10.30	141.56	0.20	0.10	28.41
6	6.50	1.60	11.35	128.92	0.20	0.10	25.88
7	7.20	1.60	12.40	137.97	0.20	0.10	27.69
8	7.90	1.60	13.45	137.97	0.20	0.10	27.69
9	8.60	1.60	14.50	137.97	0.20	0.10	27.69
10	9.30	1.60	15.55	137.97	0.20	0.10	27.69
11	10.00	1.60	16.60	137.97	0.20	0.10	27.69
12	10.70	1.60	17.65	137.97	0.20	0.10	27.69
13	11.40	1.60	18.70	137.97	0.20	0.10	27.69
14	12.10	1.60	19.75	137.97	0.20	0.10	27.69
15	12.80	1.60	20.80	137.97	0.20	0.10	27.69

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 11:16
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-A-5
Cone: 652:T1500F15U35



Max Depth: 2.100 m / 6.89 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPA-5.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6238 Long: -70.9176

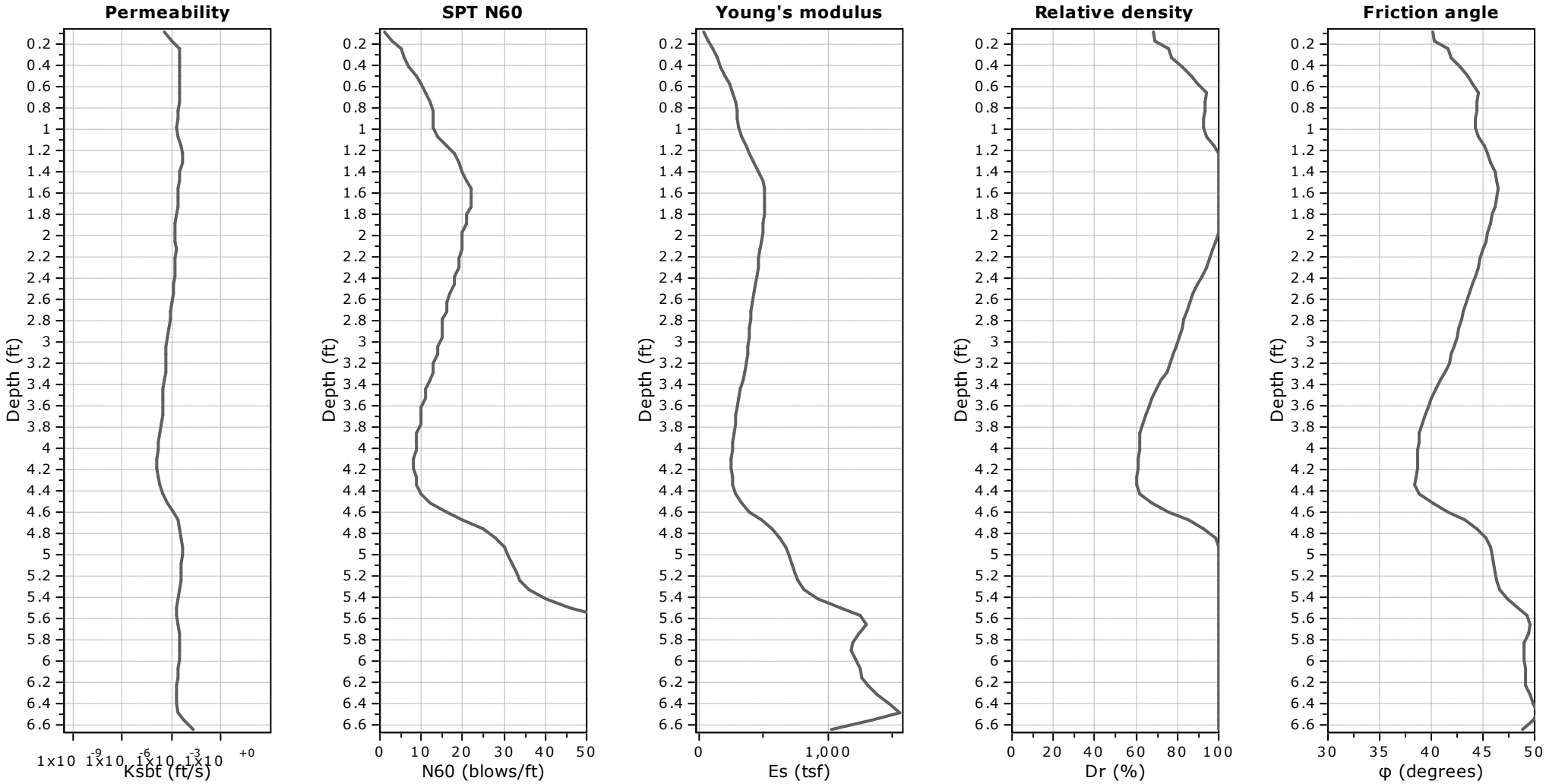
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: A-5
Total depth: 6.89 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



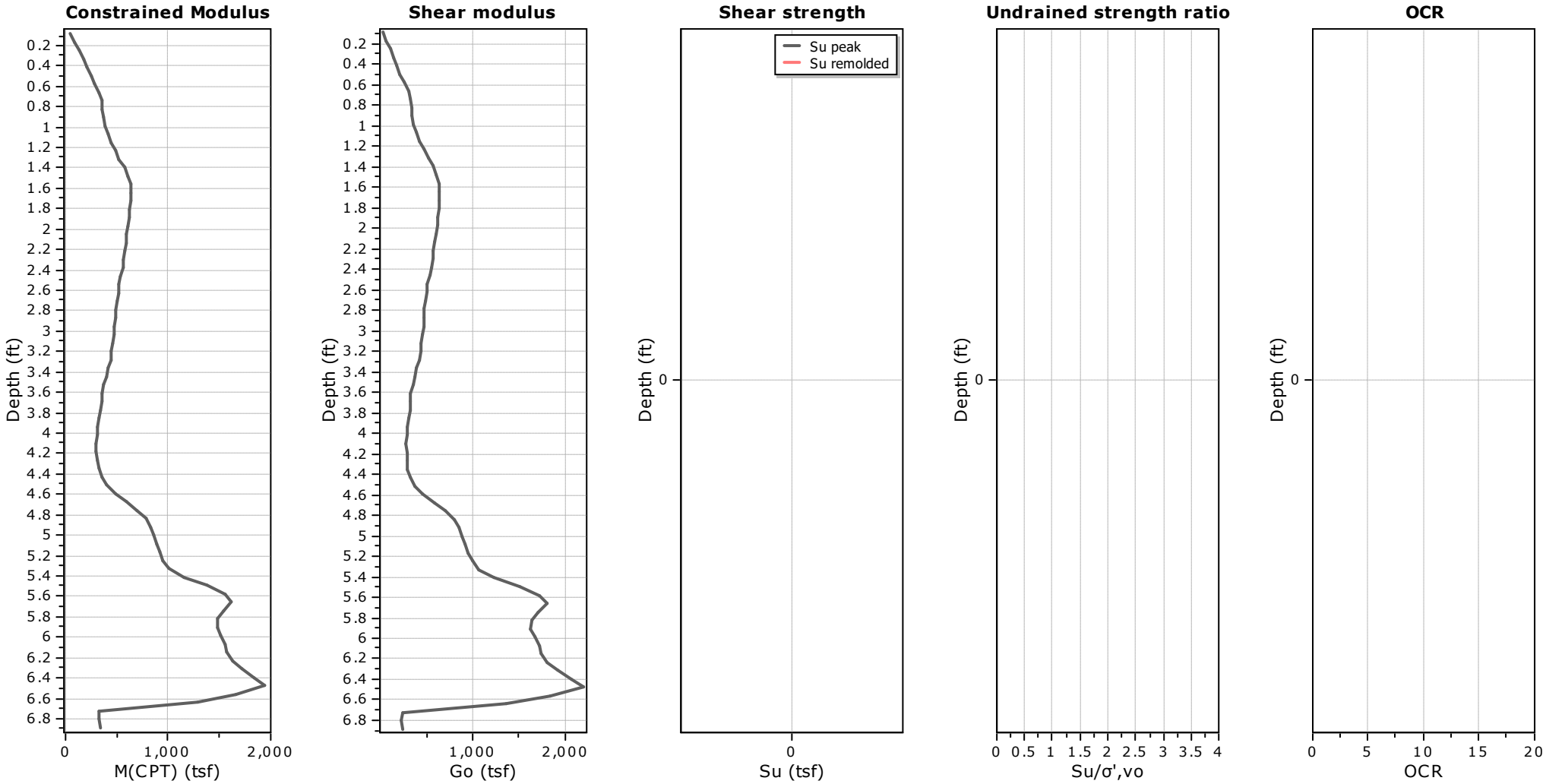
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

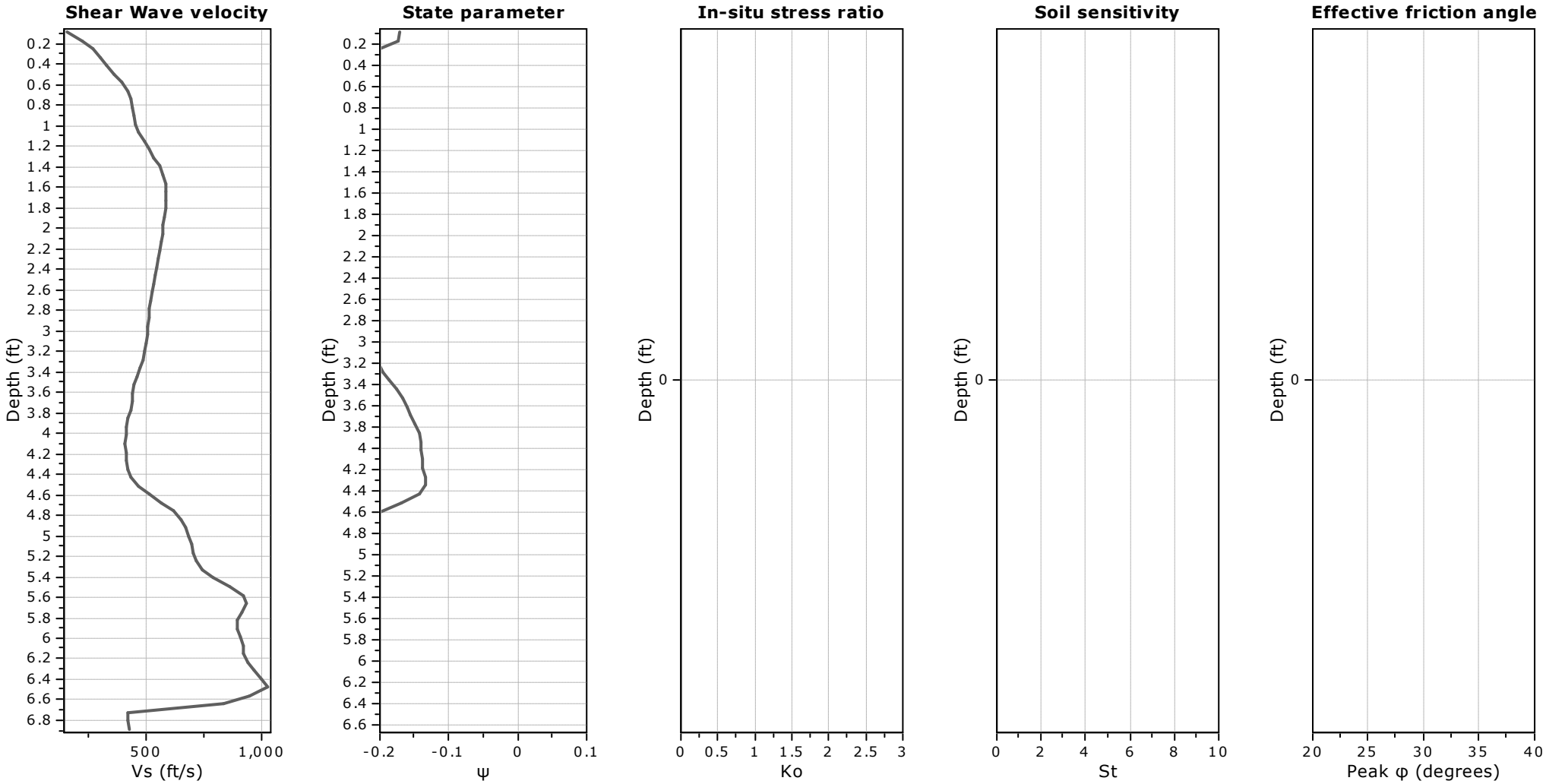
CPT: A-5
Total depth: 6.89 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



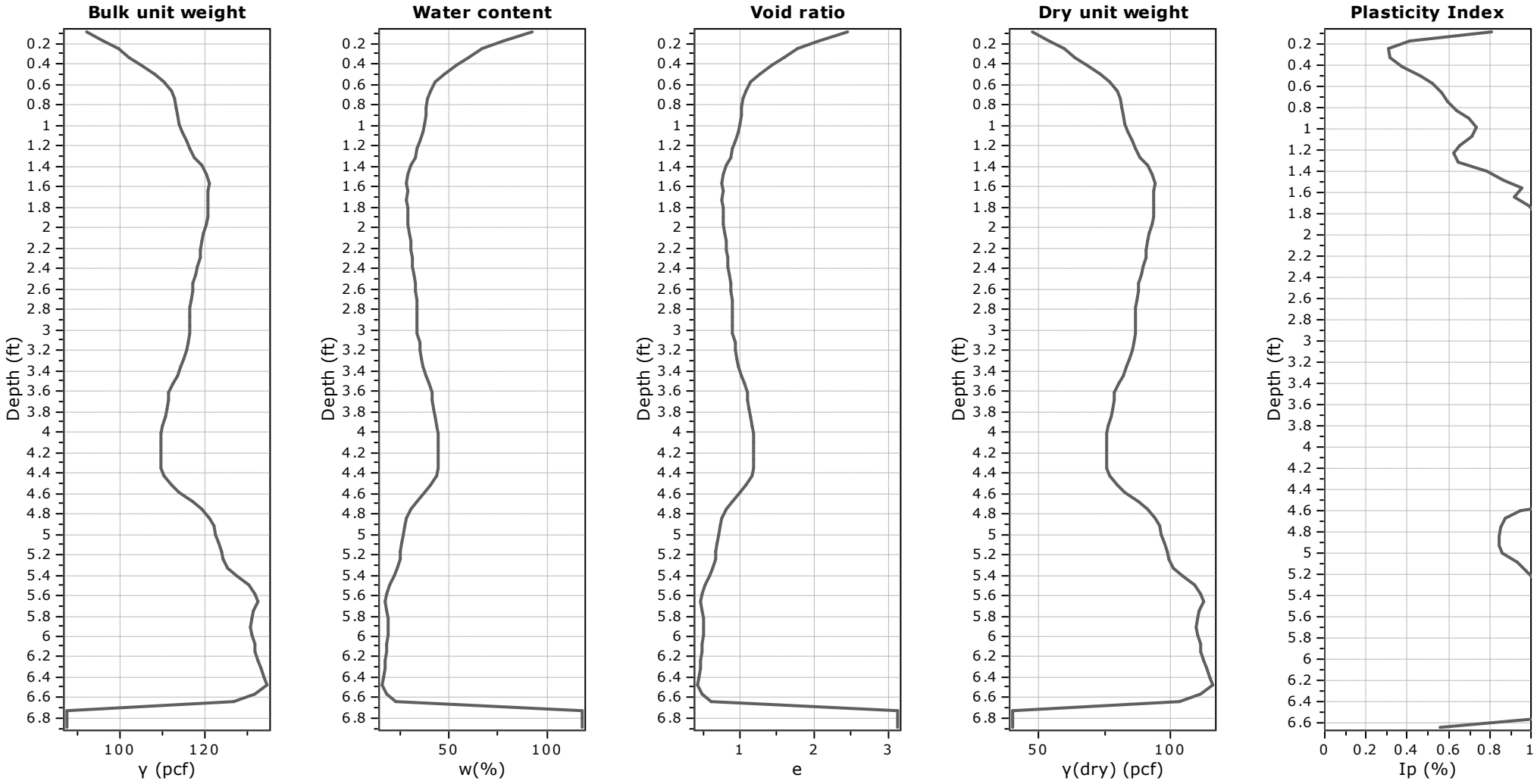
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

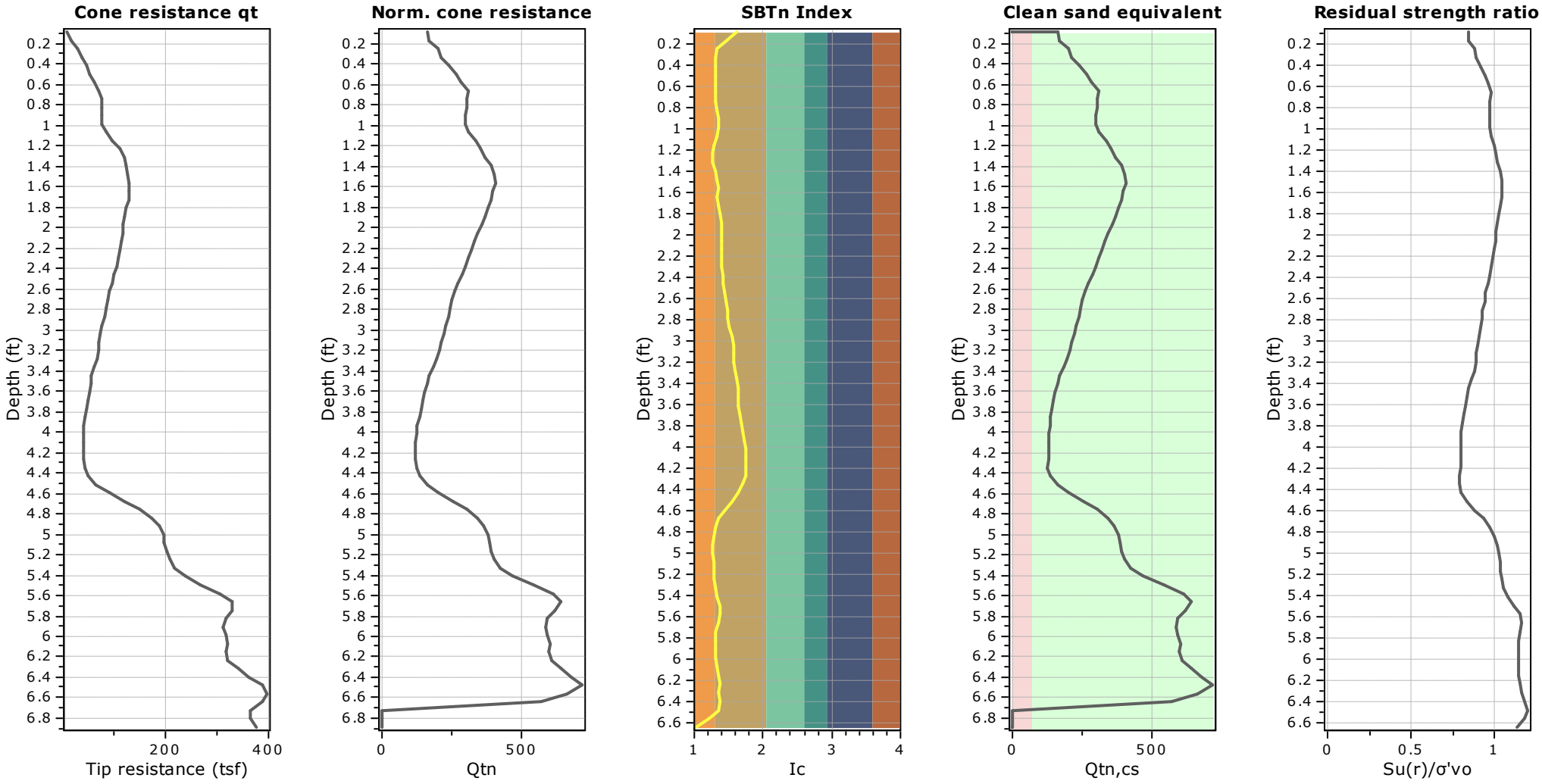
Soil Sensitivity factor, N_S: 7.00

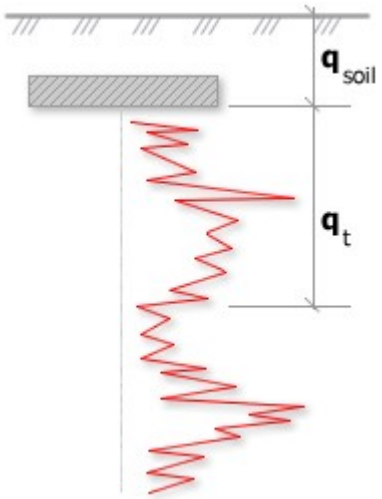

Bulk unit weight
Water content
Void ratio
Dry unit weight
Plasticity Index
Depth (ft)
γ (pcf)
w(%)
e
γ(dry) (pcf)
Ip (%)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: A-5
Total depth: 6.89 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

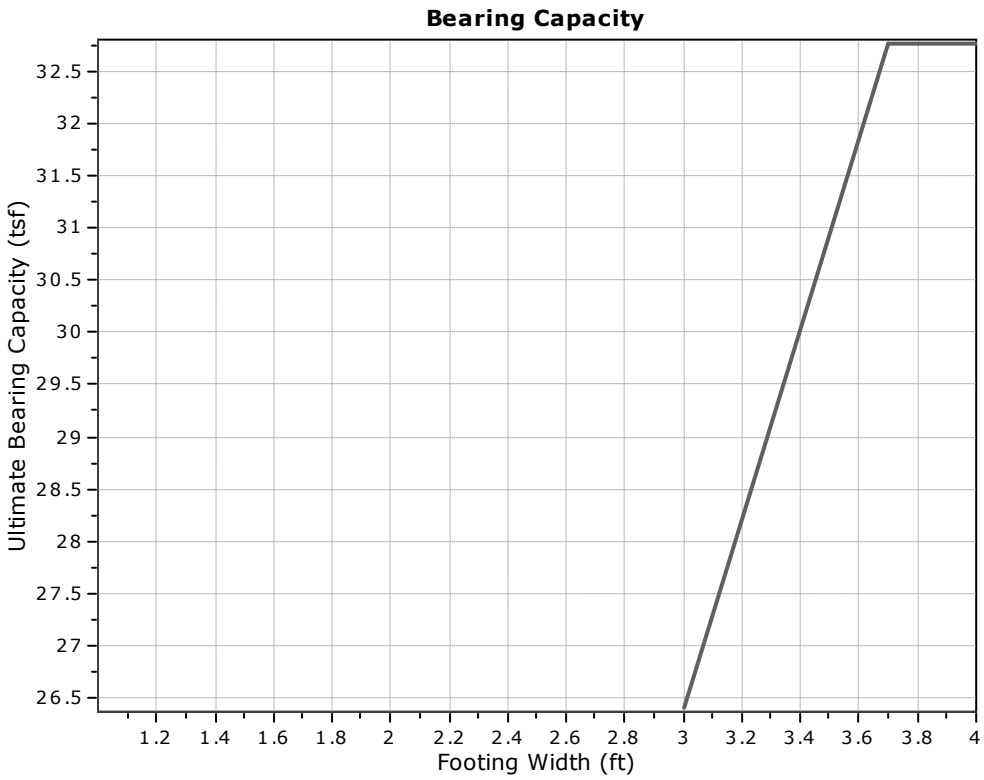




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

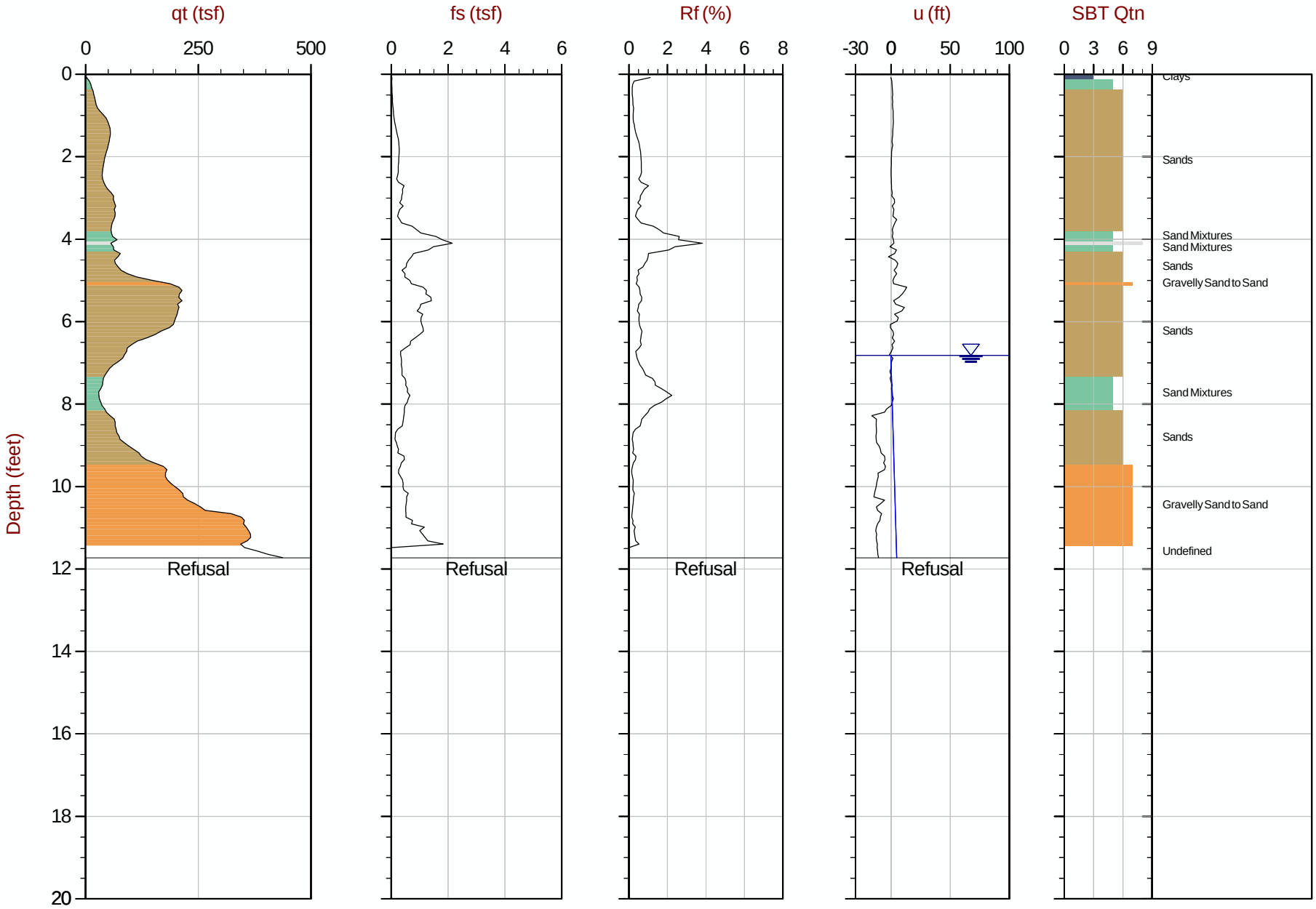
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	131.55	0.20	0.10	26.41
2	3.70	1.60	7.15	163.34	0.20	0.10	32.76
3	4.40	1.60	8.20	163.34	0.20	0.10	32.76
4	5.10	1.60	9.25	163.34	0.20	0.10	32.76
5	5.80	1.60	10.30	163.34	0.20	0.10	32.76
6	6.50	1.60	11.35	163.34	0.20	0.10	32.76
7	7.20	1.60	12.40	163.34	0.20	0.10	32.76
8	7.90	1.60	13.45	163.34	0.20	0.10	32.76
9	8.60	1.60	14.50	163.34	0.20	0.10	32.76
10	9.30	1.60	15.55	163.34	0.20	0.10	32.76
11	10.00	1.60	16.60	163.34	0.20	0.10	32.76
12	10.70	1.60	17.65	163.34	0.20	0.10	32.76
13	11.40	1.60	18.70	163.34	0.20	0.10	32.76
14	12.10	1.60	19.75	163.34	0.20	0.10	32.76
15	12.80	1.60	20.80	163.34	0.20	0.10	32.76

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 14:46
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-B-9
Cone: 652:T1500F15U35



Max Depth: 3.575 m / 11.73 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPB-9.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6240 Long: -70.9175

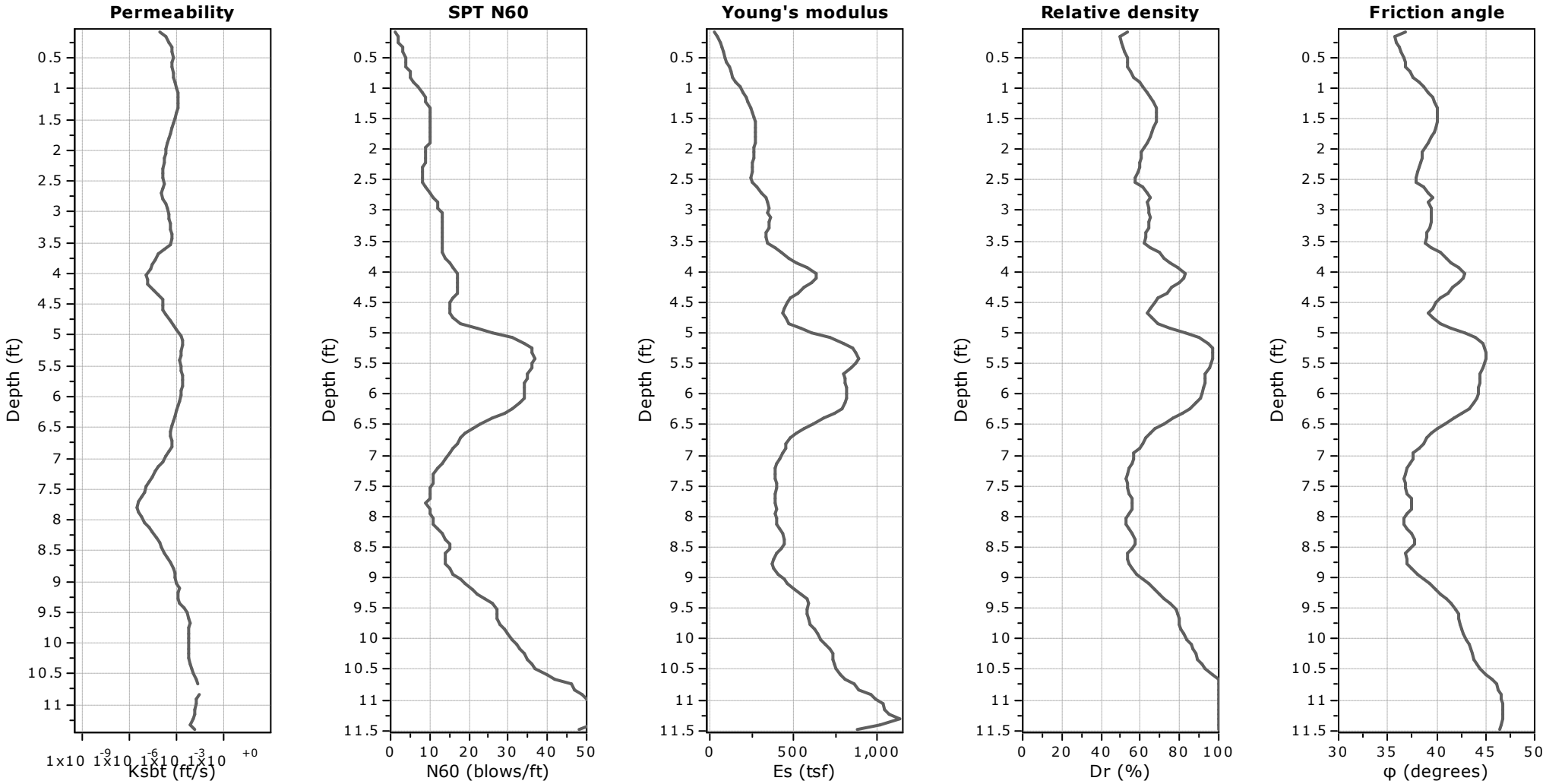
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: B-9
Total depth: 11.73 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



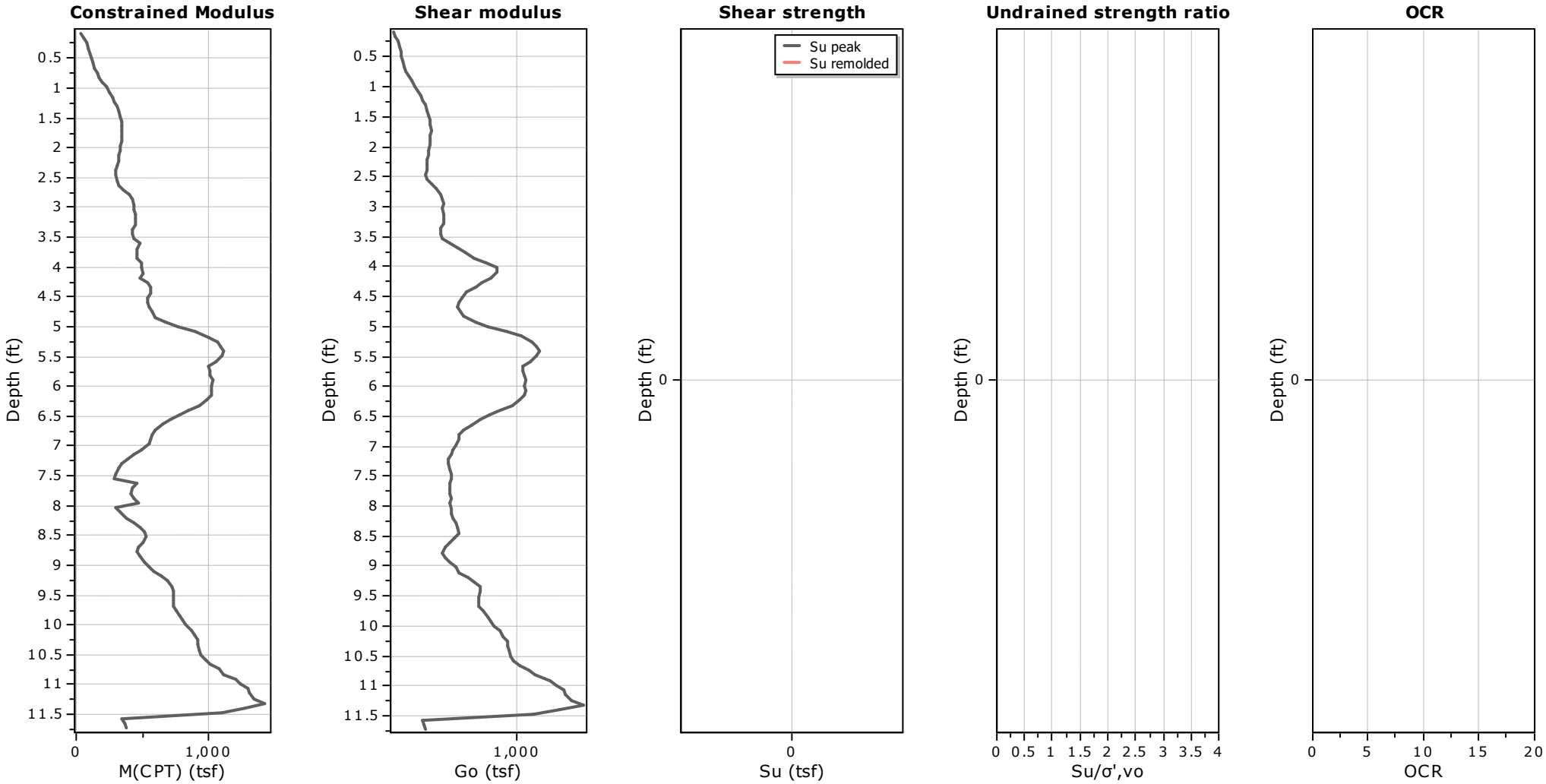
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: B-9
Total depth: 11.73 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

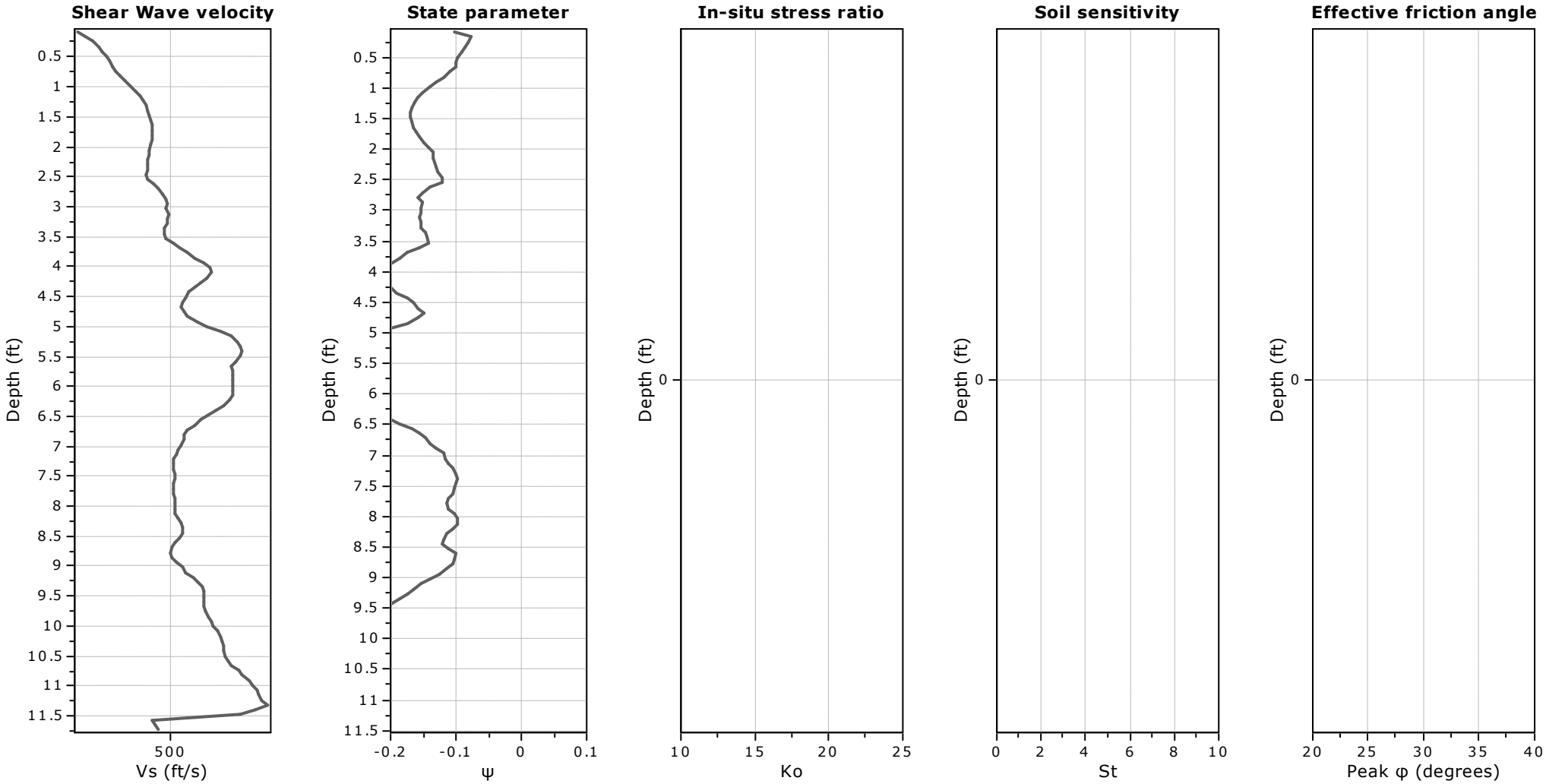
Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



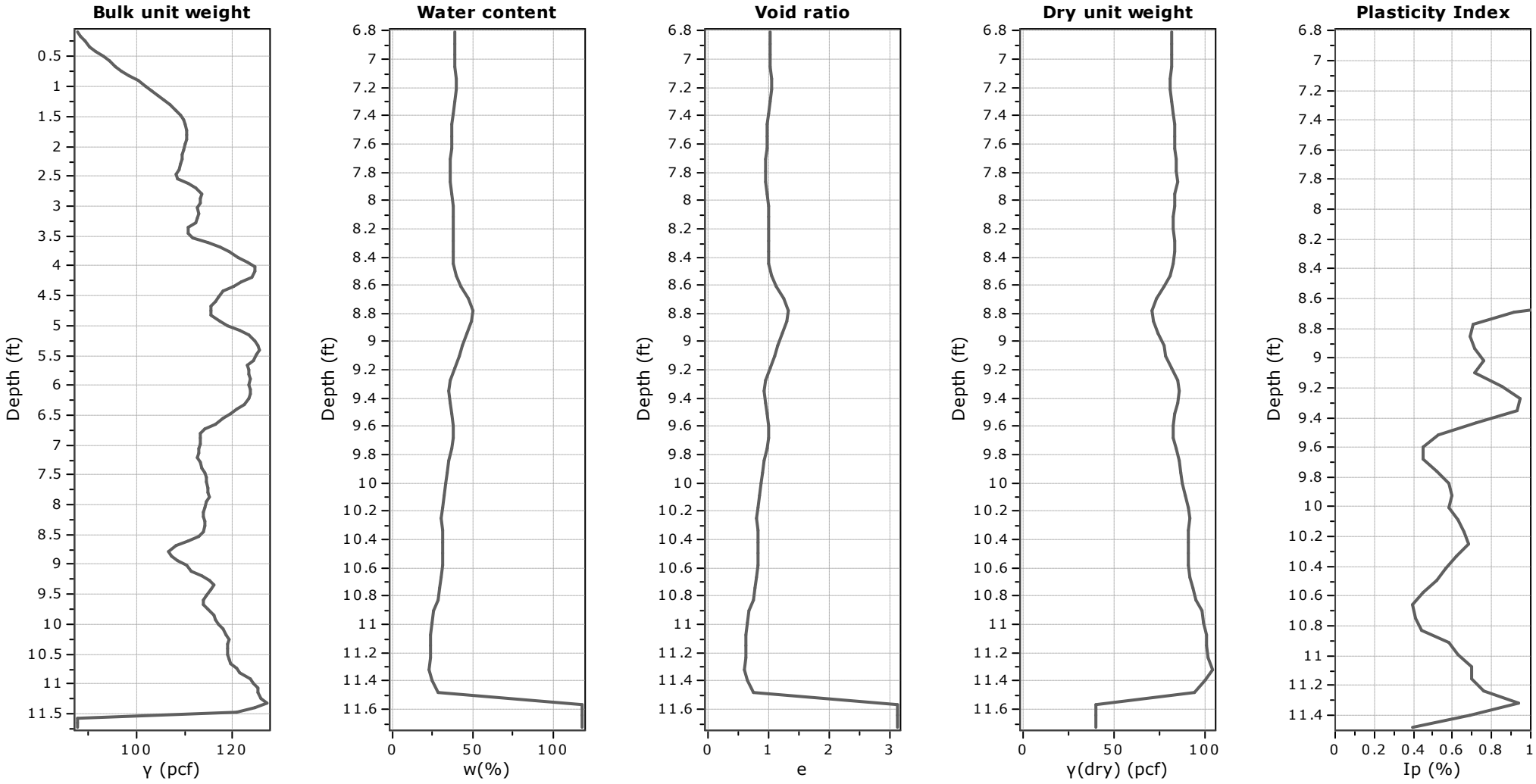
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: B-9
Total depth: 11.73 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
Geotechnical Engineers
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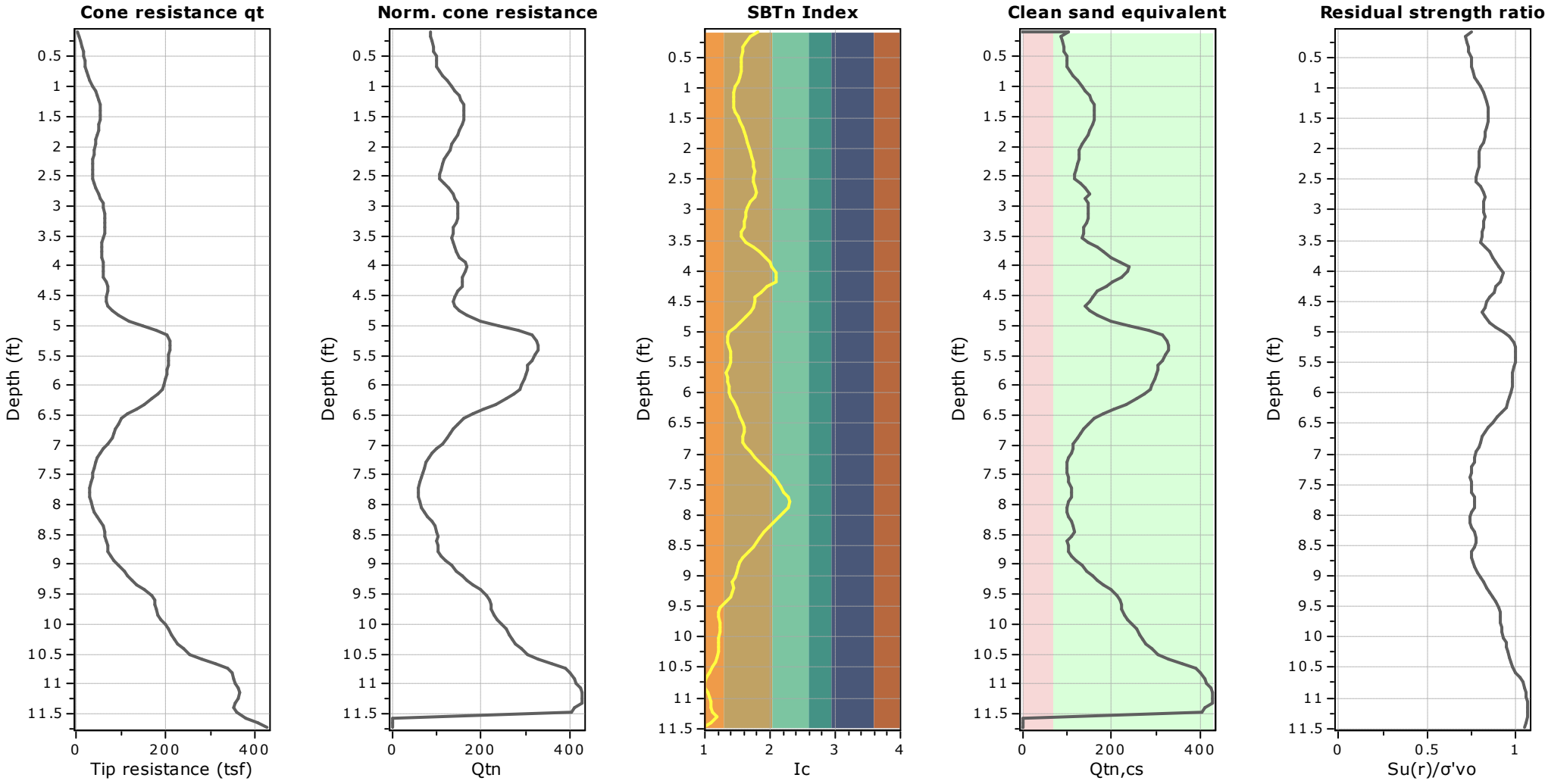
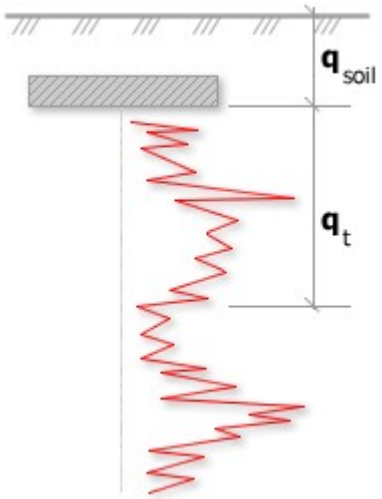
http://www.geologismiki.gr

CPT: B-9
Total depth: 11.73 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

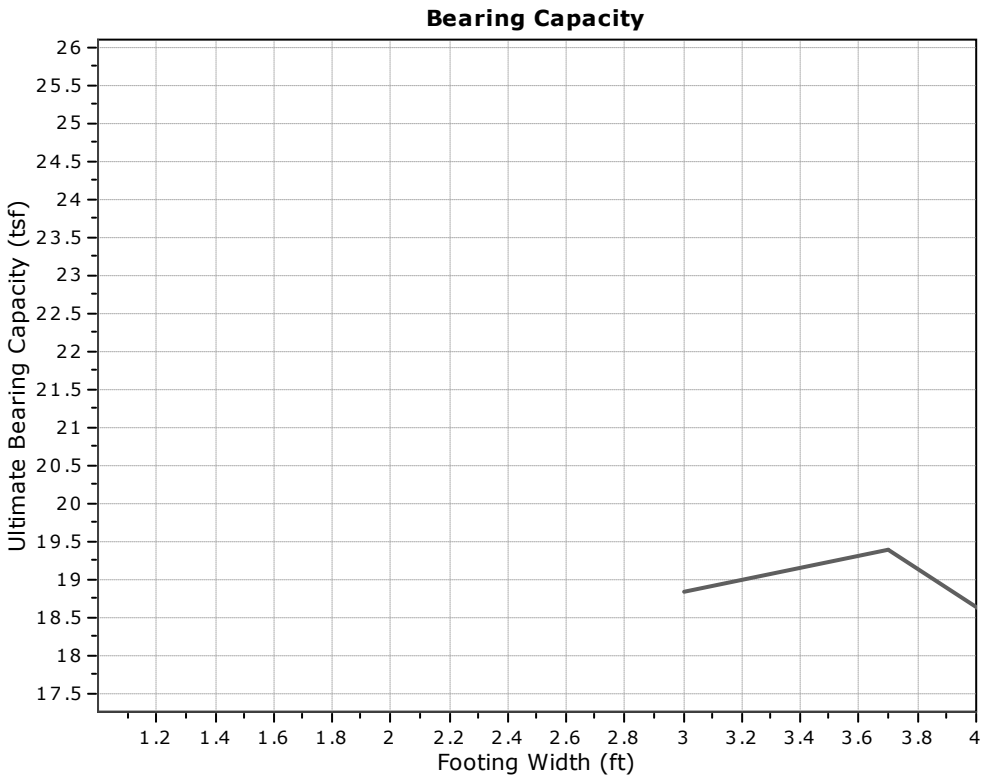




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

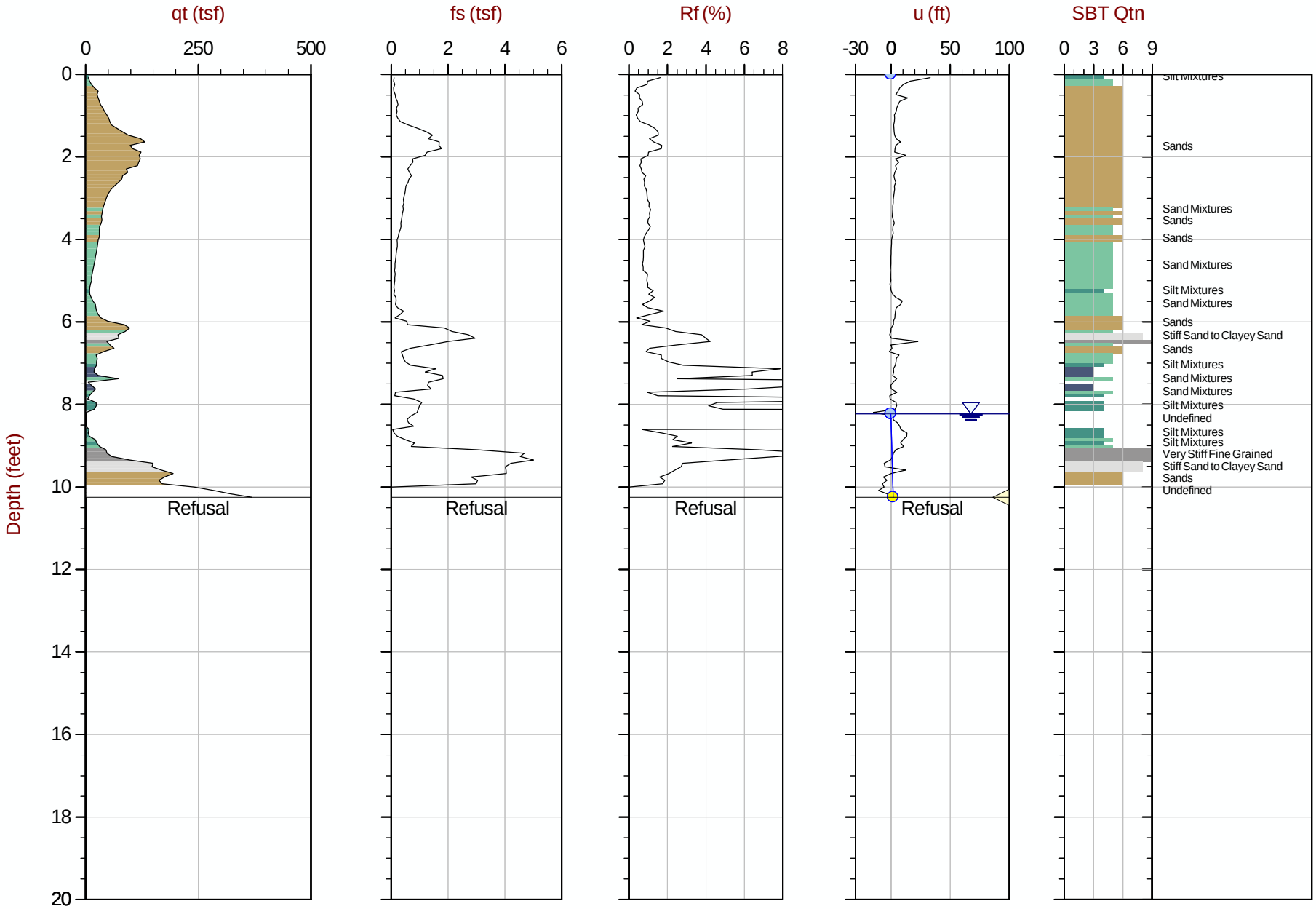
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	93.78	0.20	0.10	18.85
2	3.70	1.60	7.15	96.43	0.20	0.10	19.38
3	4.40	1.60	8.20	87.65	0.20	0.10	17.63
4	5.10	1.60	9.25	86.10	0.20	0.10	17.32
5	5.80	1.60	10.30	97.43	0.20	0.10	19.58
6	6.50	1.60	11.35	121.56	0.20	0.10	24.41
7	7.20	1.60	12.40	129.72	0.20	0.10	26.04
8	7.90	1.60	13.45	129.72	0.20	0.10	26.04
9	8.60	1.60	14.50	129.72	0.20	0.10	26.04
10	9.30	1.60	15.55	129.72	0.20	0.10	26.04
11	10.00	1.60	16.60	129.72	0.20	0.10	26.04
12	10.70	1.60	17.65	129.72	0.20	0.10	26.04
13	11.40	1.60	18.70	129.72	0.20	0.10	26.04
14	12.10	1.60	19.75	129.72	0.20	0.10	26.04
15	12.80	1.60	20.80	129.72	0.20	0.10	26.04

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 08:45
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-BB-0
Cone: 652:T1500F15U35



Max Depth: 3.125 m / 10.25 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPBB-0.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6234 Long: -70.9176

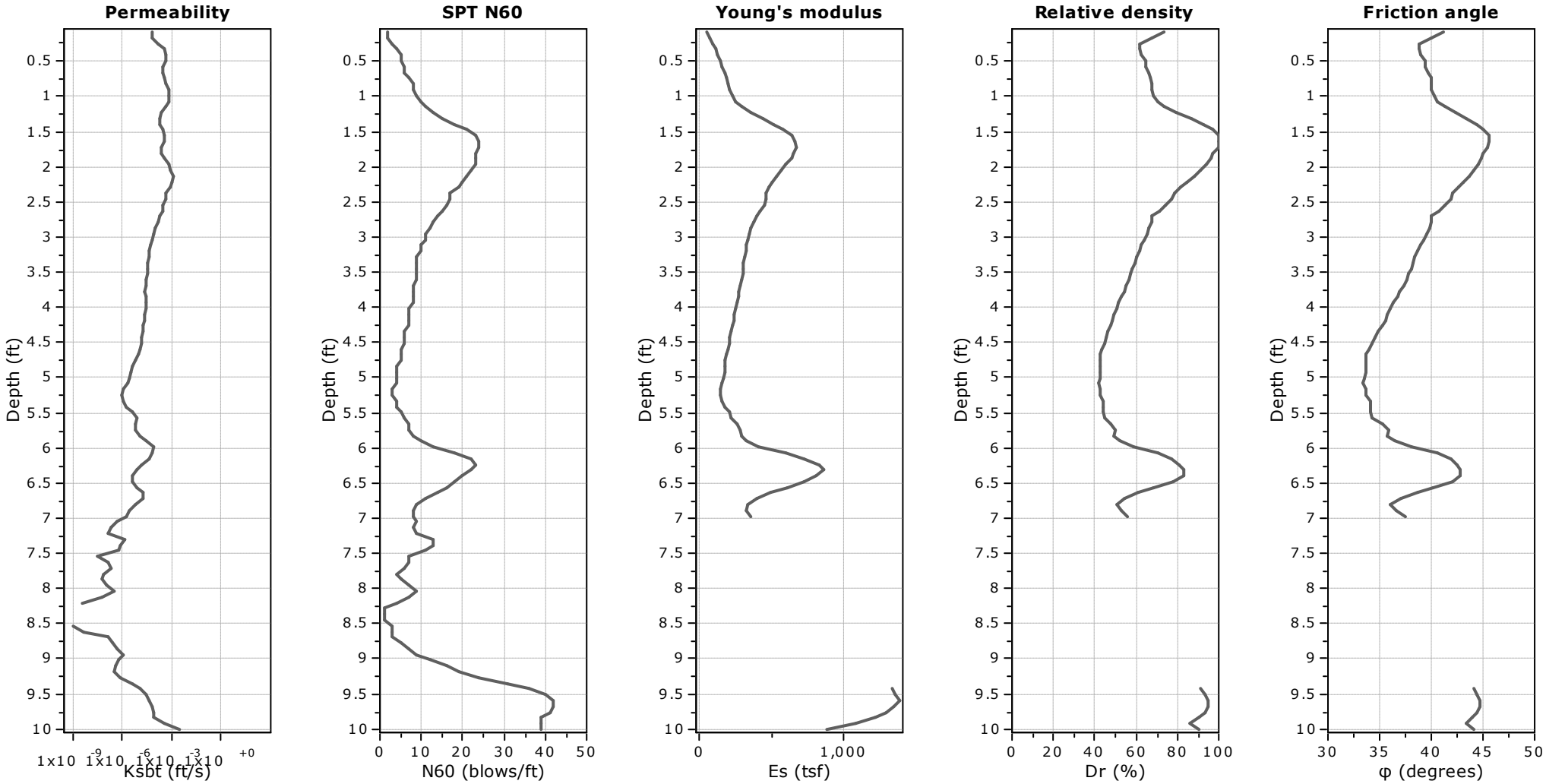
Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: BB-0
Total depth: 10.25 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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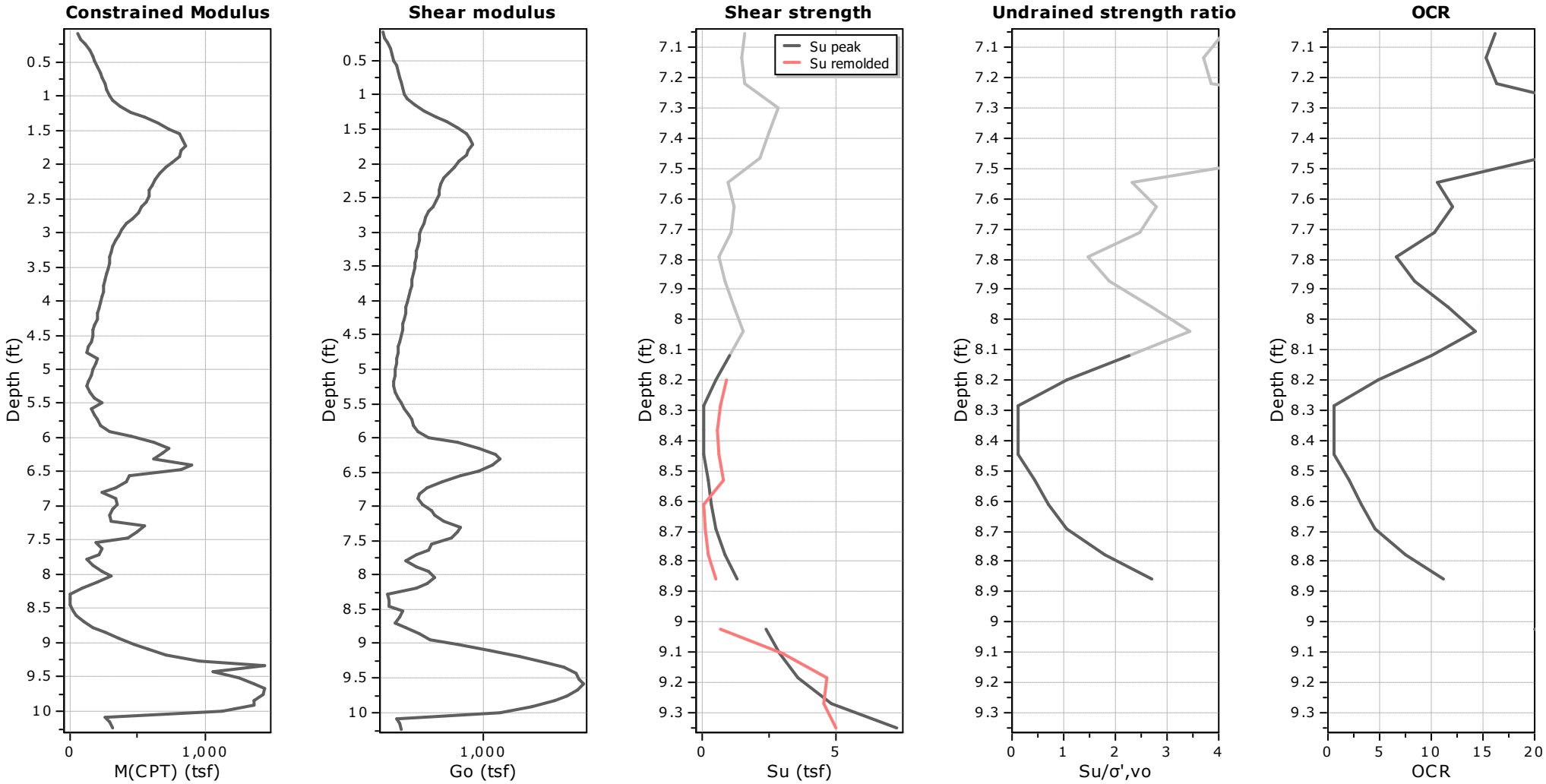
Merarhias 56
http://www.geologismiki.gr

CPT: BB-0
Total depth: 10.25 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

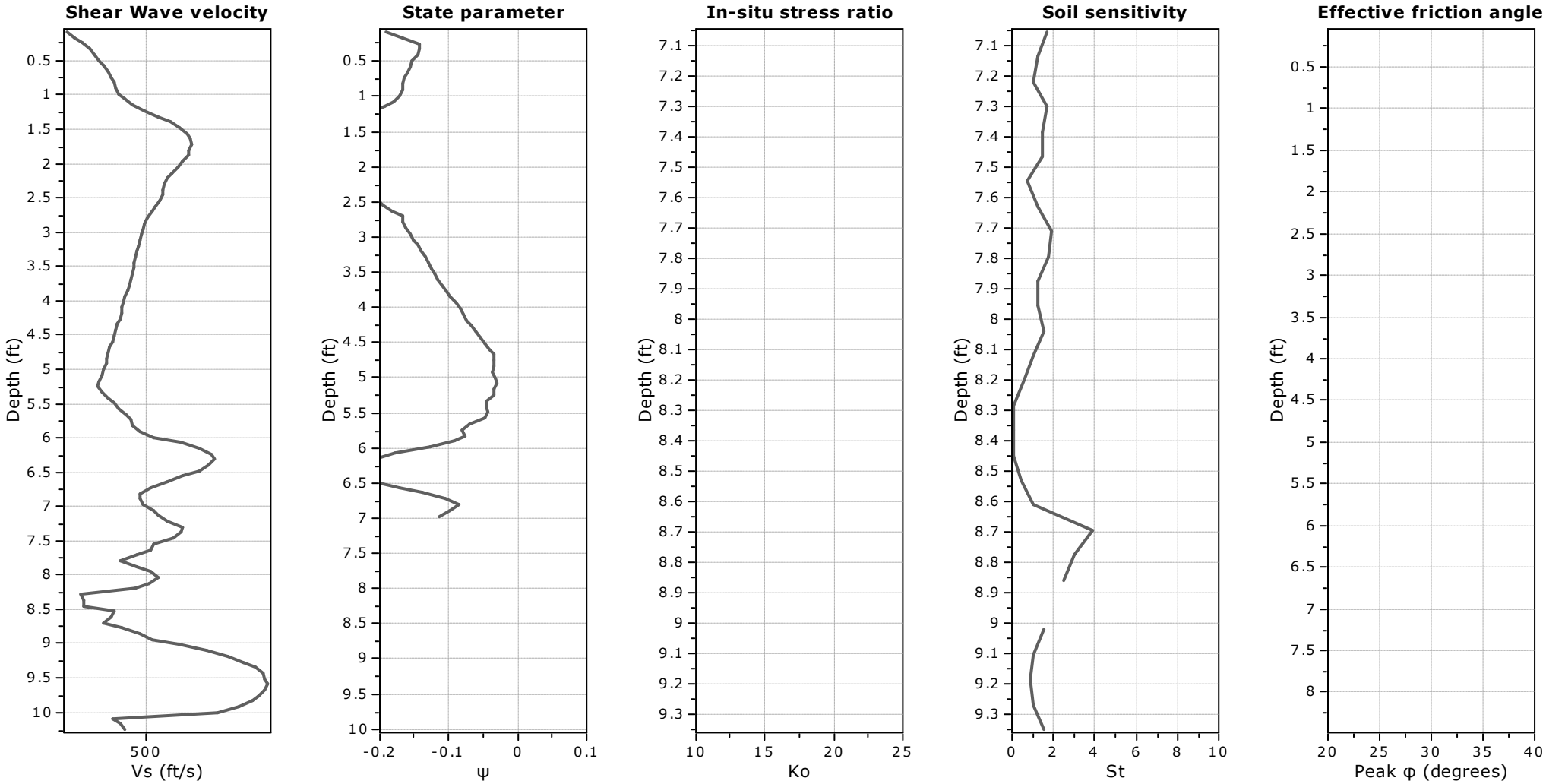
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: BB-0
Total depth: 10.25 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



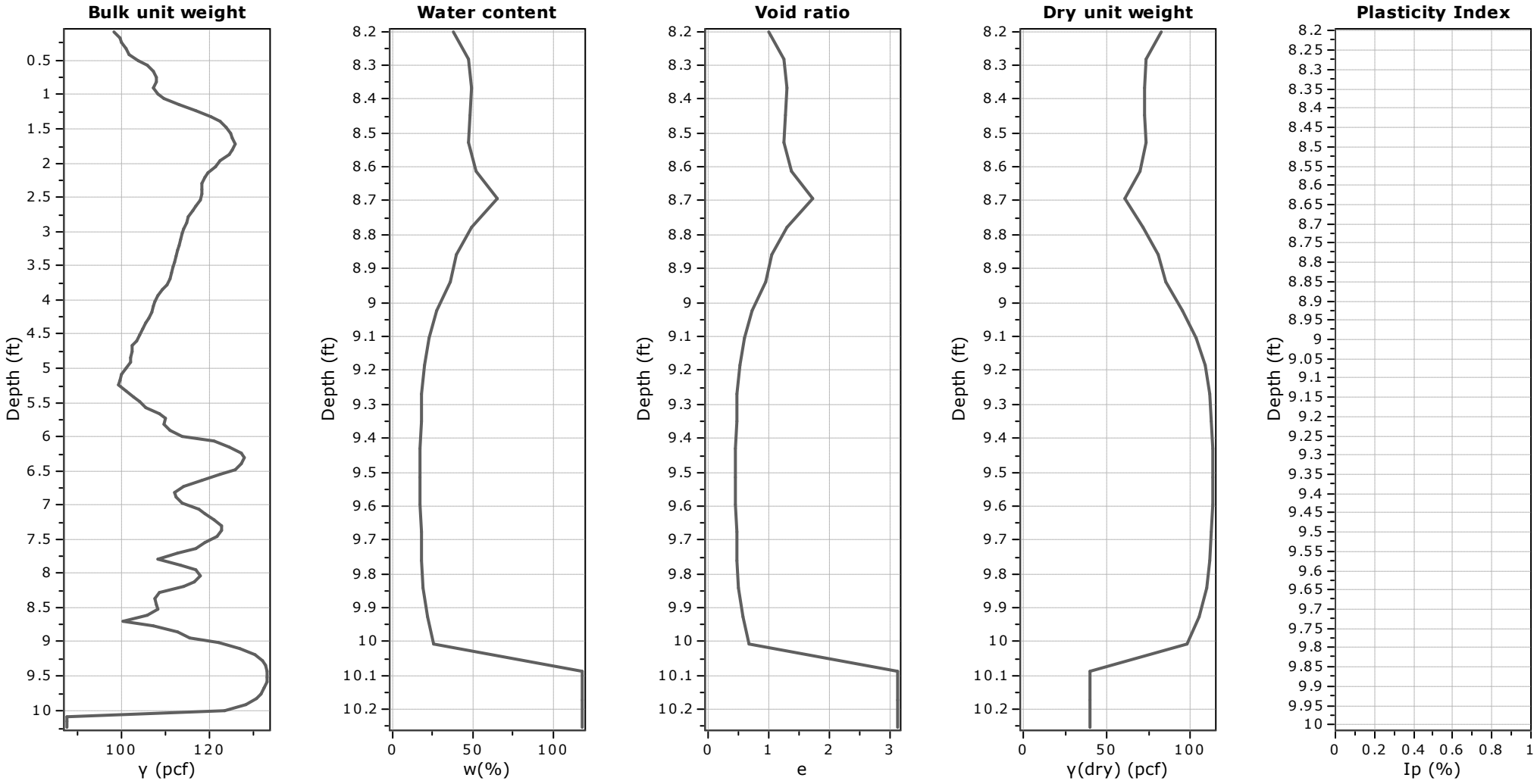
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: BB-0
Total depth: 10.25 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

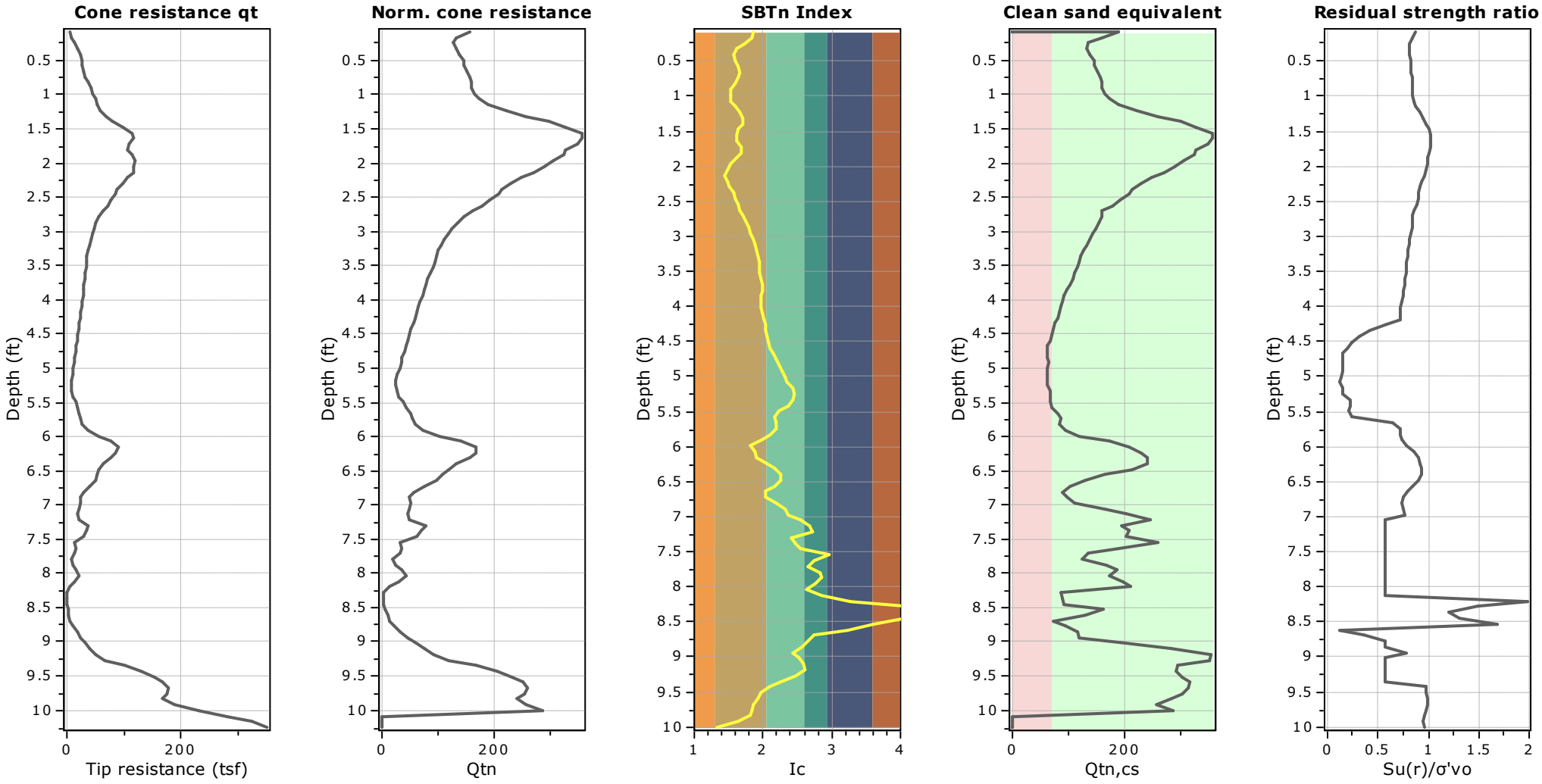
Project:
Location:

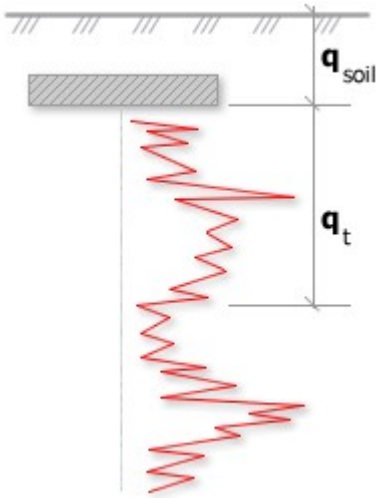


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: BB-0
Total depth: 10.25 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

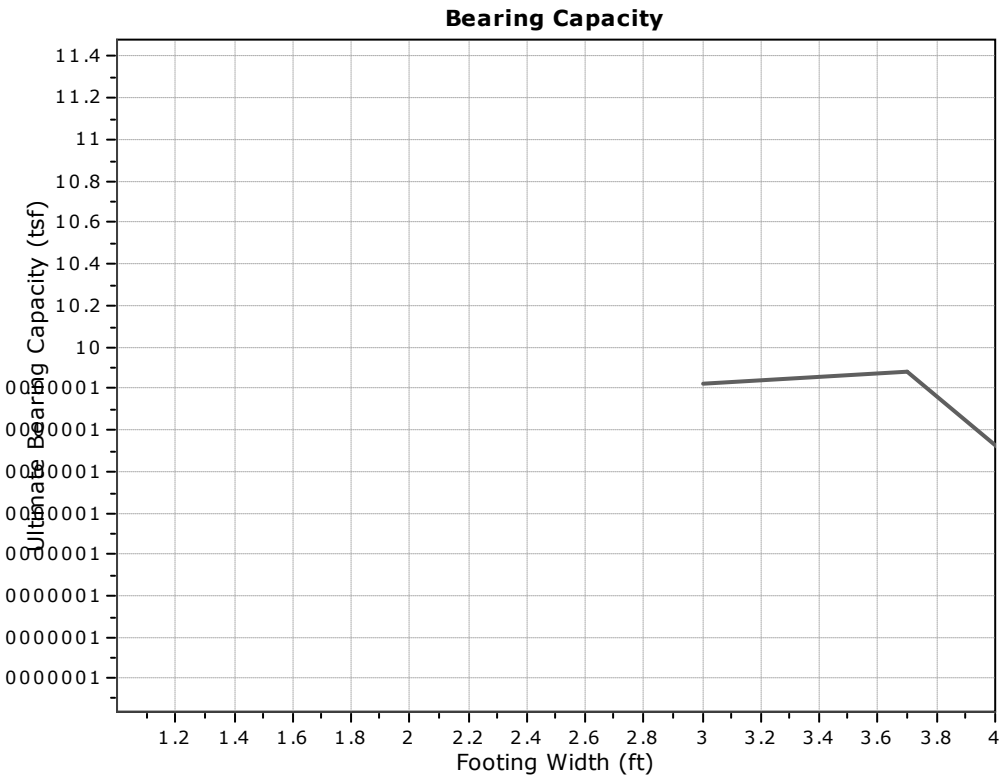




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

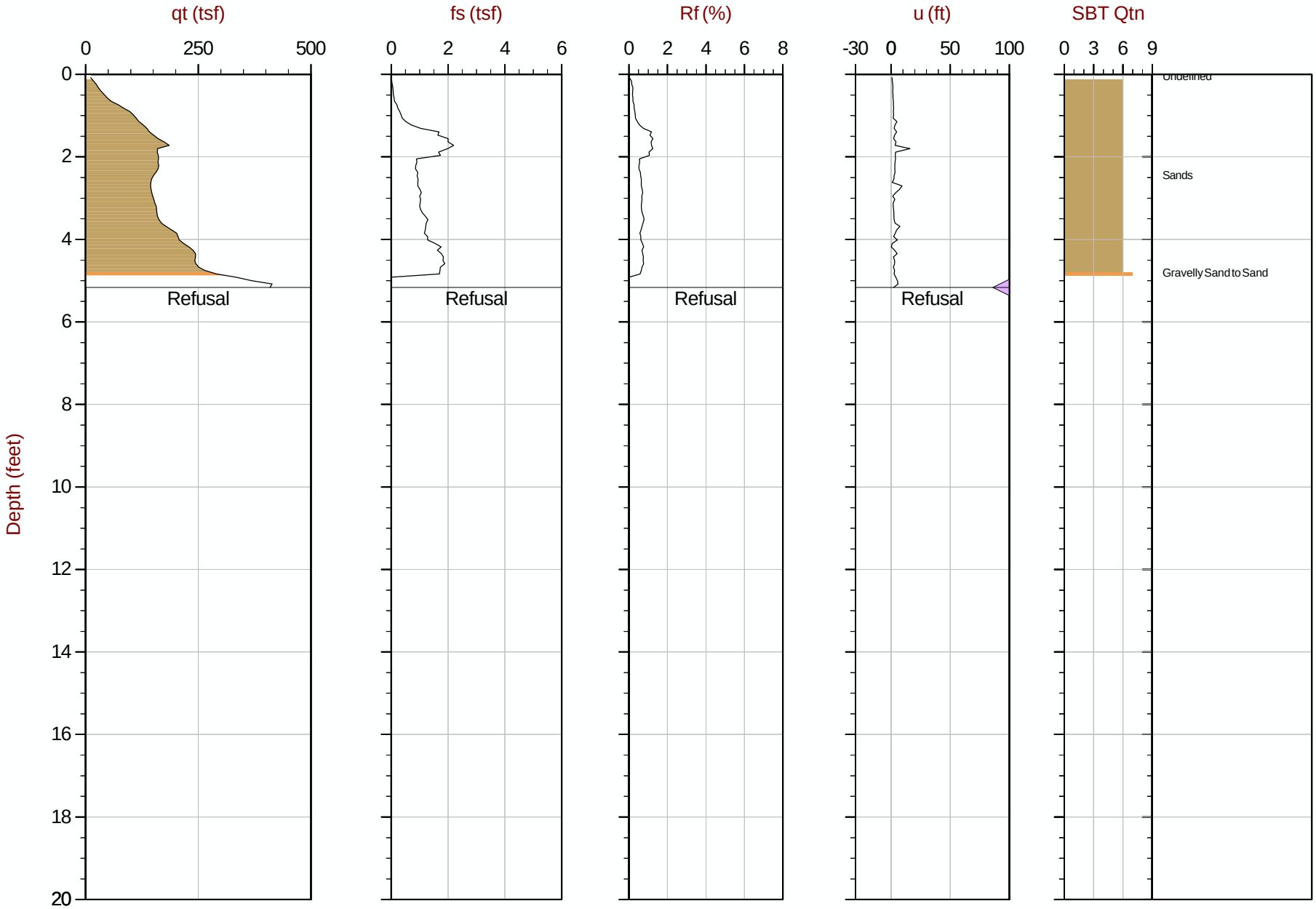
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	48.65	0.20	0.10	9.83
2	3.70	1.60	7.15	48.92	0.20	0.10	9.88
3	4.40	1.60	8.20	44.78	0.20	0.10	9.05
4	5.10	1.60	9.25	40.82	0.20	0.10	8.26
5	5.80	1.60	10.30	56.83	0.20	0.10	11.46
6	6.50	1.60	11.35	56.83	0.20	0.10	11.46
7	7.20	1.60	12.40	56.83	0.20	0.10	11.46
8	7.90	1.60	13.45	56.83	0.20	0.10	11.46
9	8.60	1.60	14.50	56.83	0.20	0.10	11.46
10	9.30	1.60	15.55	56.83	0.20	0.10	11.46
11	10.00	1.60	16.60	56.83	0.20	0.10	11.46
12	10.70	1.60	17.65	56.83	0.20	0.10	11.46
13	11.40	1.60	18.70	56.83	0.20	0.10	11.46
14	12.10	1.60	19.75	56.83	0.20	0.10	11.46
15	12.80	1.60	20.80	56.83	0.20	0.10	11.46

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 15:46
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-BB-4
Cone: 652:T1500F15U35



Max Depth: 1.575 m / 5.17 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPBB-4.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6237 Long: -70.9177

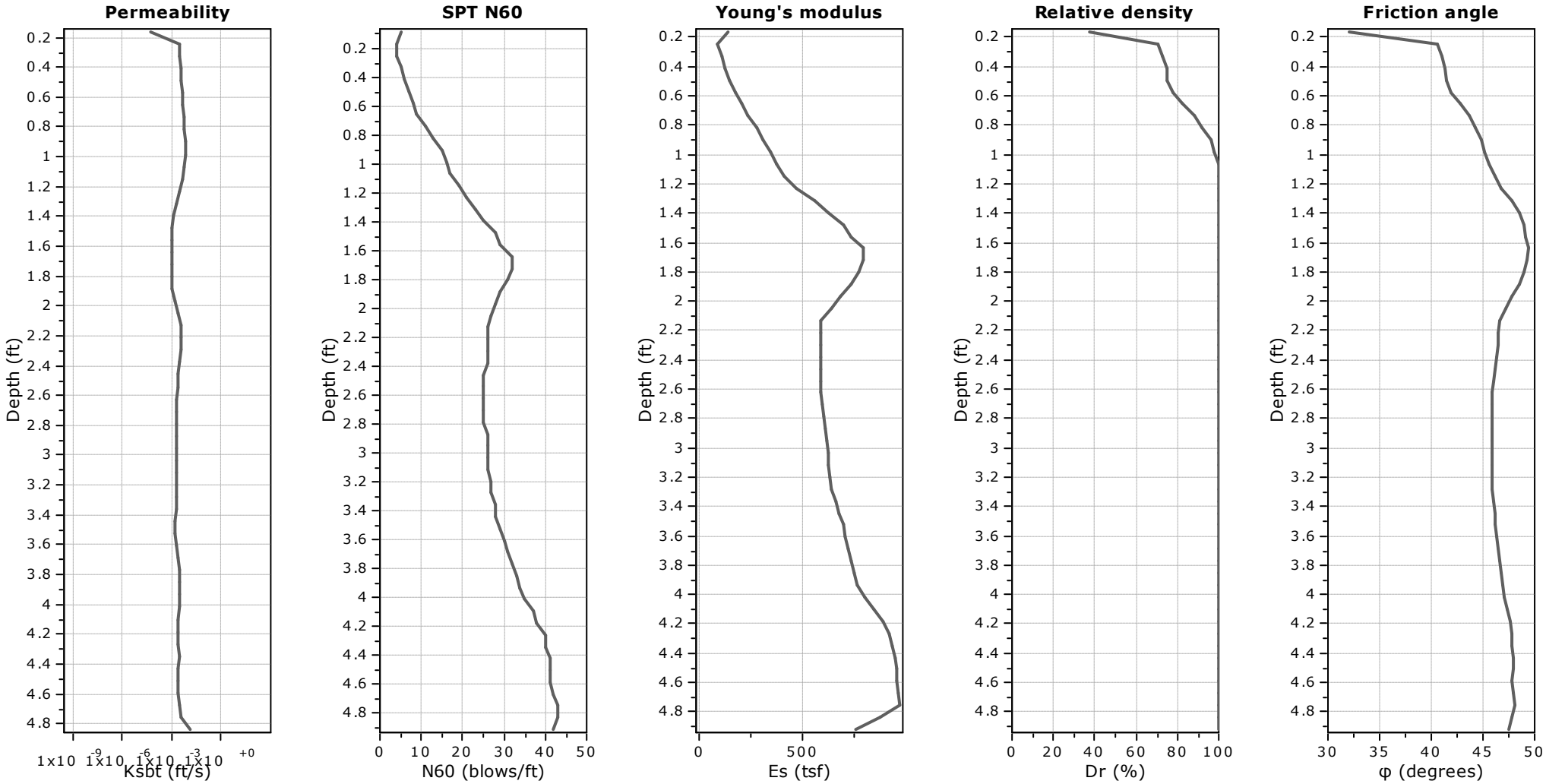
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

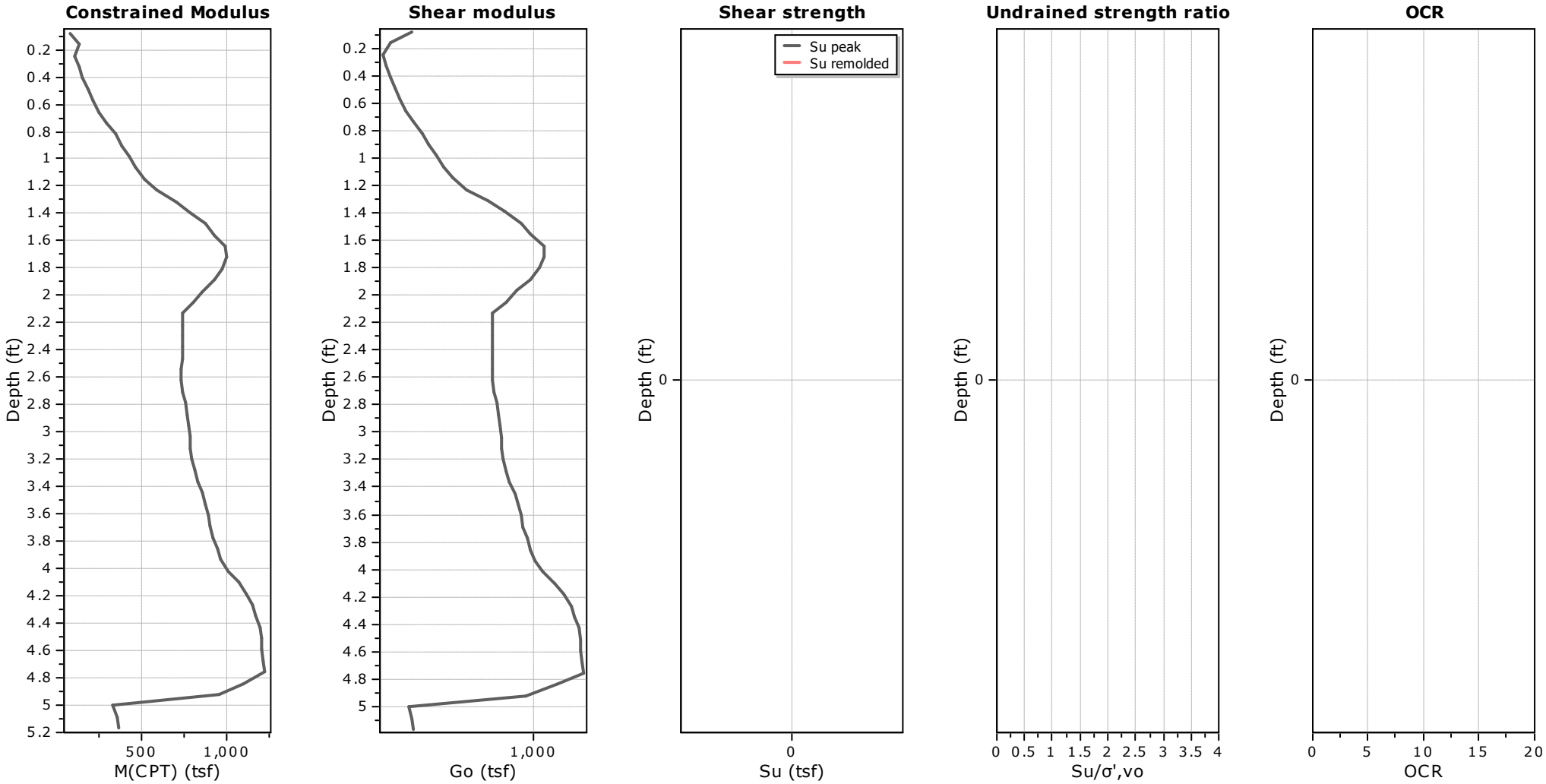
CPT: BB-4
Total depth: 5.17 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

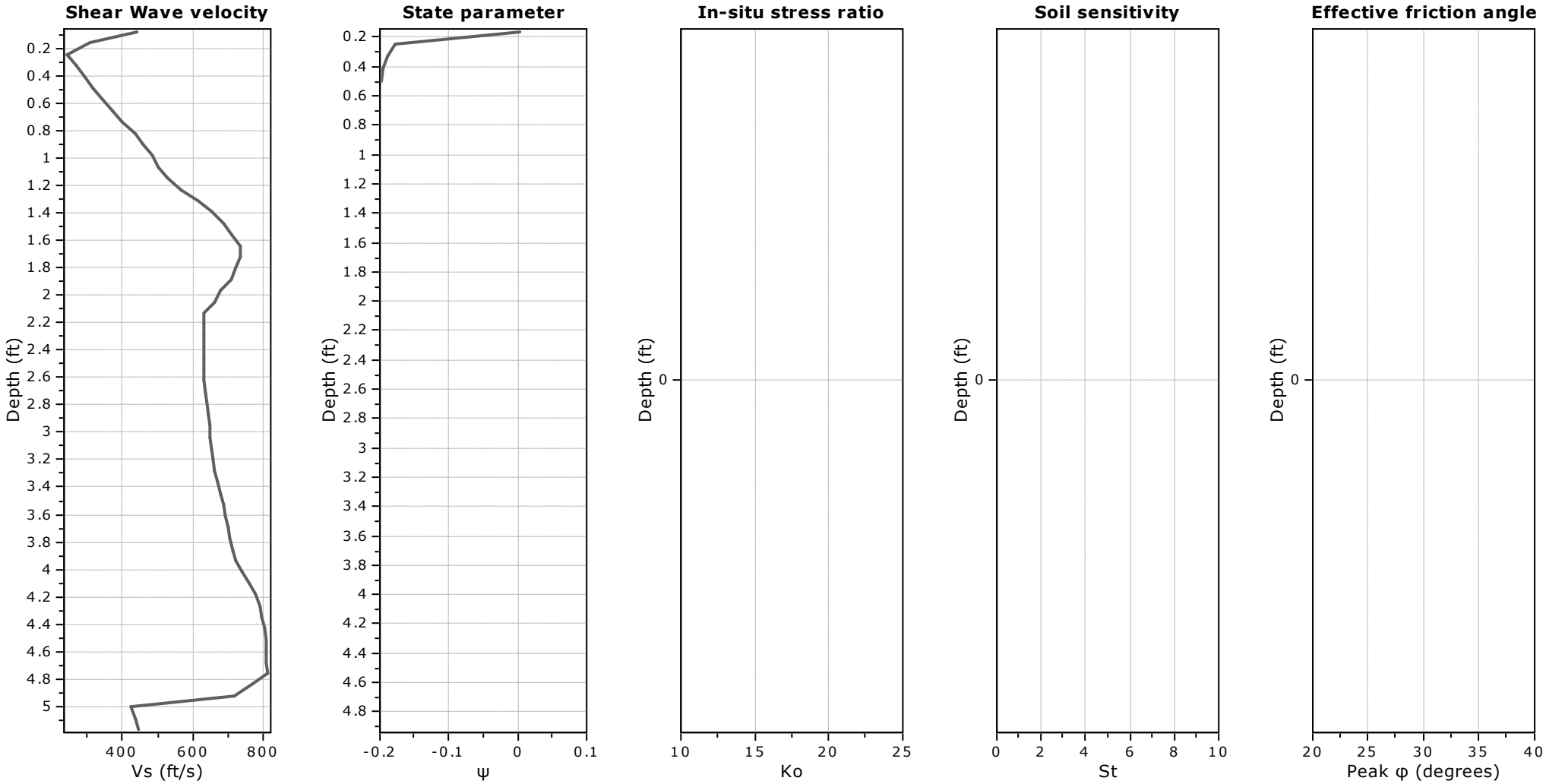
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



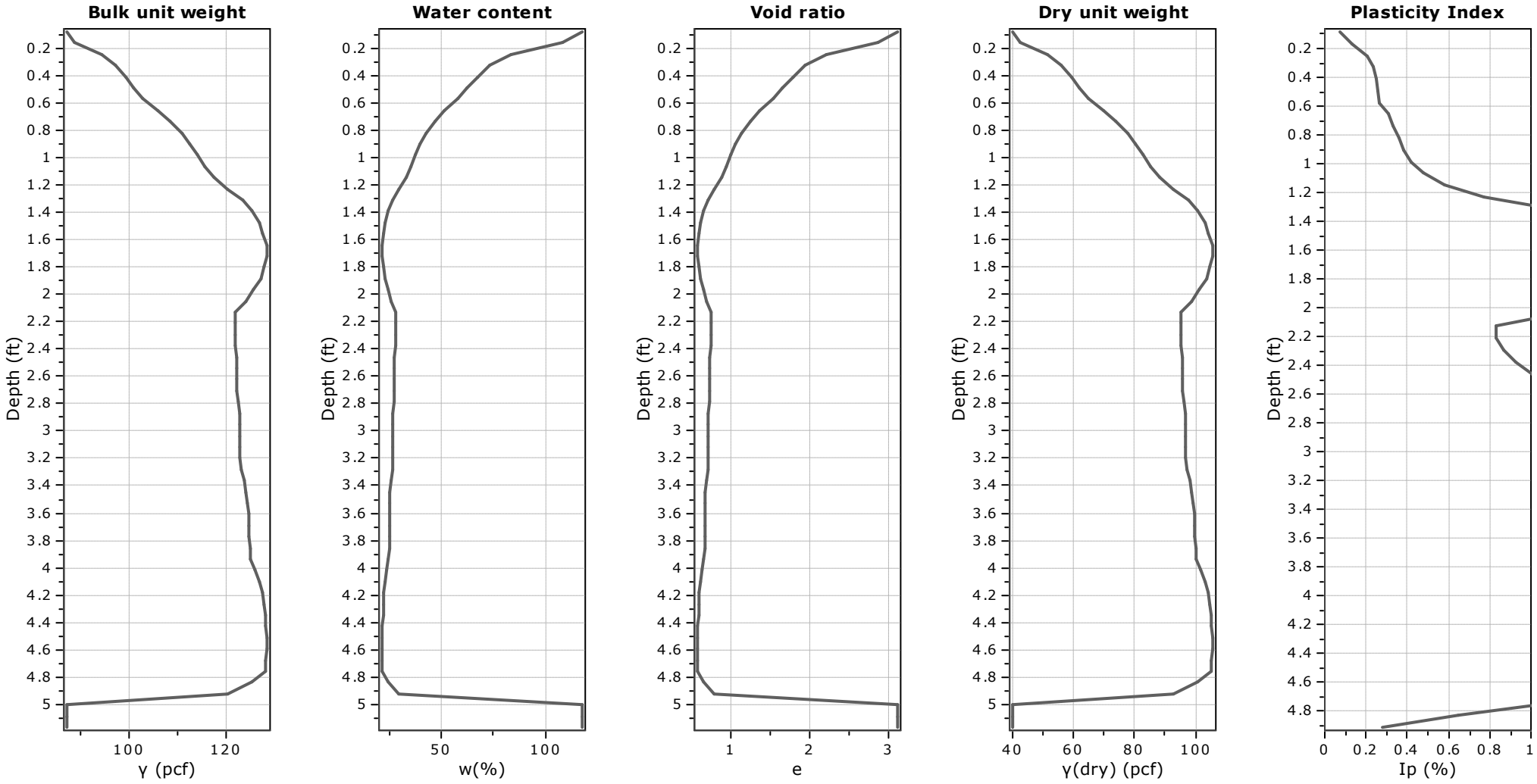
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: BB-4
Total depth: 5.17 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

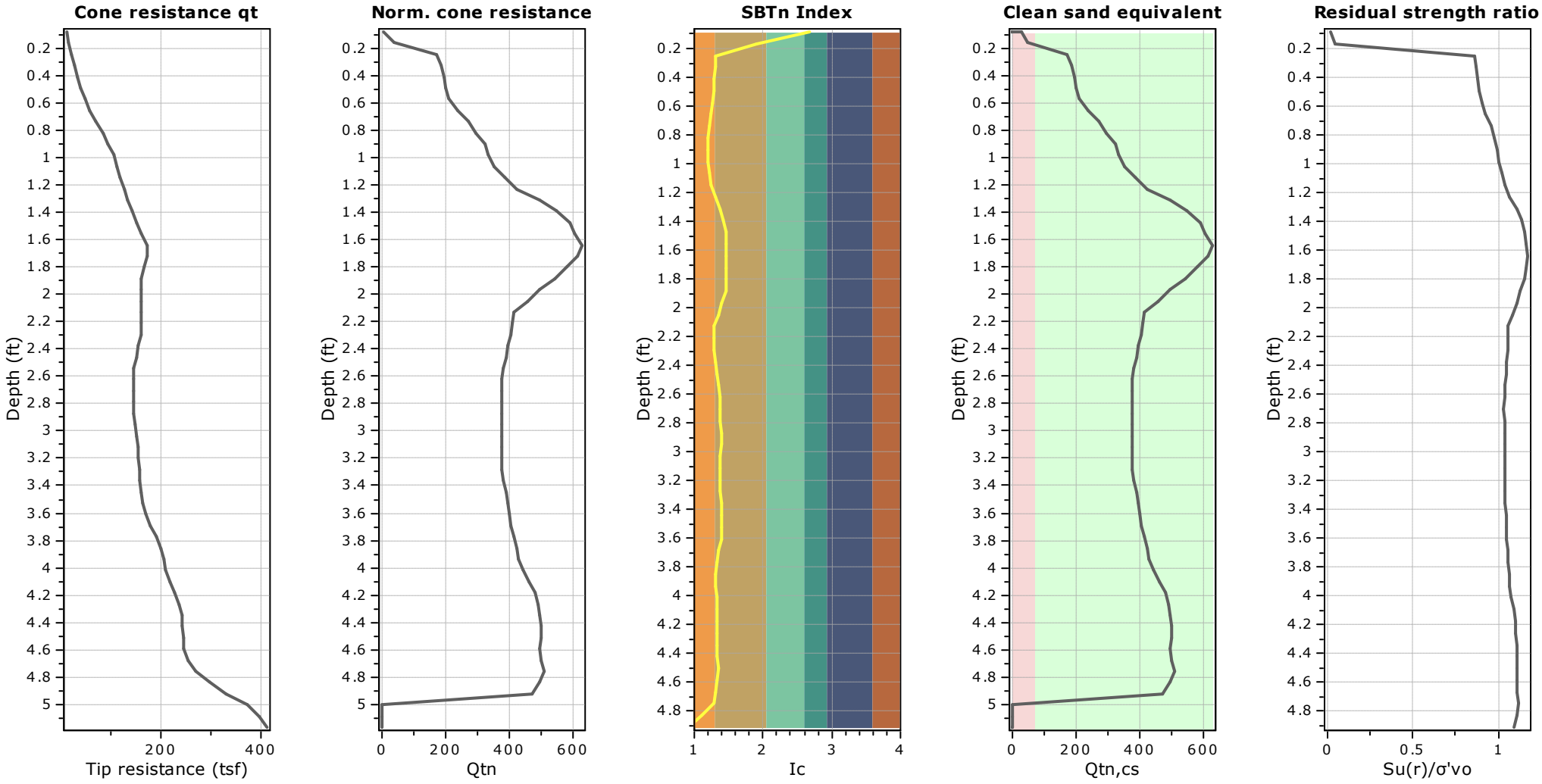
Project:
Location:

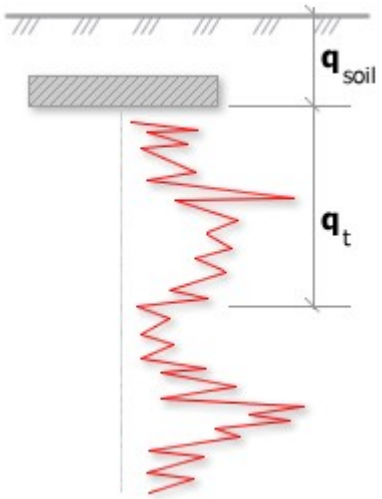


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: BB-4
Total depth: 5.17 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

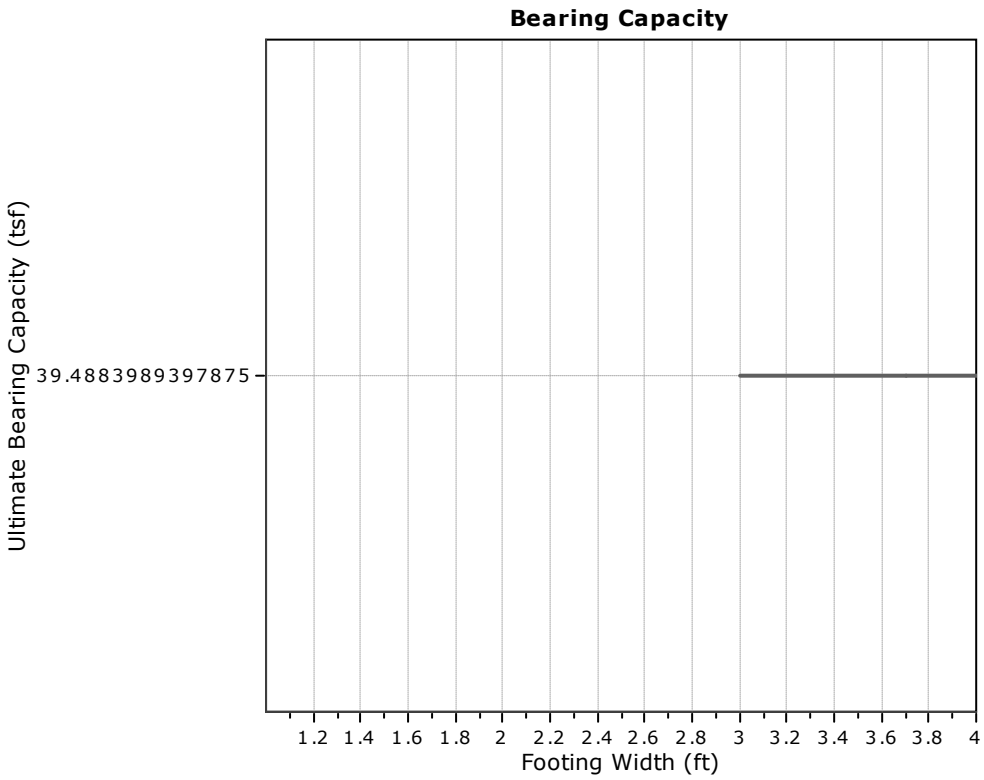




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

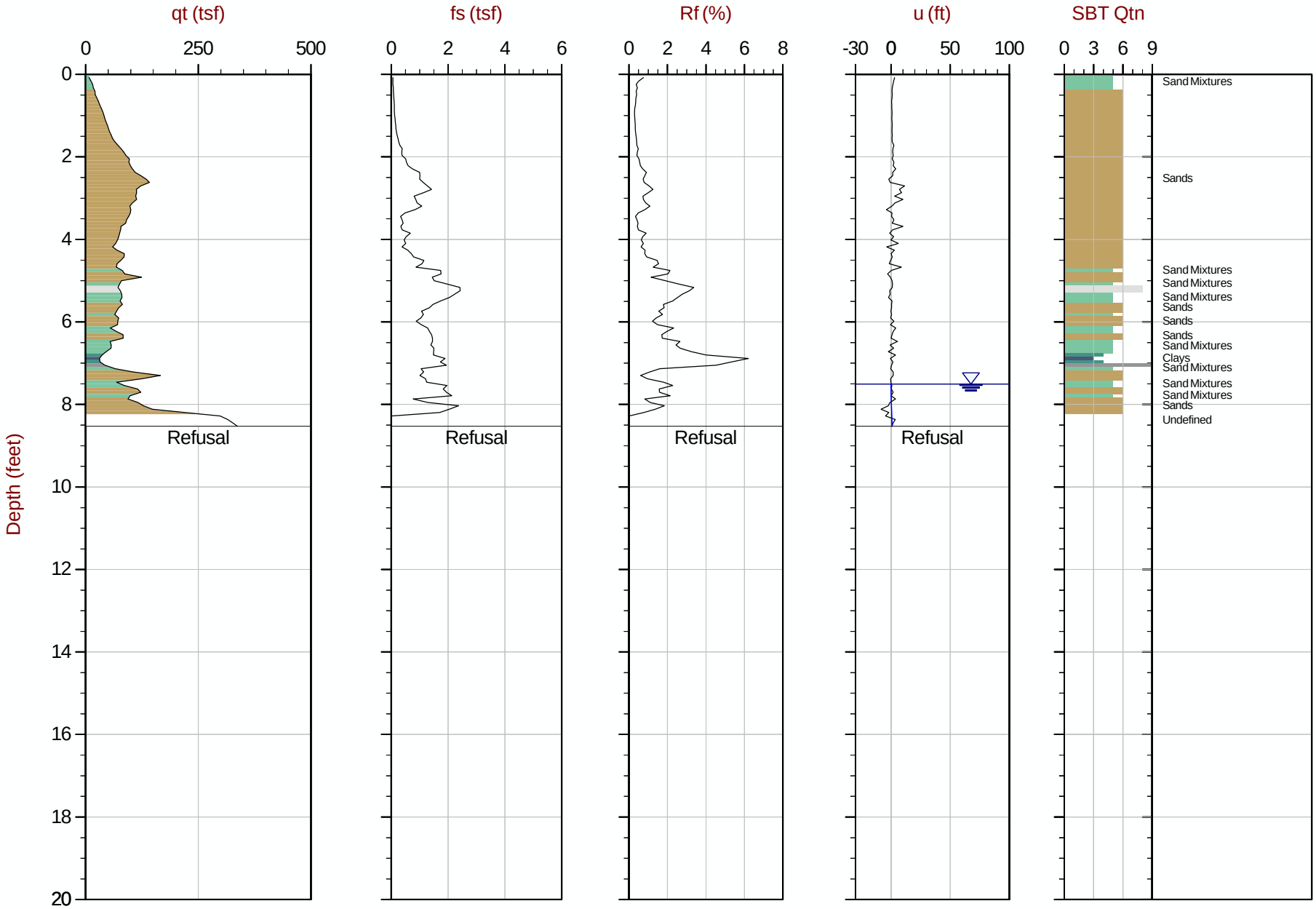
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	196.96	0.20	0.10	39.49
2	3.70	1.60	7.15	196.96	0.20	0.10	39.49
3	4.40	1.60	8.20	196.96	0.20	0.10	39.49
4	5.10	1.60	9.25	196.96	0.20	0.10	39.49
5	5.80	1.60	10.30	196.96	0.20	0.10	39.49
6	6.50	1.60	11.35	196.96	0.20	0.10	39.49
7	7.20	1.60	12.40	196.96	0.20	0.10	39.49
8	7.90	1.60	13.45	196.96	0.20	0.10	39.49
9	8.60	1.60	14.50	196.96	0.20	0.10	39.49
10	9.30	1.60	15.55	196.96	0.20	0.10	39.49
11	10.00	1.60	16.60	196.96	0.20	0.10	39.49
12	10.70	1.60	17.65	196.96	0.20	0.10	39.49
13	11.40	1.60	18.70	196.96	0.20	0.10	39.49
14	12.10	1.60	19.75	196.96	0.20	0.10	39.49
15	12.80	1.60	20.80	196.96	0.20	0.10	39.49

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 09:50
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-C-0
Cone: 652:T1500F15U35



Max Depth: 2.600 m / 8.53 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPC-0.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6235 Long: -70.9173

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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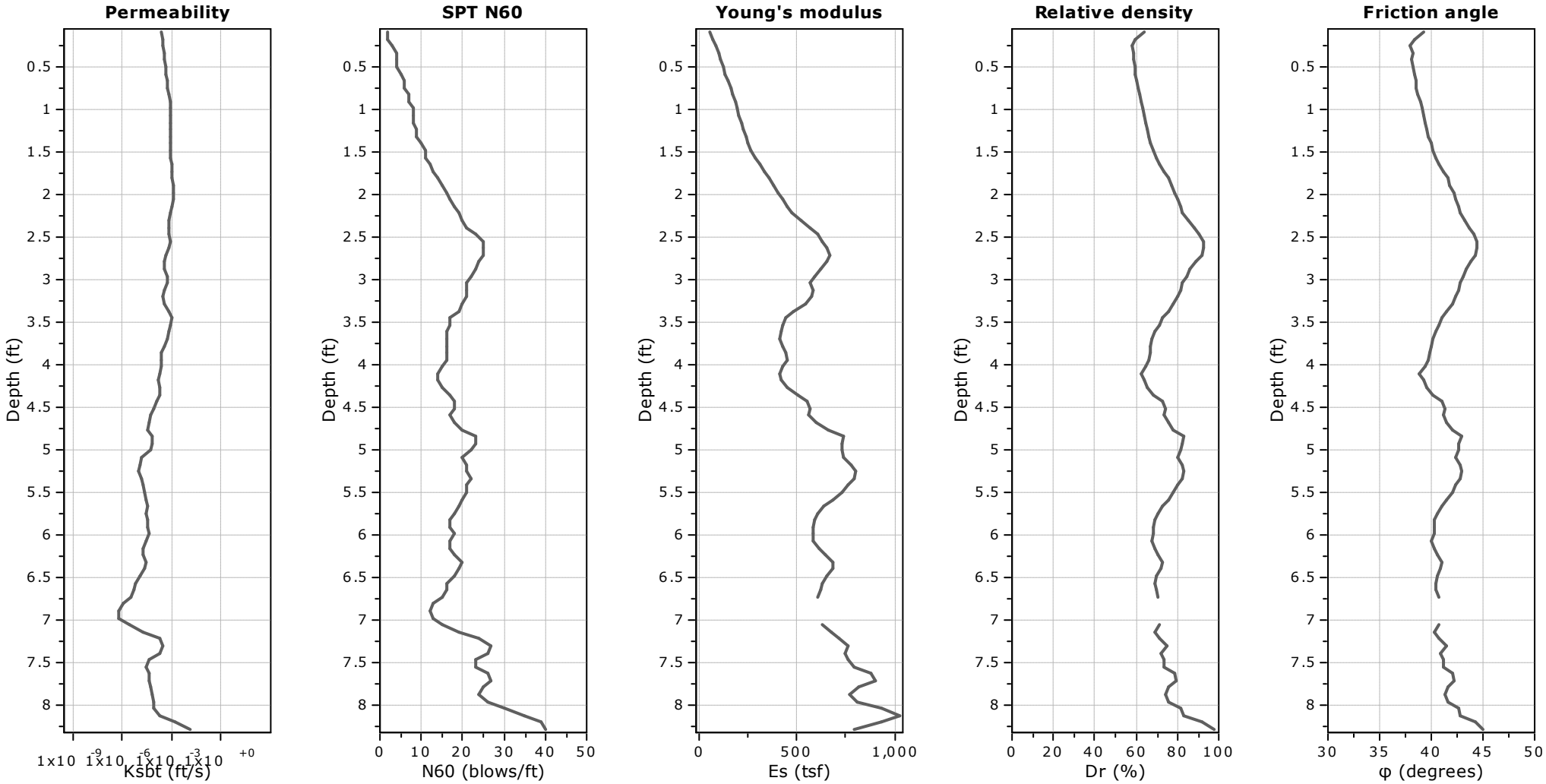
CPT: C-0
Total depth: 8.53 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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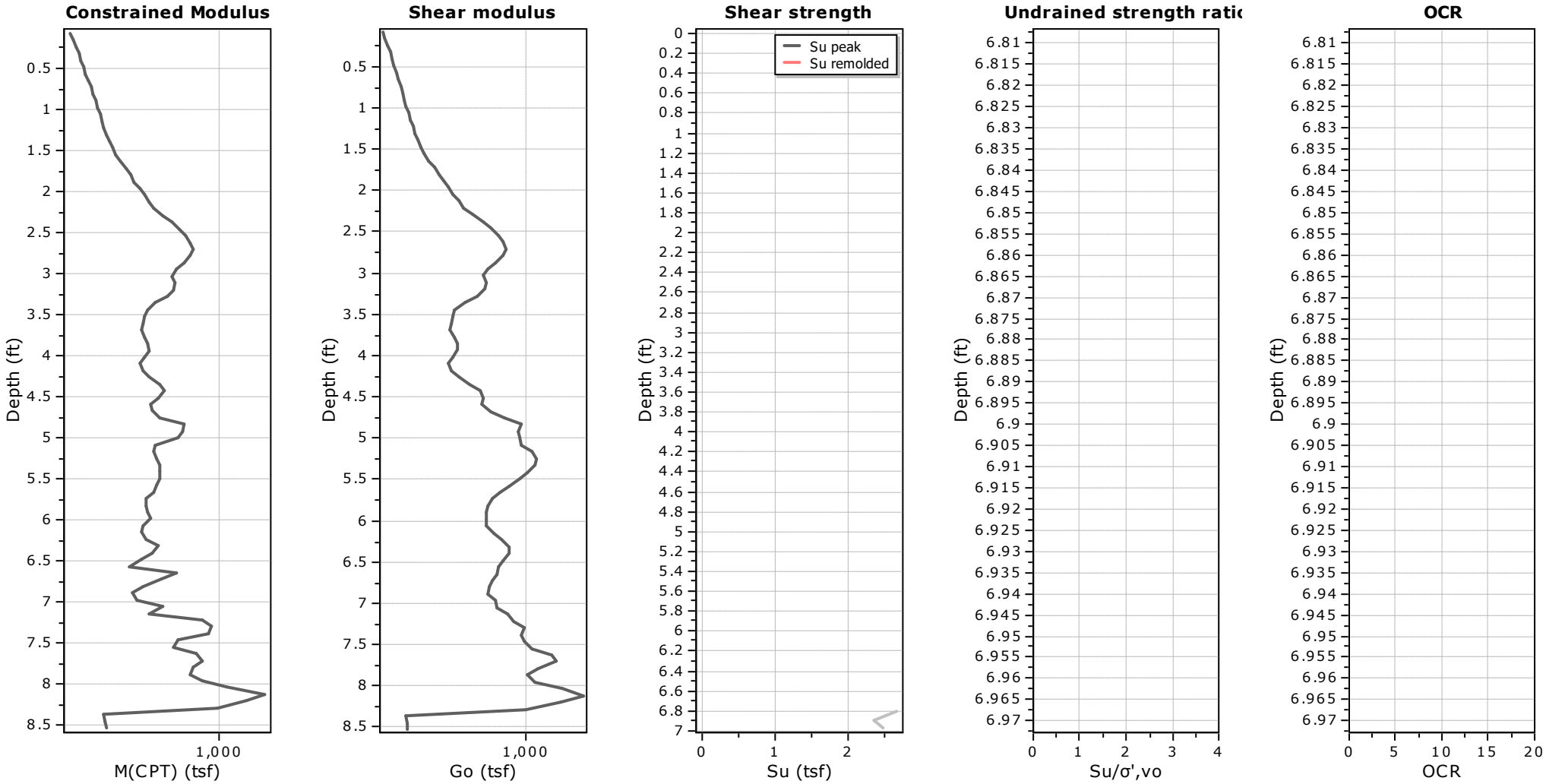
http://www.geologismiki.gr

CPT: C-0
Total depth: 8.53 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

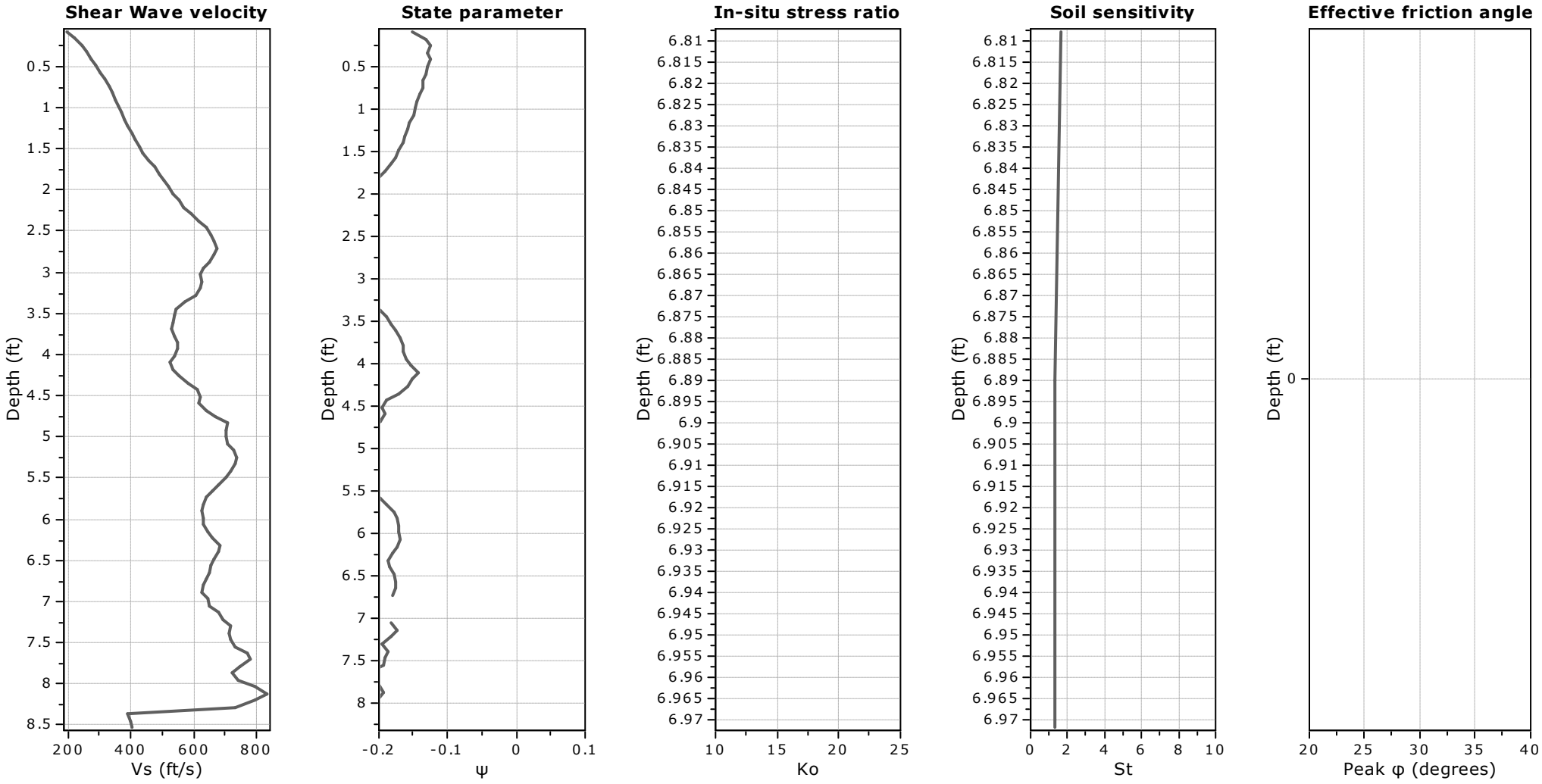
Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

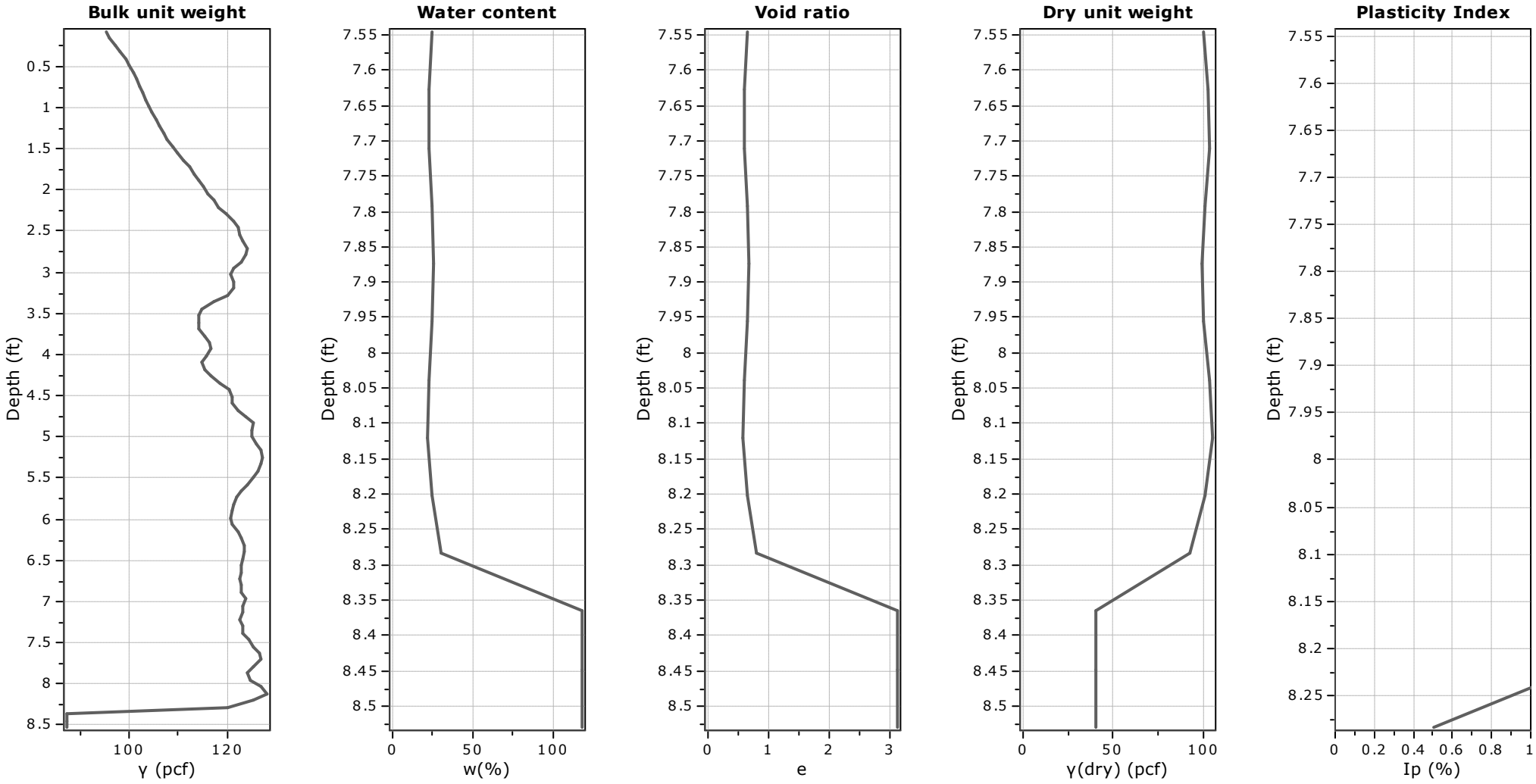


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: C-0
Total depth: 8.53 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
Geotechnical Engineers
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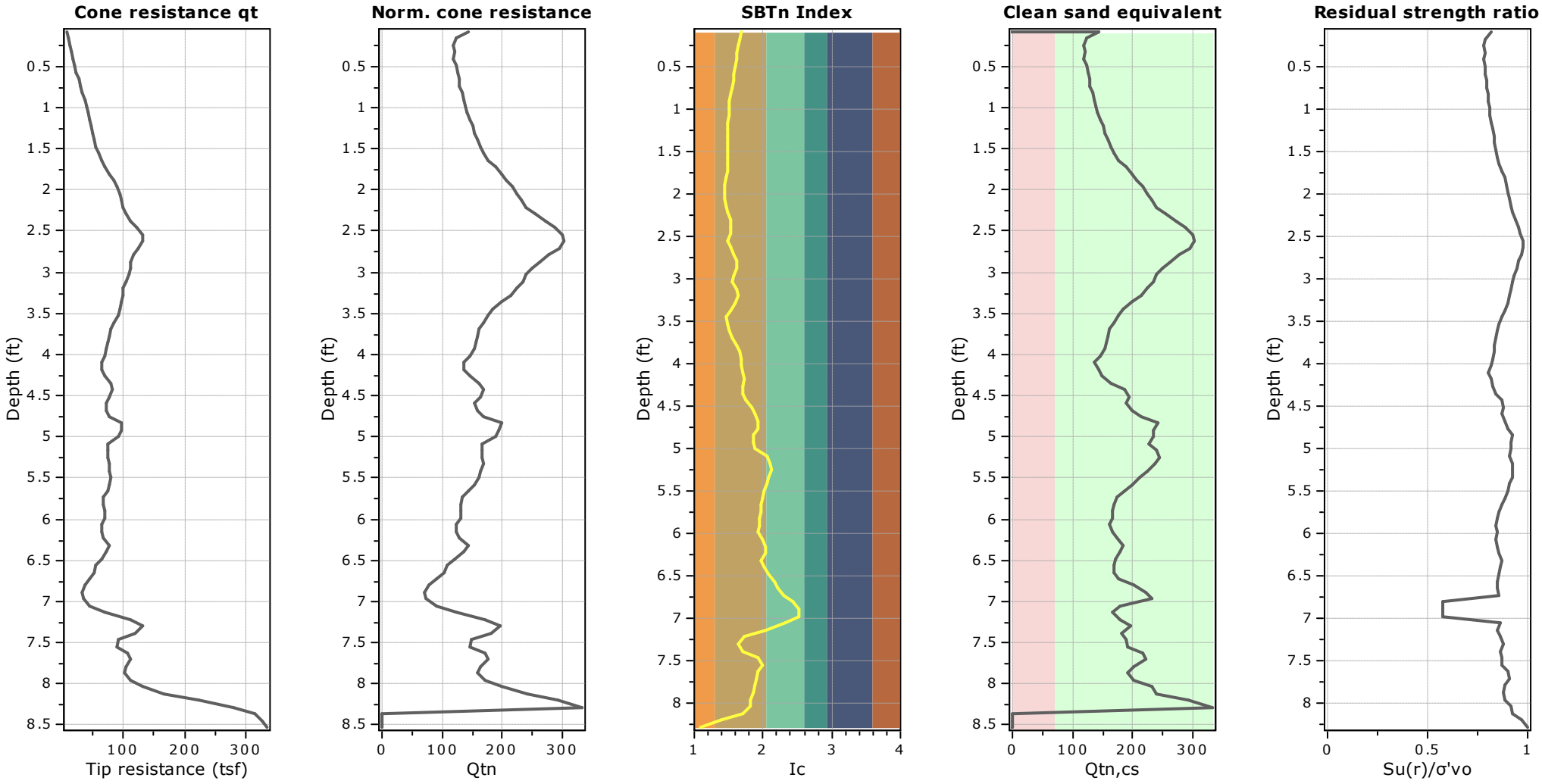
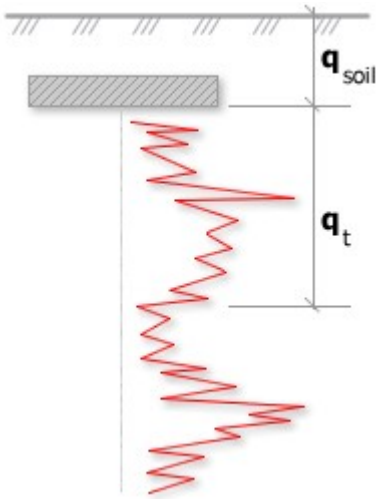
http://www.geologismiki.gr

CPT: C-0
Total depth: 8.53 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

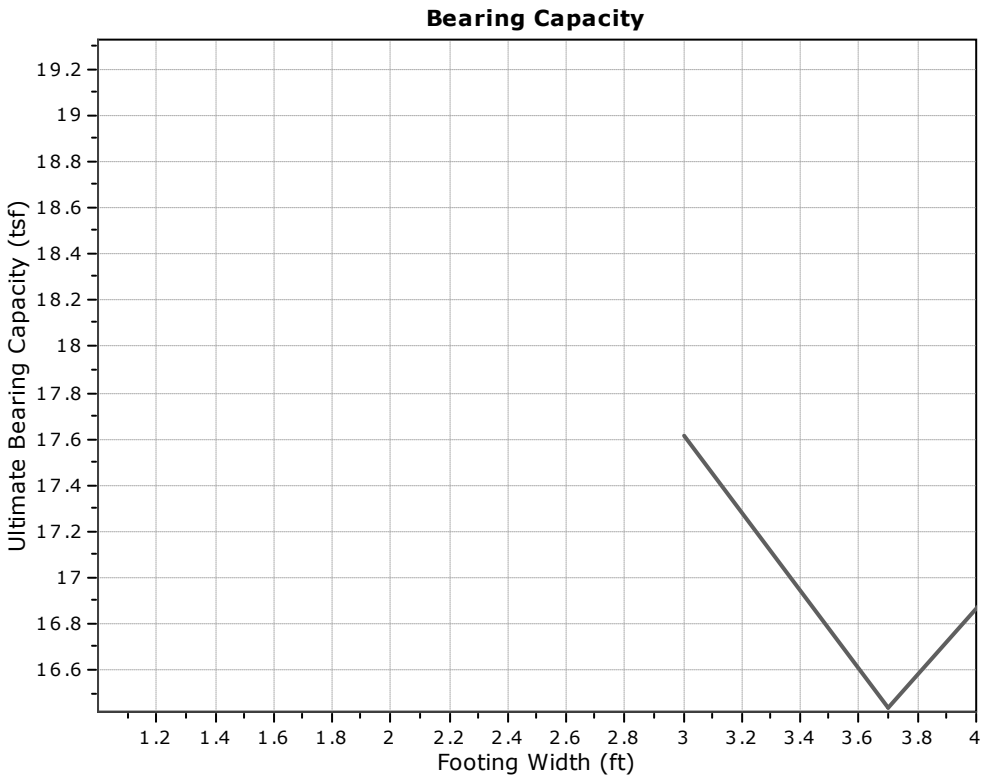




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

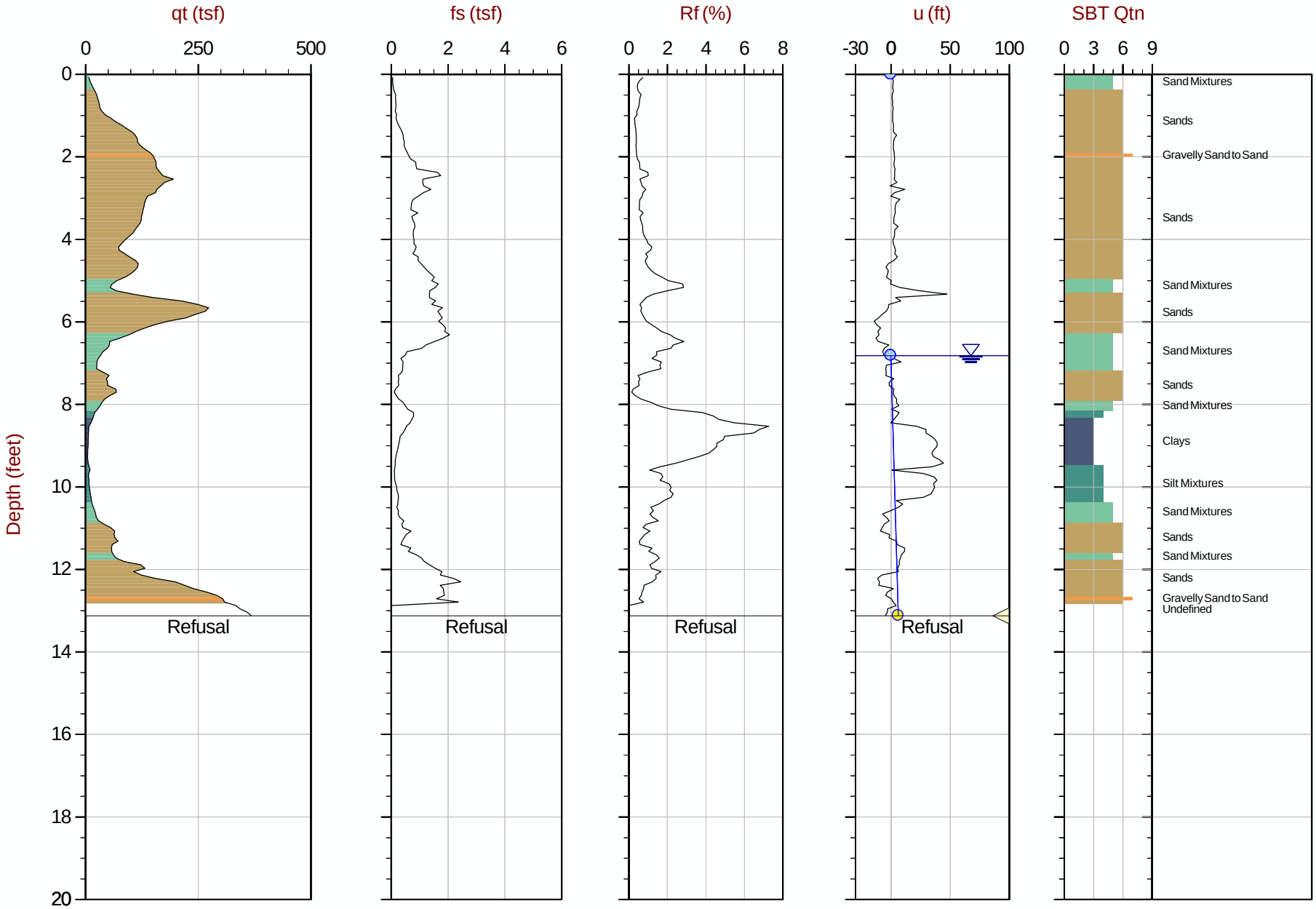
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	87.61	0.20	0.10	17.62
2	3.70	1.60	7.15	81.71	0.20	0.10	16.44
3	4.40	1.60	8.20	86.73	0.20	0.10	17.44
4	5.10	1.60	9.25	96.08	0.20	0.10	19.31
5	5.80	1.60	10.30	96.08	0.20	0.10	19.31
6	6.50	1.60	11.35	96.08	0.20	0.10	19.31
7	7.20	1.60	12.40	96.08	0.20	0.10	19.31
8	7.90	1.60	13.45	96.08	0.20	0.10	19.31
9	8.60	1.60	14.50	96.08	0.20	0.10	19.31
10	9.30	1.60	15.55	96.08	0.20	0.10	19.31
11	10.00	1.60	16.60	96.08	0.20	0.10	19.31
12	10.70	1.60	17.65	96.08	0.20	0.10	19.31
13	11.40	1.60	18.70	96.08	0.20	0.10	19.31
14	12.10	1.60	19.75	96.08	0.20	0.10	19.31
15	12.80	1.60	20.80	96.08	0.20	0.10	19.31

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 15:09
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-CC-7
Cone: 652:T1500F15U35



Max Depth: 4.000 m / 13.12 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPCC-7.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6239 Long: -70.9178

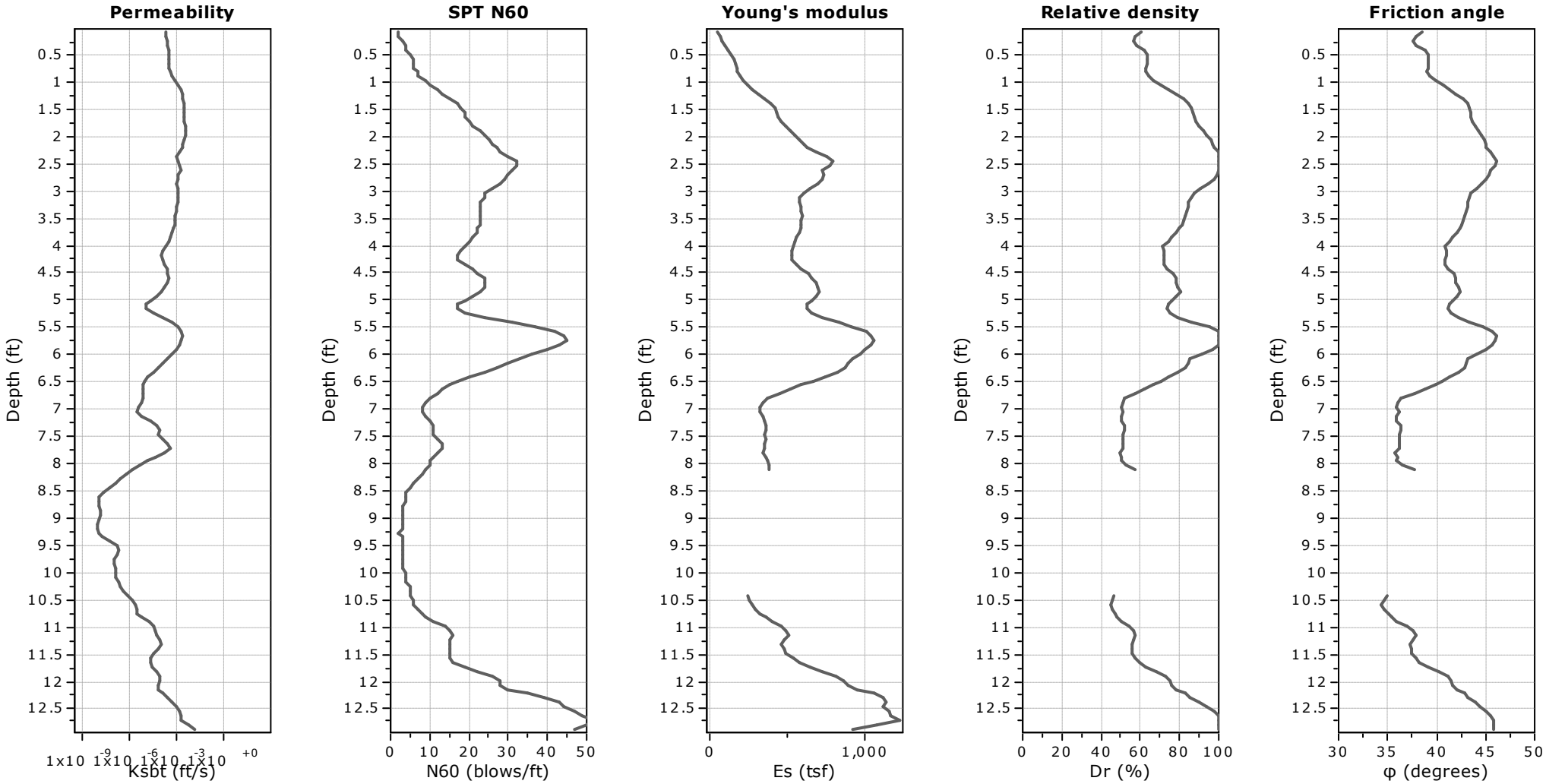
Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

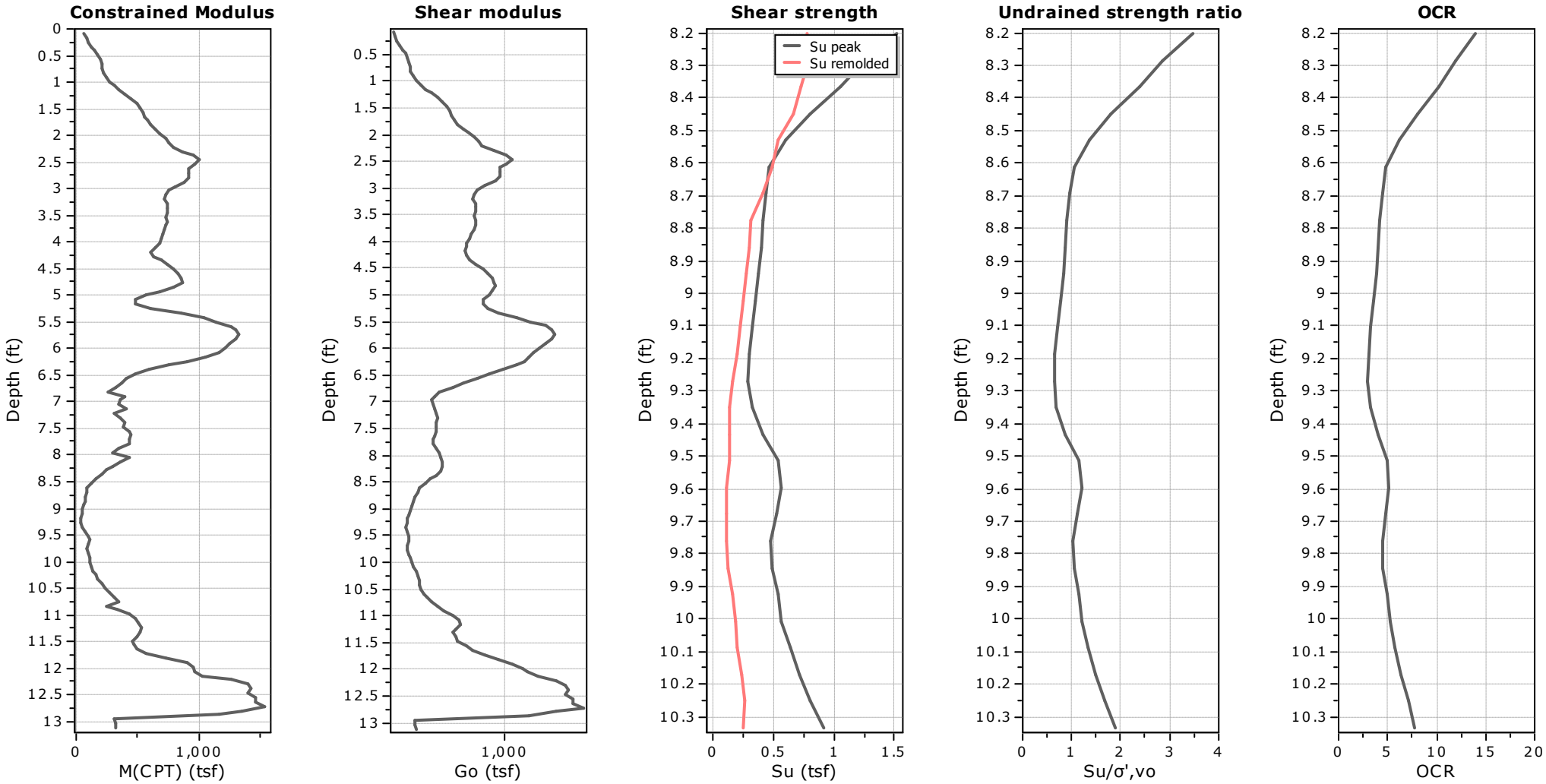
CPT: CC-7
Total depth: 13.12 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

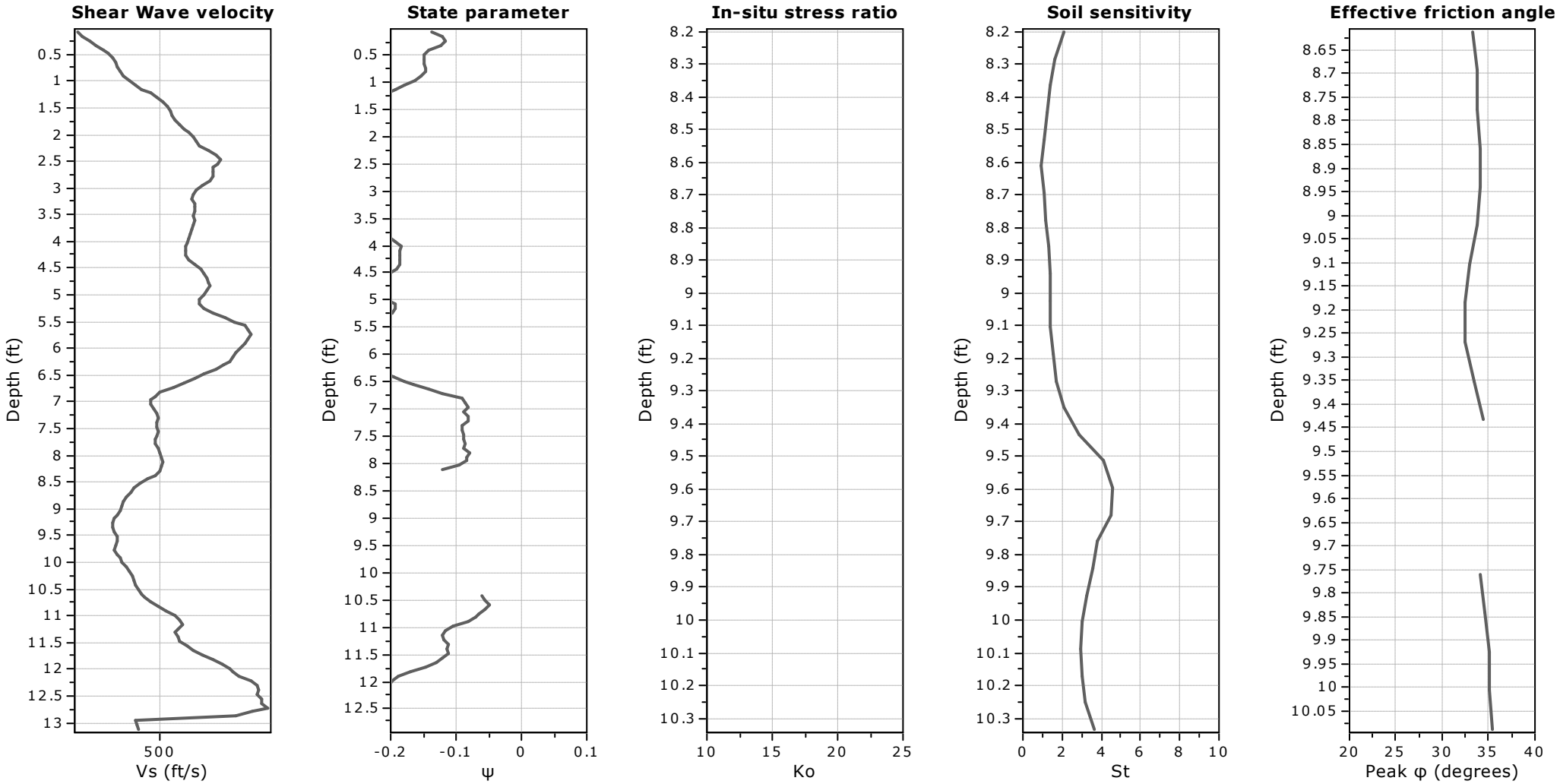
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

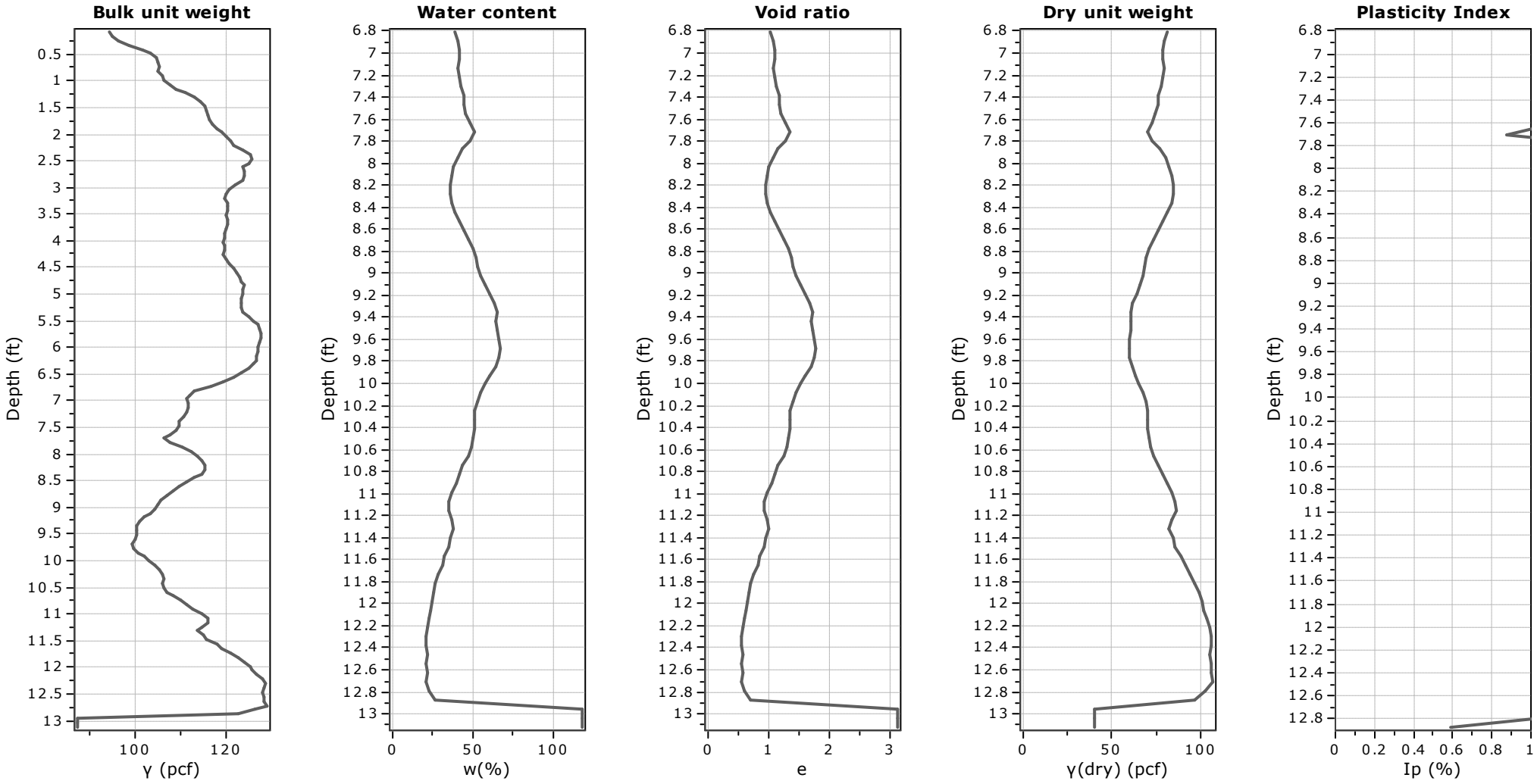
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00


Bulk unit weight
Water content
Void ratio
Dry unit weight
Plasticity Index
Depth (ft)
γ (pcf)
w(%)
e
γ(dry) (pcf)
Ip (%)

GeoLogismiki
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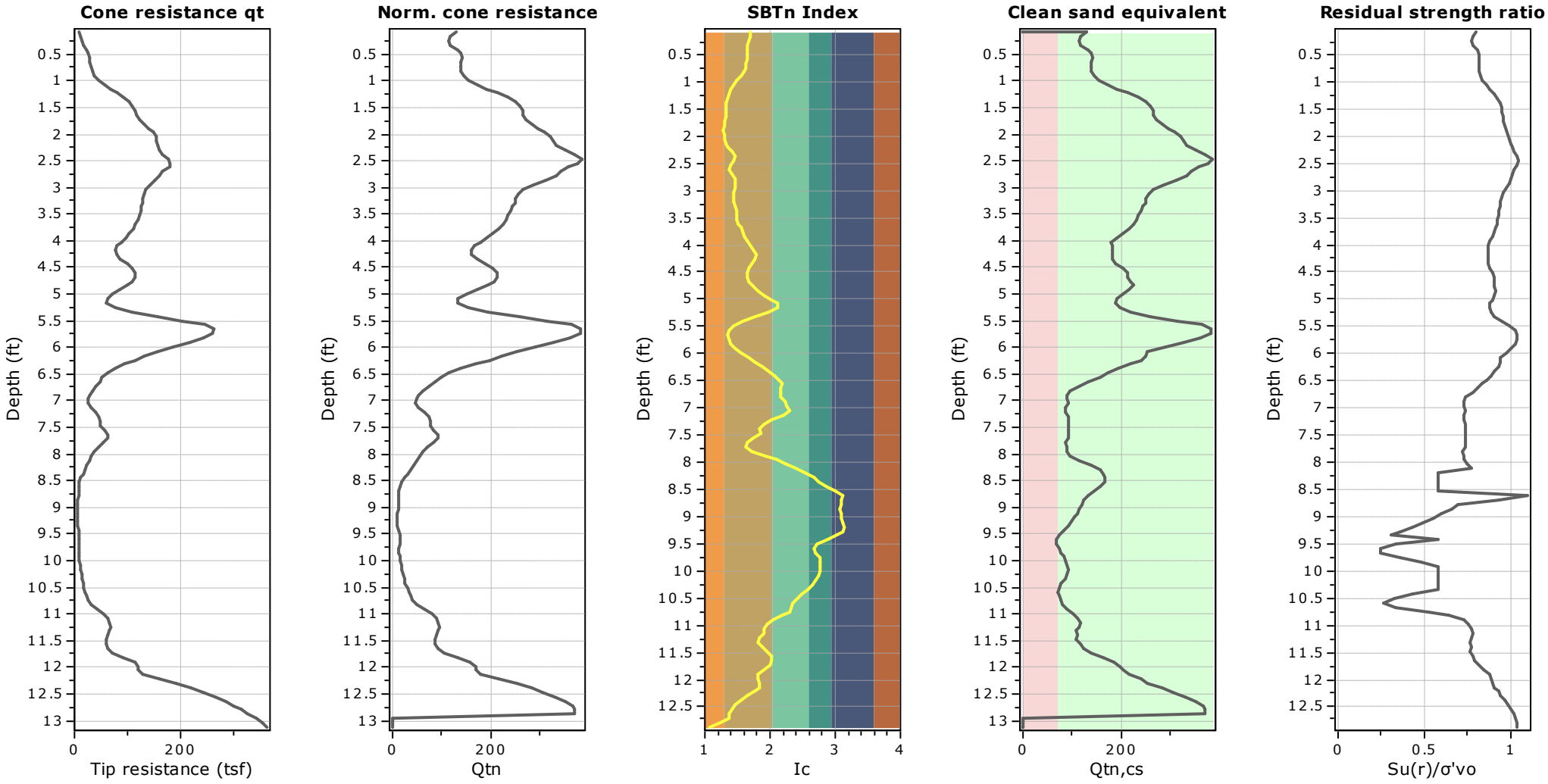
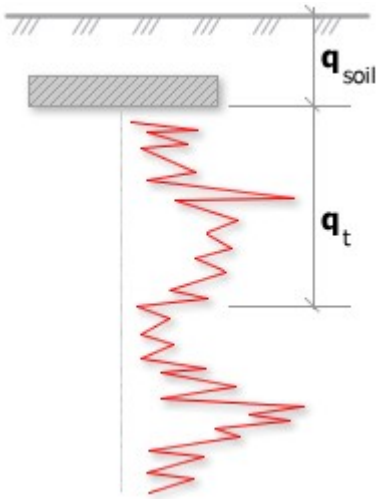
http://www.geologismiki.gr

CPT: CC-7
Total depth: 13.12 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

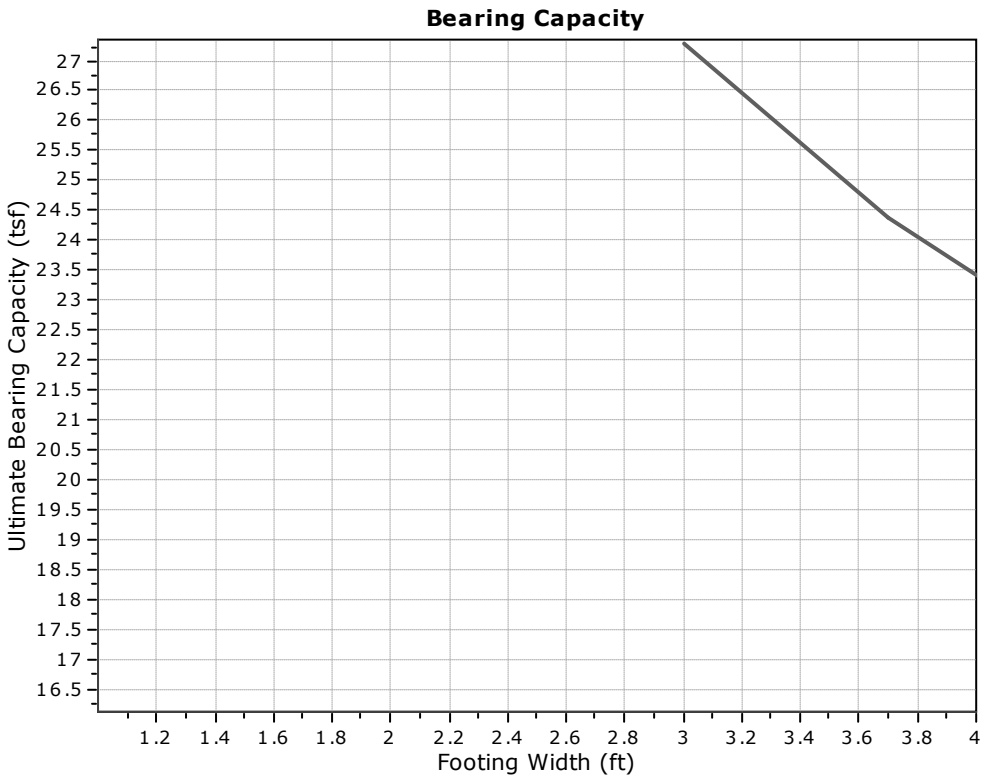




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

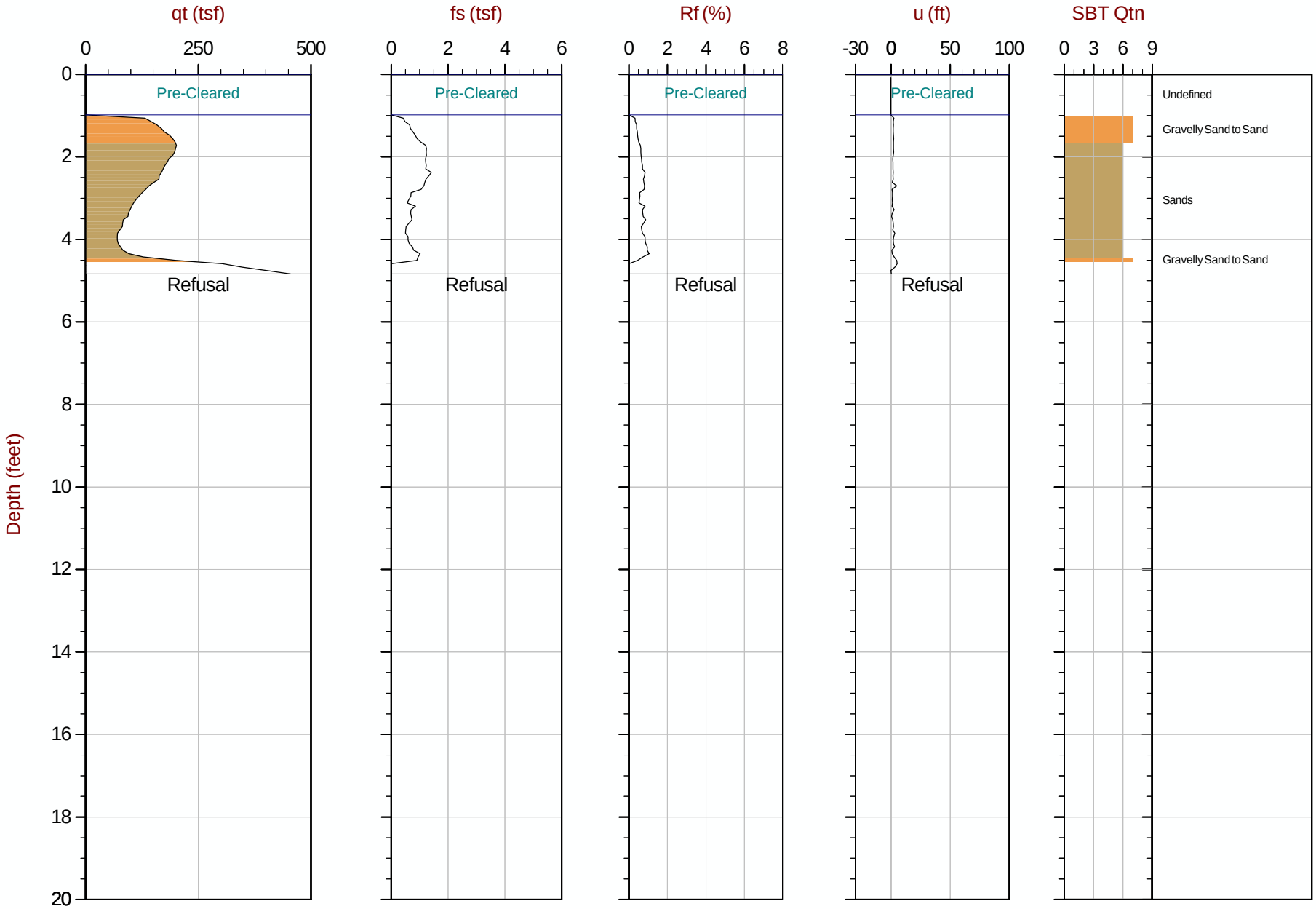
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	135.95	0.20	0.10	27.29
2	3.70	1.60	7.15	121.32	0.20	0.10	24.36
3	4.40	1.60	8.20	110.20	0.20	0.10	22.14
4	5.10	1.60	9.25	96.27	0.20	0.10	19.35
5	5.80	1.60	10.30	85.54	0.20	0.10	17.20
6	6.50	1.60	11.35	80.44	0.20	0.10	16.18
7	7.20	1.60	12.40	83.55	0.20	0.10	16.81
8	7.90	1.60	13.45	96.15	0.20	0.10	19.33
9	8.60	1.60	14.50	96.15	0.20	0.10	19.33
10	9.30	1.60	15.55	96.15	0.20	0.10	19.33
11	10.00	1.60	16.60	96.15	0.20	0.10	19.33
12	10.70	1.60	17.65	96.15	0.20	0.10	19.33
13	11.40	1.60	18.70	96.15	0.20	0.10	19.33
14	12.10	1.60	19.75	96.15	0.20	0.10	19.33
15	12.80	1.60	20.80	96.15	0.20	0.10	19.33

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 10:16
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-DD-3
Cone: 652:T1500F15U35



Max Depth: 1.475 m / 4.84 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPDD-3.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9179

Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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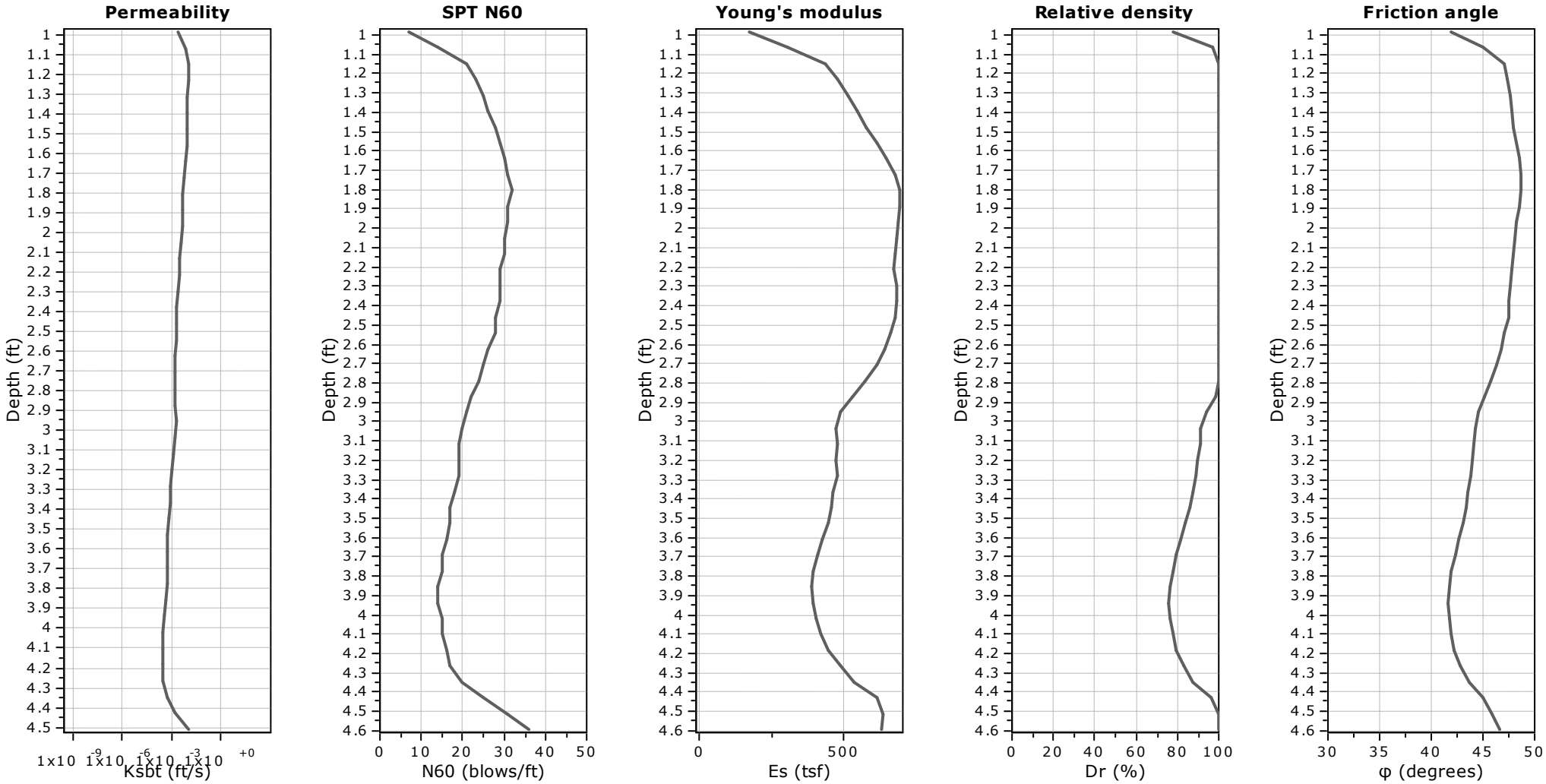
http://www.geologismiki.gr

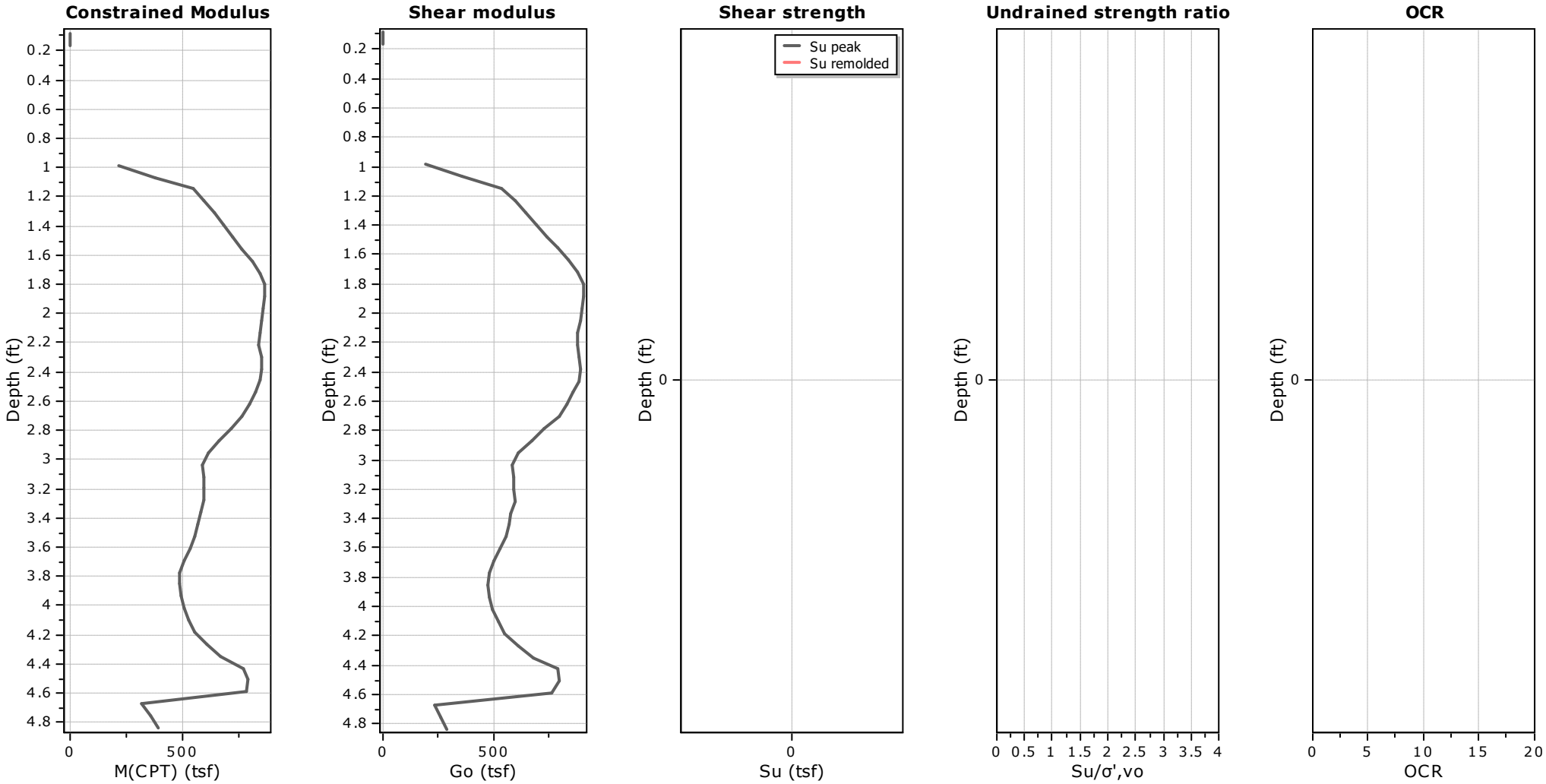
CPT: DD-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



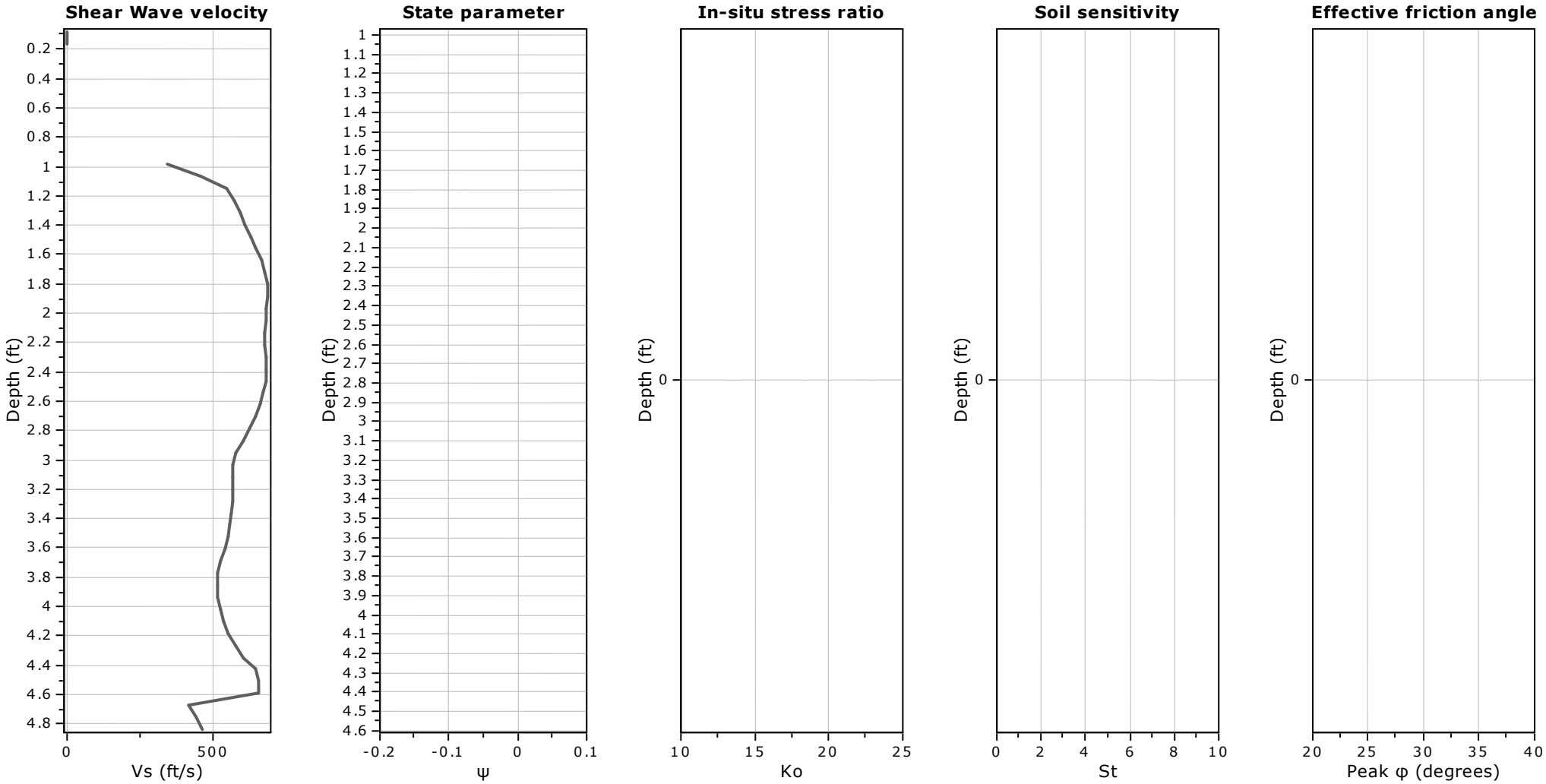
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



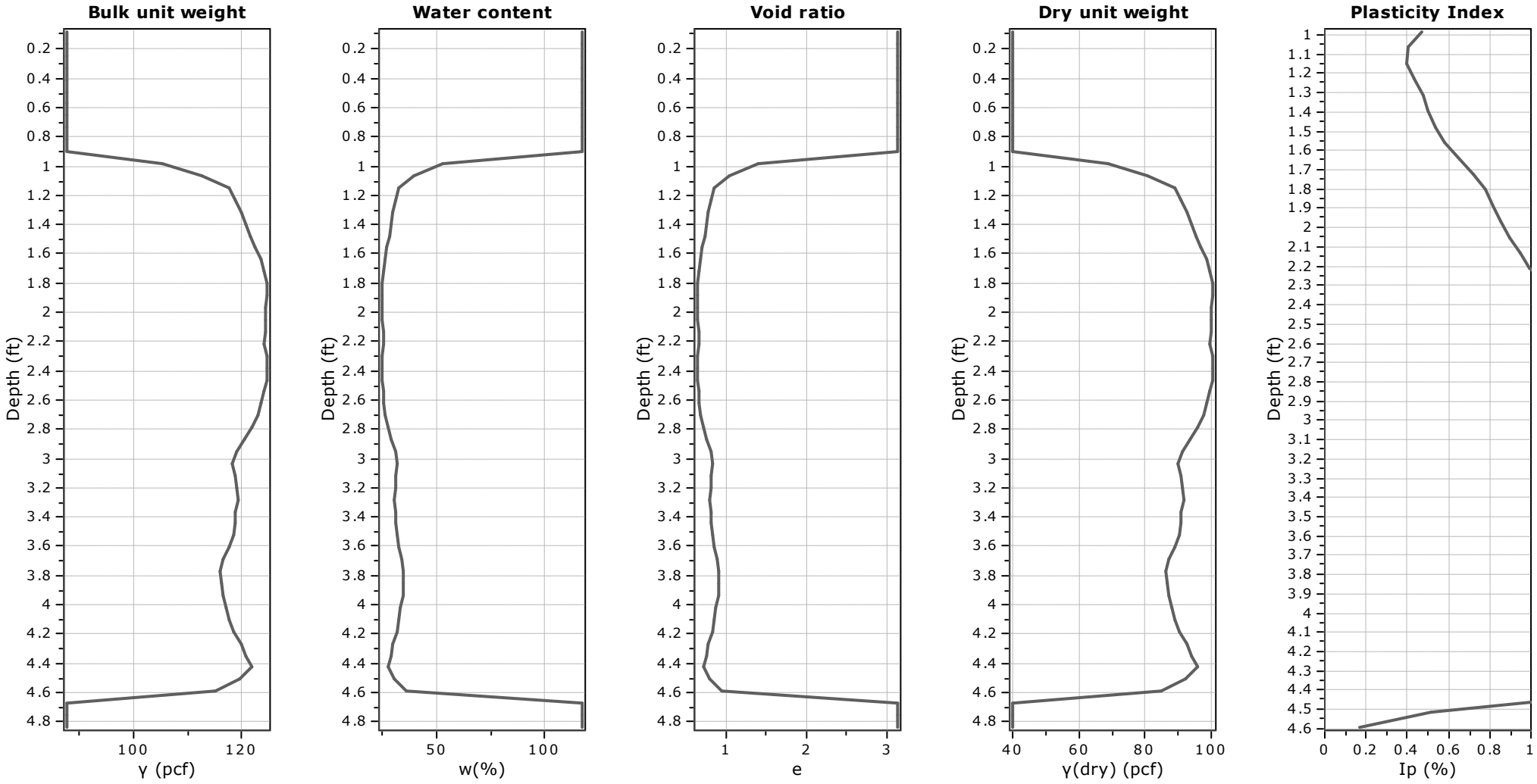
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

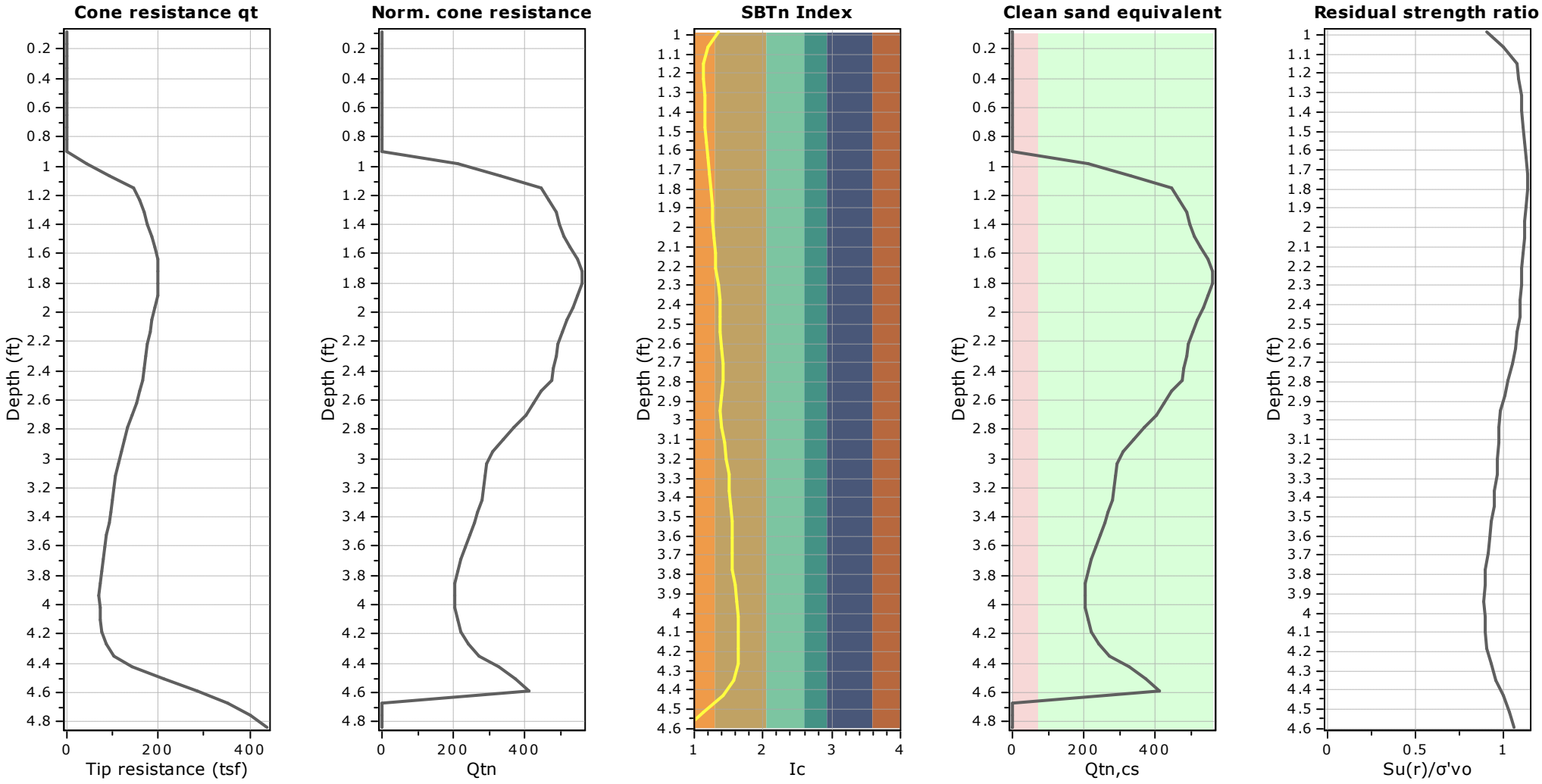
Project:
Location:

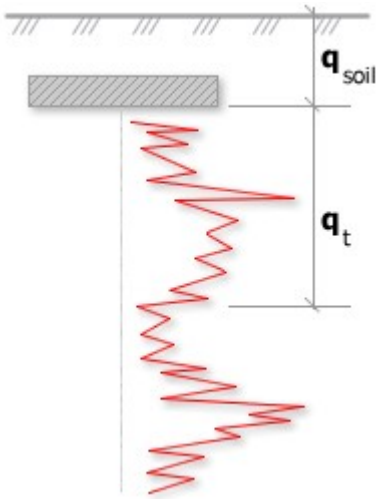


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

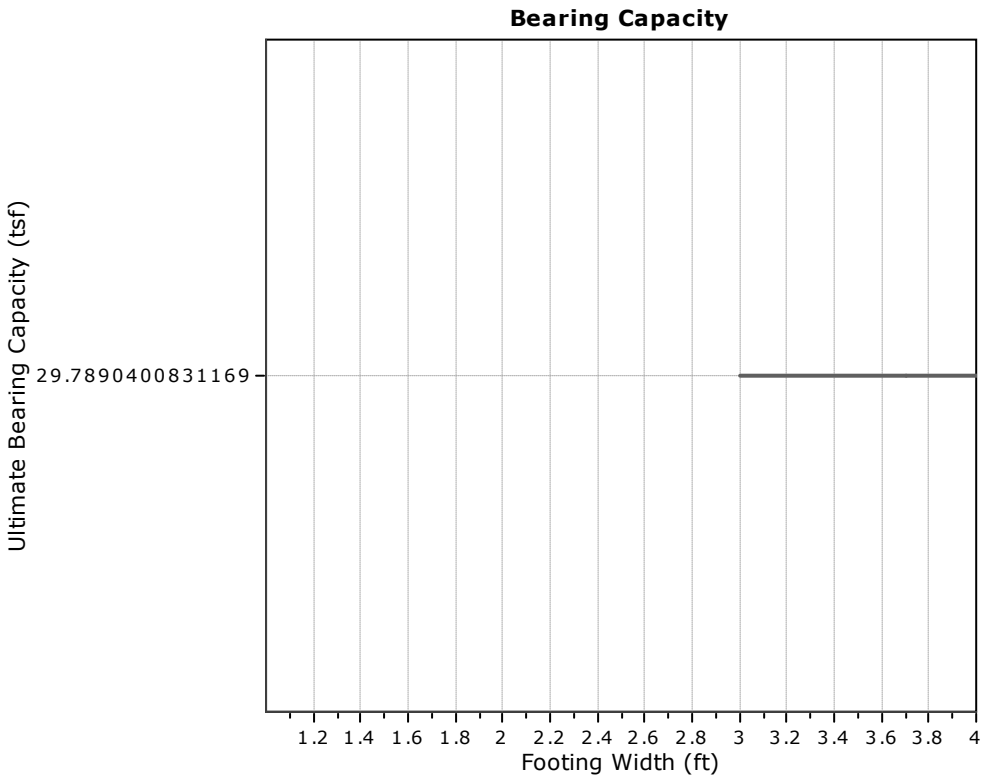




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

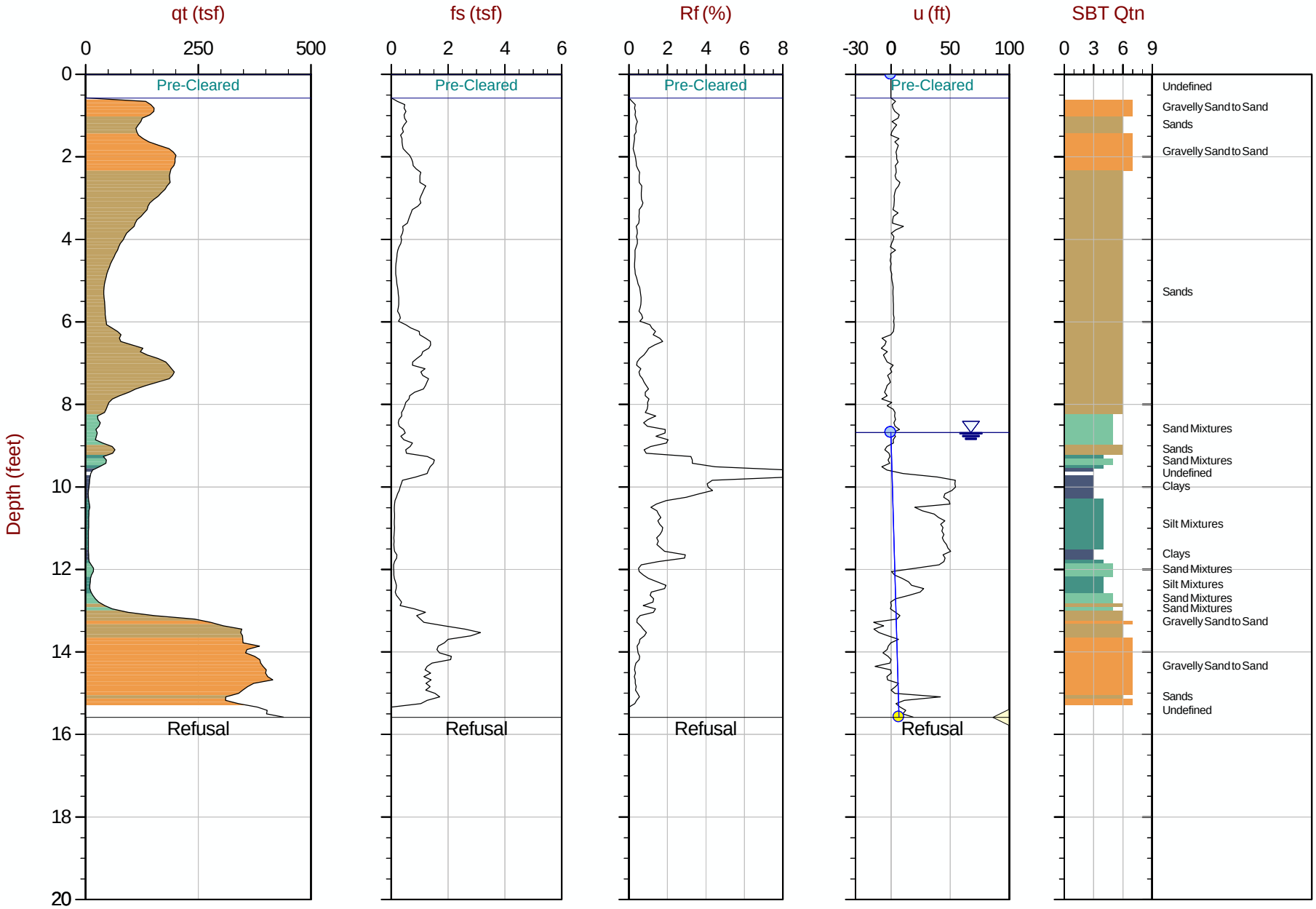
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	148.47	0.20	0.10	29.79
2	3.70	1.60	7.15	148.47	0.20	0.10	29.79
3	4.40	1.60	8.20	148.47	0.20	0.10	29.79
4	5.10	1.60	9.25	148.47	0.20	0.10	29.79
5	5.80	1.60	10.30	148.47	0.20	0.10	29.79
6	6.50	1.60	11.35	148.47	0.20	0.10	29.79
7	7.20	1.60	12.40	148.47	0.20	0.10	29.79
8	7.90	1.60	13.45	148.47	0.20	0.10	29.79
9	8.60	1.60	14.50	148.47	0.20	0.10	29.79
10	9.30	1.60	15.55	148.47	0.20	0.10	29.79
11	10.00	1.60	16.60	148.47	0.20	0.10	29.79
12	10.70	1.60	17.65	148.47	0.20	0.10	29.79
13	11.40	1.60	18.70	148.47	0.20	0.10	29.79
14	12.10	1.60	19.75	148.47	0.20	0.10	29.79
15	12.80	1.60	20.80	148.47	0.20	0.10	29.79

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 11:25
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-DD-6
Cone: 652:T1500F15U35



Max Depth: 4.750 m / 15.58 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPDD-6.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6238 Long: -70.9180

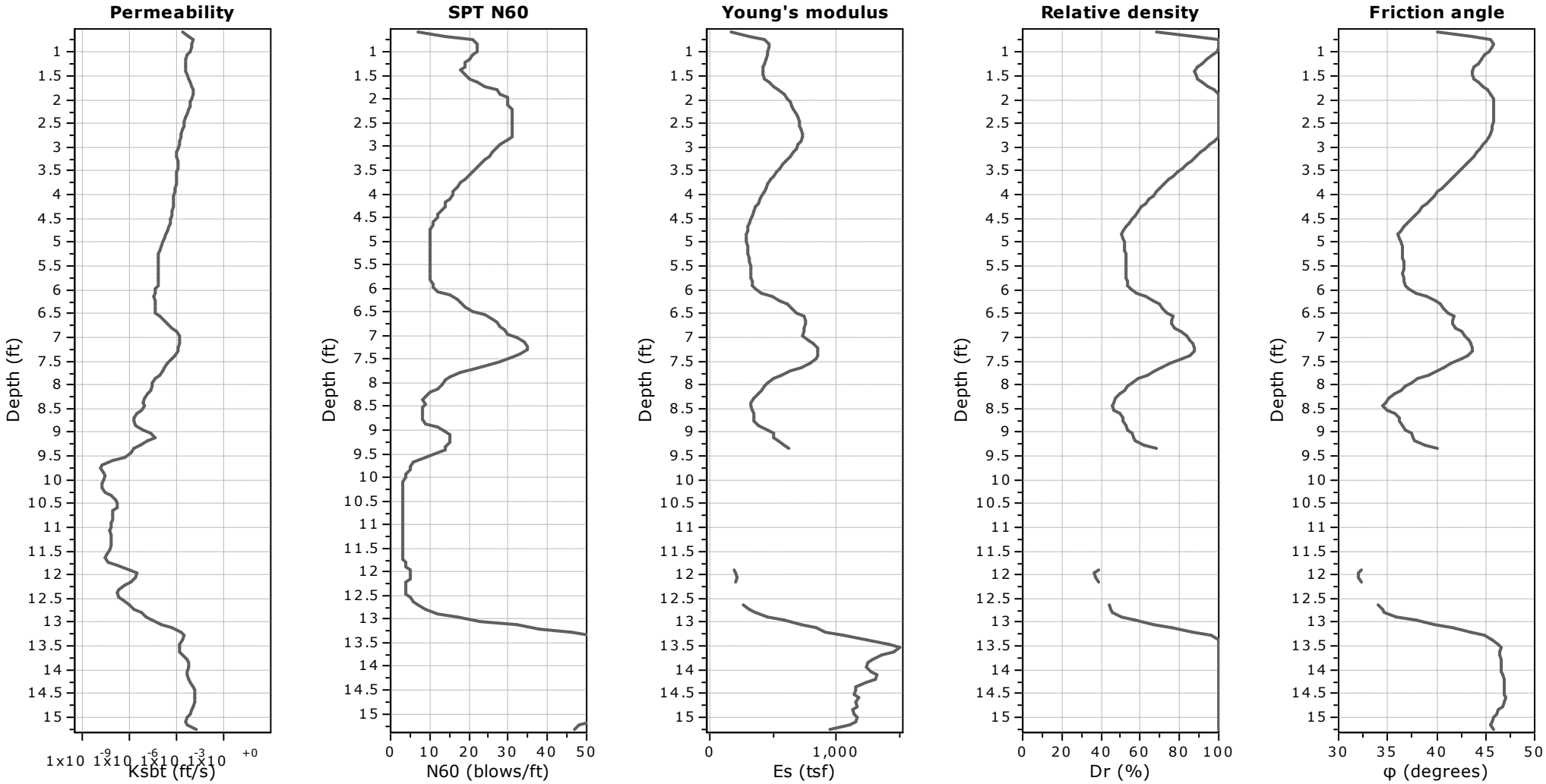
Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-6
Total depth: 15.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



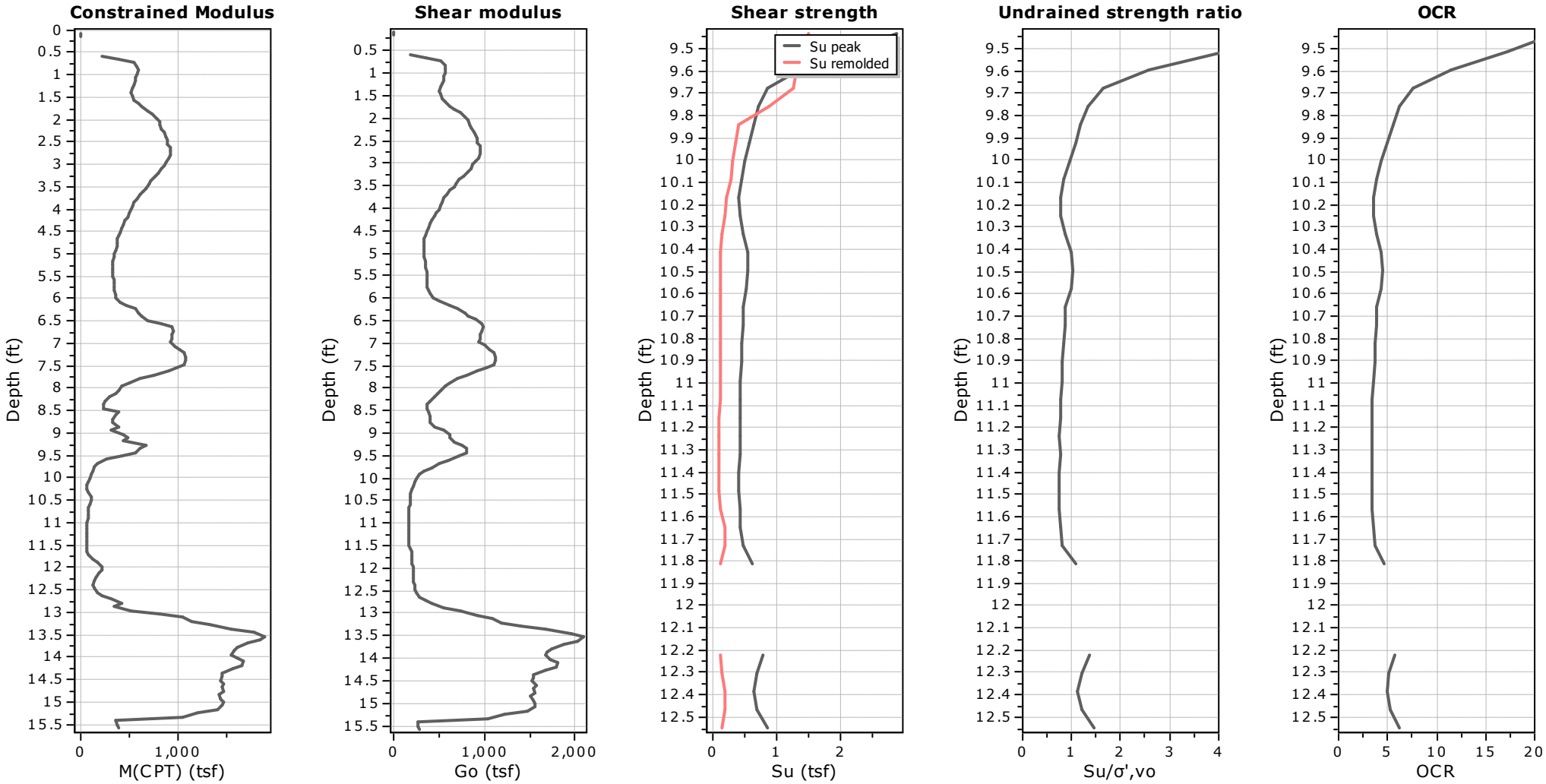
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

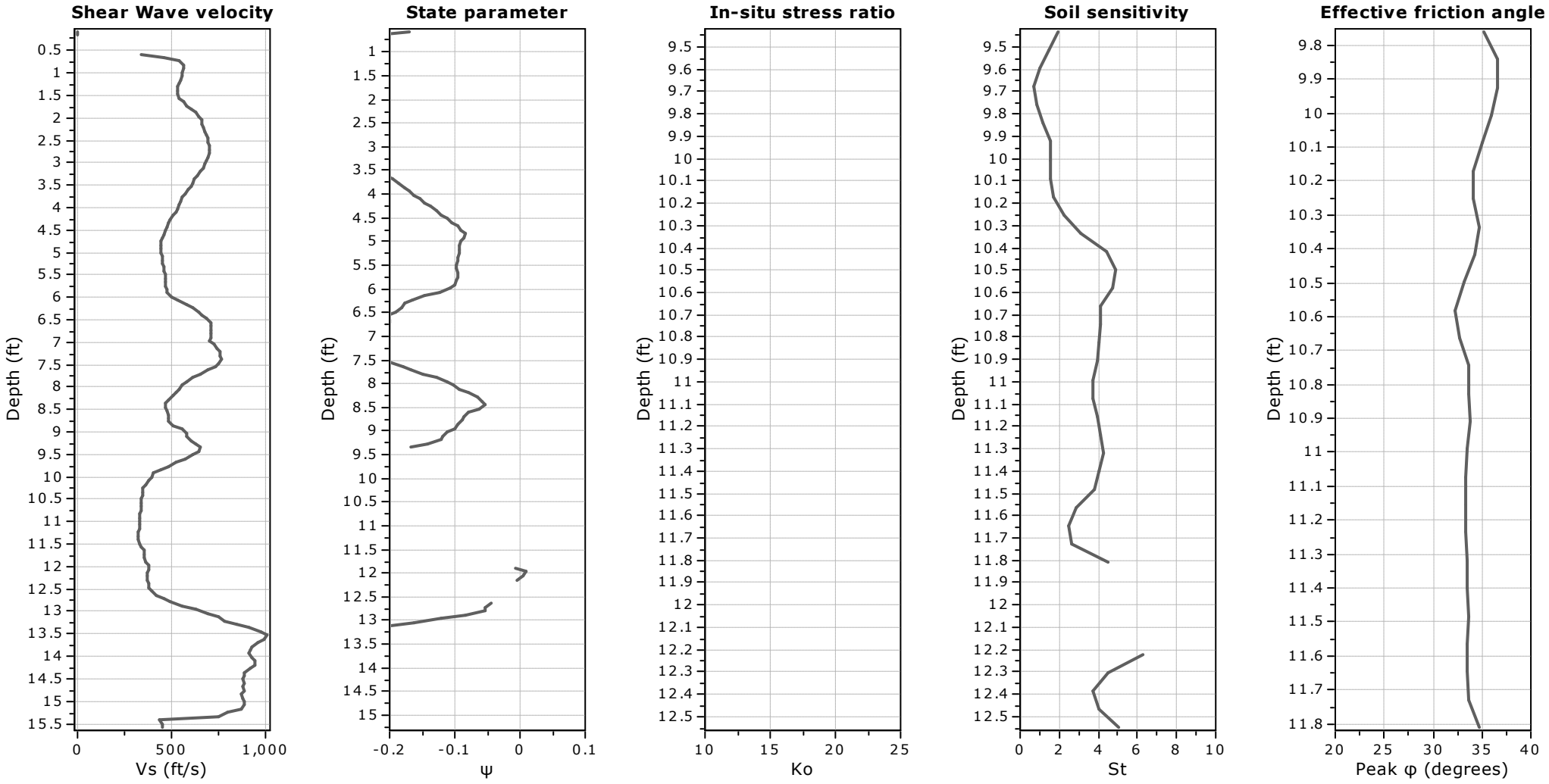
CPT: DD-6
Total depth: 15.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



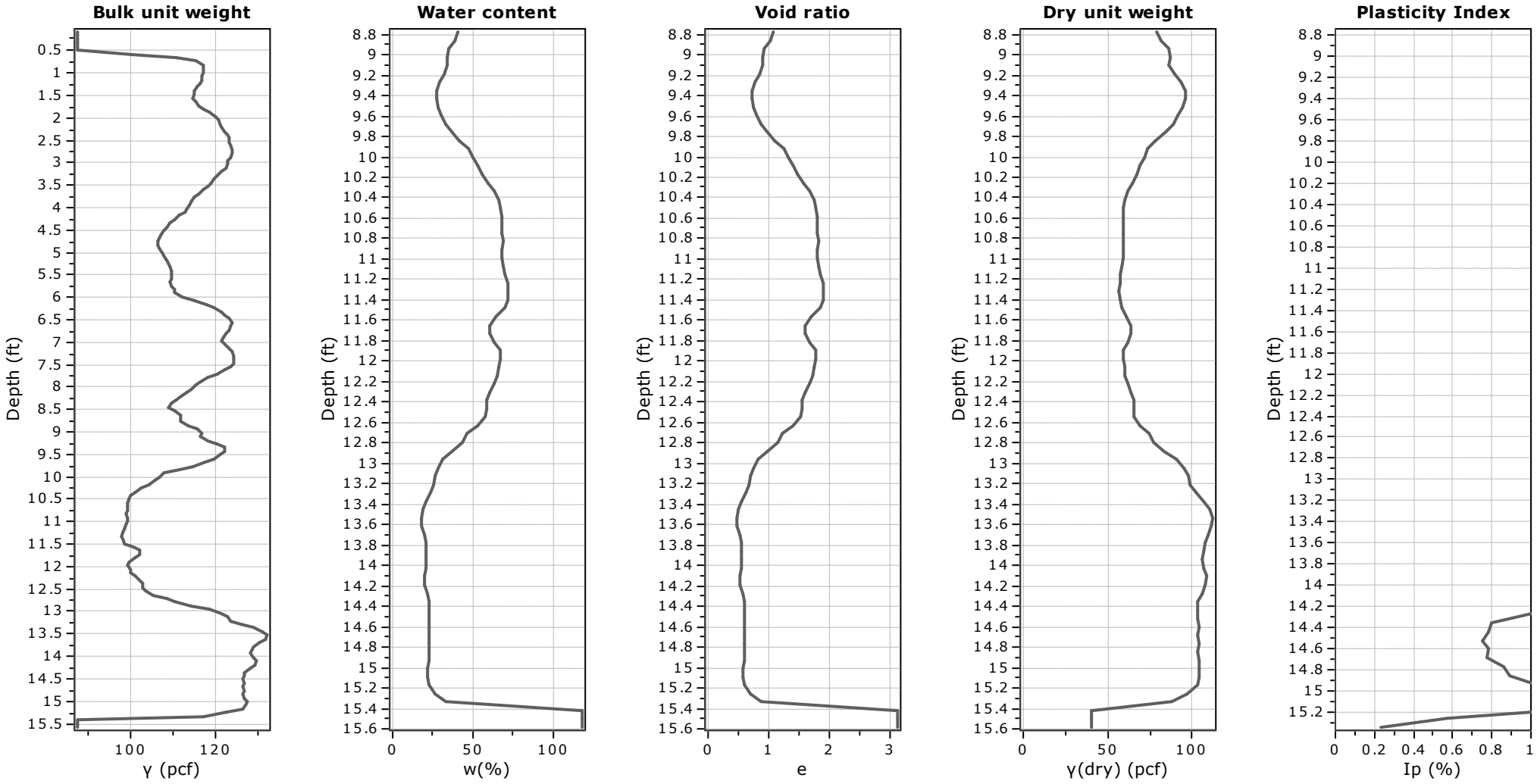
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-6
Total depth: 15.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

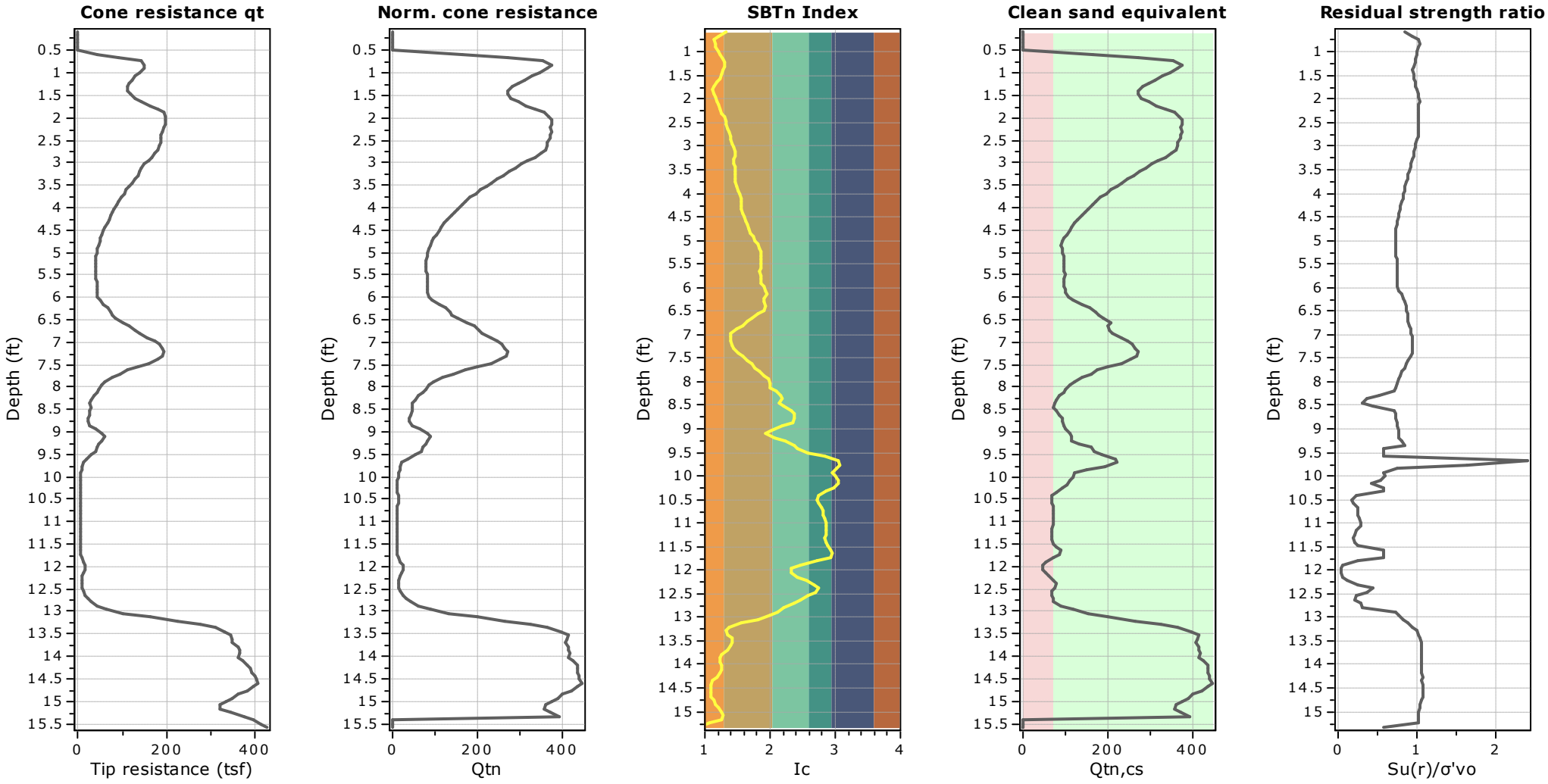
Project:
Location:

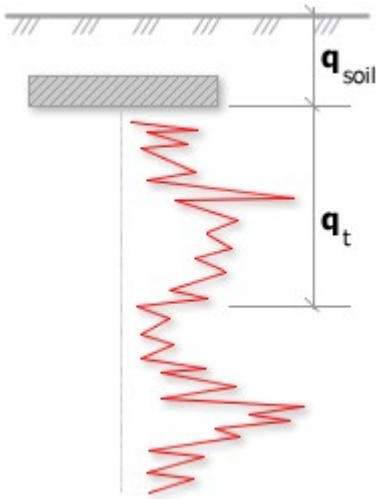


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-6
Total depth: 15.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

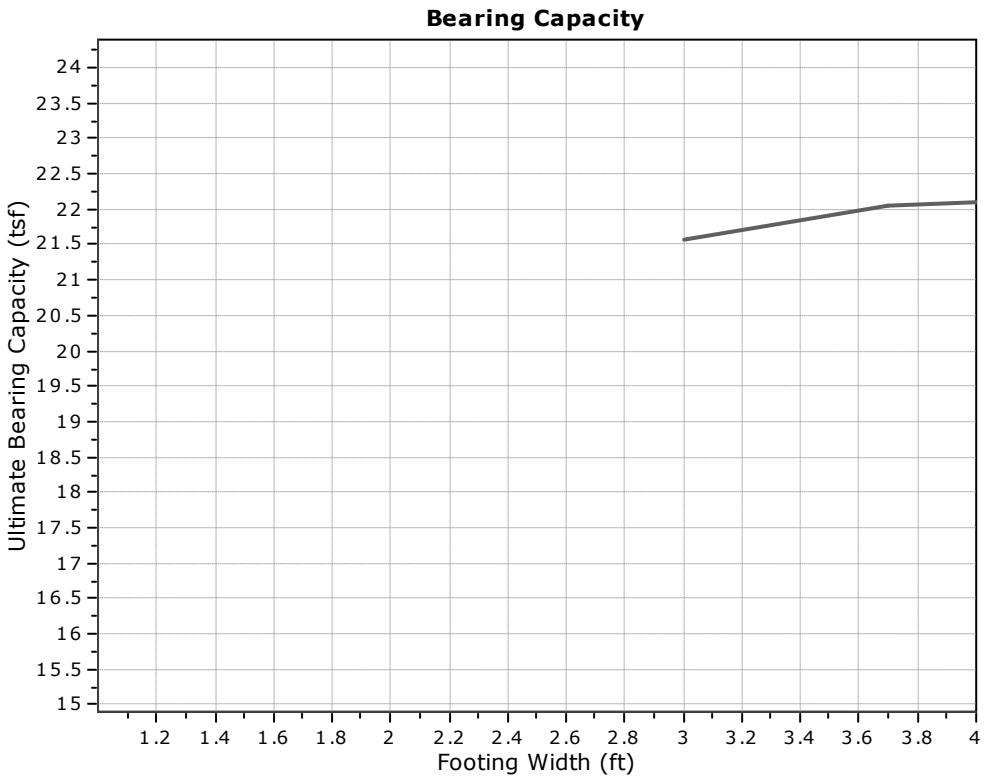




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

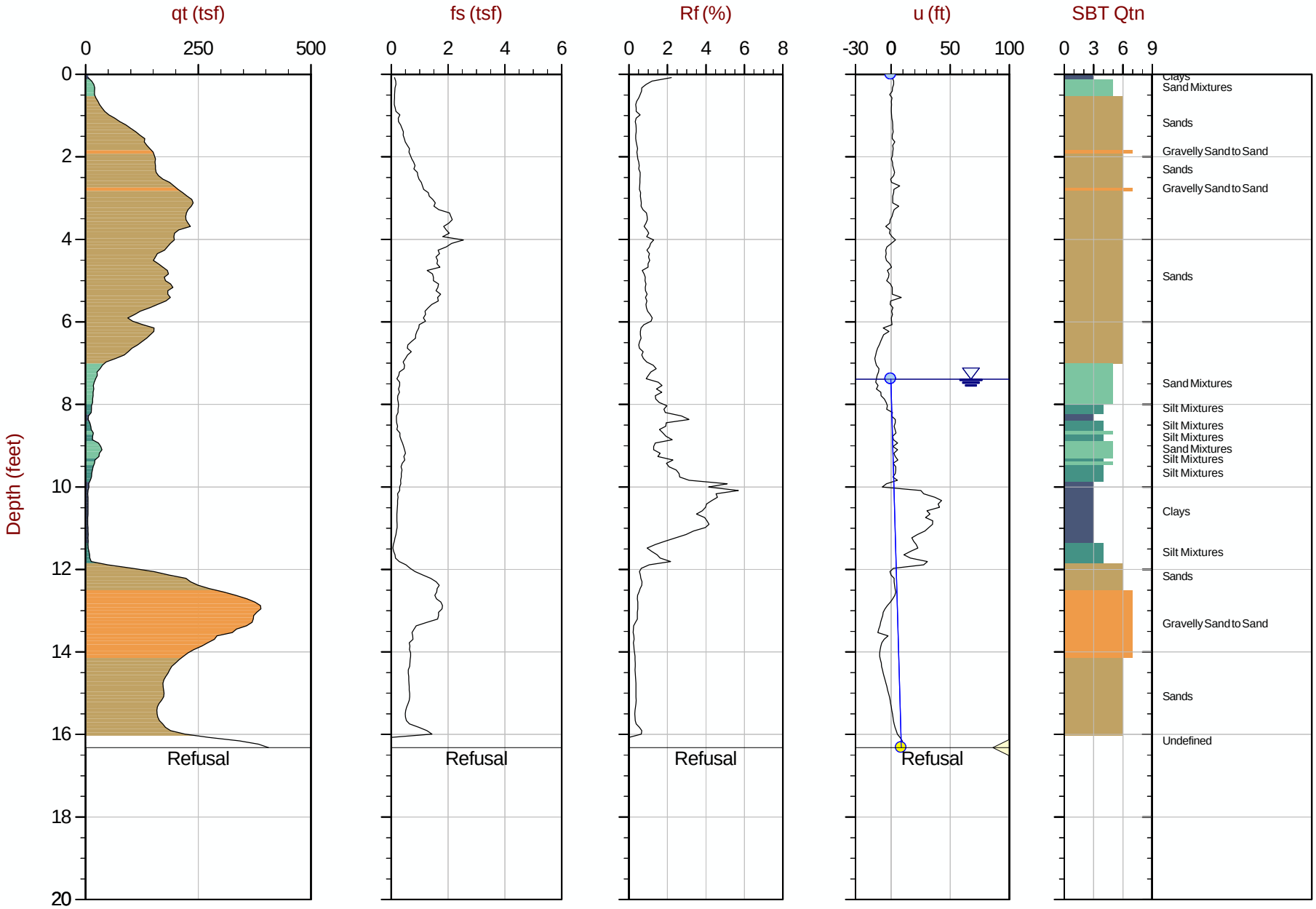
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	107.36	0.20	0.10	21.57
2	3.70	1.60	7.15	109.81	0.20	0.10	22.06
3	4.40	1.60	8.20	110.29	0.20	0.10	22.15
4	5.10	1.60	9.25	100.04	0.20	0.10	20.10
5	5.80	1.60	10.30	90.23	0.20	0.10	18.14
6	6.50	1.60	11.35	81.24	0.20	0.10	16.34
7	7.20	1.60	12.40	74.30	0.20	0.10	14.96
8	7.90	1.60	13.45	76.95	0.20	0.10	15.49
9	8.60	1.60	14.50	100.80	0.20	0.10	20.26
10	9.30	1.60	15.55	121.22	0.20	0.10	24.34
11	10.00	1.60	16.60	121.22	0.20	0.10	24.34
12	10.70	1.60	17.65	121.22	0.20	0.10	24.34
13	11.40	1.60	18.70	121.22	0.20	0.10	24.34
14	12.10	1.60	19.75	121.22	0.20	0.10	24.34
15	12.80	1.60	20.80	121.22	0.20	0.10	24.34

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 13:50
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-DD-8
Cone: 652:T1500F15U35



Max Depth: 4.975 m / 16.32 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPDD-8.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6239 Long: -70.9180

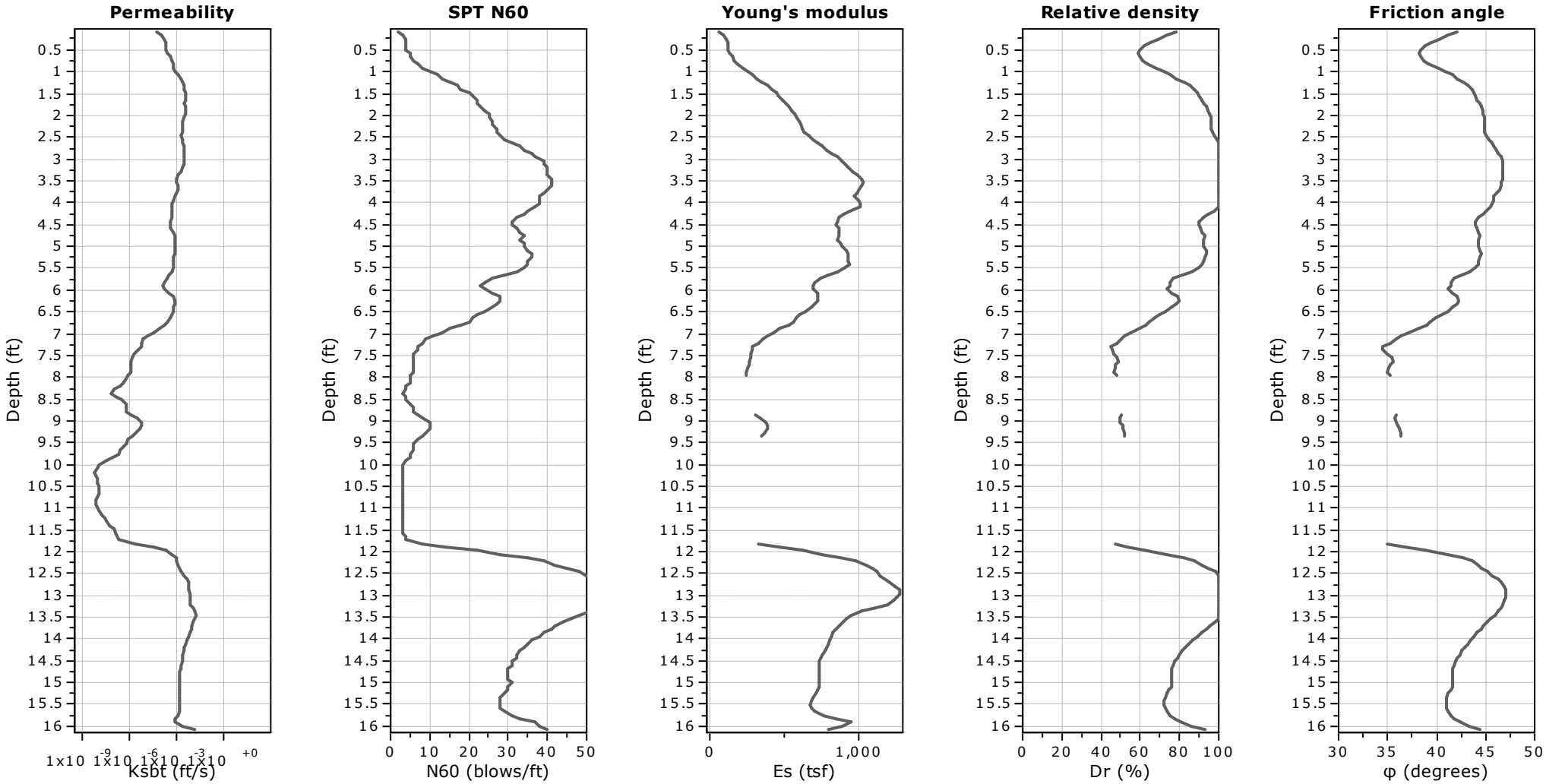
Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

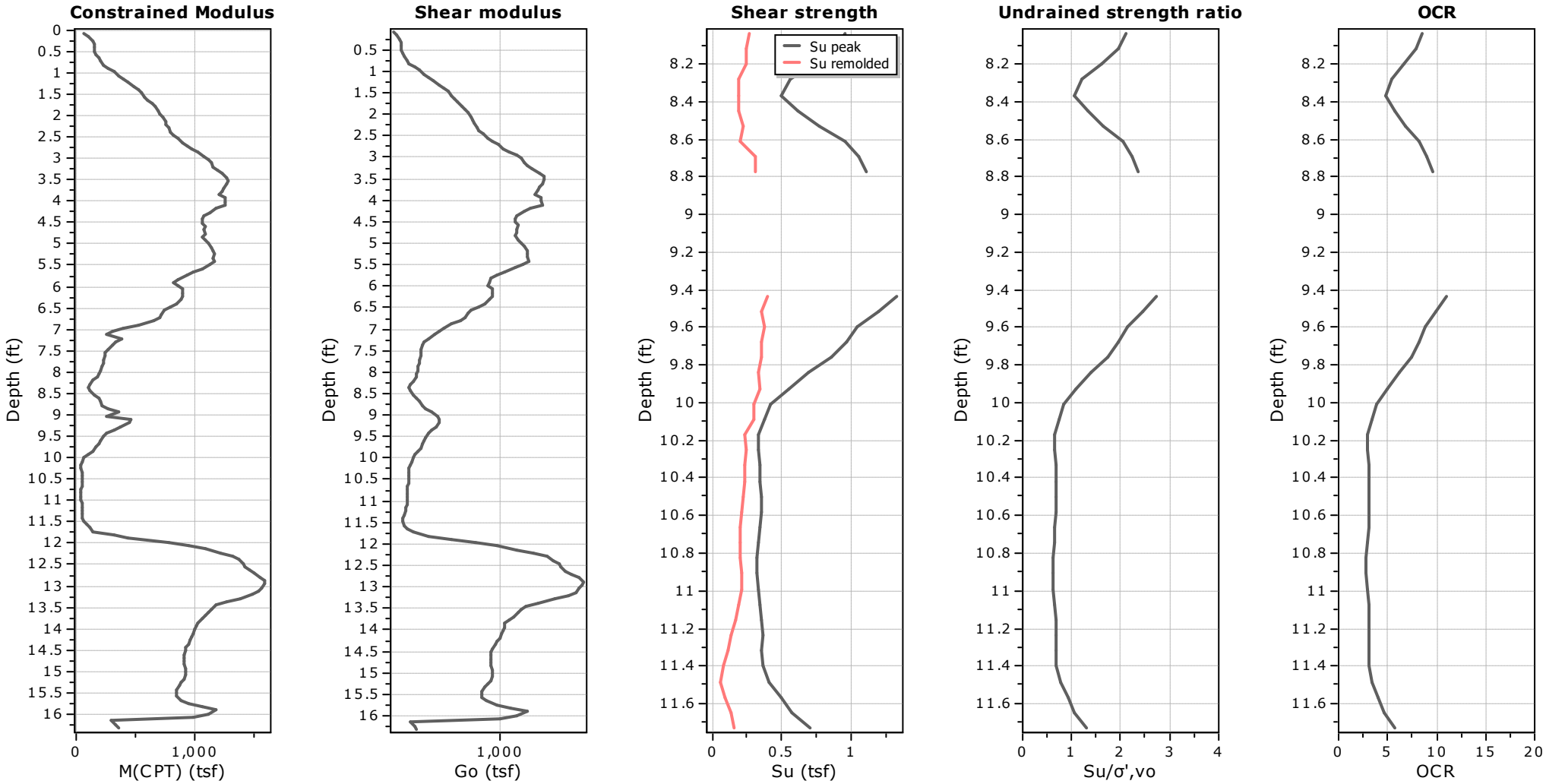
CPT: DD-8
Total depth: 16.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

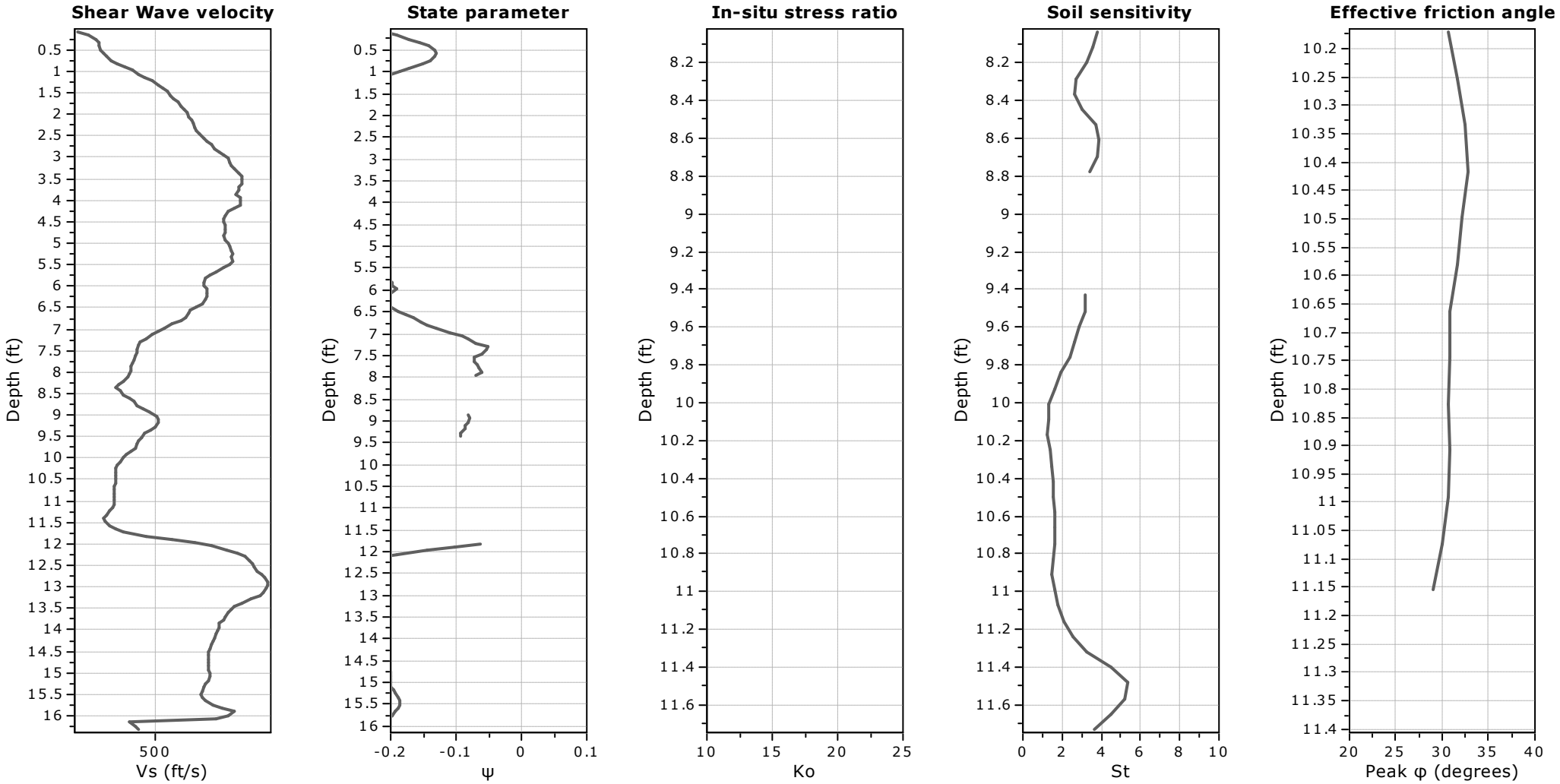
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-8
Total depth: 16.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



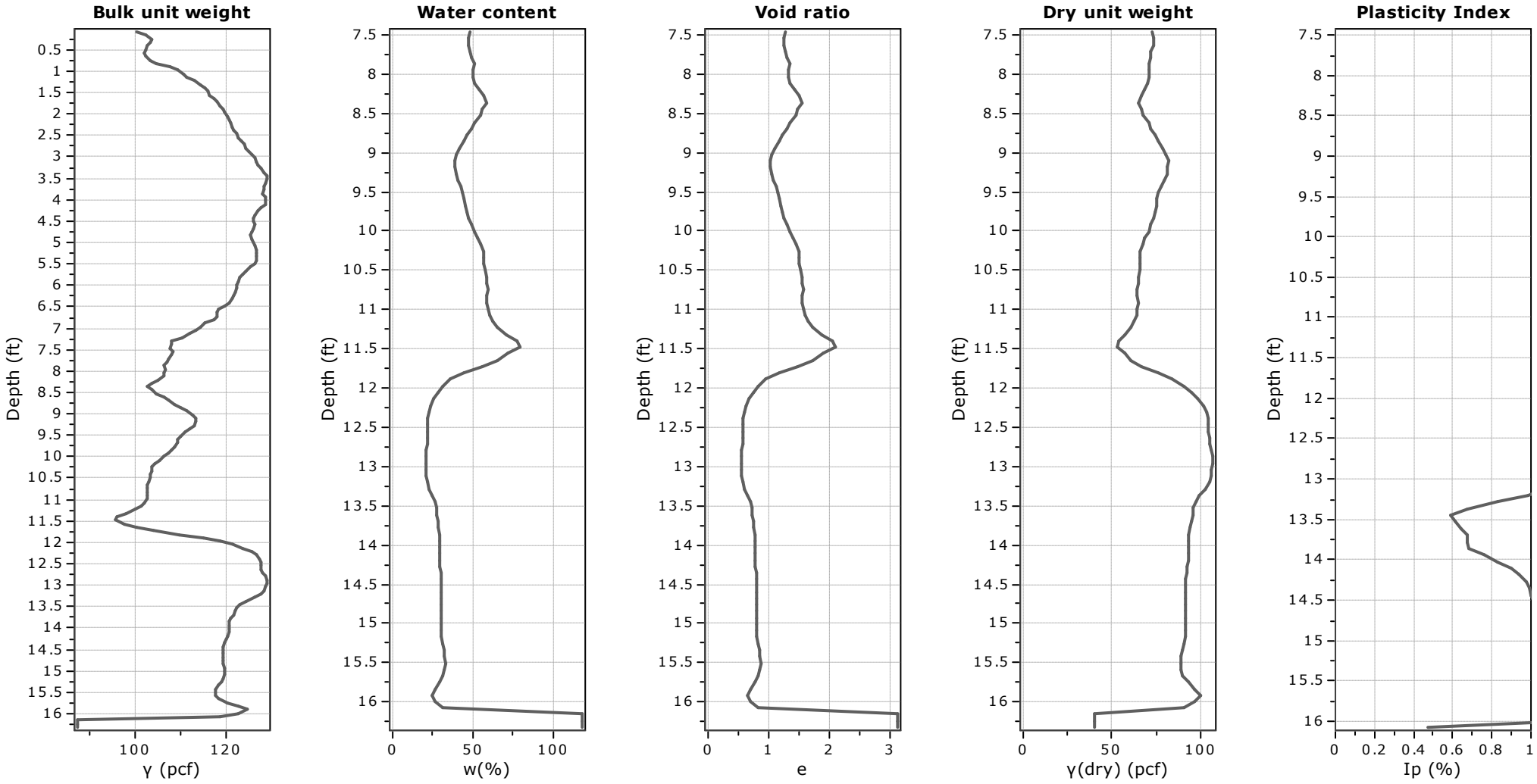
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-8
Total depth: 16.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

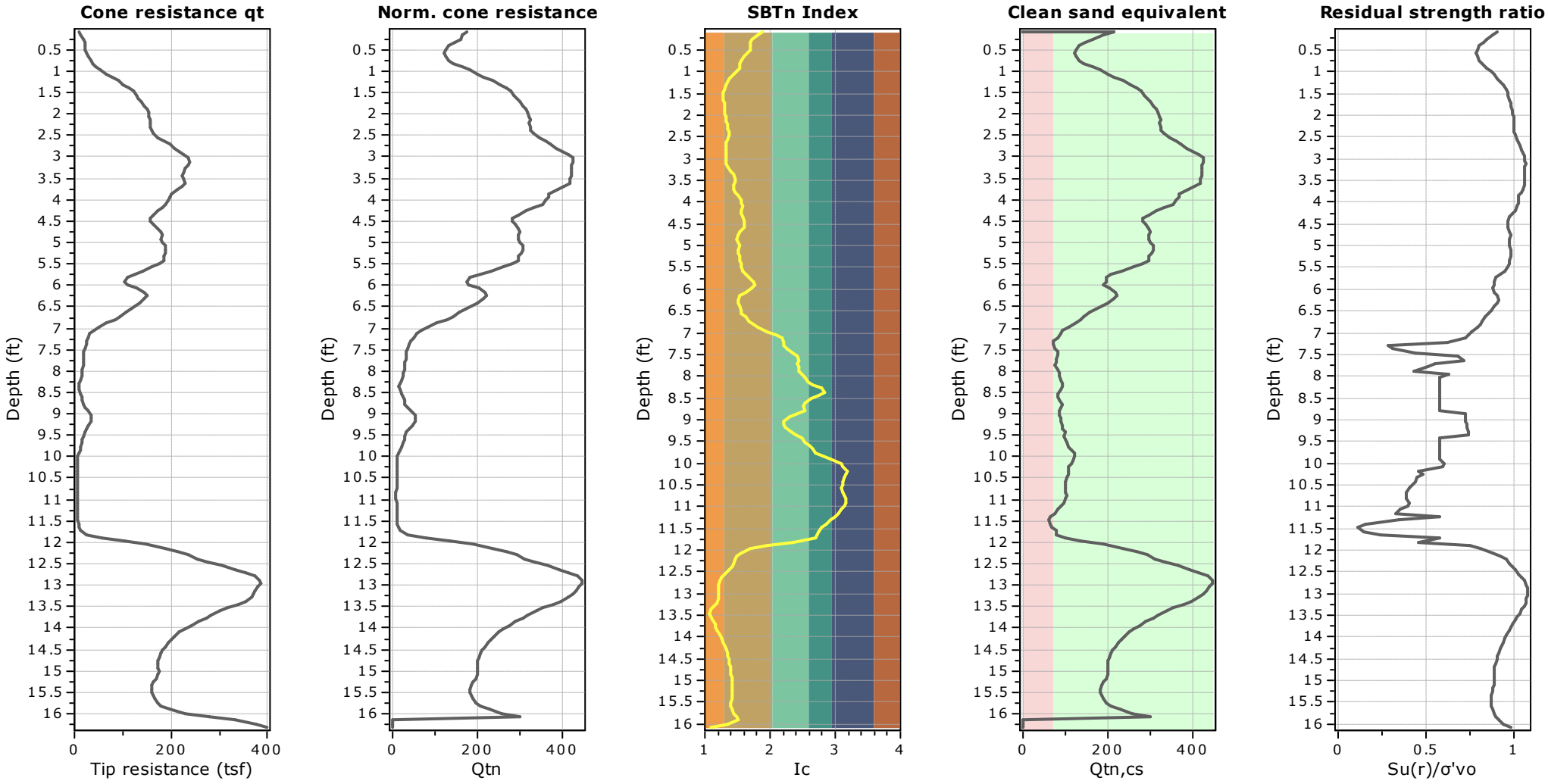
Project:
Location:

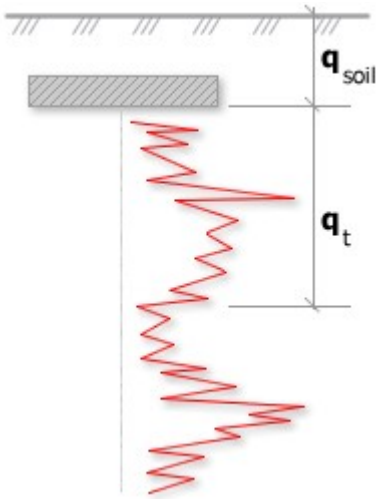


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: DD-8
Total depth: 16.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

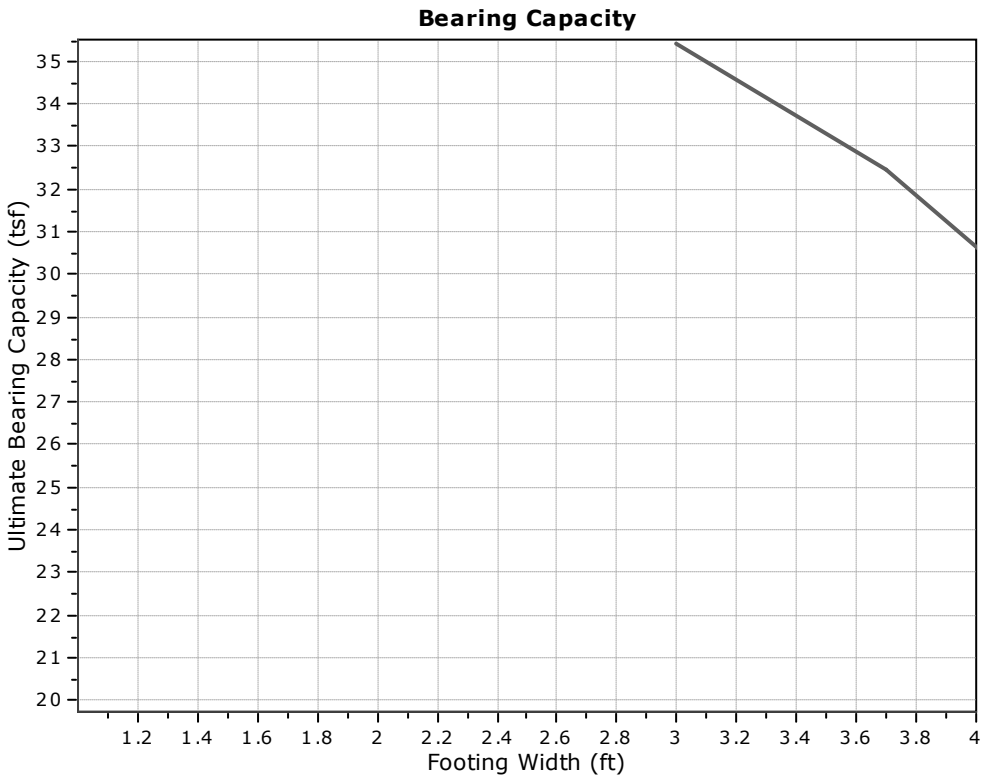




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

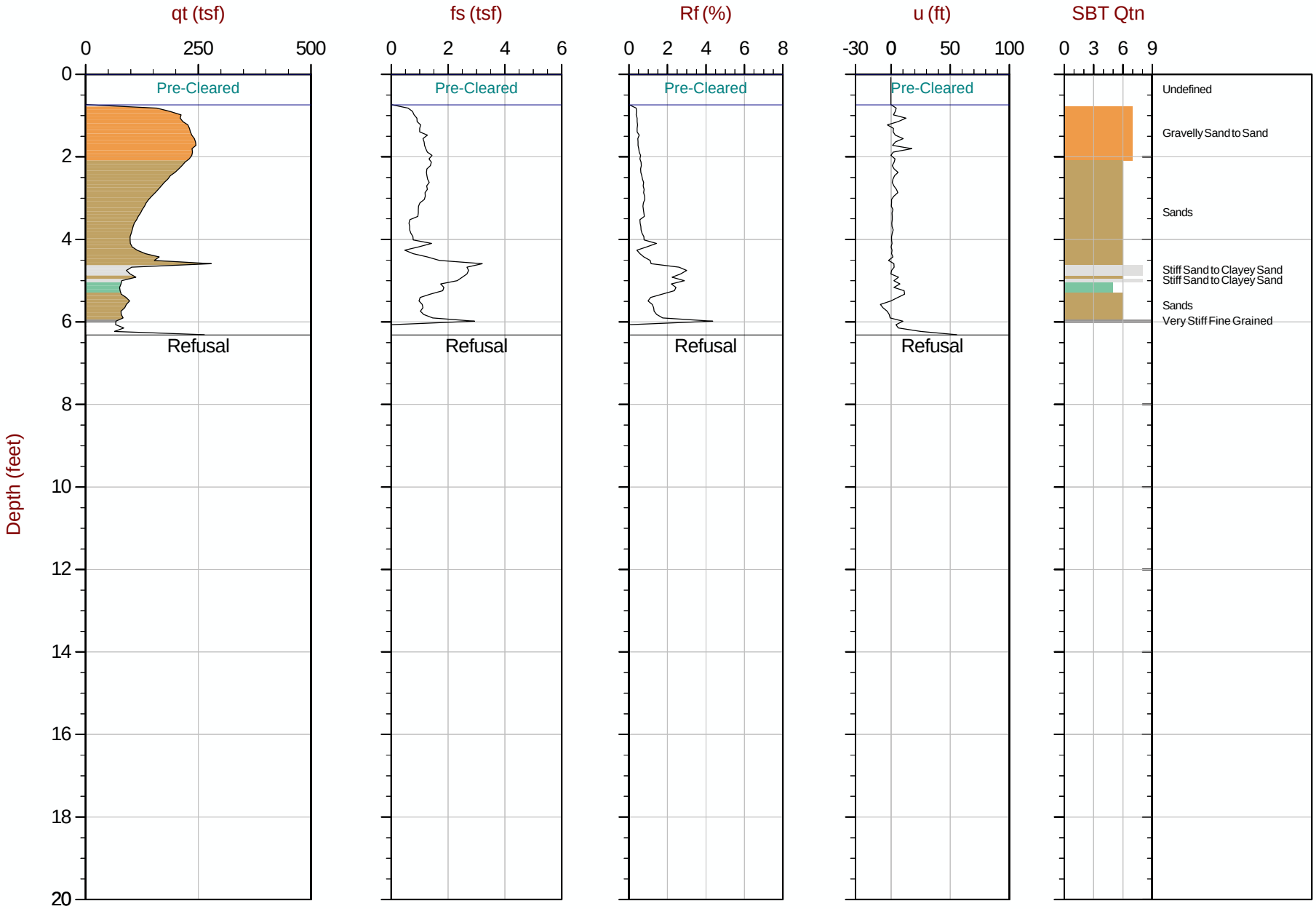
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	176.55	0.20	0.10	35.41
2	3.70	1.60	7.15	161.83	0.20	0.10	32.46
3	4.40	1.60	8.20	140.61	0.20	0.10	28.22
4	5.10	1.60	9.25	123.69	0.20	0.10	24.83
5	5.80	1.60	10.30	110.25	0.20	0.10	22.15
6	6.50	1.60	11.35	98.89	0.20	0.10	19.87
7	7.20	1.60	12.40	98.67	0.20	0.10	19.83
8	7.90	1.60	13.45	119.91	0.20	0.10	24.08
9	8.60	1.60	14.50	130.57	0.20	0.10	26.21
10	9.30	1.60	15.55	133.57	0.20	0.10	26.81
11	10.00	1.60	16.60	138.50	0.20	0.10	27.80
12	10.70	1.60	17.65	138.50	0.20	0.10	27.80
13	11.40	1.60	18.70	138.50	0.20	0.10	27.80
14	12.10	1.60	19.75	138.50	0.20	0.10	27.80
15	12.80	1.60	20.80	138.50	0.20	0.10	27.80

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 11:51
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-E-7
Cone: 652:T1500F15U35



Max Depth: 1.925 m / 6.32 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPE-7.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6240 Long: -70.9172

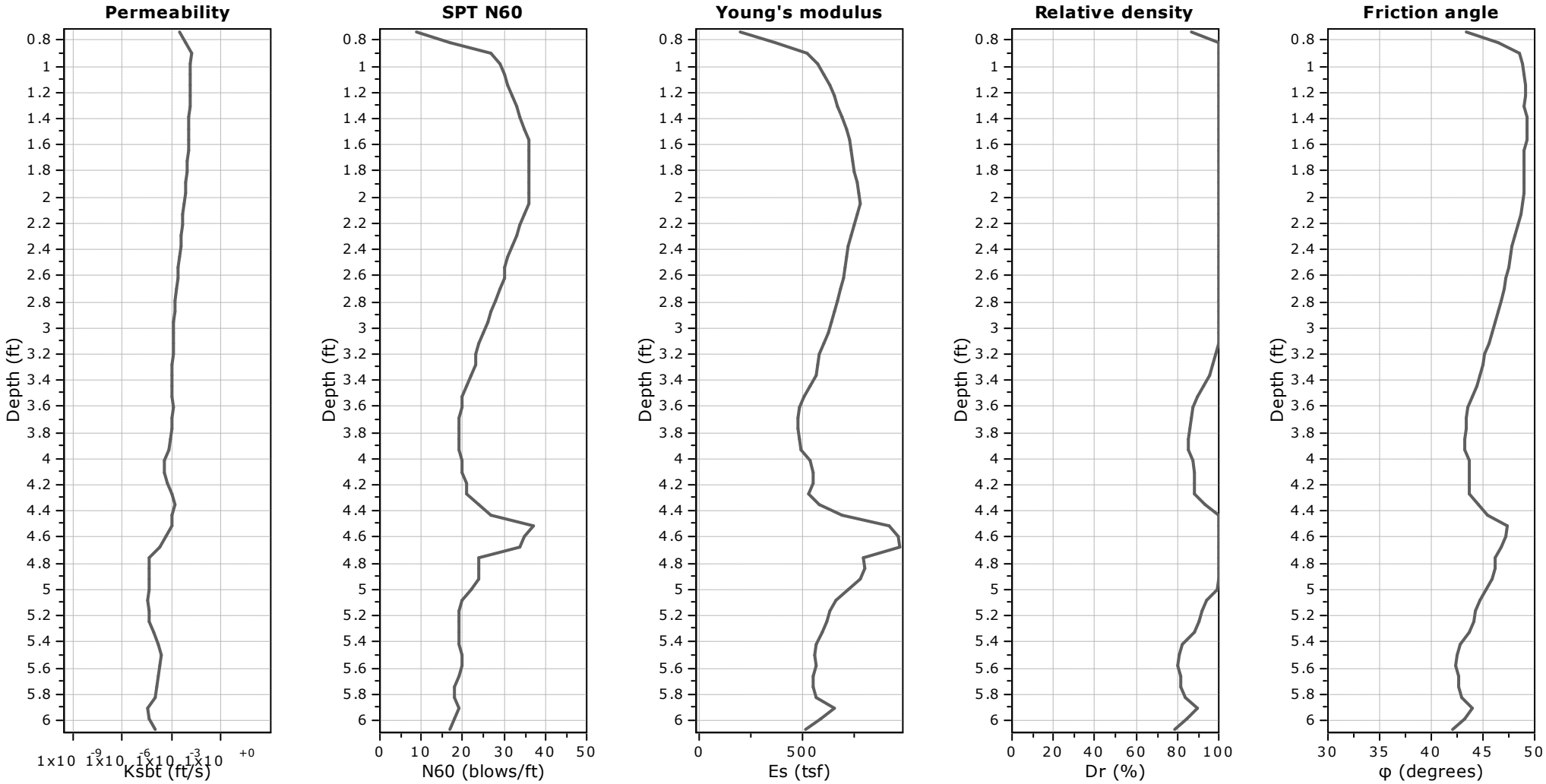
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

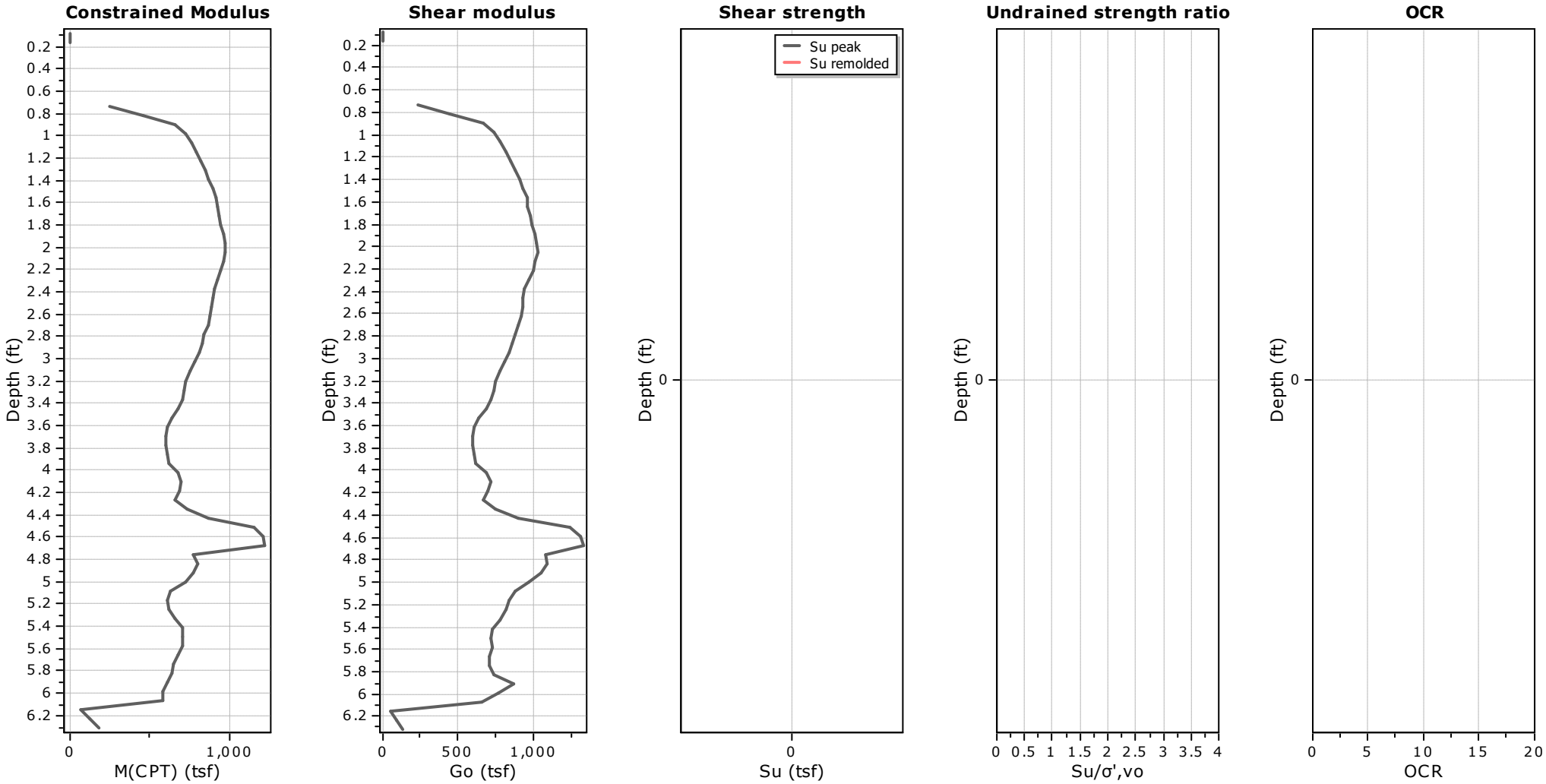
CPT: E-7
Total depth: 6.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



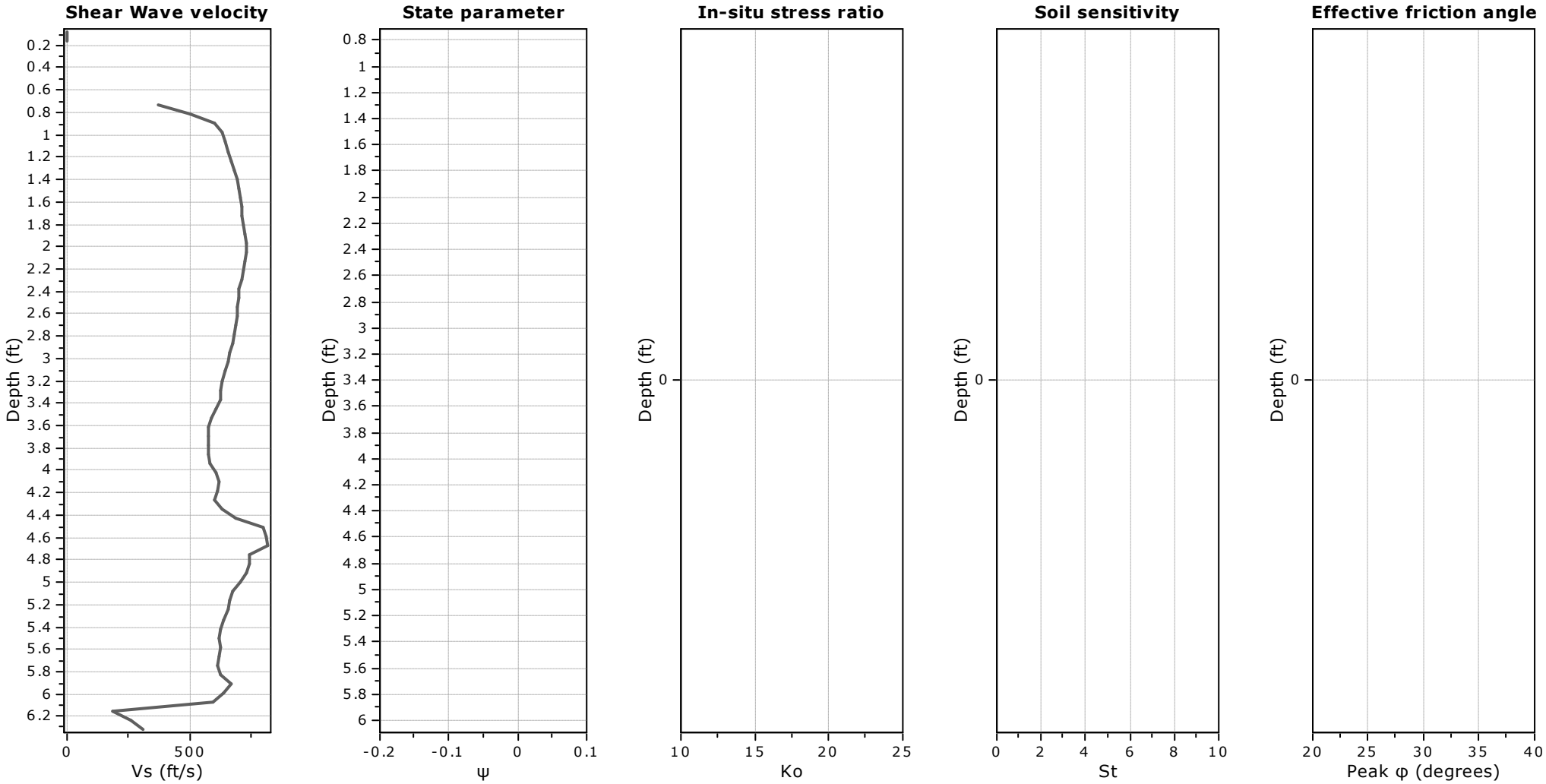
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

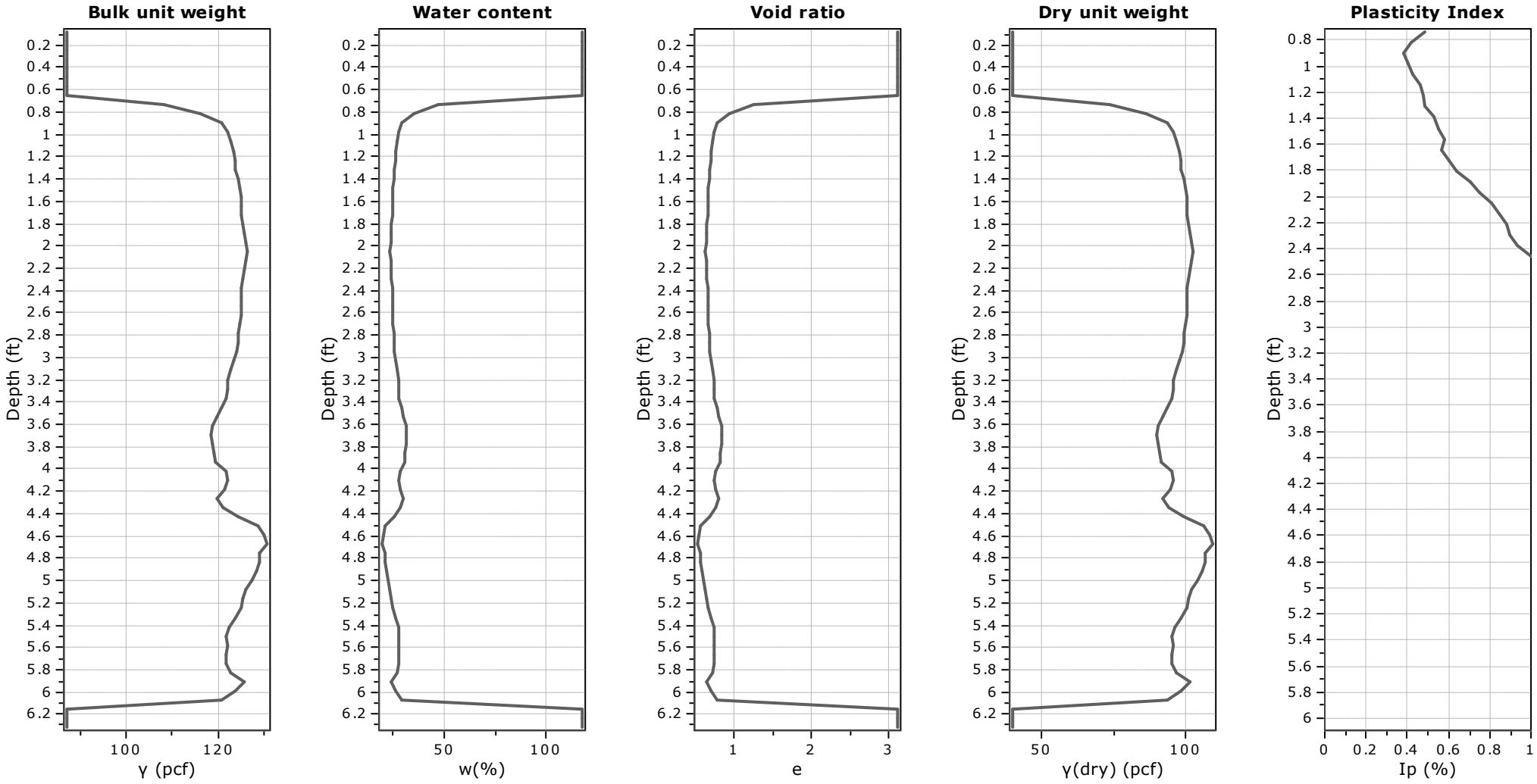


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: E-7
Total depth: 6.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
Geotechnical Engineers
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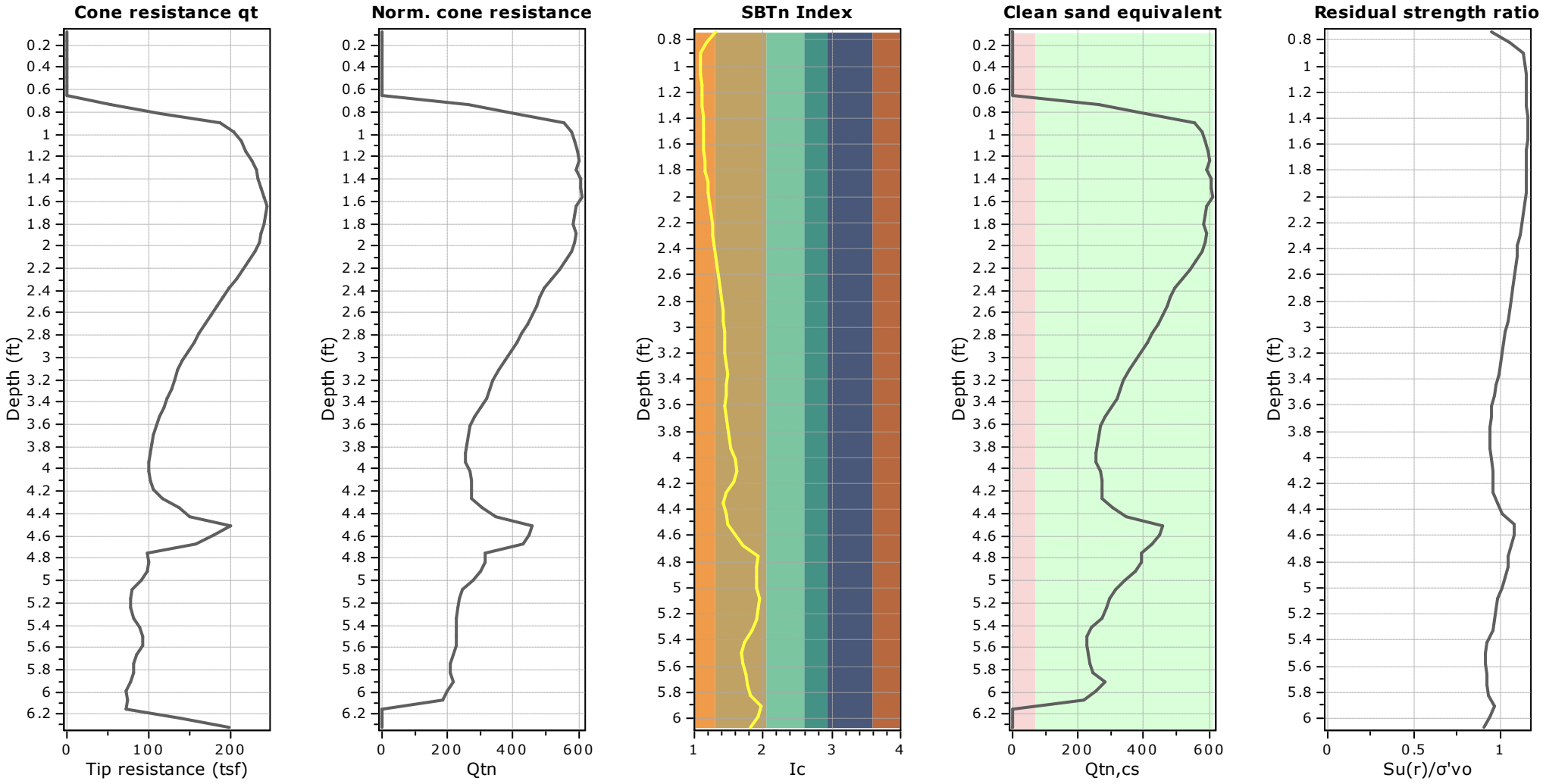
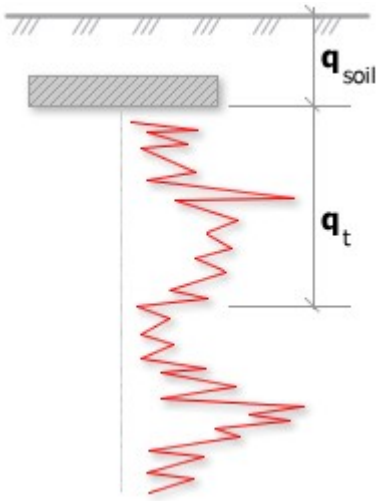
http://www.geologismiki.gr

CPT: E-7
Total depth: 6.32 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

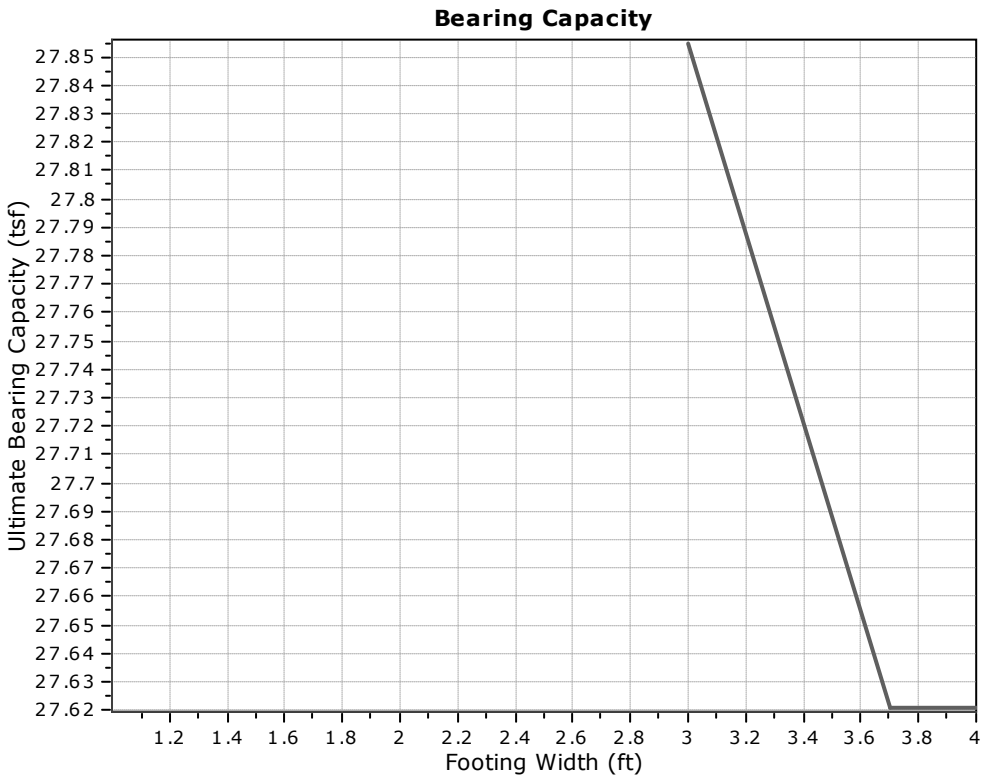




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

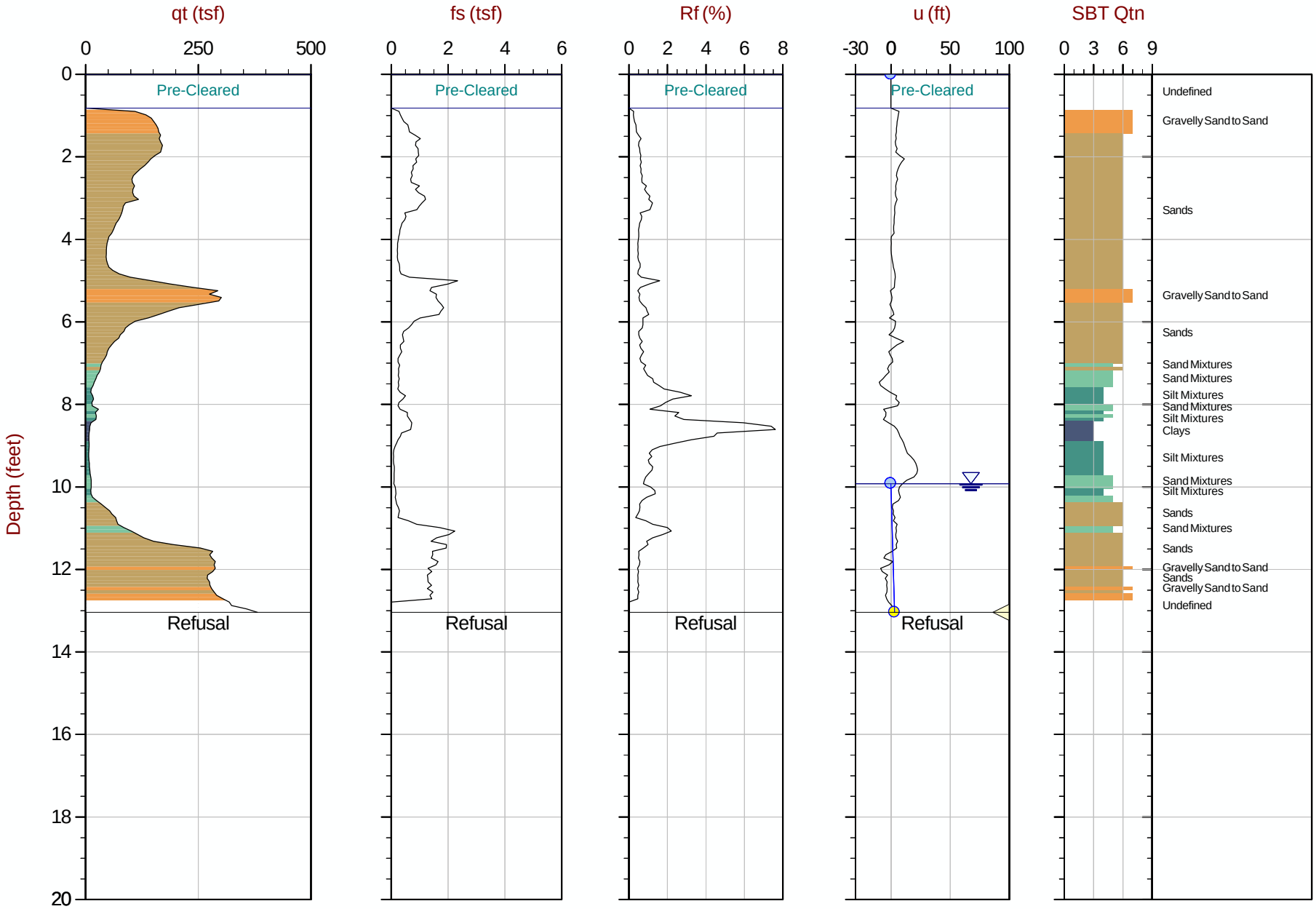
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	138.79	0.20	0.10	27.85
2	3.70	1.60	7.15	137.62	0.20	0.10	27.62
3	4.40	1.60	8.20	137.62	0.20	0.10	27.62
4	5.10	1.60	9.25	137.62	0.20	0.10	27.62
5	5.80	1.60	10.30	137.62	0.20	0.10	27.62
6	6.50	1.60	11.35	137.62	0.20	0.10	27.62
7	7.20	1.60	12.40	137.62	0.20	0.10	27.62
8	7.90	1.60	13.45	137.62	0.20	0.10	27.62
9	8.60	1.60	14.50	137.62	0.20	0.10	27.62
10	9.30	1.60	15.55	137.62	0.20	0.10	27.62
11	10.00	1.60	16.60	137.62	0.20	0.10	27.62
12	10.70	1.60	17.65	137.62	0.20	0.10	27.62
13	11.40	1.60	18.70	137.62	0.20	0.10	27.62
14	12.10	1.60	19.75	137.62	0.20	0.10	27.62
15	12.80	1.60	20.80	137.62	0.20	0.10	27.62

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 09:00
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-EE-4
Cone: 652:T1500F15U35



Max Depth: 3.975 m / 13.04 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPEE-4.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9180

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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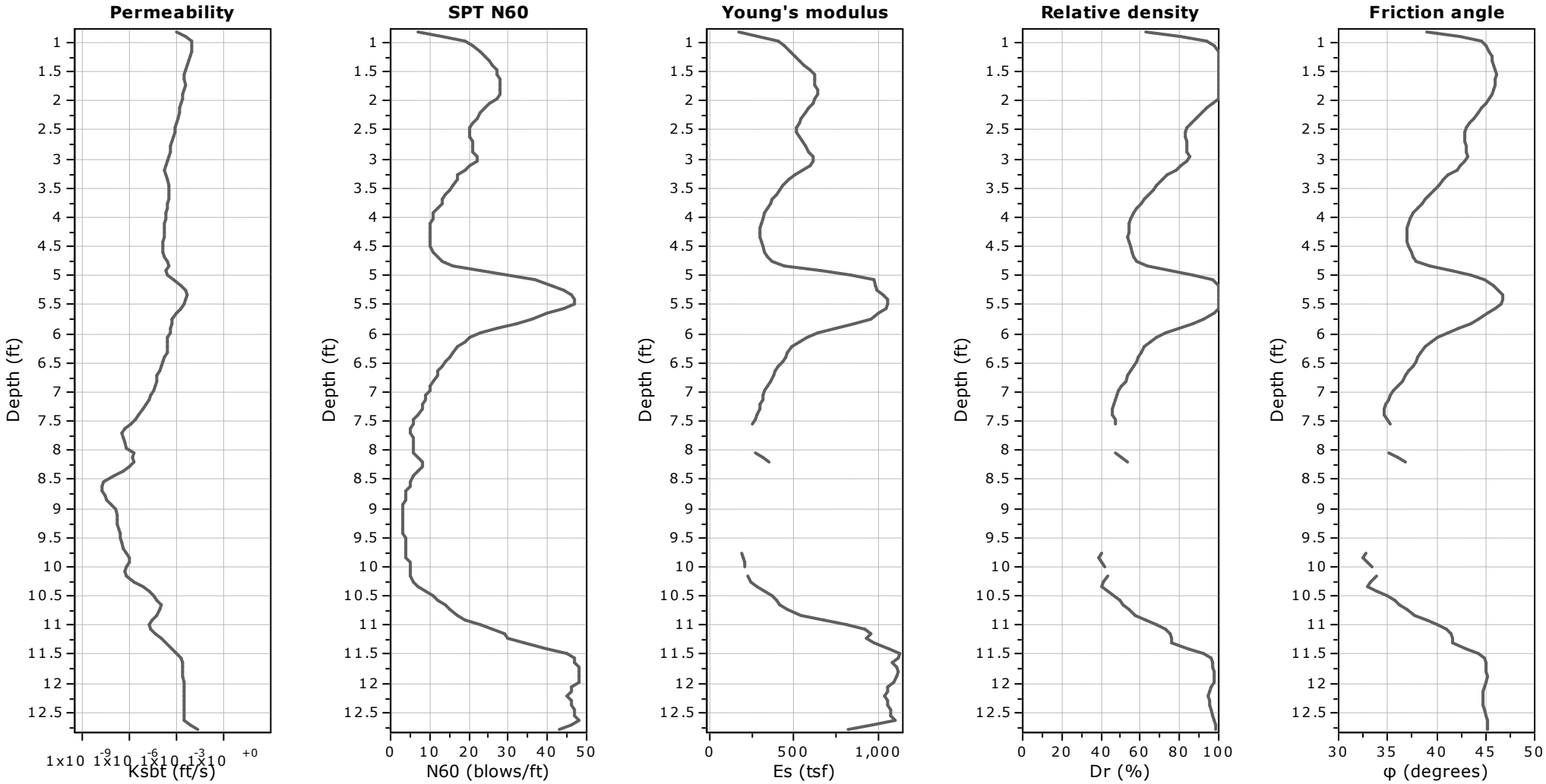
http://www.geologismiki.gr

CPT: EE-4
Total depth: 13.04 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



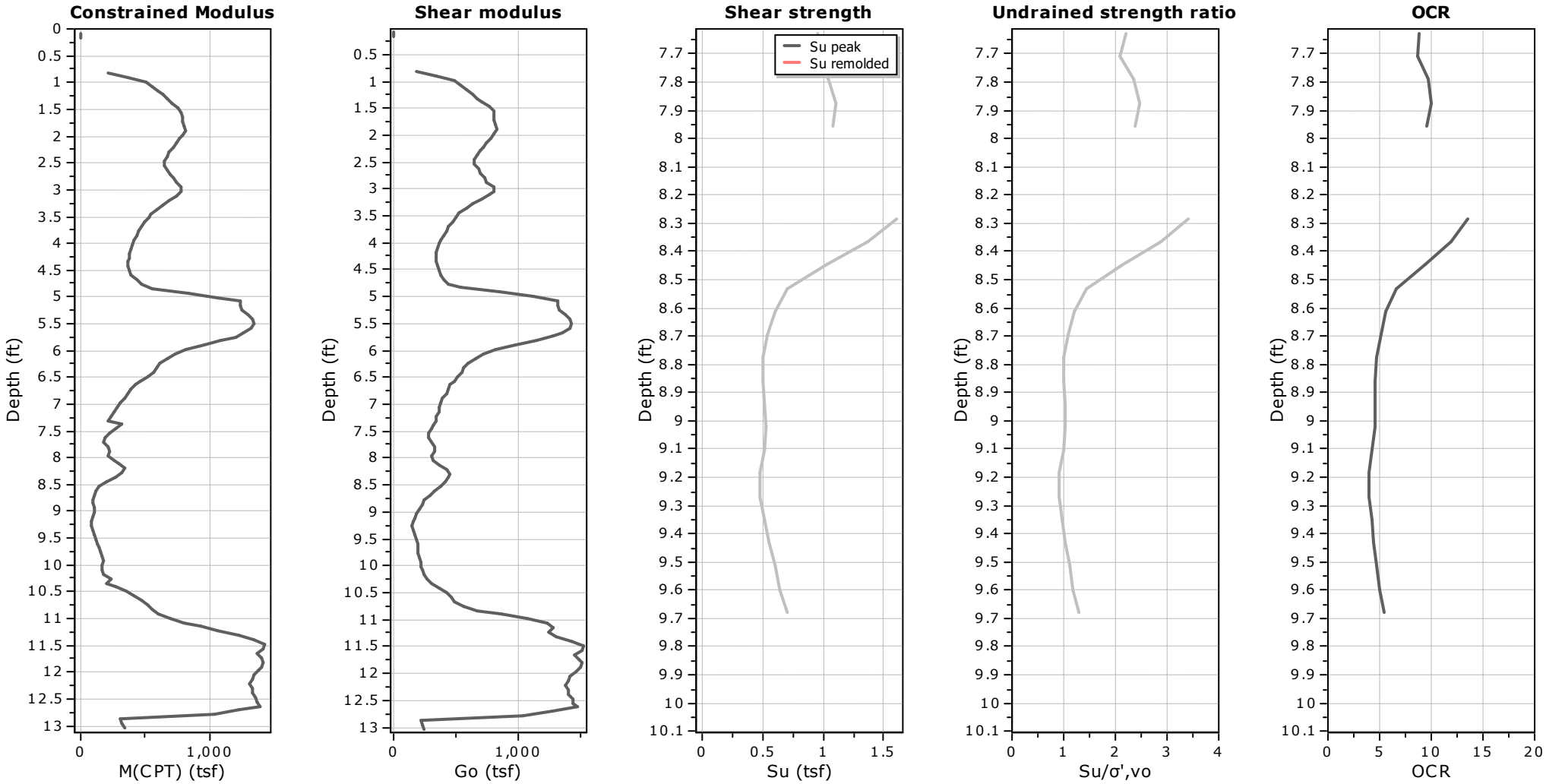
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: EE-4
Total depth: 13.04 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

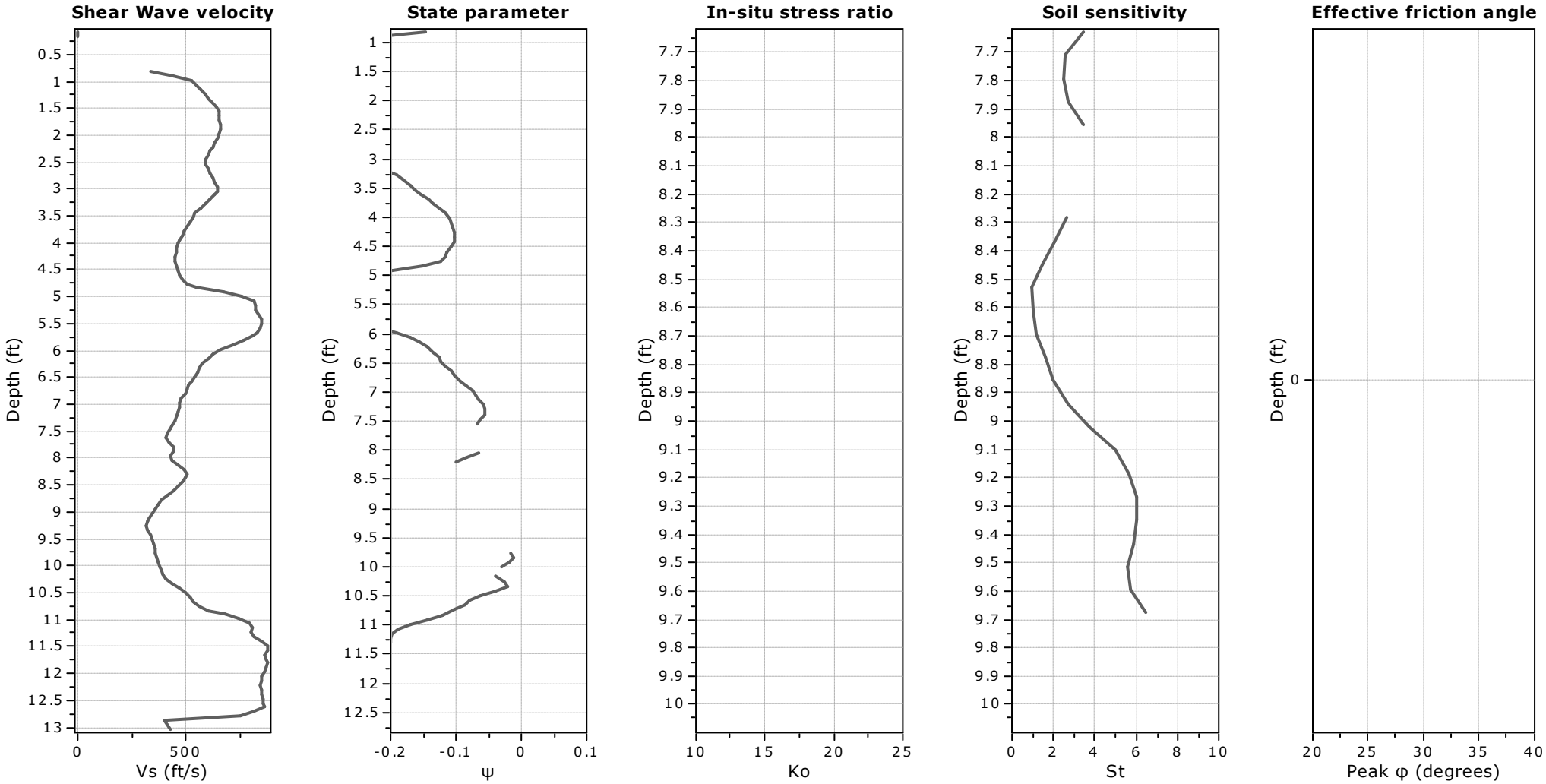
Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
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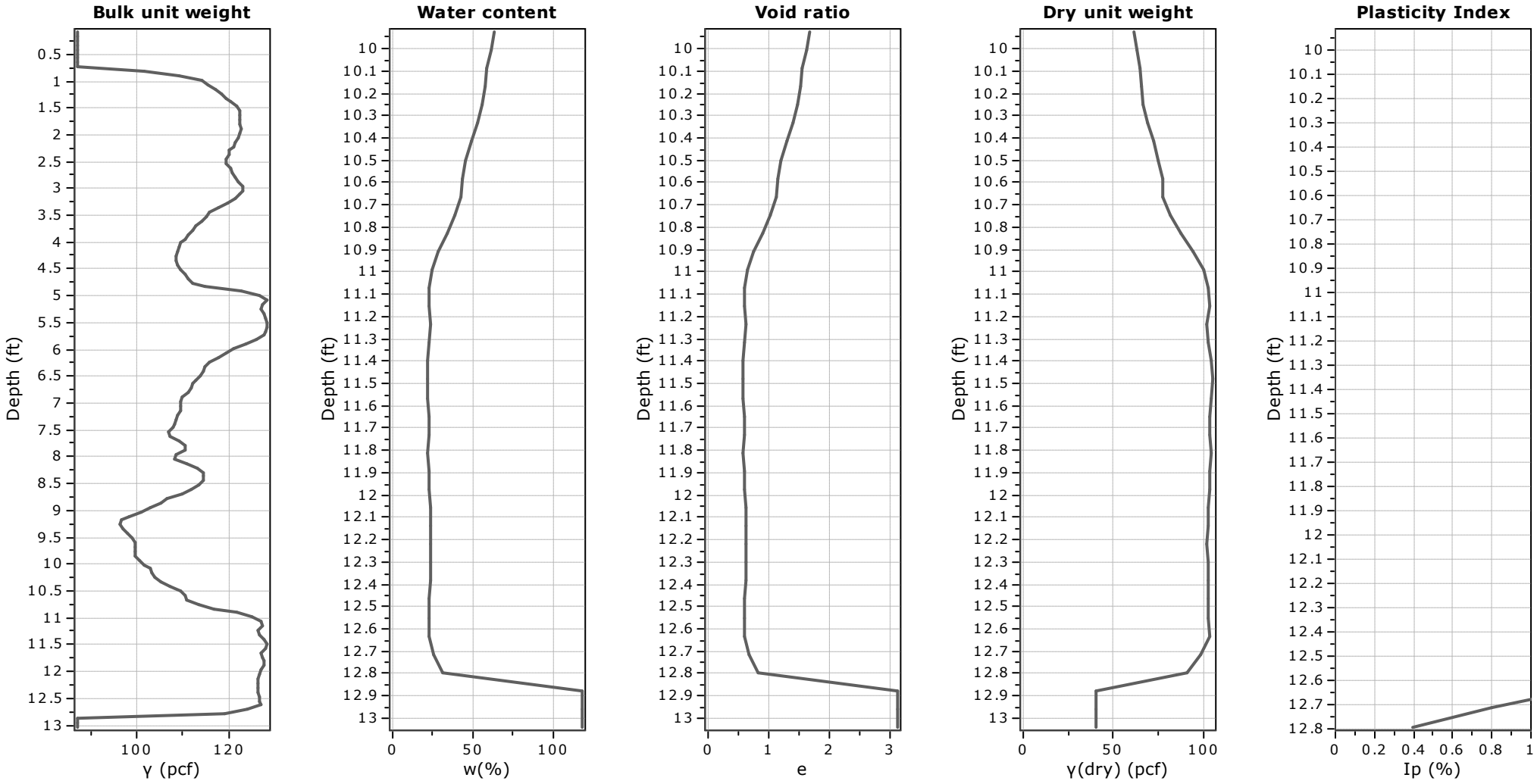
http://www.geologismiki.gr

CPT: EE-4
Total depth: 13.04 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
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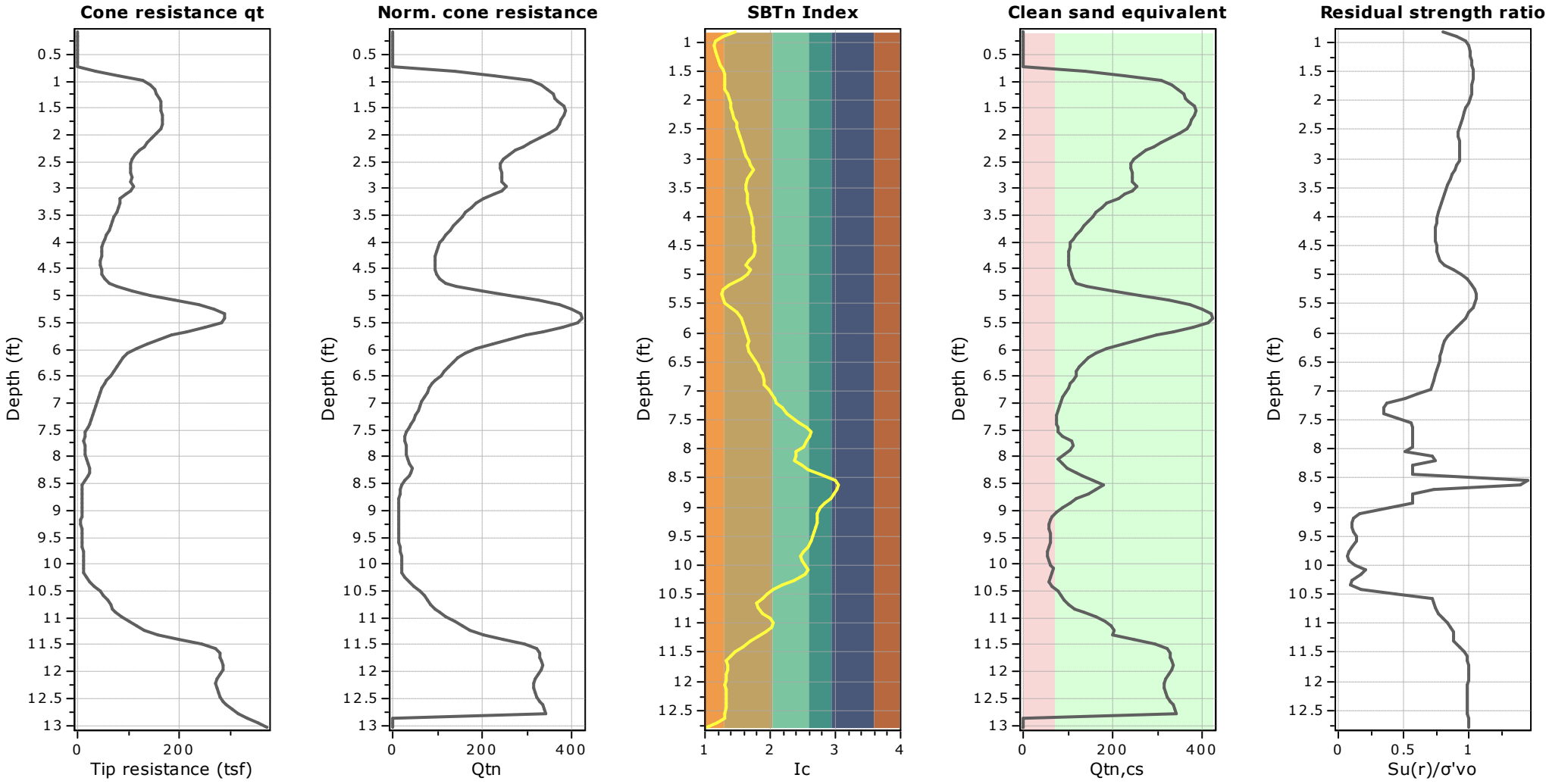
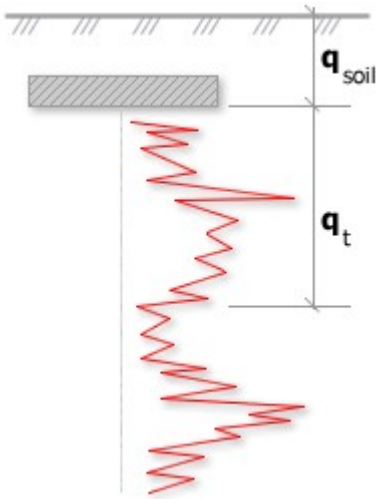
http://www.geologismiki.gr

CPT: EE-4
Total depth: 13.04 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

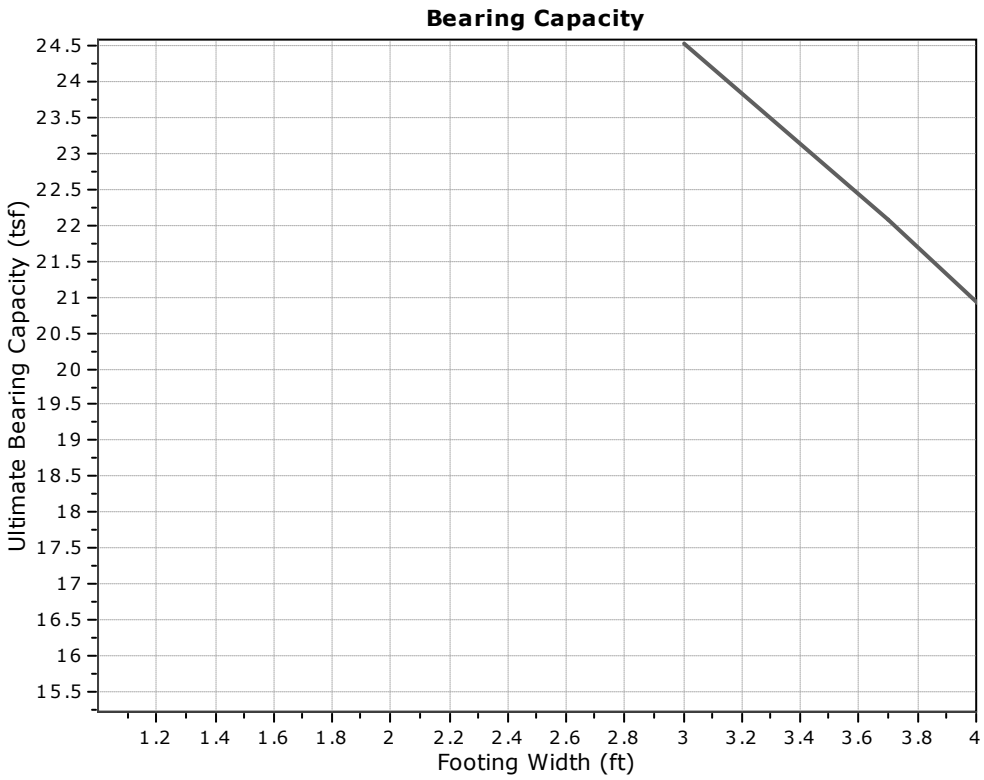




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

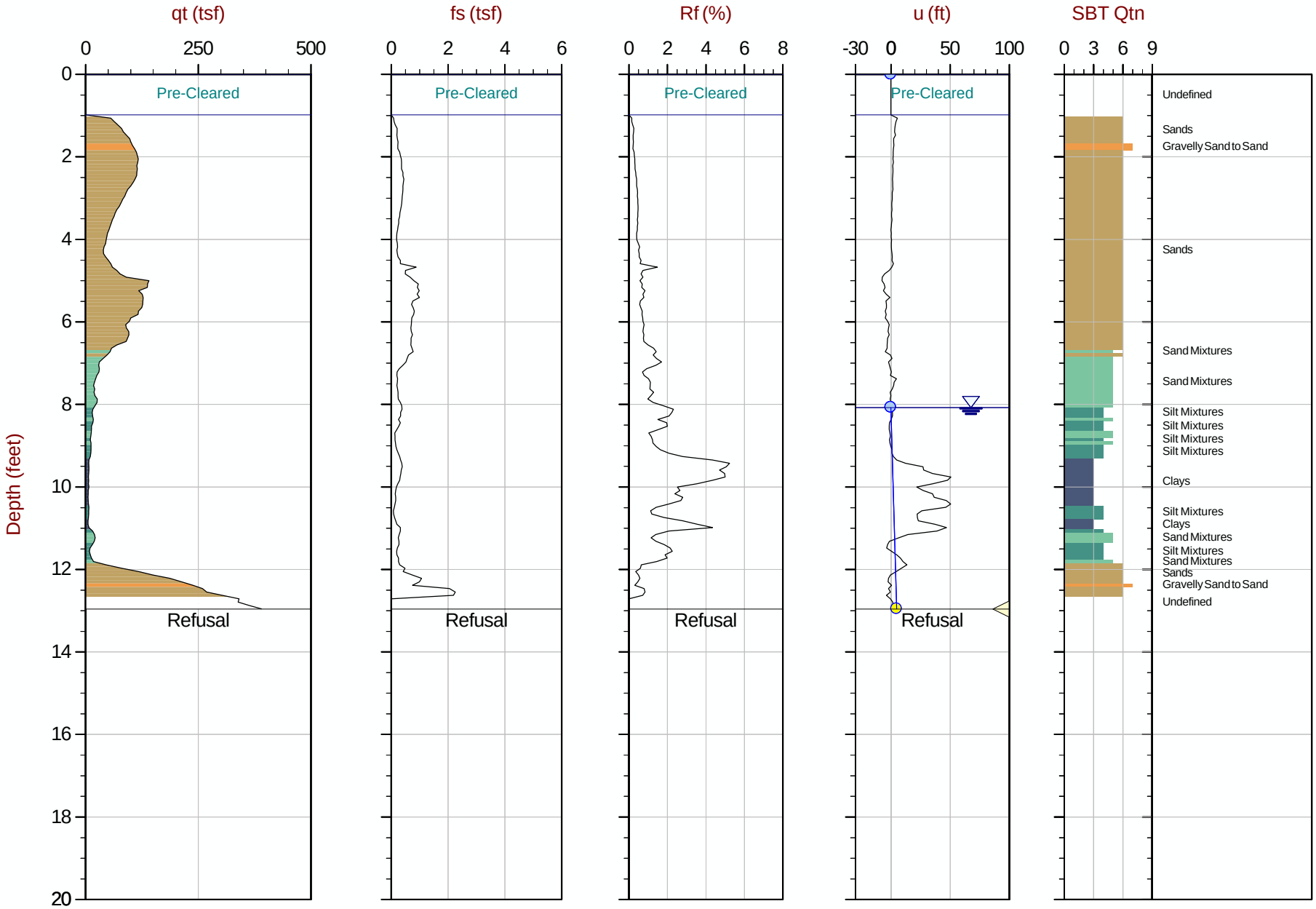
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	122.22	0.20	0.10	24.54
2	3.70	1.60	7.15	109.96	0.20	0.10	22.09
3	4.40	1.60	8.20	96.50	0.20	0.10	19.40
4	5.10	1.60	9.25	84.81	0.20	0.10	17.06
5	5.80	1.60	10.30	75.86	0.20	0.10	15.27
6	6.50	1.60	11.35	76.11	0.20	0.10	15.32
7	7.20	1.60	12.40	95.07	0.20	0.10	19.11
8	7.90	1.60	13.45	105.81	0.20	0.10	21.26
9	8.60	1.60	14.50	105.81	0.20	0.10	21.26
10	9.30	1.60	15.55	105.81	0.20	0.10	21.26
11	10.00	1.60	16.60	105.81	0.20	0.10	21.26
12	10.70	1.60	17.65	105.81	0.20	0.10	21.26
13	11.40	1.60	18.70	105.81	0.20	0.10	21.26
14	12.10	1.60	19.75	105.81	0.20	0.10	21.26
15	12.80	1.60	20.80	105.81	0.20	0.10	21.26

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 12:28
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-EE-6
Cone: 652:T1500F15U35



Max Depth: 3.950 m / 12.96 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPEE-6.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6237 Long: -70.9181

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
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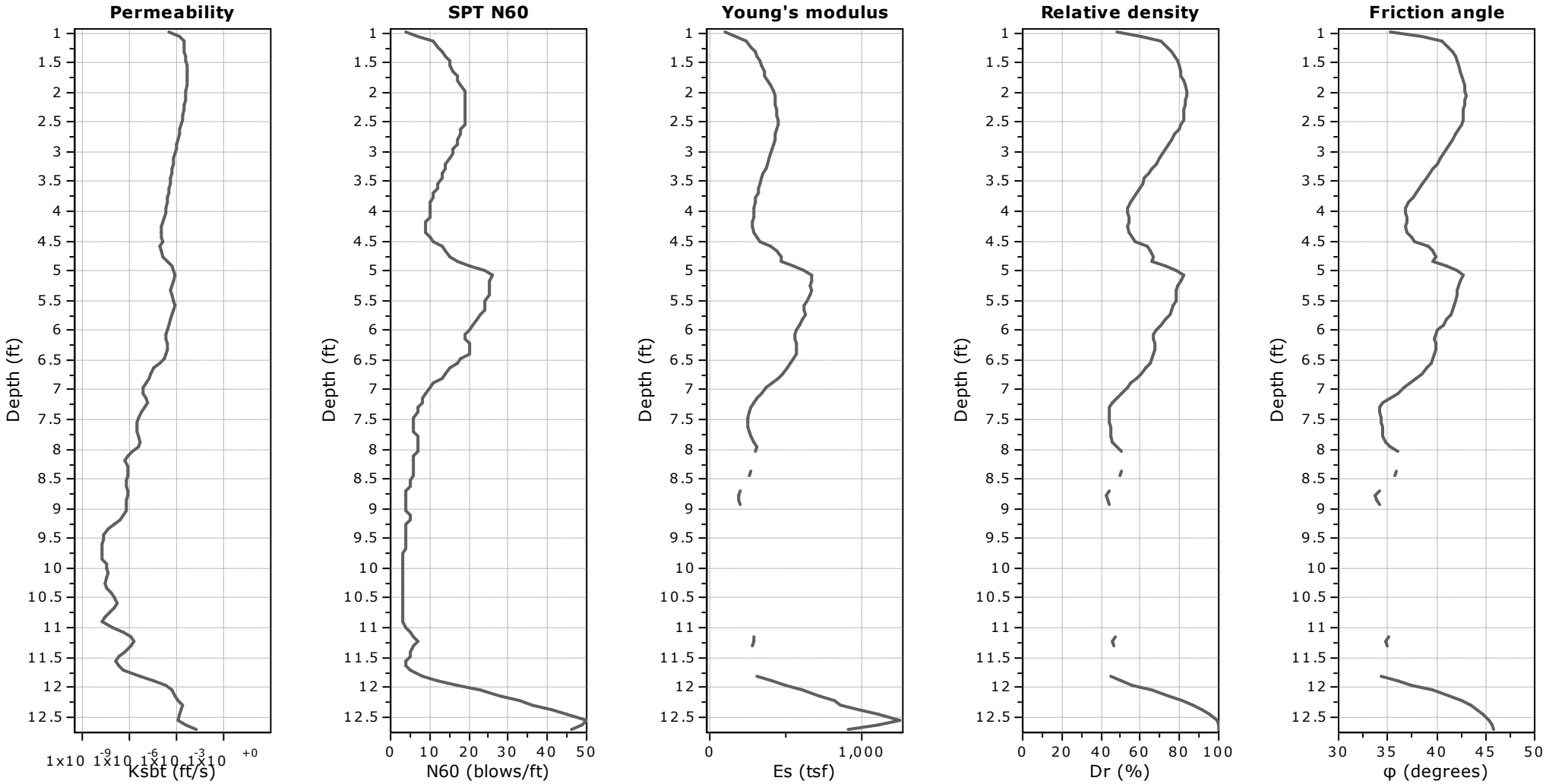
http://www.geologismiki.gr

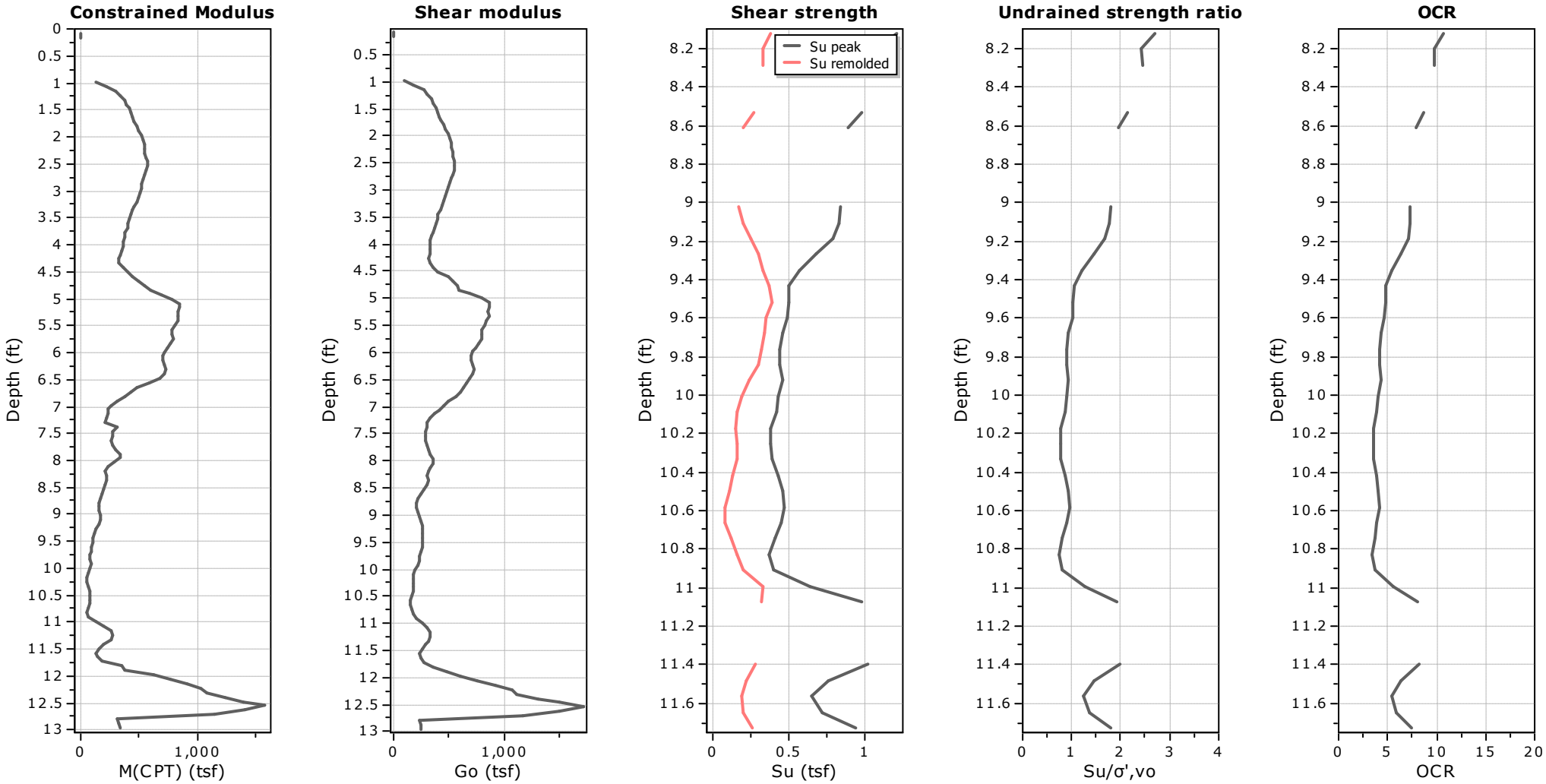
CPT: EE-6
Total depth: 12.96 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

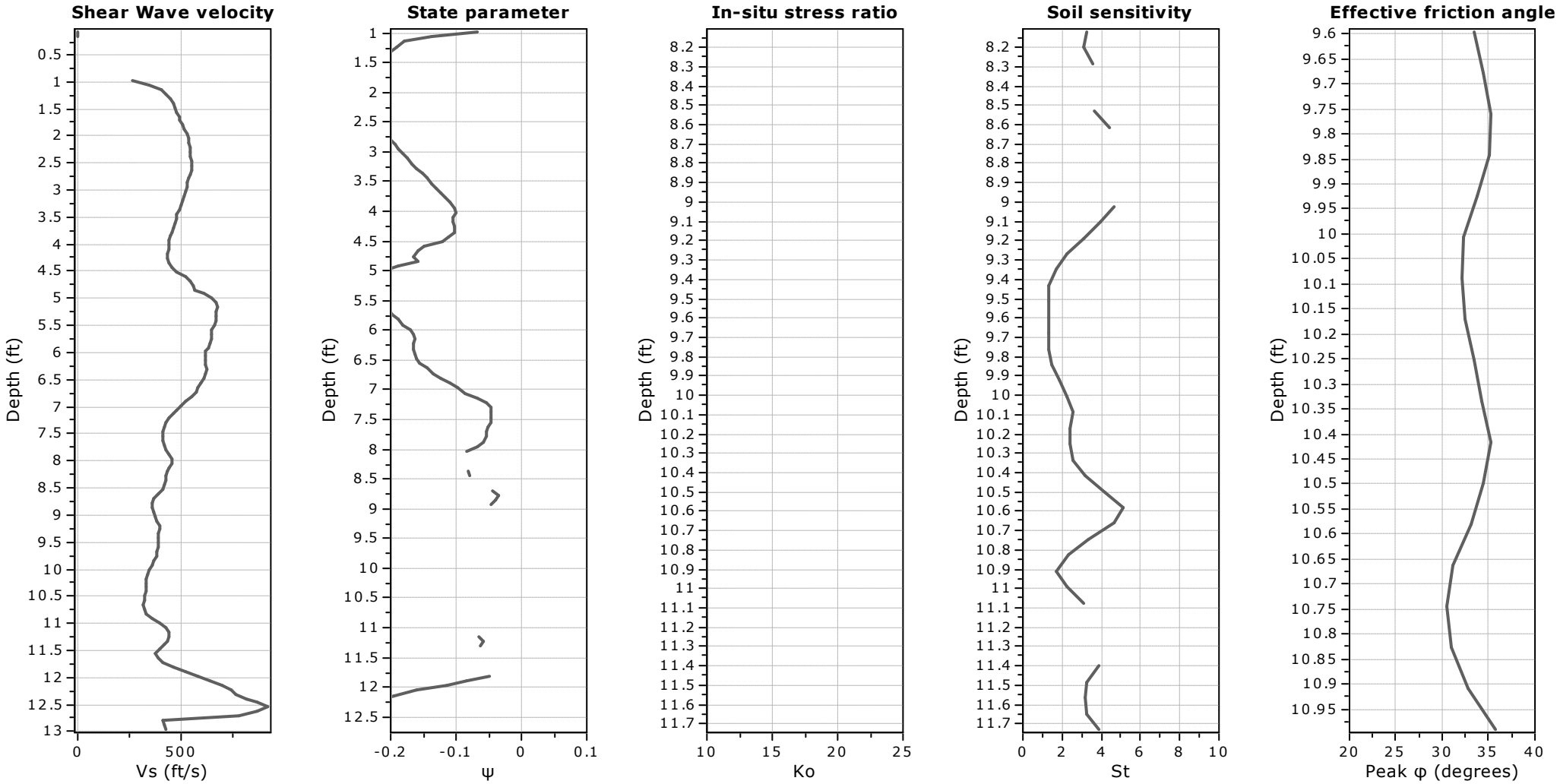
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

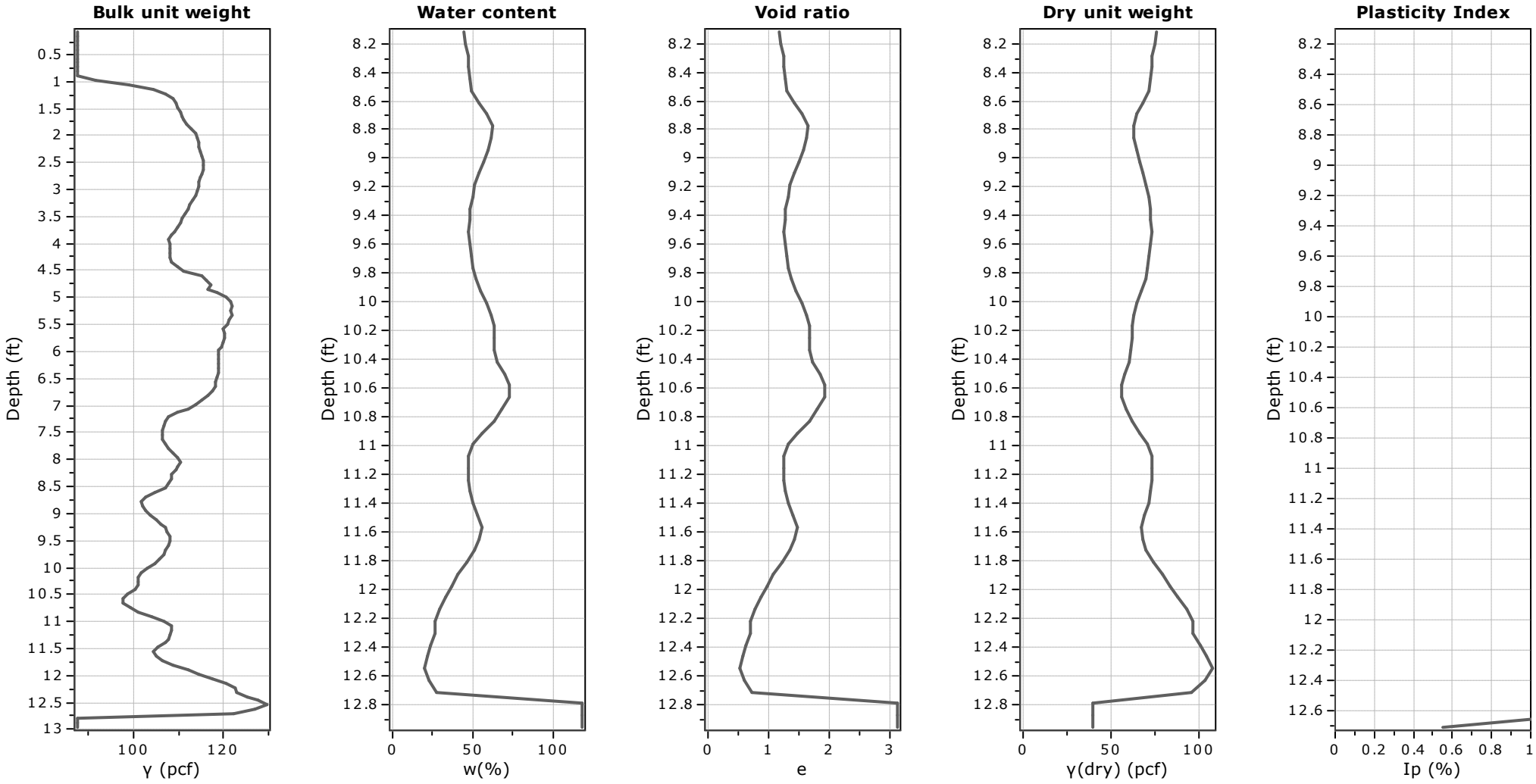
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00


Bulk unit weight
Water content
Void ratio
Dry unit weight
Plasticity Index
Depth (ft)
γ (pcf)
w(%)
e
γ(dry) (pcf)
Ip (%)

GeoLogismiki
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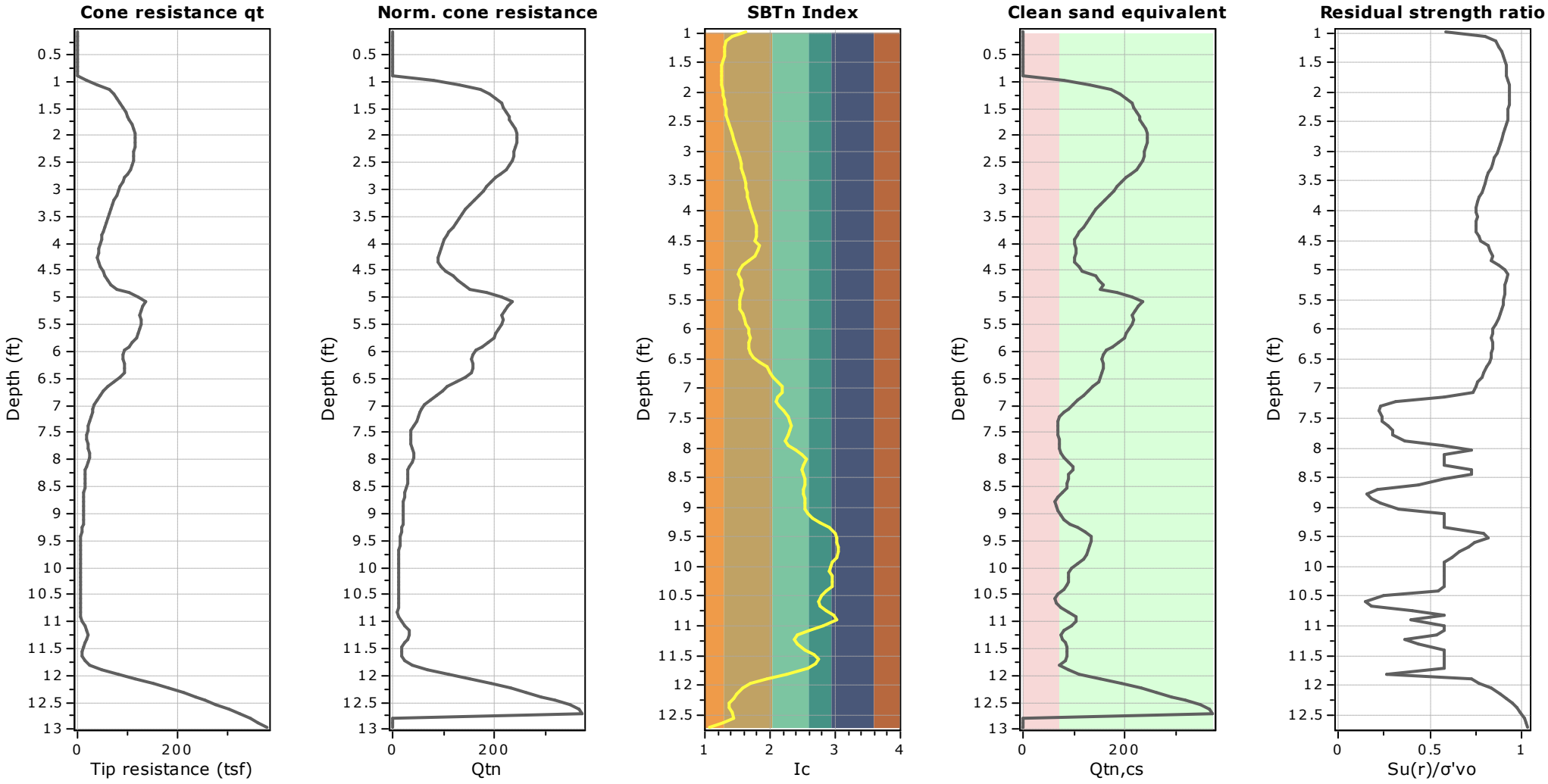
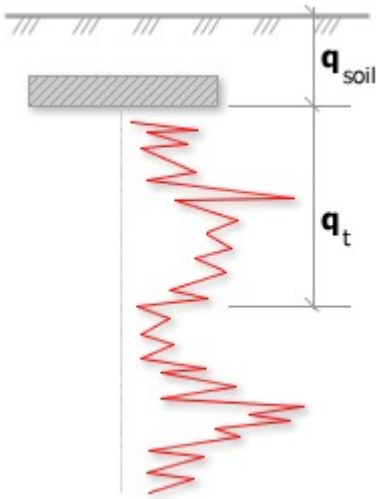
http://www.geologismiki.gr

CPT: EE-6
Total depth: 12.96 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

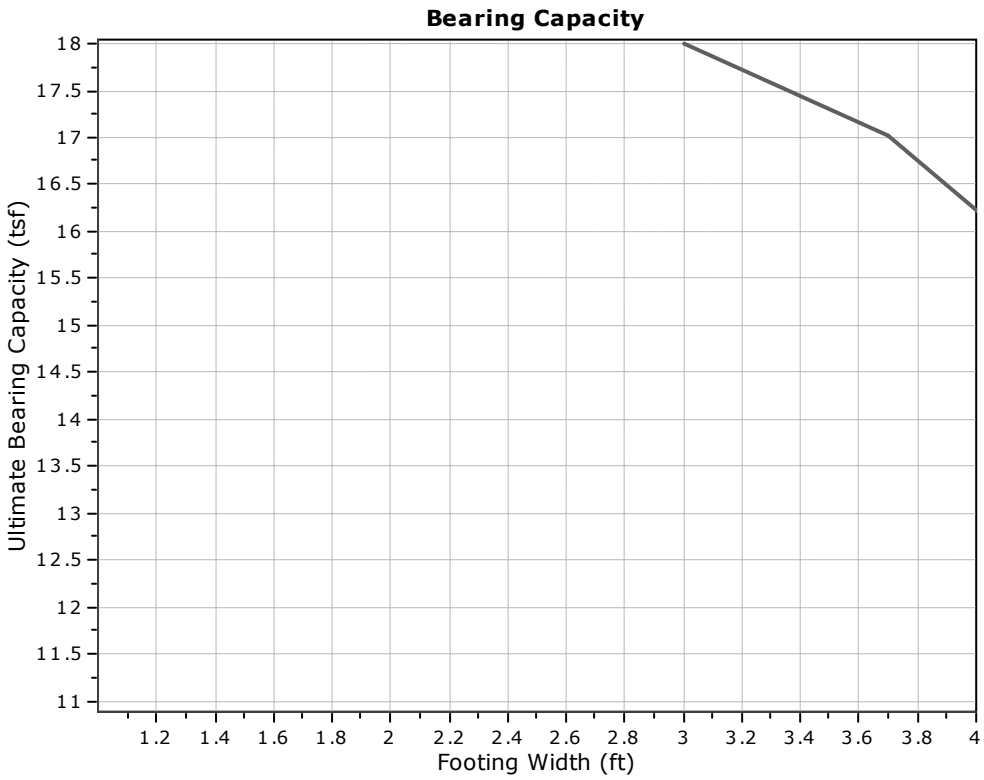




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

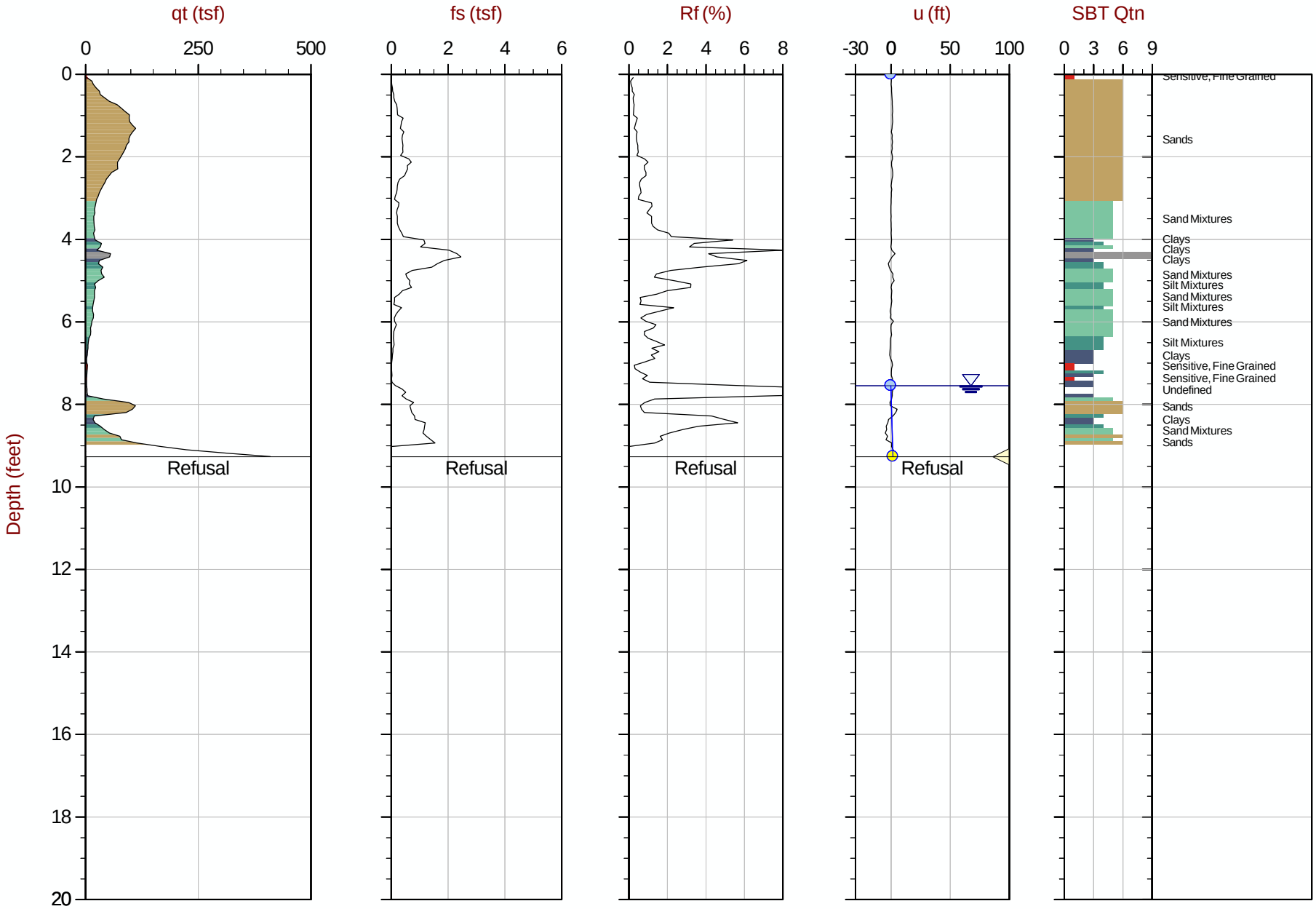
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	89.52	0.20	0.10	18.00
2	3.70	1.60	7.15	84.60	0.20	0.10	17.02
3	4.40	1.60	8.20	75.32	0.20	0.10	15.16
4	5.10	1.60	9.25	66.76	0.20	0.10	13.45
5	5.80	1.60	10.30	59.51	0.20	0.10	12.00
6	6.50	1.60	11.35	54.18	0.20	0.10	10.93
7	7.20	1.60	12.40	57.28	0.20	0.10	11.55
8	7.90	1.60	13.45	68.31	0.20	0.10	13.76
9	8.60	1.60	14.50	68.31	0.20	0.10	13.76
10	9.30	1.60	15.55	68.31	0.20	0.10	13.76
11	10.00	1.60	16.60	68.31	0.20	0.10	13.76
12	10.70	1.60	17.65	68.31	0.20	0.10	13.76
13	11.40	1.60	18.70	68.31	0.20	0.10	13.76
14	12.10	1.60	19.75	68.31	0.20	0.10	13.76
15	12.80	1.60	20.80	68.31	0.20	0.10	13.76

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 10:41
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-FF-1
Cone: 652:T1500F15U35



Max Depth: 2.825 m / 9.27 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPFF-1.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6234 Long: -70.9180

Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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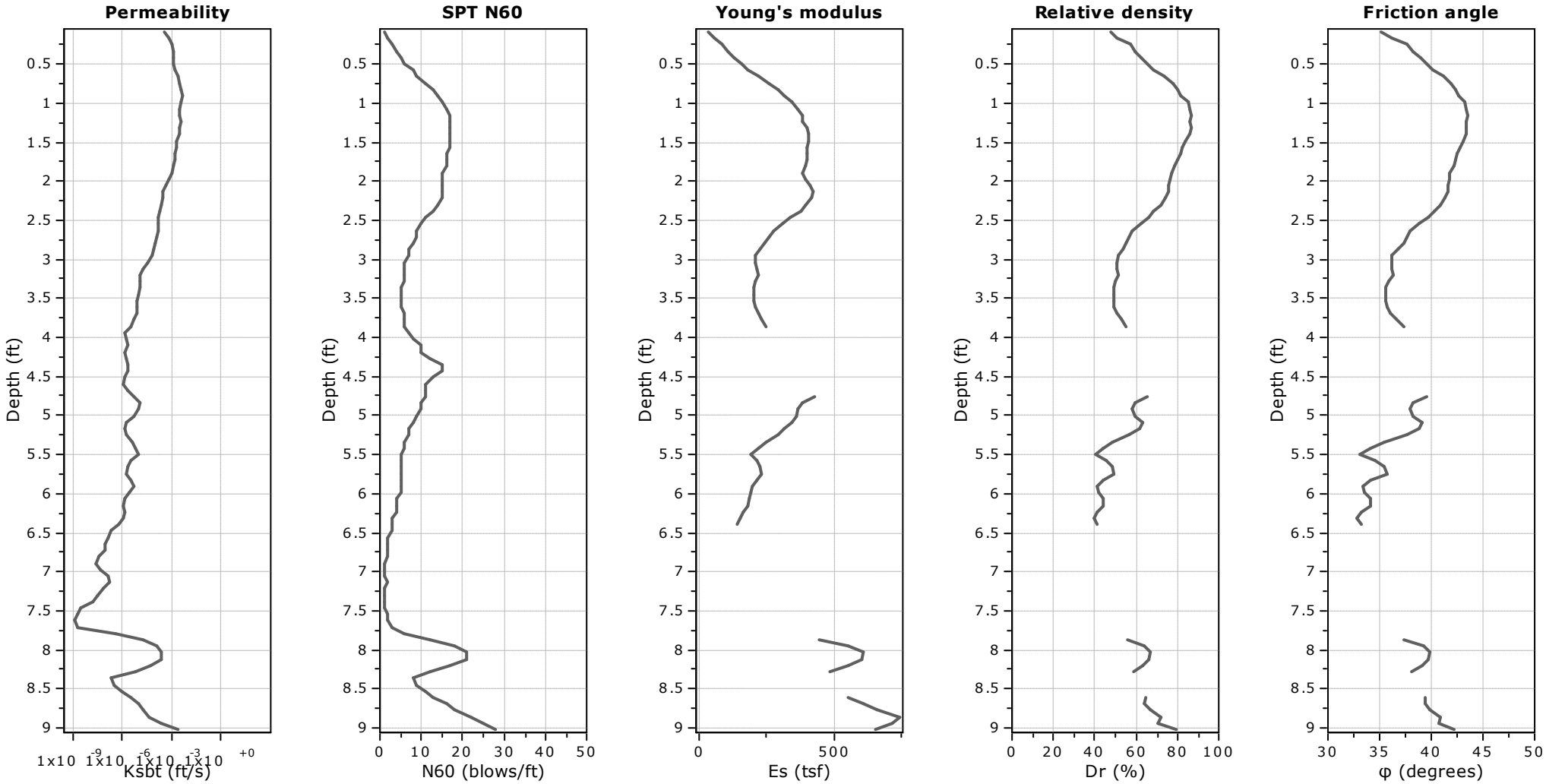
Merarhias 56
http://www.geologismiki.gr

CPT: FF-1
Total depth: 9.27 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

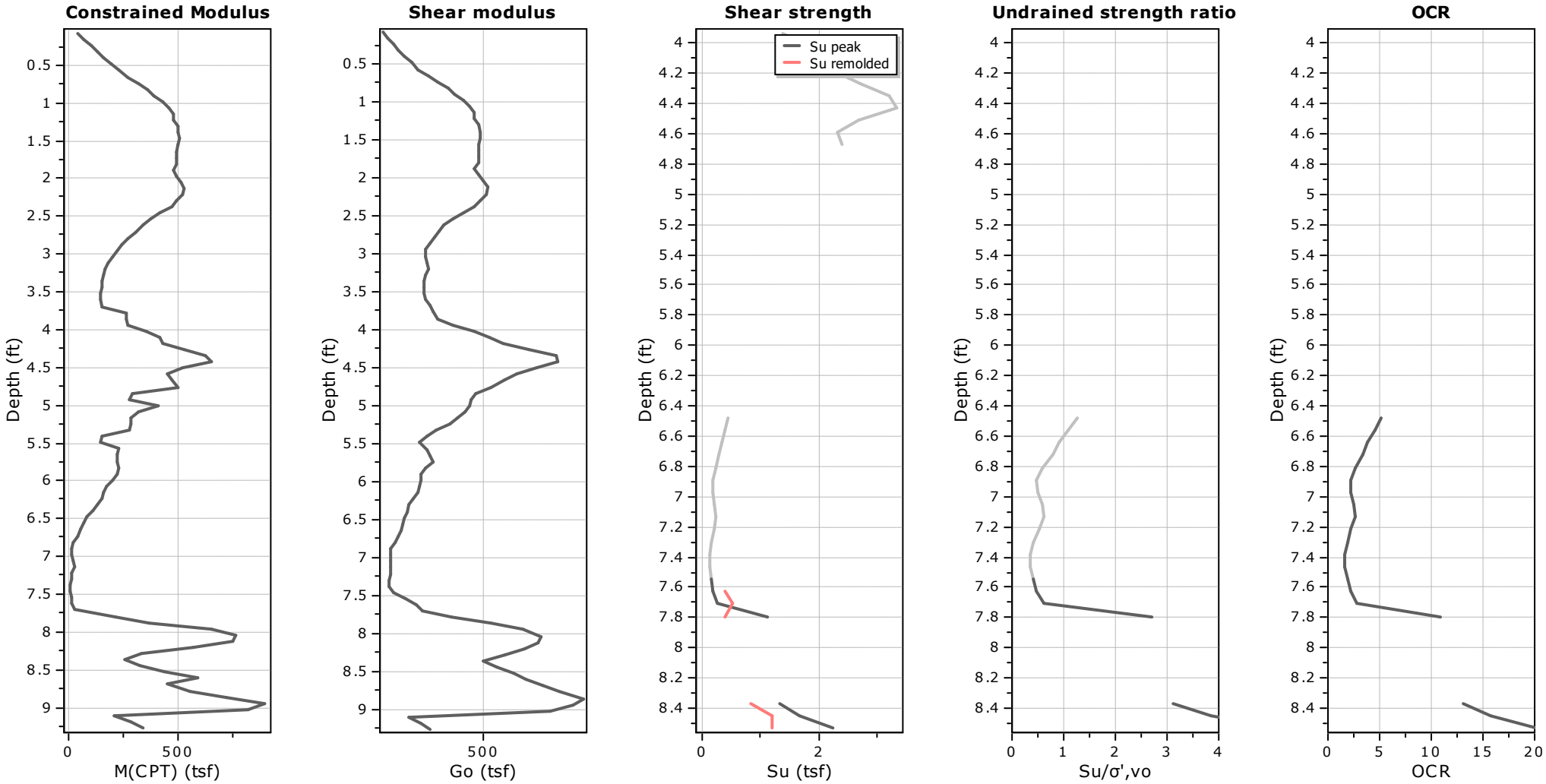


Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

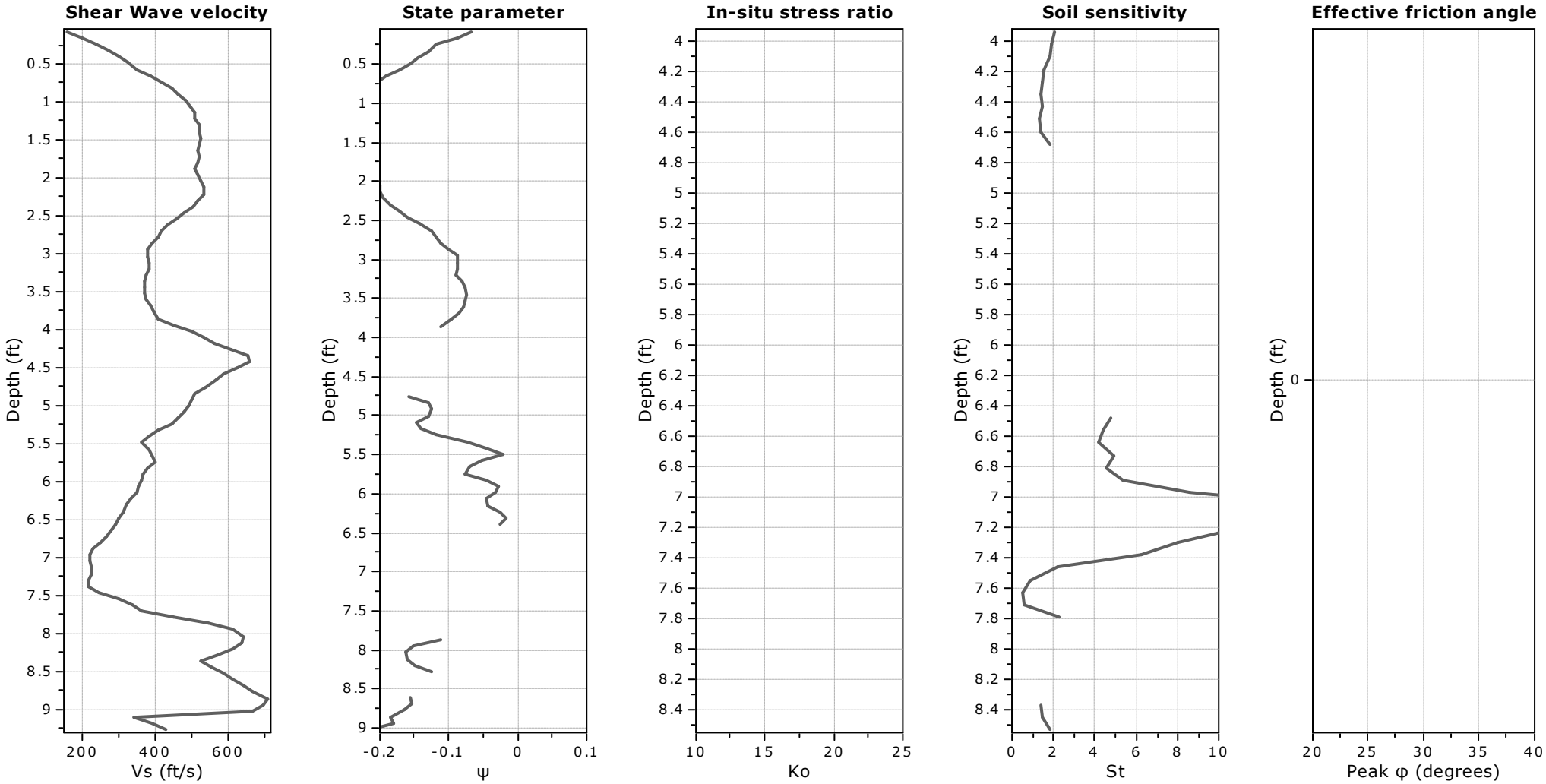
CPT: FF-1
Total depth: 9.27 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
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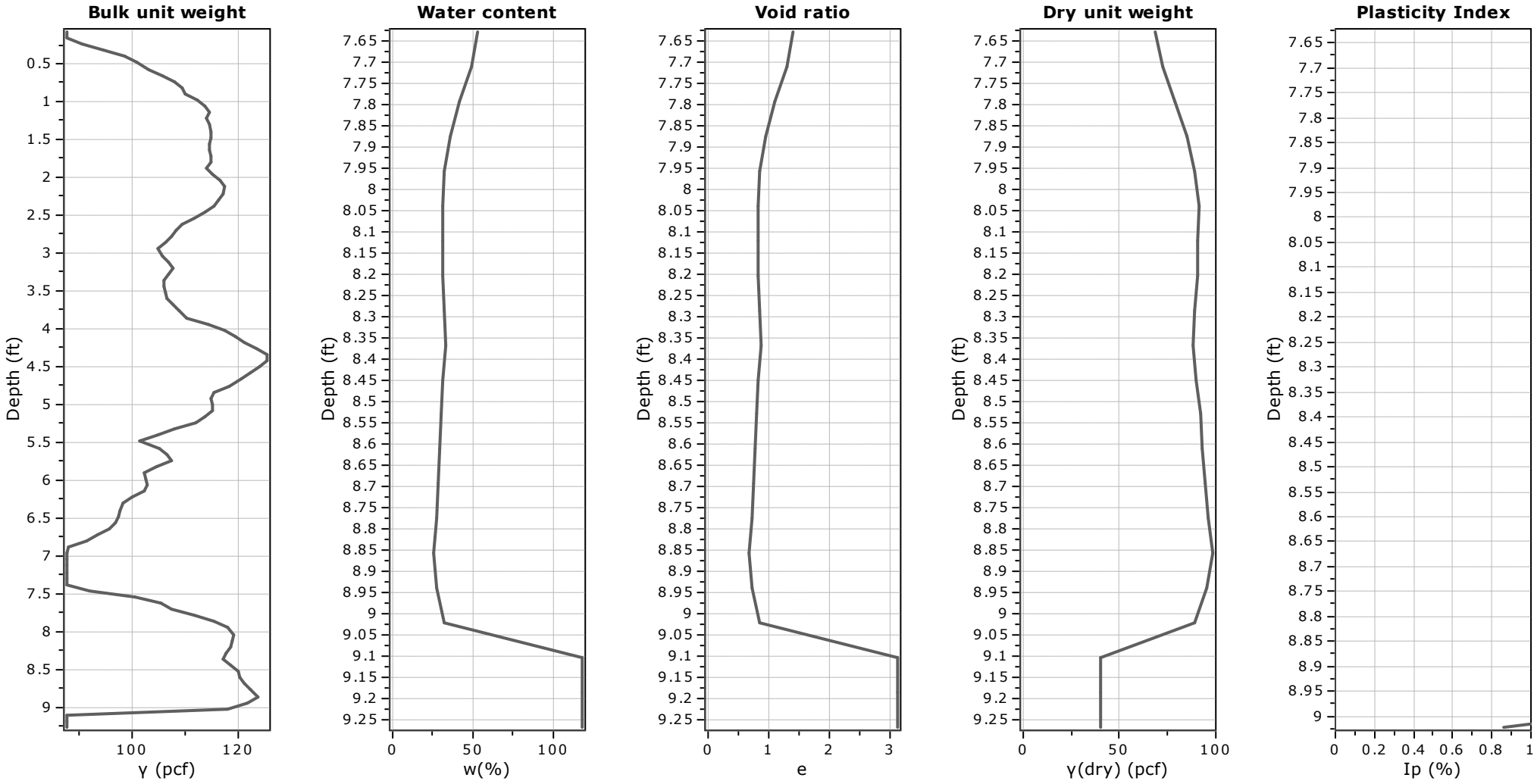
http://www.geologismiki.gr

CPT: FF-1
Total depth: 9.27 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



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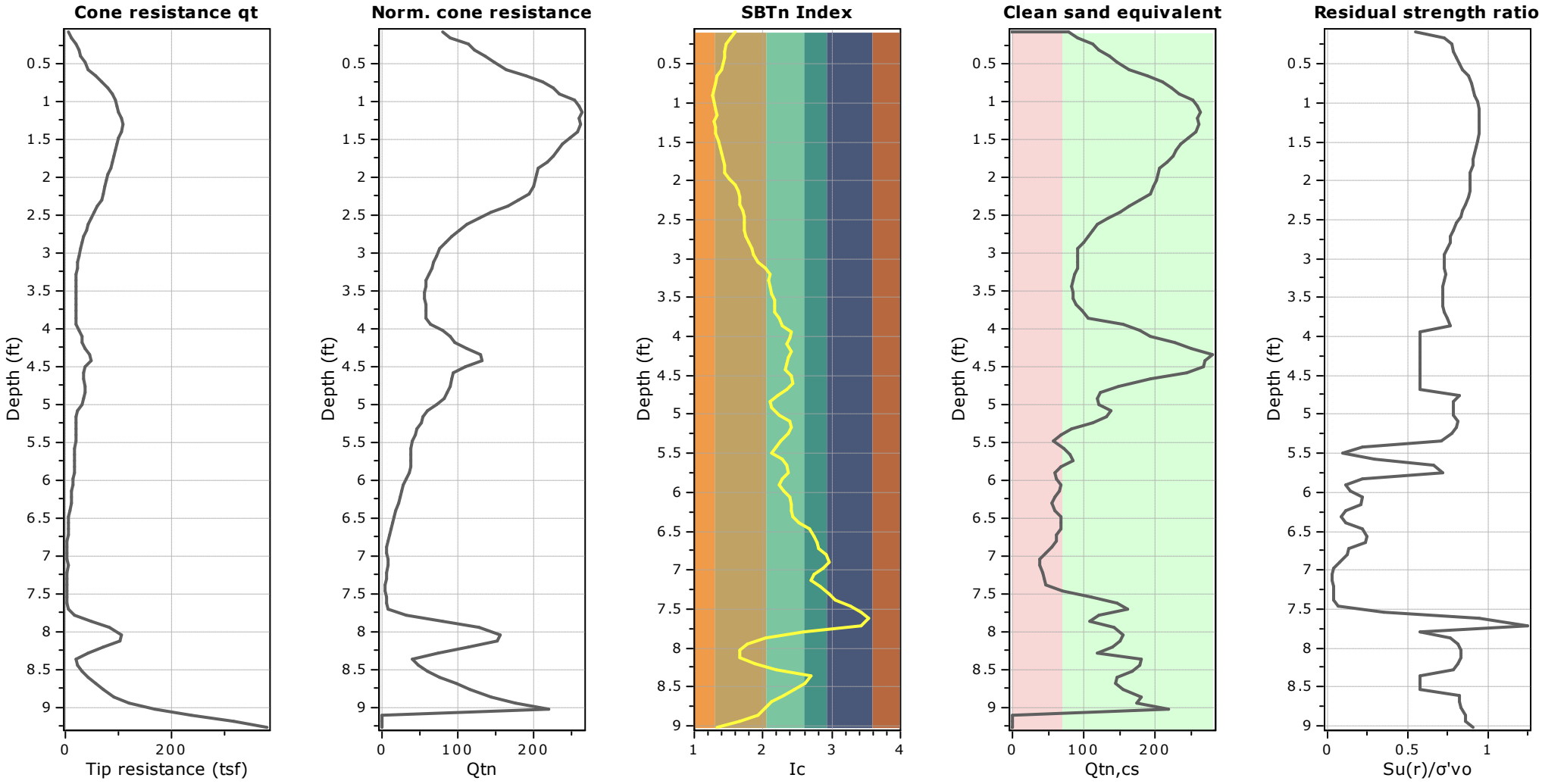
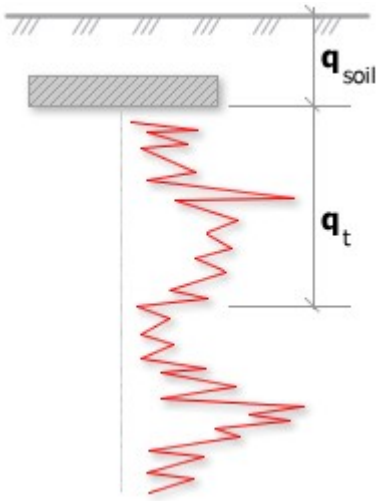
http://www.geologismiki.gr

CPT: FF-1
Total depth: 9.27 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

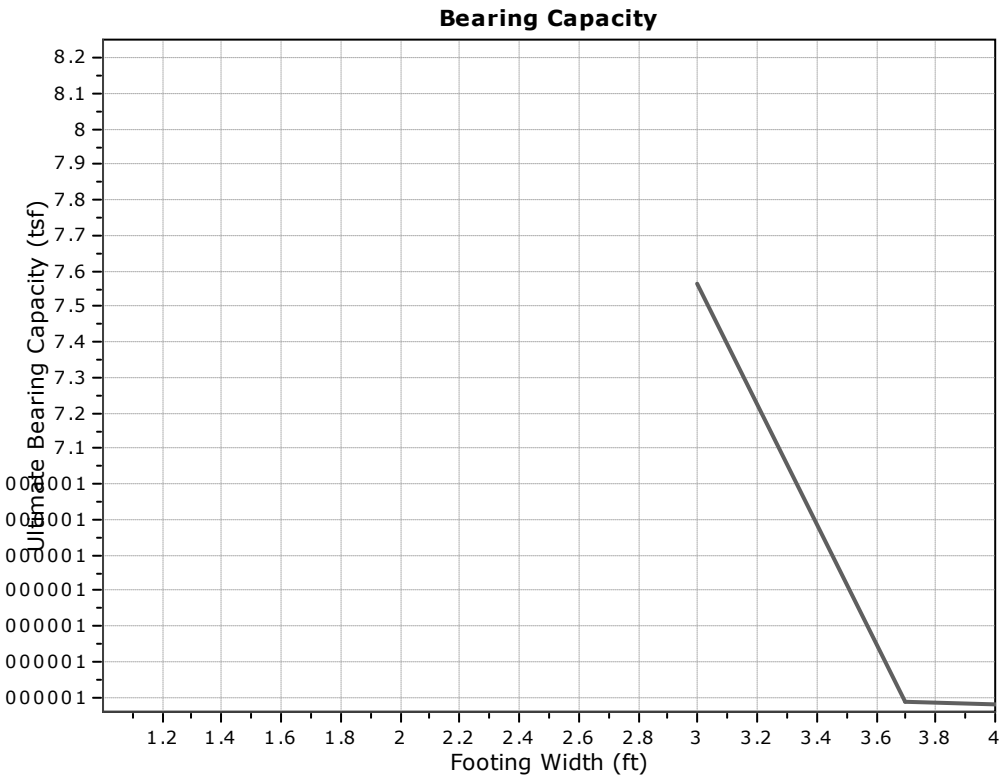




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

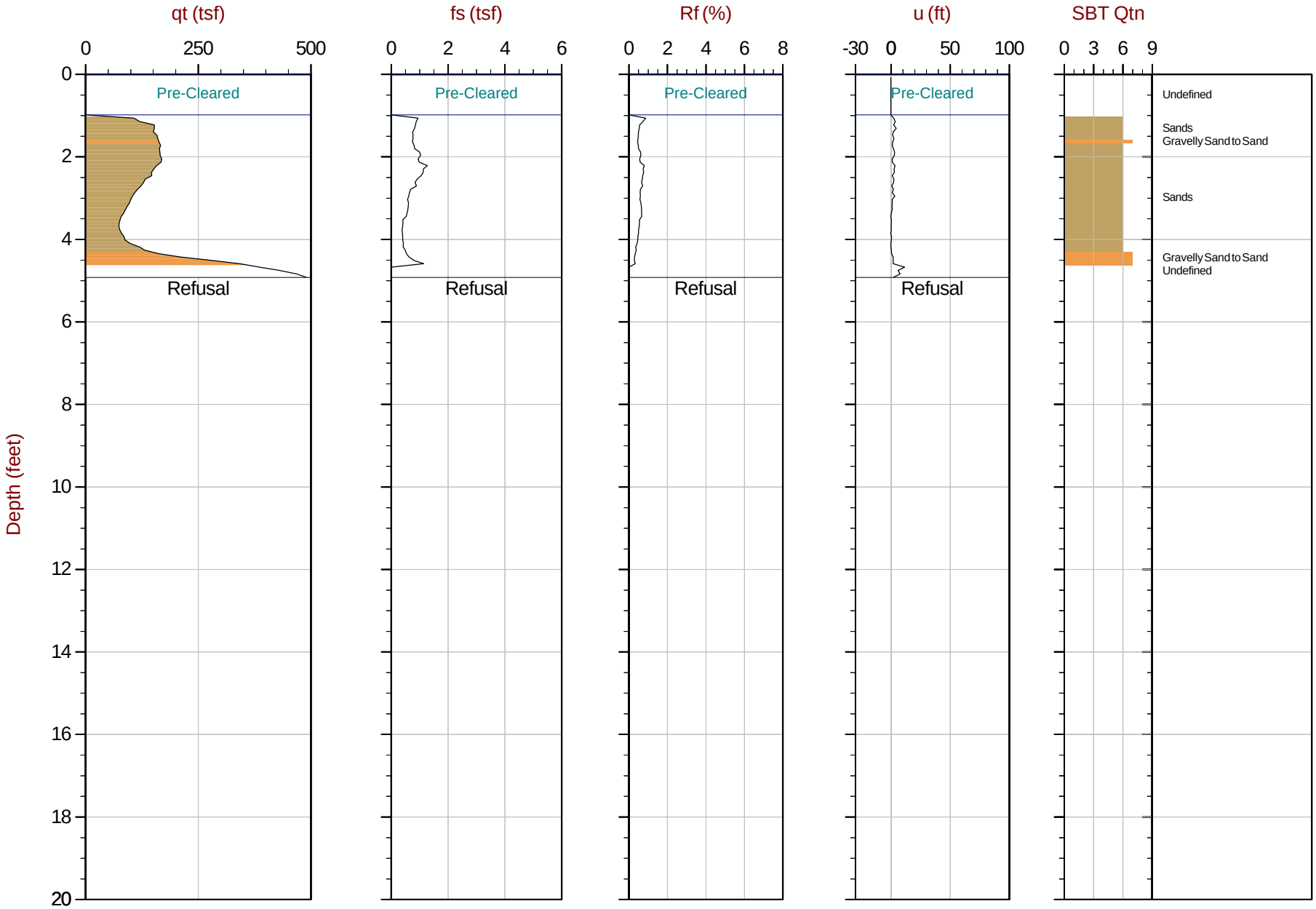
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	37.34	0.20	0.10	7.56
2	3.70	1.60	7.15	31.46	0.20	0.10	6.39
3	4.40	1.60	8.20	31.37	0.20	0.10	6.37
4	5.10	1.60	9.25	40.72	0.20	0.10	8.24
5	5.80	1.60	10.30	40.72	0.20	0.10	8.24
6	6.50	1.60	11.35	40.72	0.20	0.10	8.24
7	7.20	1.60	12.40	40.72	0.20	0.10	8.24
8	7.90	1.60	13.45	40.72	0.20	0.10	8.24
9	8.60	1.60	14.50	40.72	0.20	0.10	8.24
10	9.30	1.60	15.55	40.72	0.20	0.10	8.24
11	10.00	1.60	16.60	40.72	0.20	0.10	8.24
12	10.70	1.60	17.65	40.72	0.20	0.10	8.24
13	11.40	1.60	18.70	40.72	0.20	0.10	8.24
14	12.10	1.60	19.75	40.72	0.20	0.10	8.24
15	12.80	1.60	20.80	40.72	0.20	0.10	8.24

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-30 09:52
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-FF-3
Cone: 652:T1500F15U35



Max Depth: 1.500 m / 4.92 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPFF-3.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9181

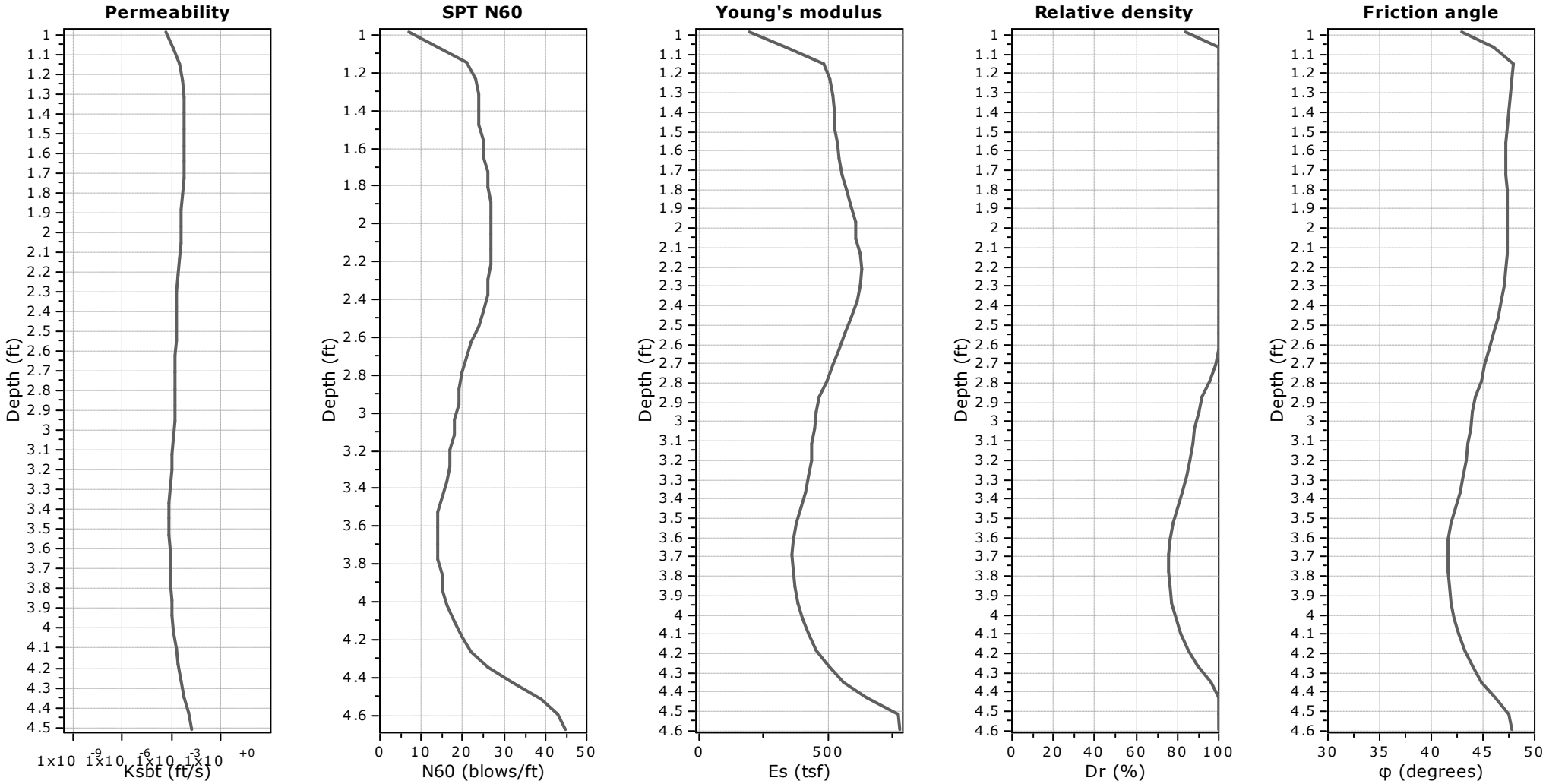
Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: FF-3
Total depth: 4.92 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



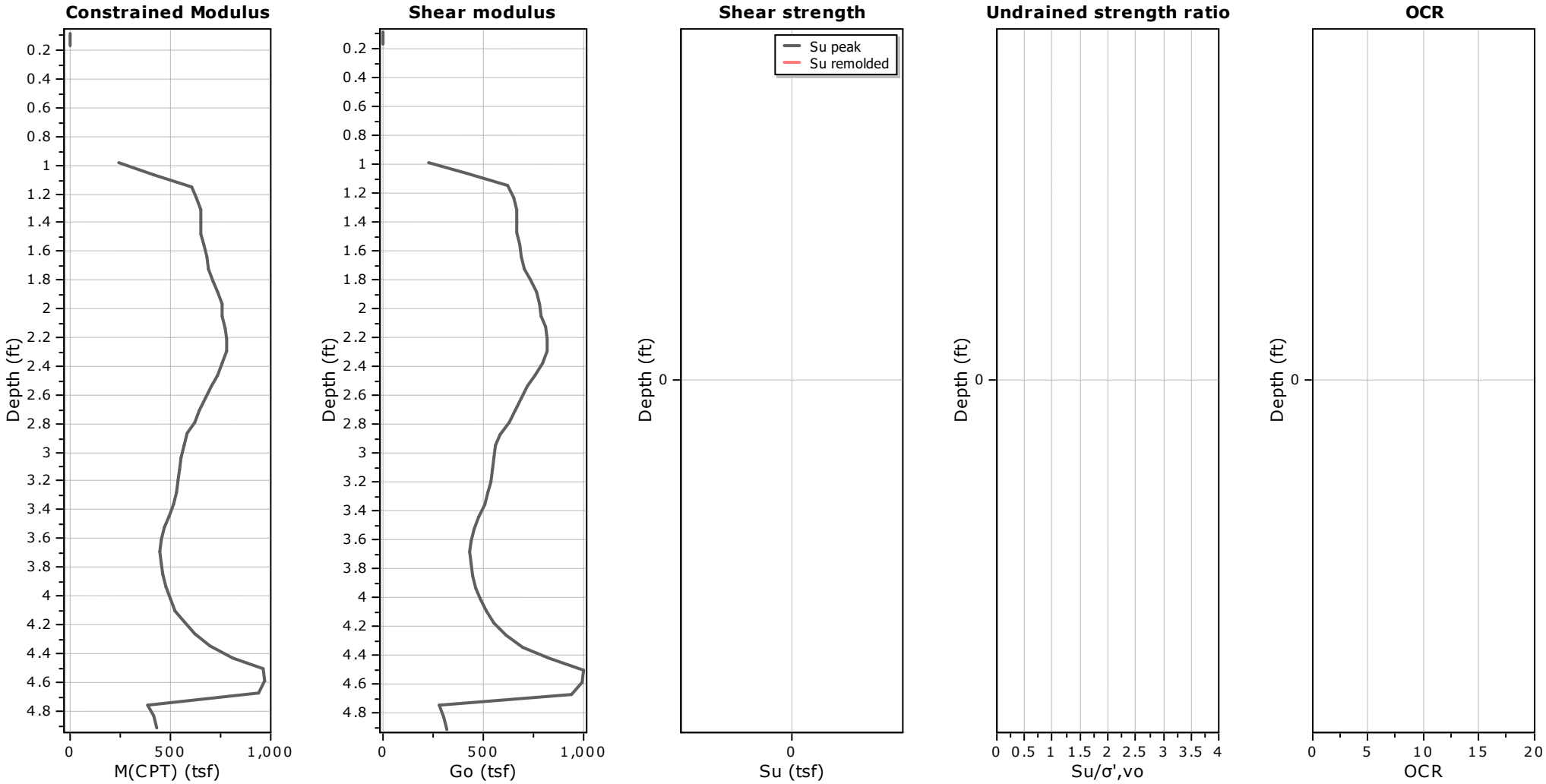
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: FF-3
Total depth: 4.92 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



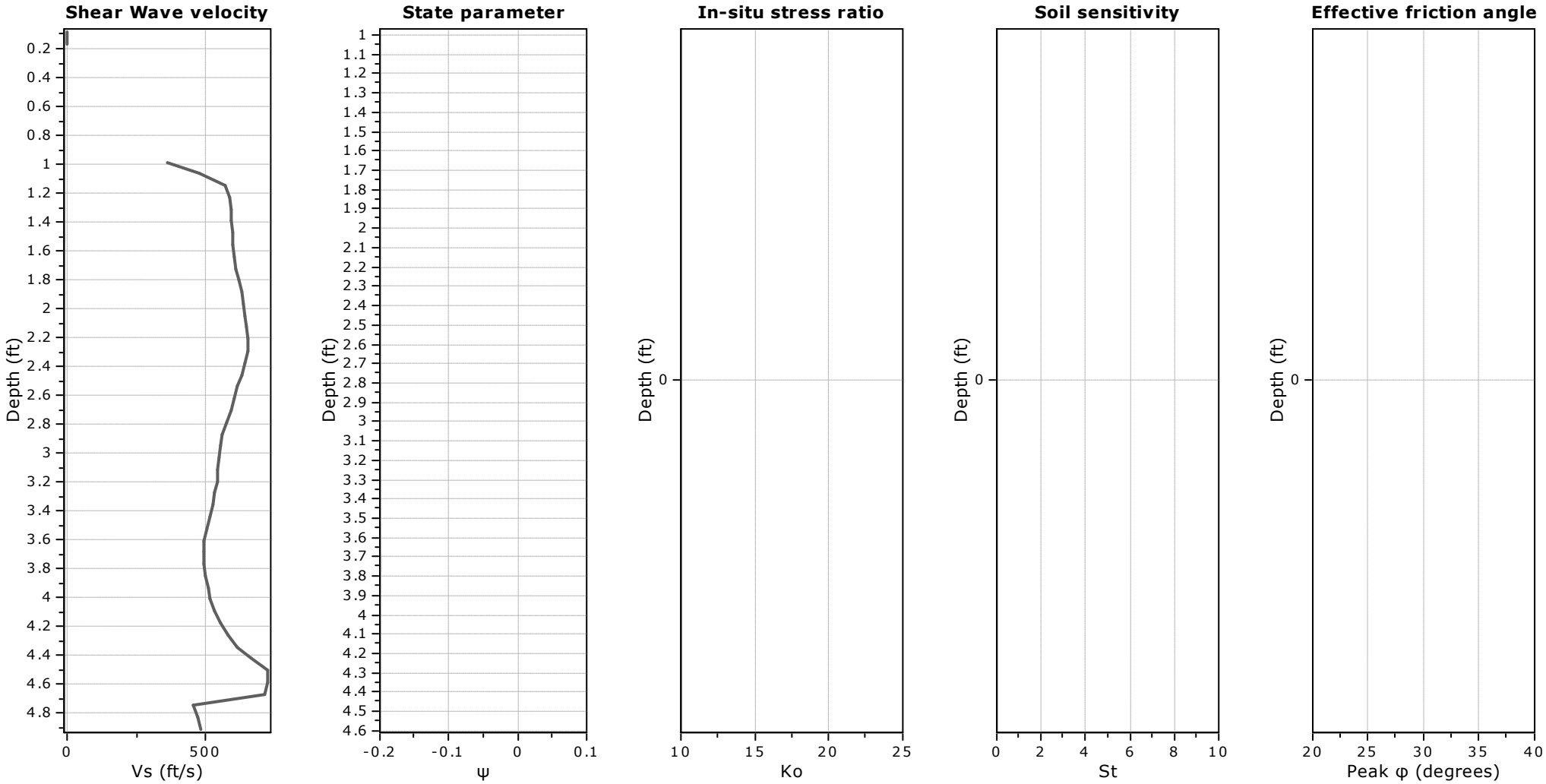
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

CPT: FF-3
Total depth: 4.92 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

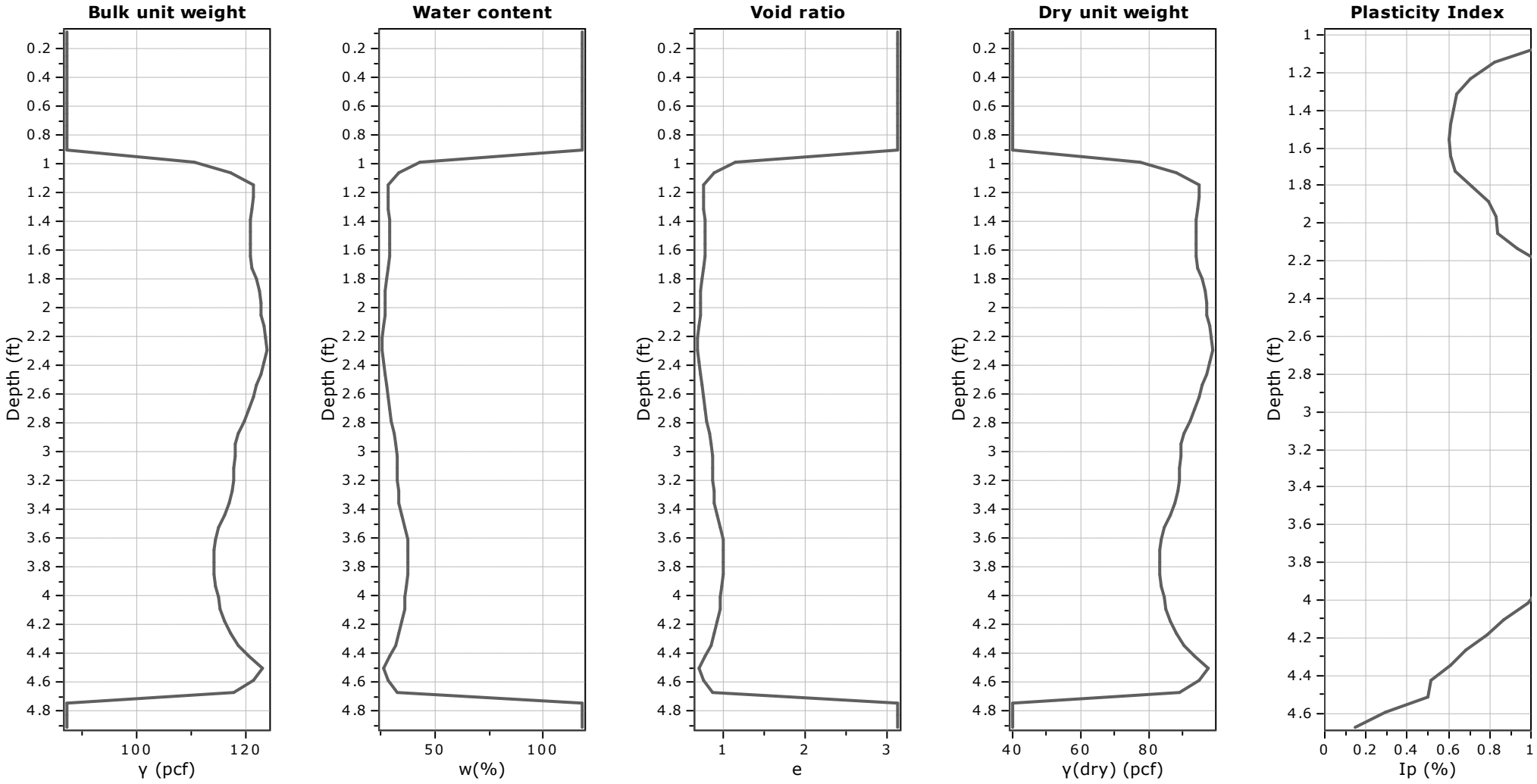


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: FF-3
Total depth: 4.92 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

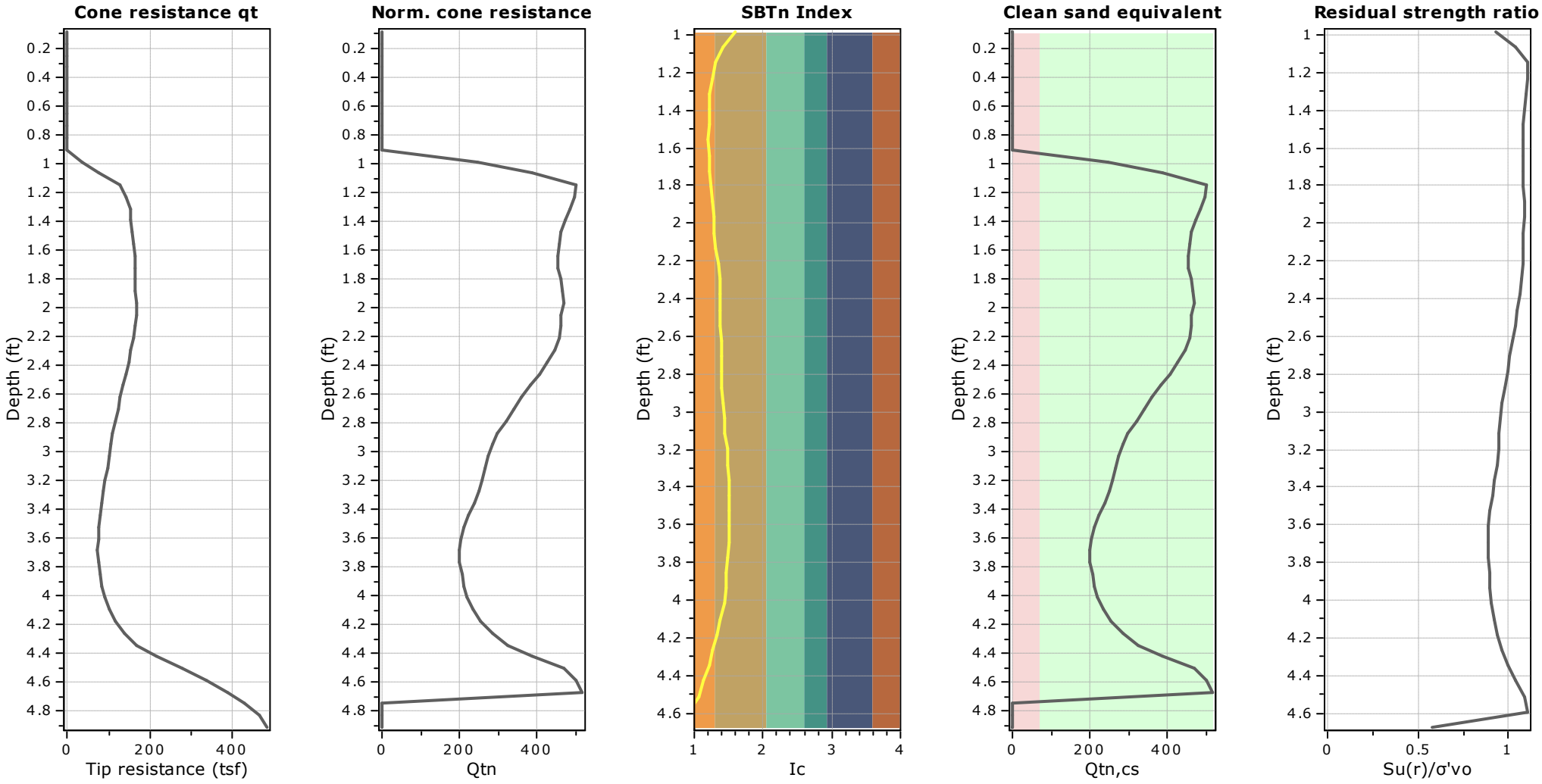
Project:
Location:

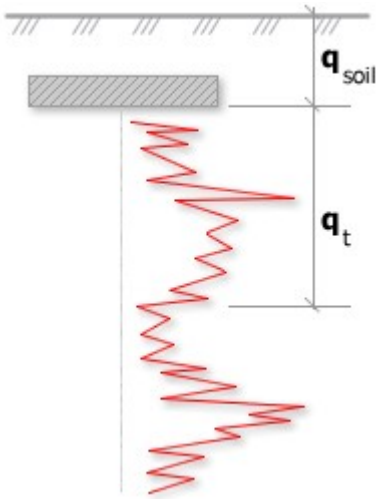


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: FF-3
Total depth: 4.92 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

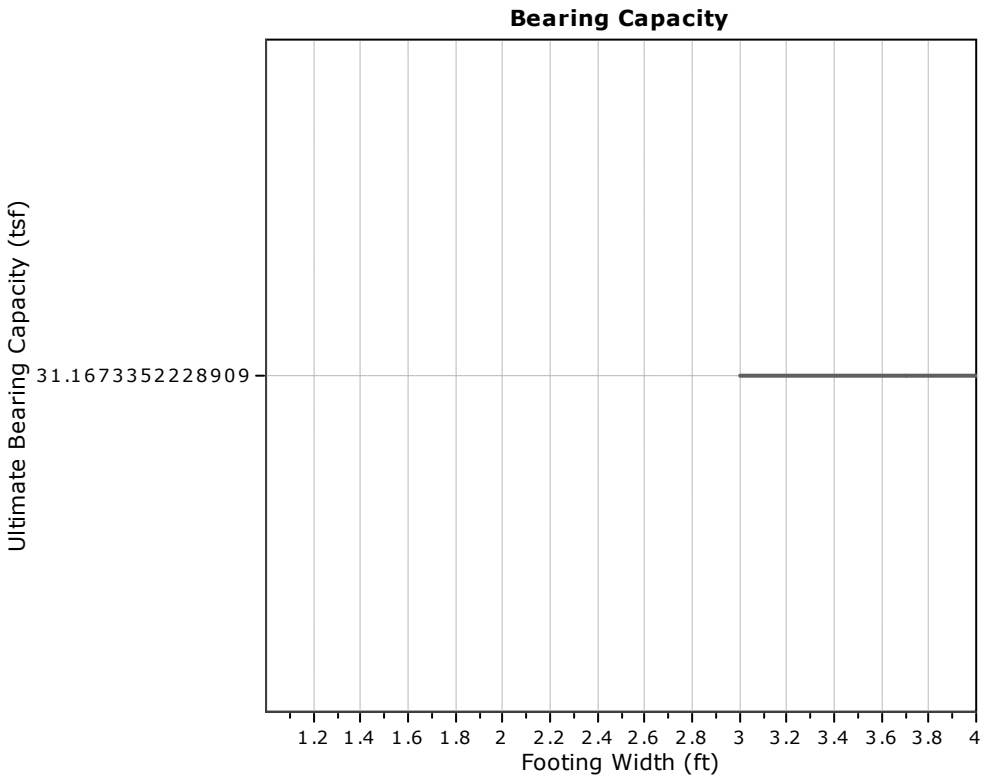




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

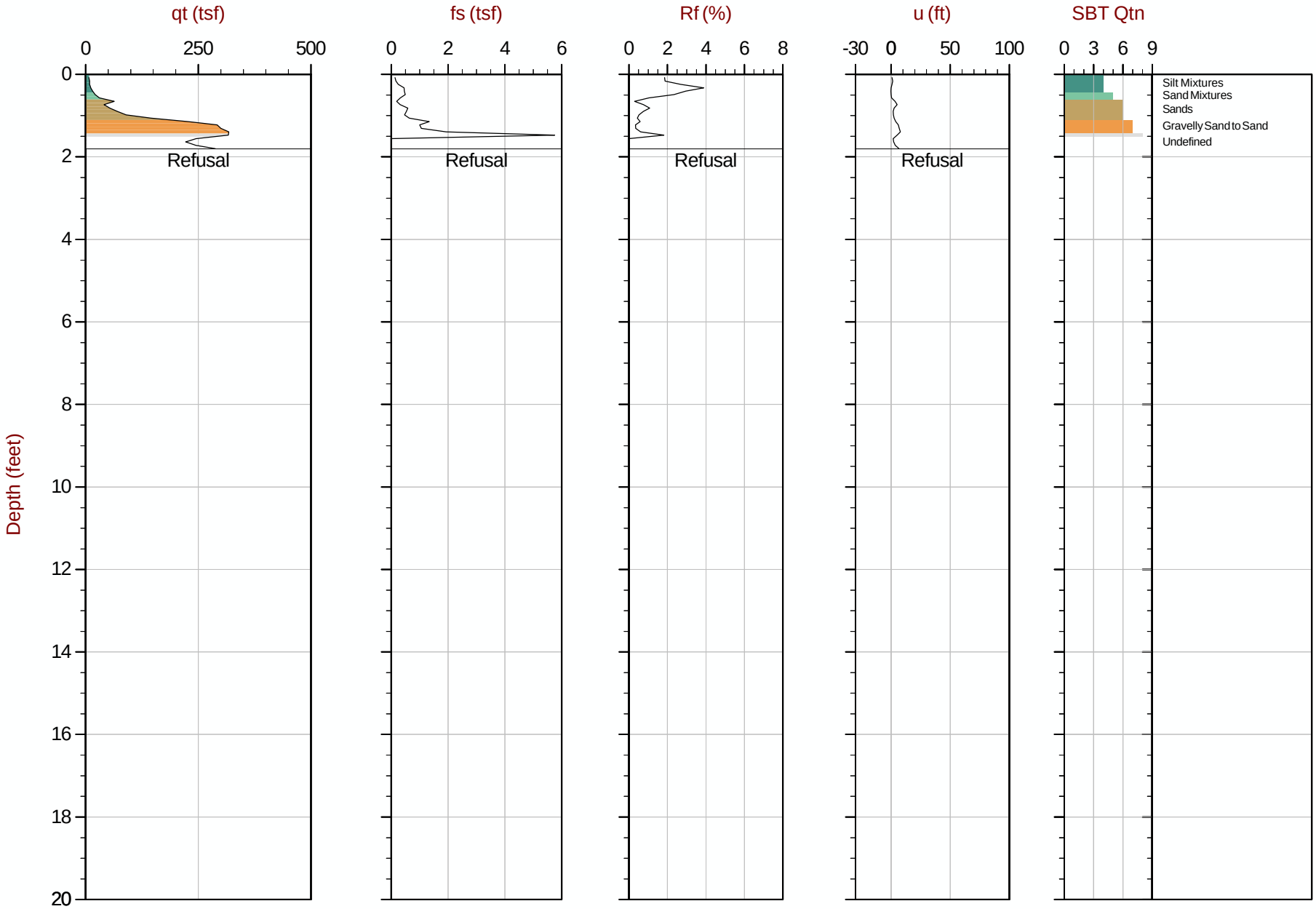
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	155.36	0.20	0.10	31.17
2	3.70	1.60	7.15	155.36	0.20	0.10	31.17
3	4.40	1.60	8.20	155.36	0.20	0.10	31.17
4	5.10	1.60	9.25	155.36	0.20	0.10	31.17
5	5.80	1.60	10.30	155.36	0.20	0.10	31.17
6	6.50	1.60	11.35	155.36	0.20	0.10	31.17
7	7.20	1.60	12.40	155.36	0.20	0.10	31.17
8	7.90	1.60	13.45	155.36	0.20	0.10	31.17
9	8.60	1.60	14.50	155.36	0.20	0.10	31.17
10	9.30	1.60	15.55	155.36	0.20	0.10	31.17
11	10.00	1.60	16.60	155.36	0.20	0.10	31.17
12	10.70	1.60	17.65	155.36	0.20	0.10	31.17
13	11.40	1.60	18.70	155.36	0.20	0.10	31.17
14	12.10	1.60	19.75	155.36	0.20	0.10	31.17
15	12.80	1.60	20.80	155.36	0.20	0.10	31.17

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 14:51
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-FF-8
Cone: 652:T1500F15U35



Max Depth: 0.550 m / 1.80 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPFF-8.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6239 Long: -70.9182

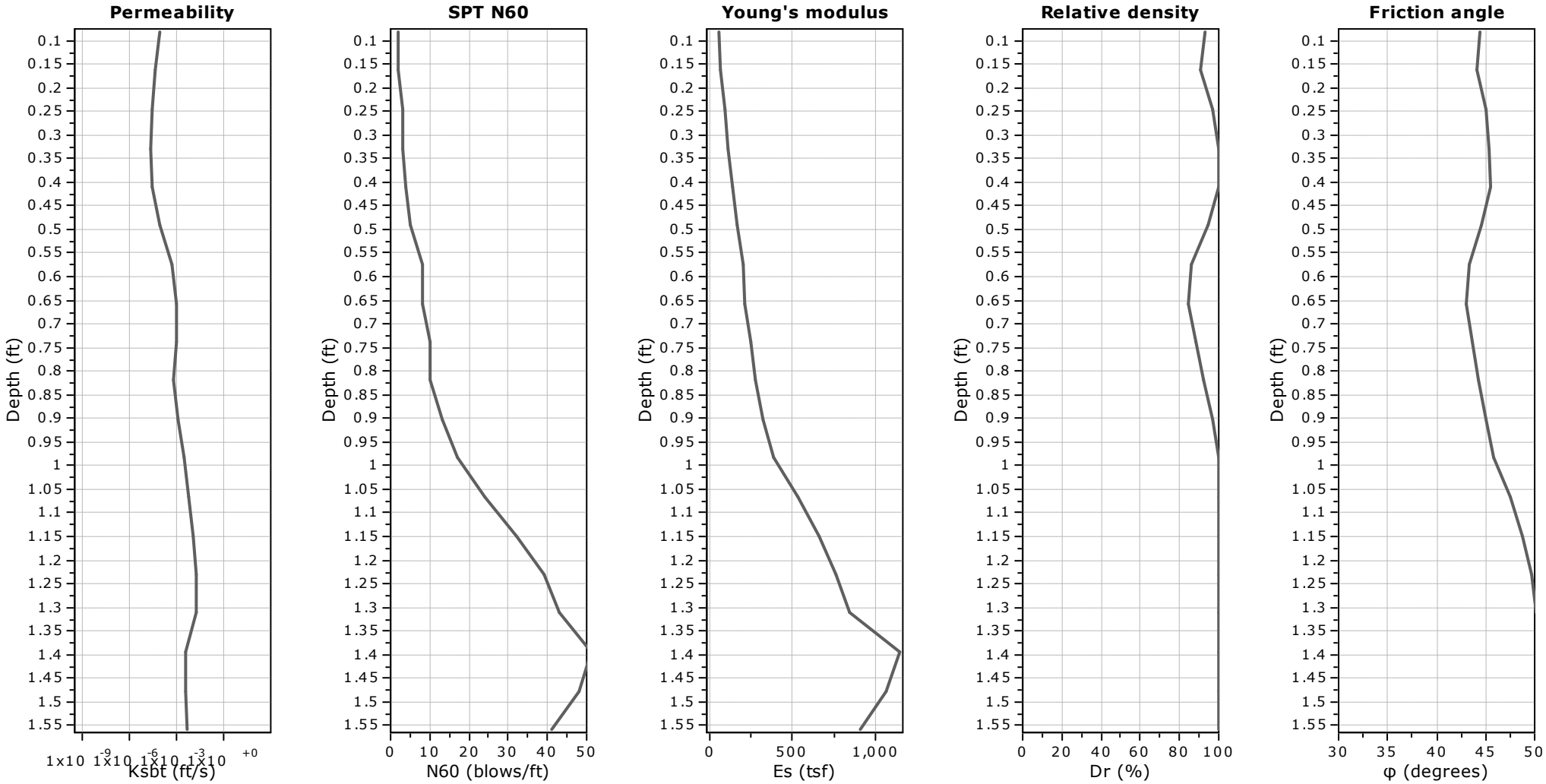
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: FF-8
Total depth: 1.80 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



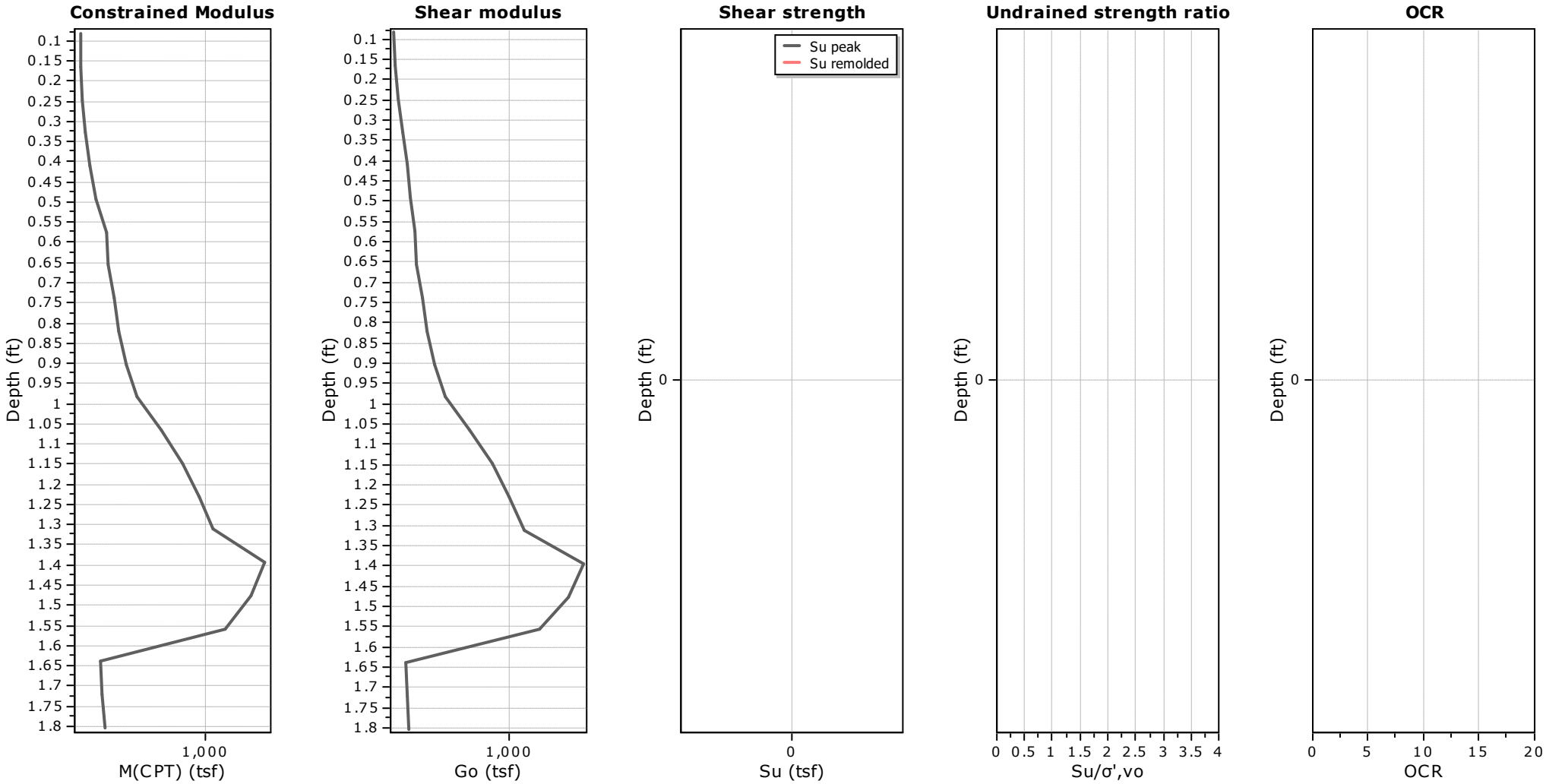
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: FF-8
Total depth: 1.80 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

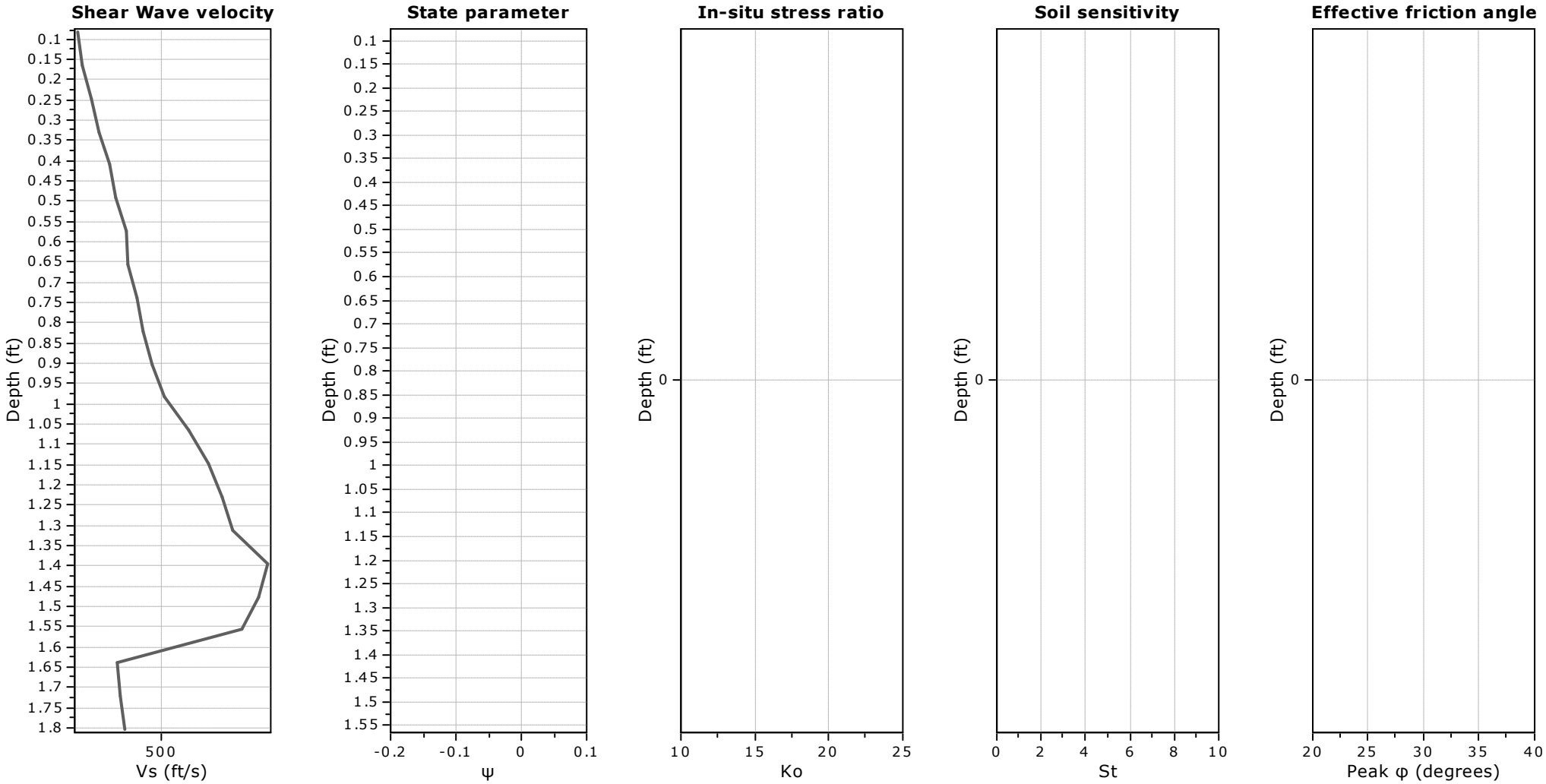


Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

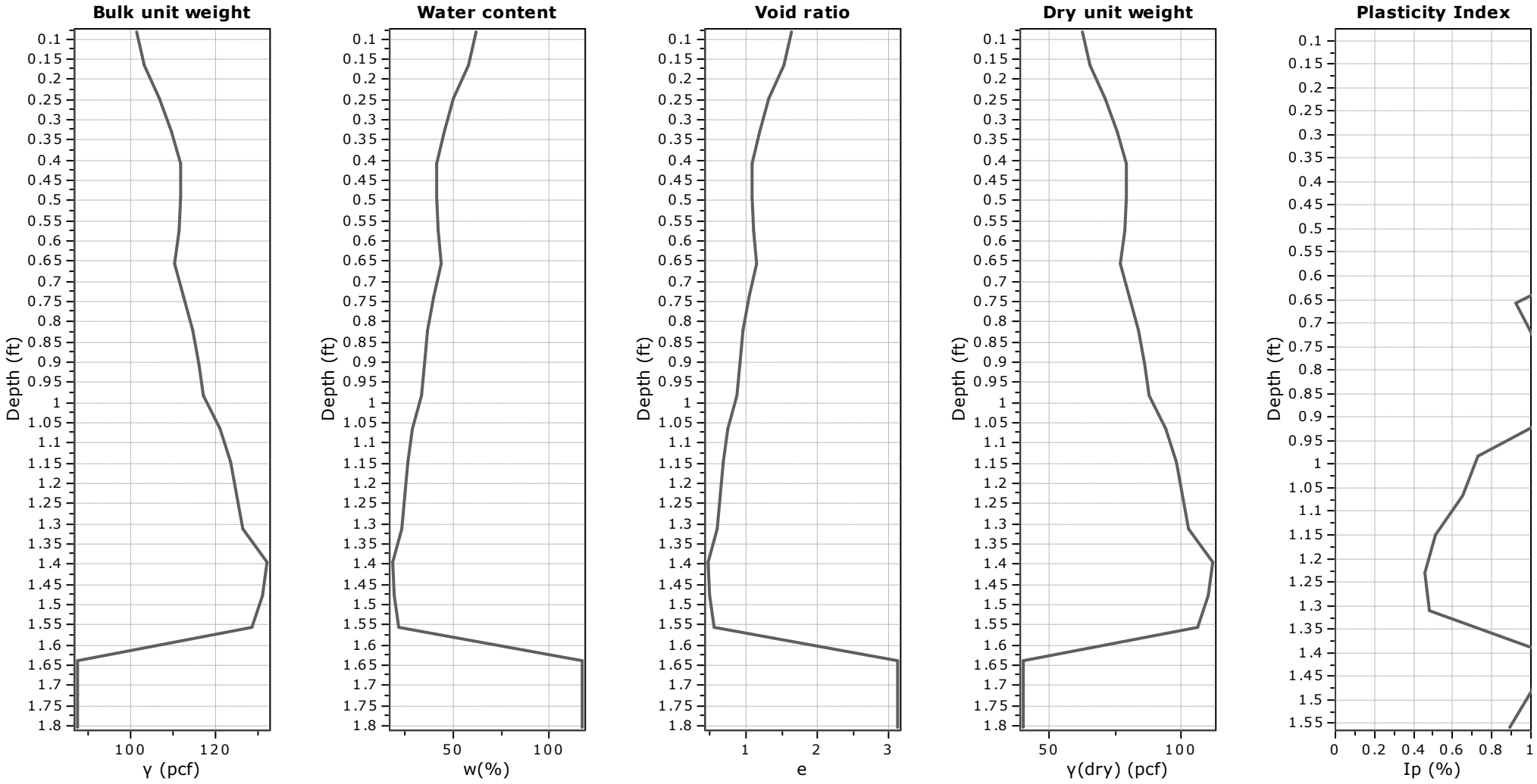
CPT: FF-8
Total depth: 1.80 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Soil Sensitivity factor, N_S: 7.00


Bulk unit weight
Water content
Void ratio
Dry unit weight
Plasticity Index
Depth (ft)
γ (pcf)
w(%)
e
γ(dry) (pcf)
Ip (%)

GeoLogismiki
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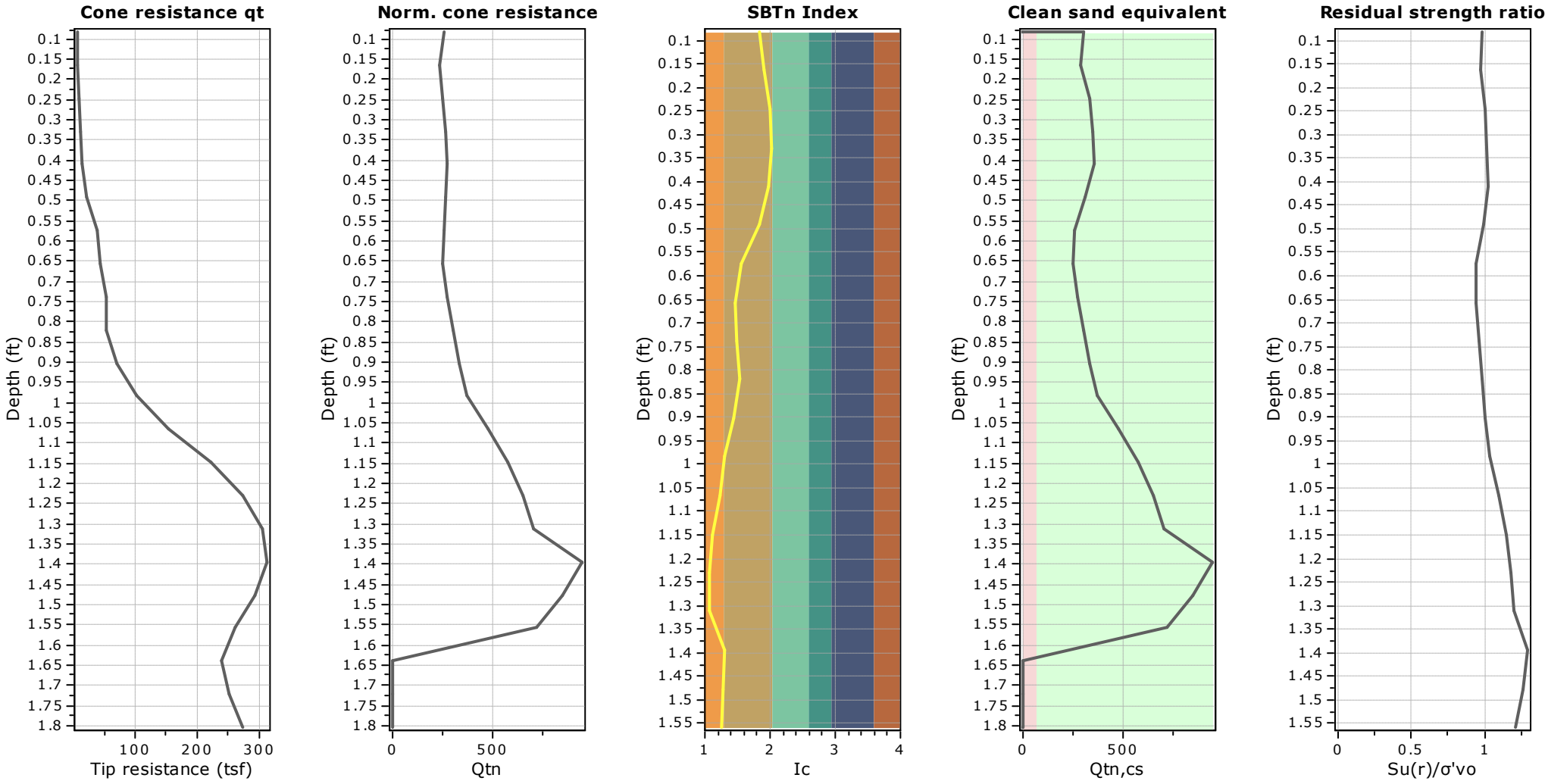
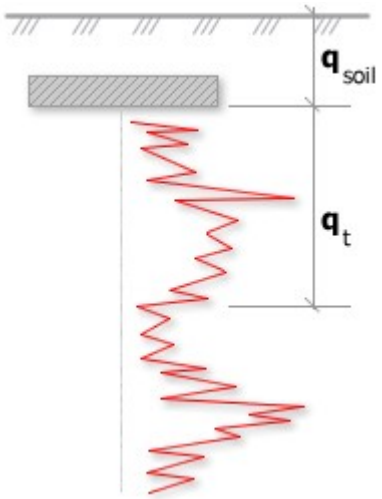
http://www.geologismiki.gr

CPT: FF-8
Total depth: 1.80 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

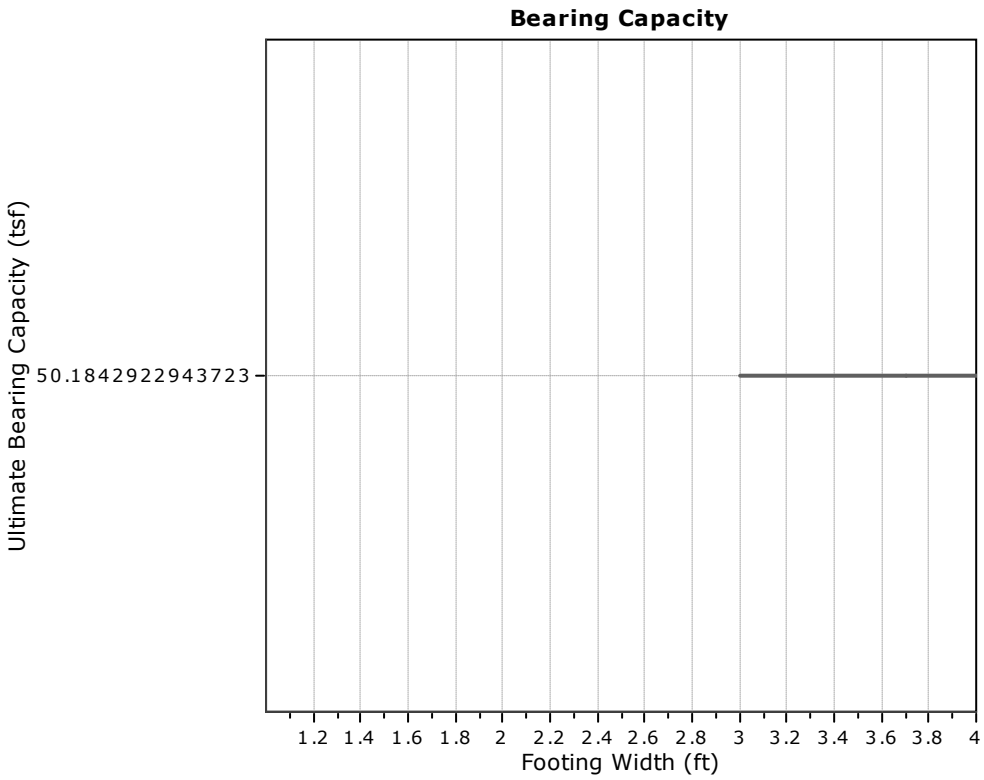




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

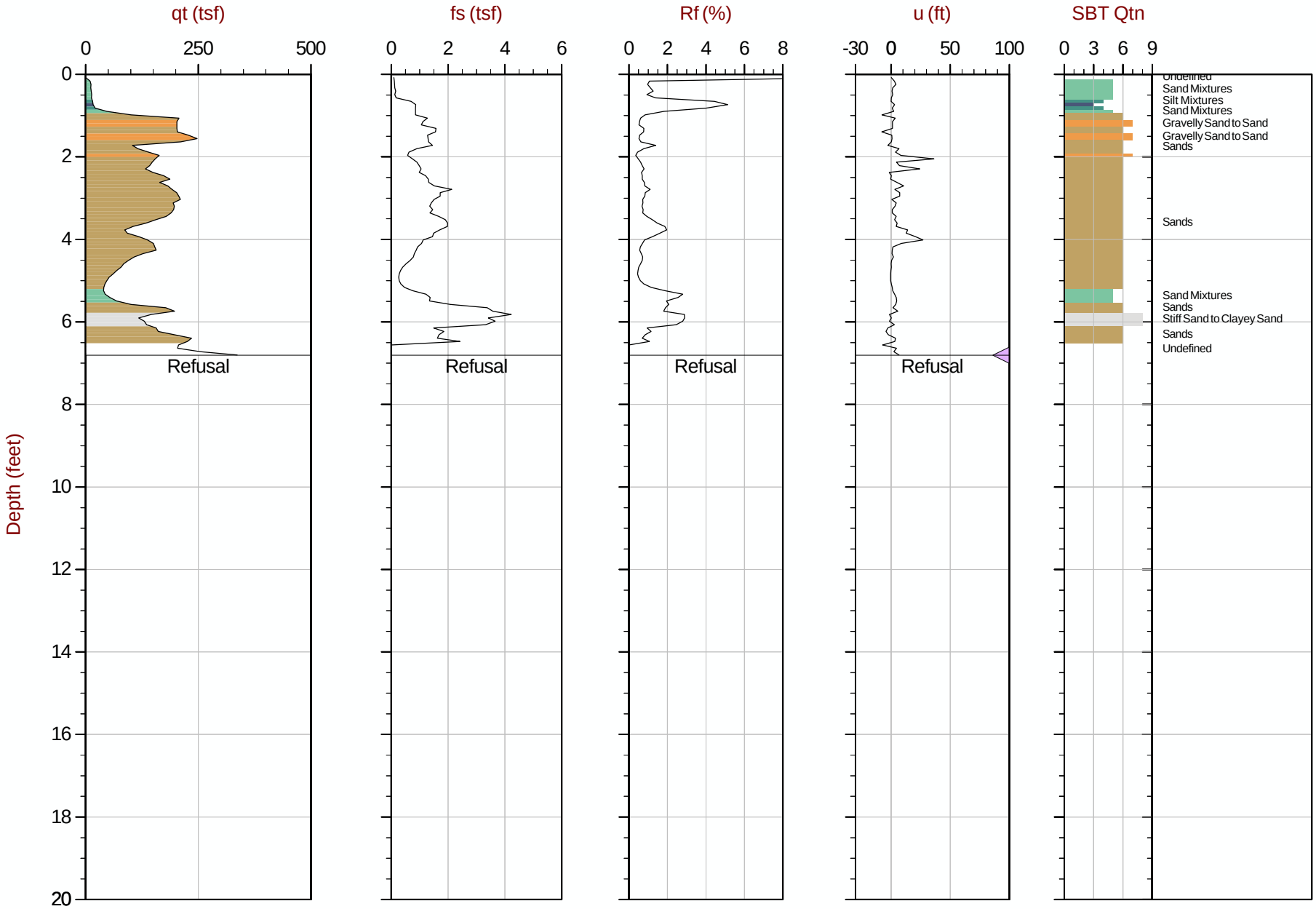
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	250.44	0.20	0.10	50.18
2	3.70	1.60	7.15	250.44	0.20	0.10	50.18
3	4.40	1.60	8.20	250.44	0.20	0.10	50.18
4	5.10	1.60	9.25	250.44	0.20	0.10	50.18
5	5.80	1.60	10.30	250.44	0.20	0.10	50.18
6	6.50	1.60	11.35	250.44	0.20	0.10	50.18
7	7.20	1.60	12.40	250.44	0.20	0.10	50.18
8	7.90	1.60	13.45	250.44	0.20	0.10	50.18
9	8.60	1.60	14.50	250.44	0.20	0.10	50.18
10	9.30	1.60	15.55	250.44	0.20	0.10	50.18
11	10.00	1.60	16.60	250.44	0.20	0.10	50.18
12	10.70	1.60	17.65	250.44	0.20	0.10	50.18
13	11.40	1.60	18.70	250.44	0.20	0.10	50.18
14	12.10	1.60	19.75	250.44	0.20	0.10	50.18
15	12.80	1.60	20.80	250.44	0.20	0.10	50.18

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 10:11
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-G-1
Cone: 652:T1500F15U35



Max Depth: 2.075 m / 6.81 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPG-1.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9169

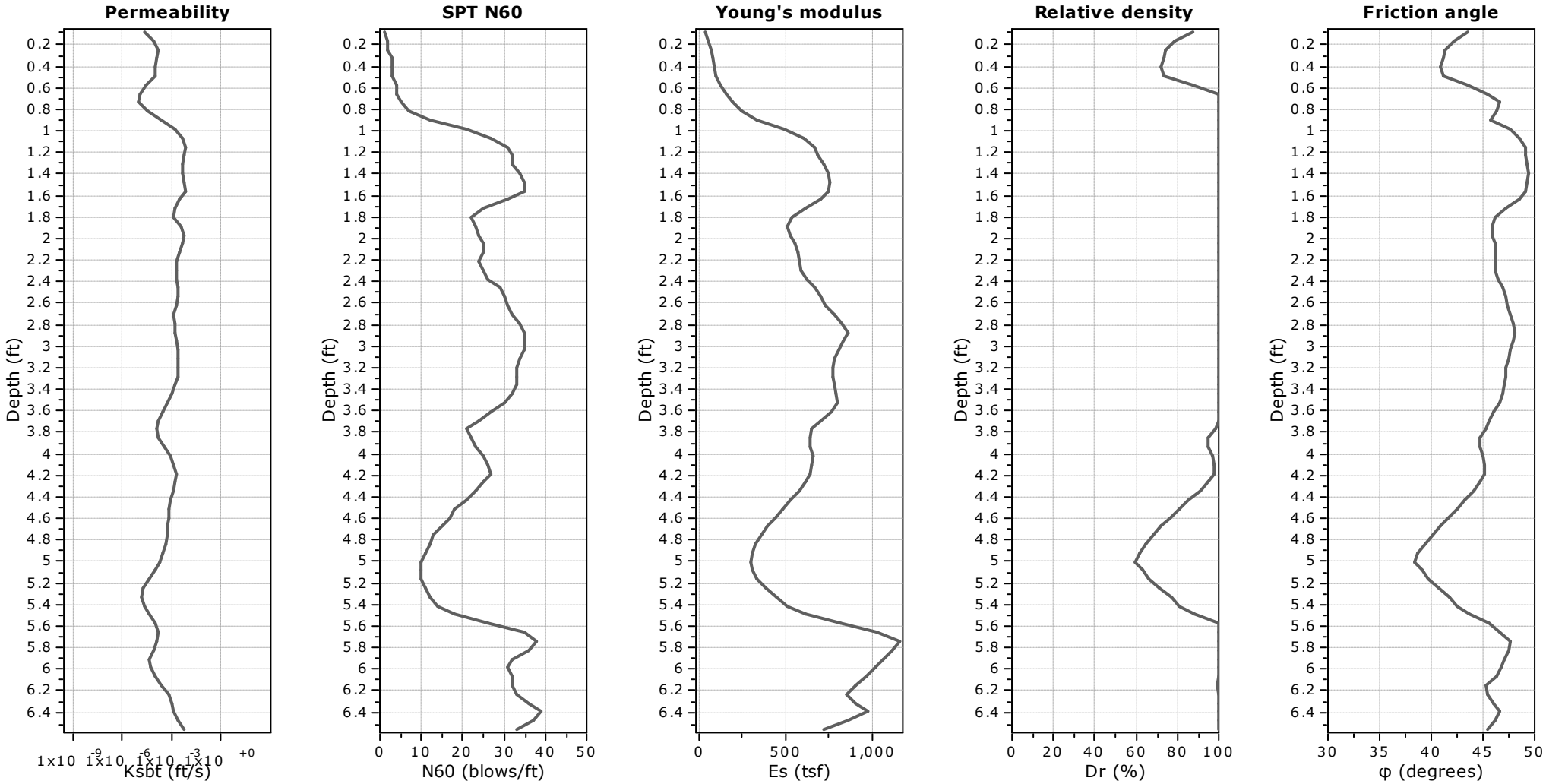
Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: G-1
Total depth: 6.81 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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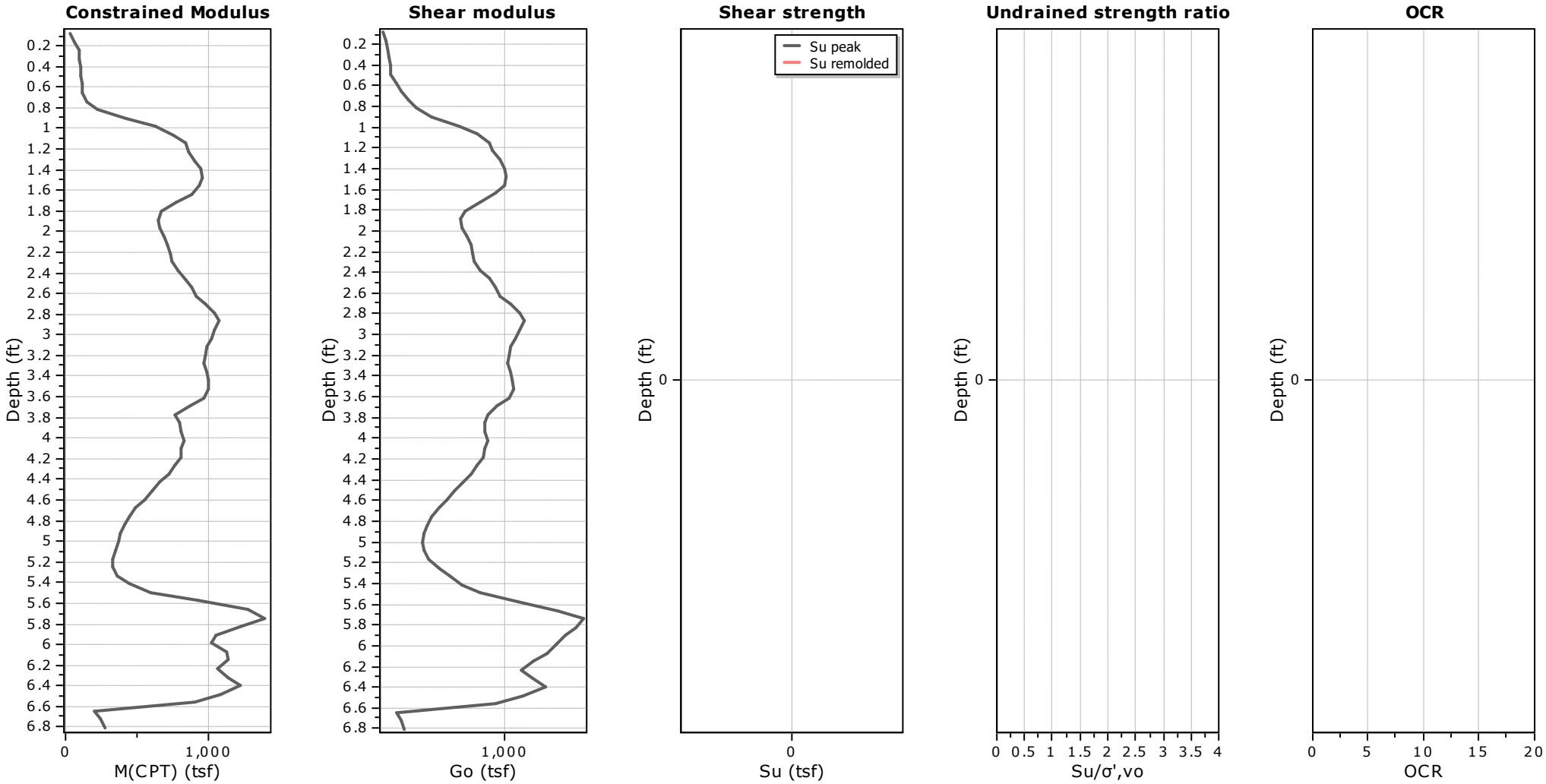
Merarhias 56
http://www.geologismiki.gr

CPT: G-1
Total depth: 6.81 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

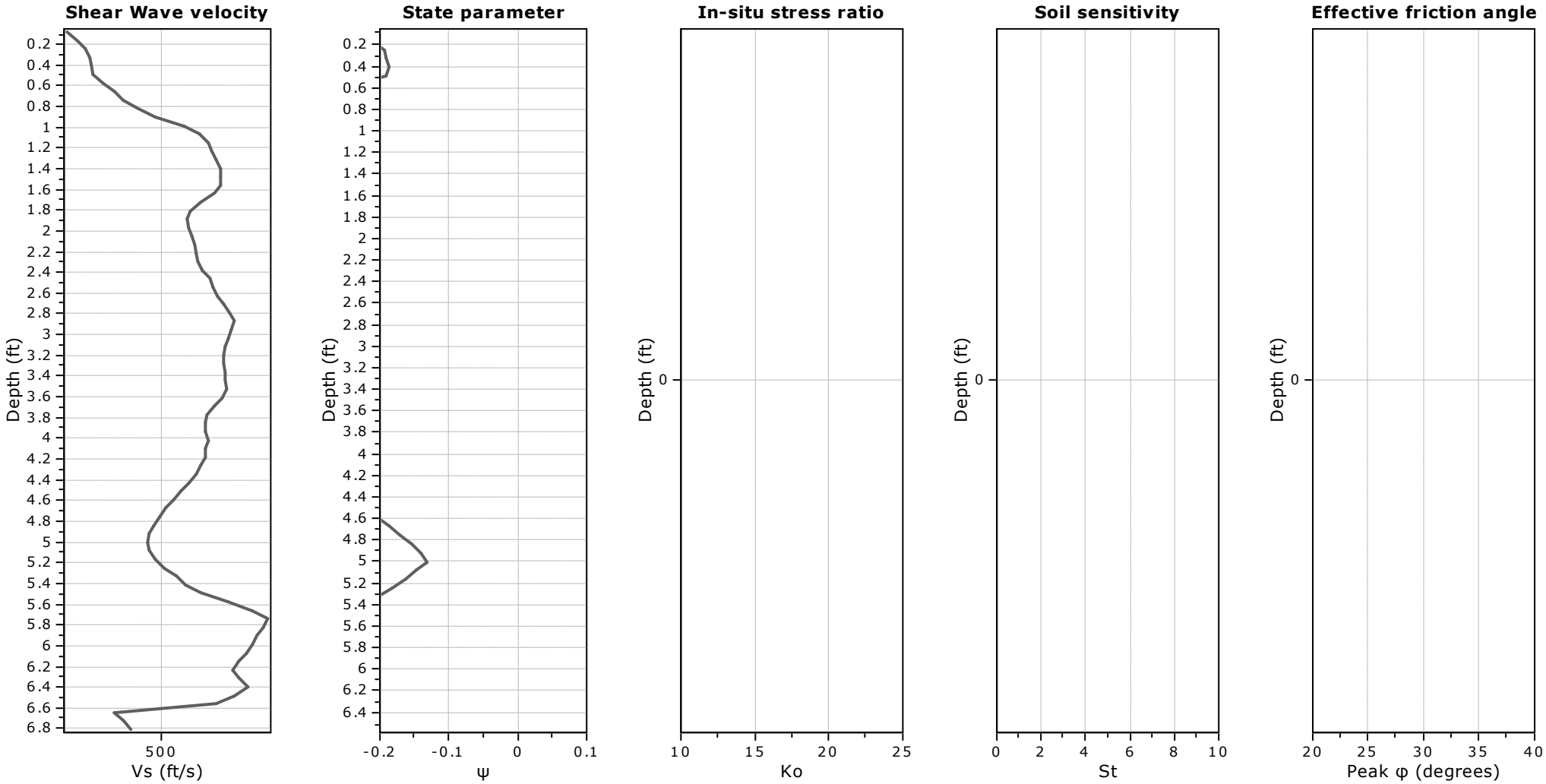
Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

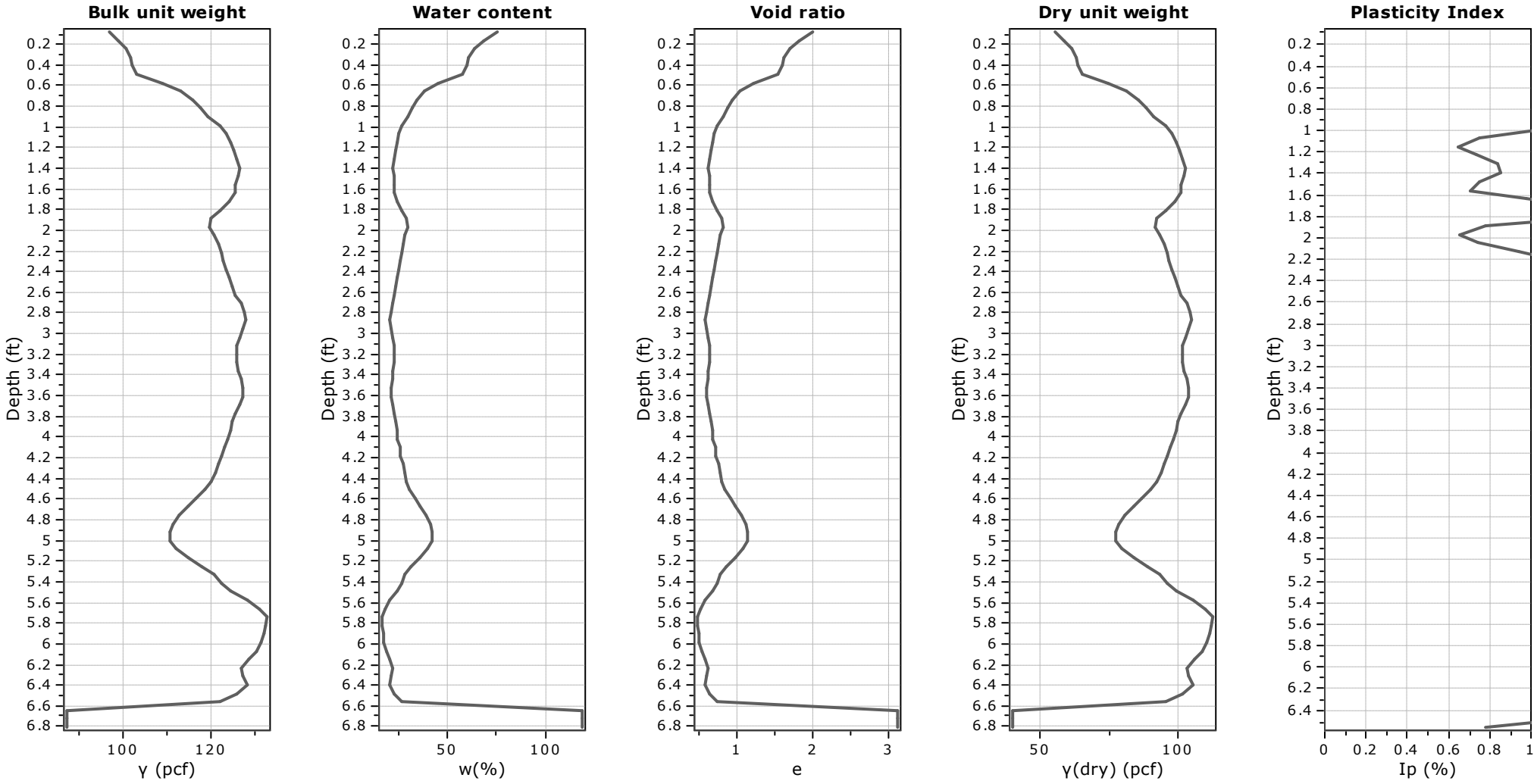


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: G-1
Total depth: 6.81 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

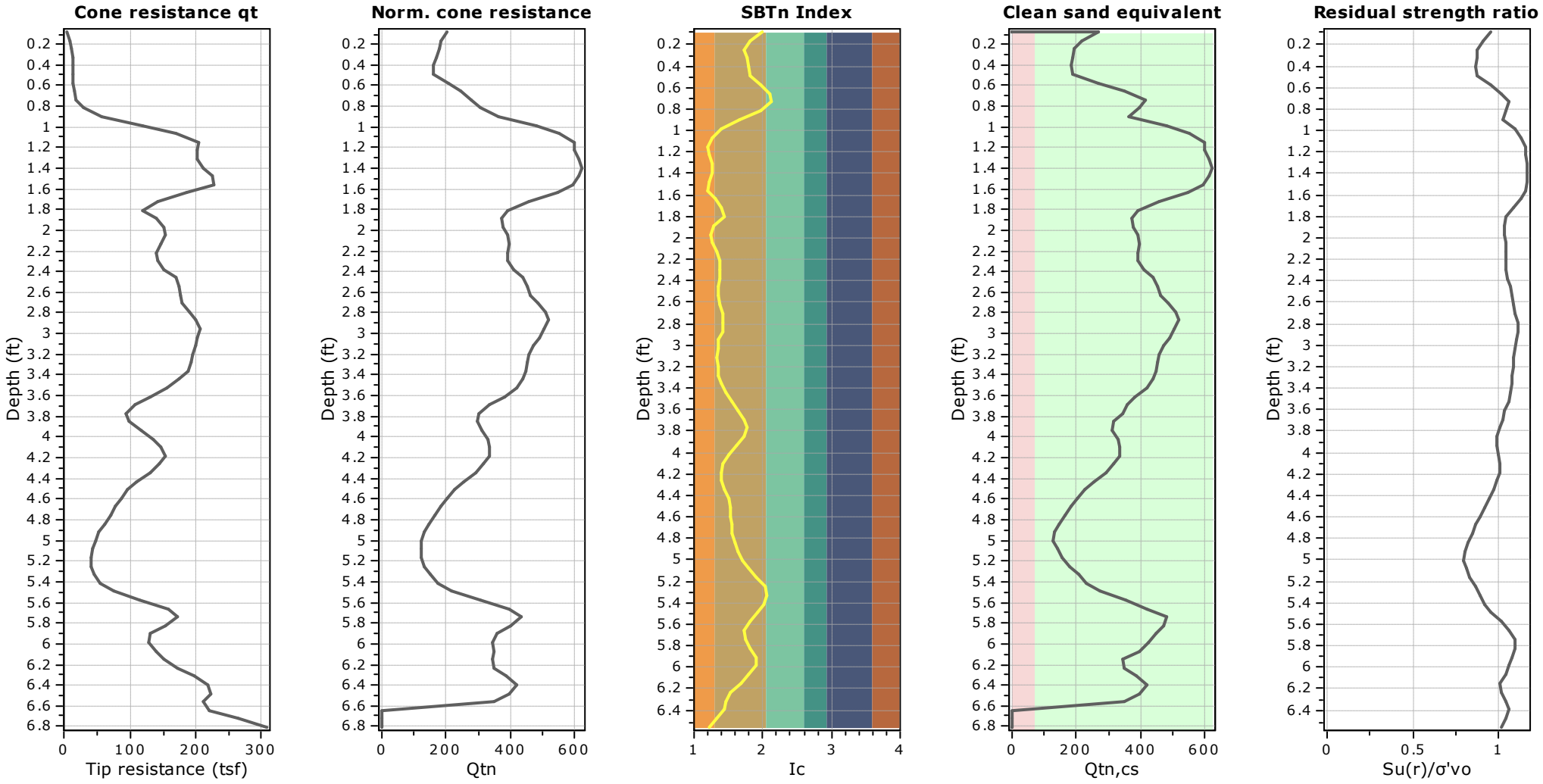
Project:
Location:

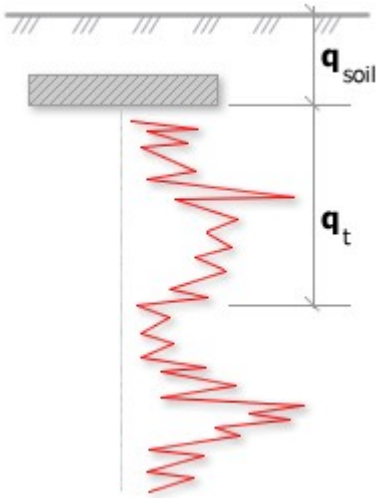


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: G-1
Total depth: 6.81 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

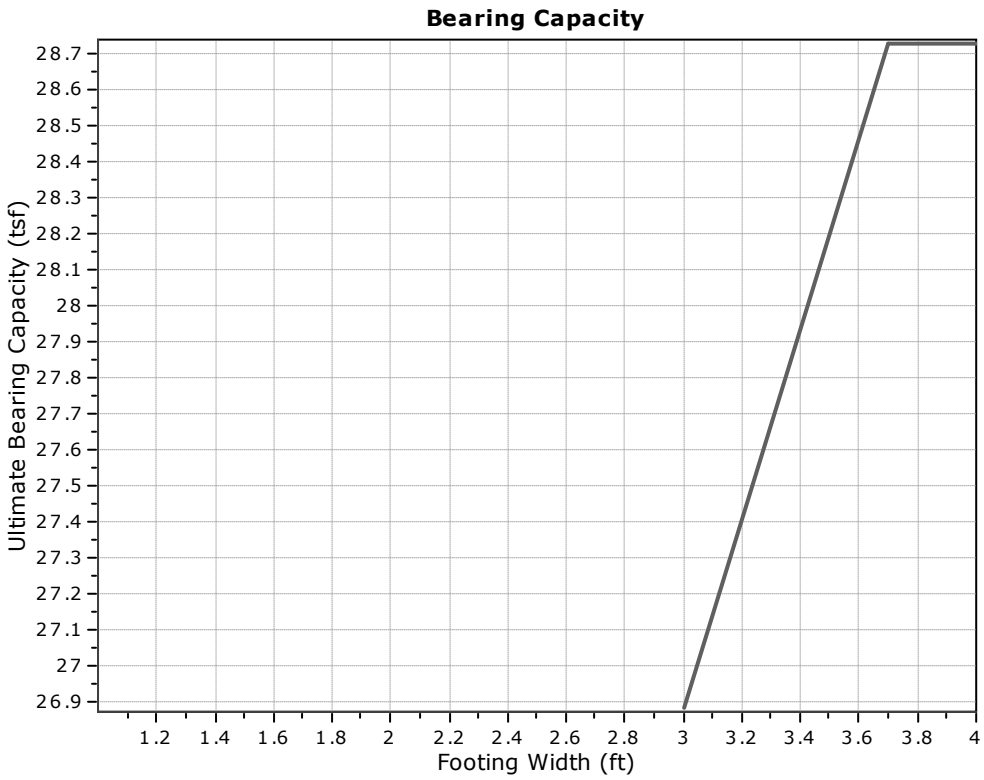




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

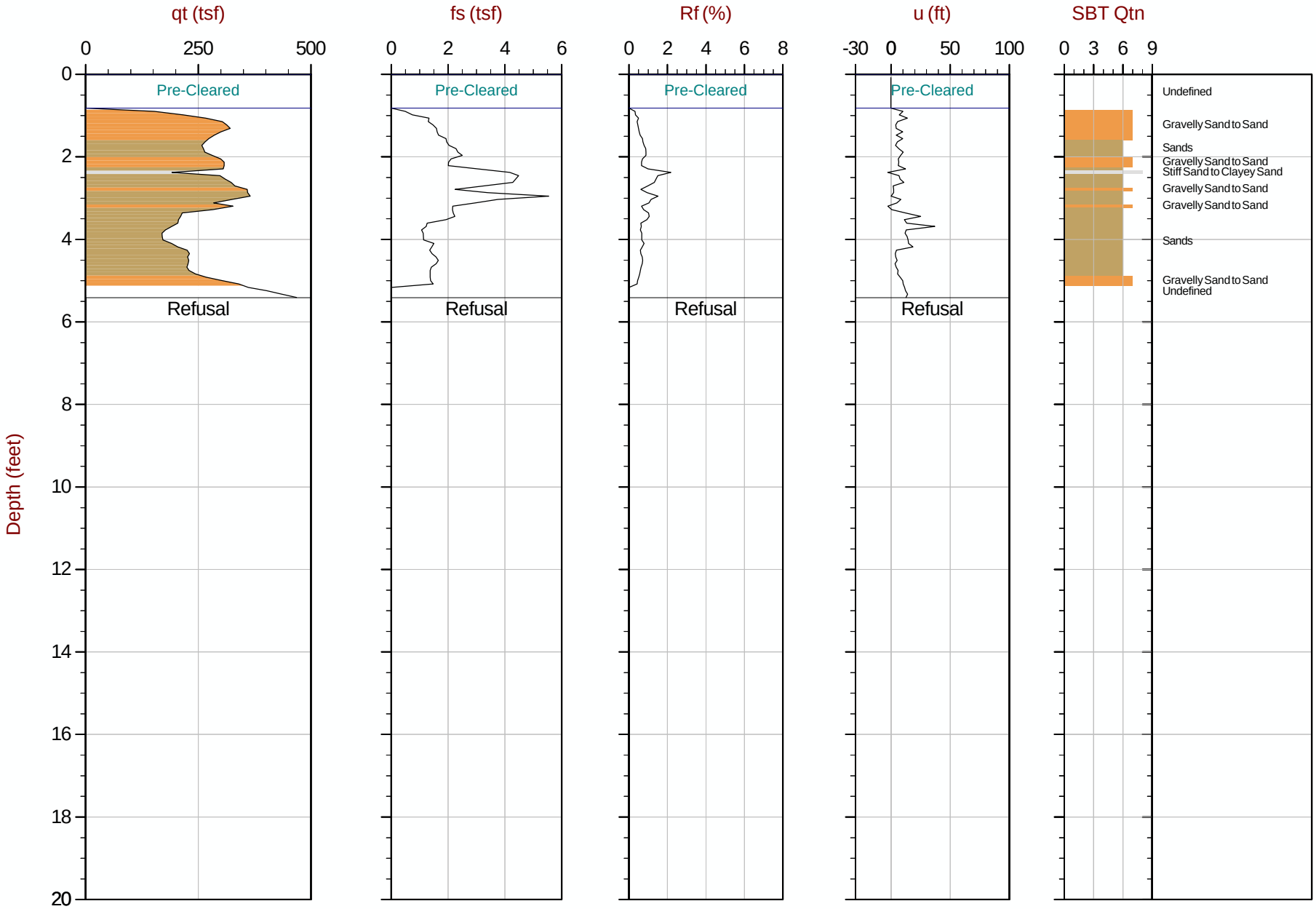
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	133.93	0.20	0.10	26.88
2	3.70	1.60	7.15	143.17	0.20	0.10	28.73
3	4.40	1.60	8.20	143.17	0.20	0.10	28.73
4	5.10	1.60	9.25	143.17	0.20	0.10	28.73
5	5.80	1.60	10.30	143.17	0.20	0.10	28.73
6	6.50	1.60	11.35	143.17	0.20	0.10	28.73
7	7.20	1.60	12.40	143.17	0.20	0.10	28.73
8	7.90	1.60	13.45	143.17	0.20	0.10	28.73
9	8.60	1.60	14.50	143.17	0.20	0.10	28.73
10	9.30	1.60	15.55	143.17	0.20	0.10	28.73
11	10.00	1.60	16.60	143.17	0.20	0.10	28.73
12	10.70	1.60	17.65	143.17	0.20	0.10	28.73
13	11.40	1.60	18.70	143.17	0.20	0.10	28.73
14	12.10	1.60	19.75	143.17	0.20	0.10	28.73
15	12.80	1.60	20.80	143.17	0.20	0.10	28.73

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 12:21
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-G-8
Cone: 652:T1500F15U35



Max Depth: 1.650 m / 5.41 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPG-8.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6241 Long: -70.9171

Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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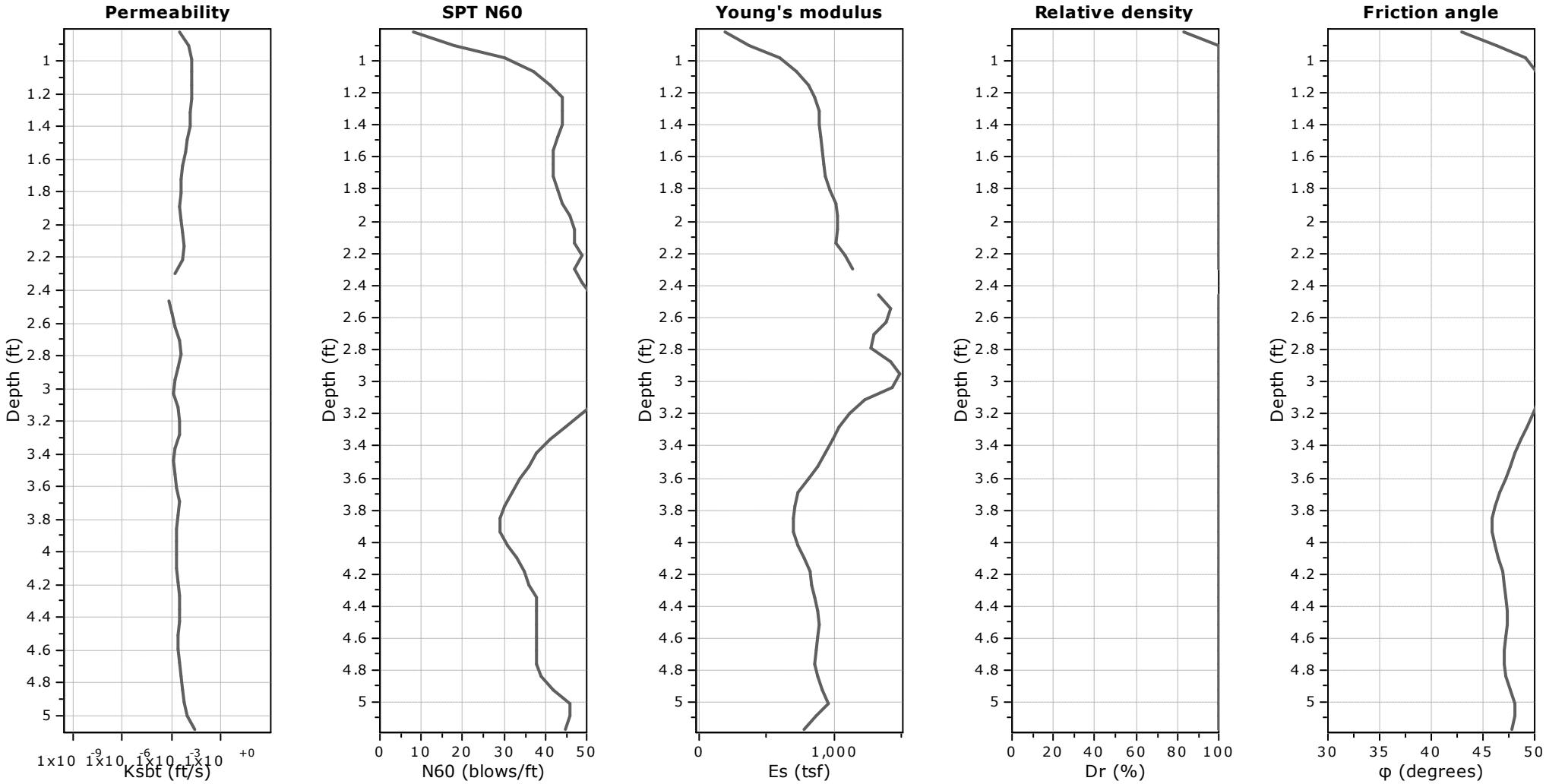
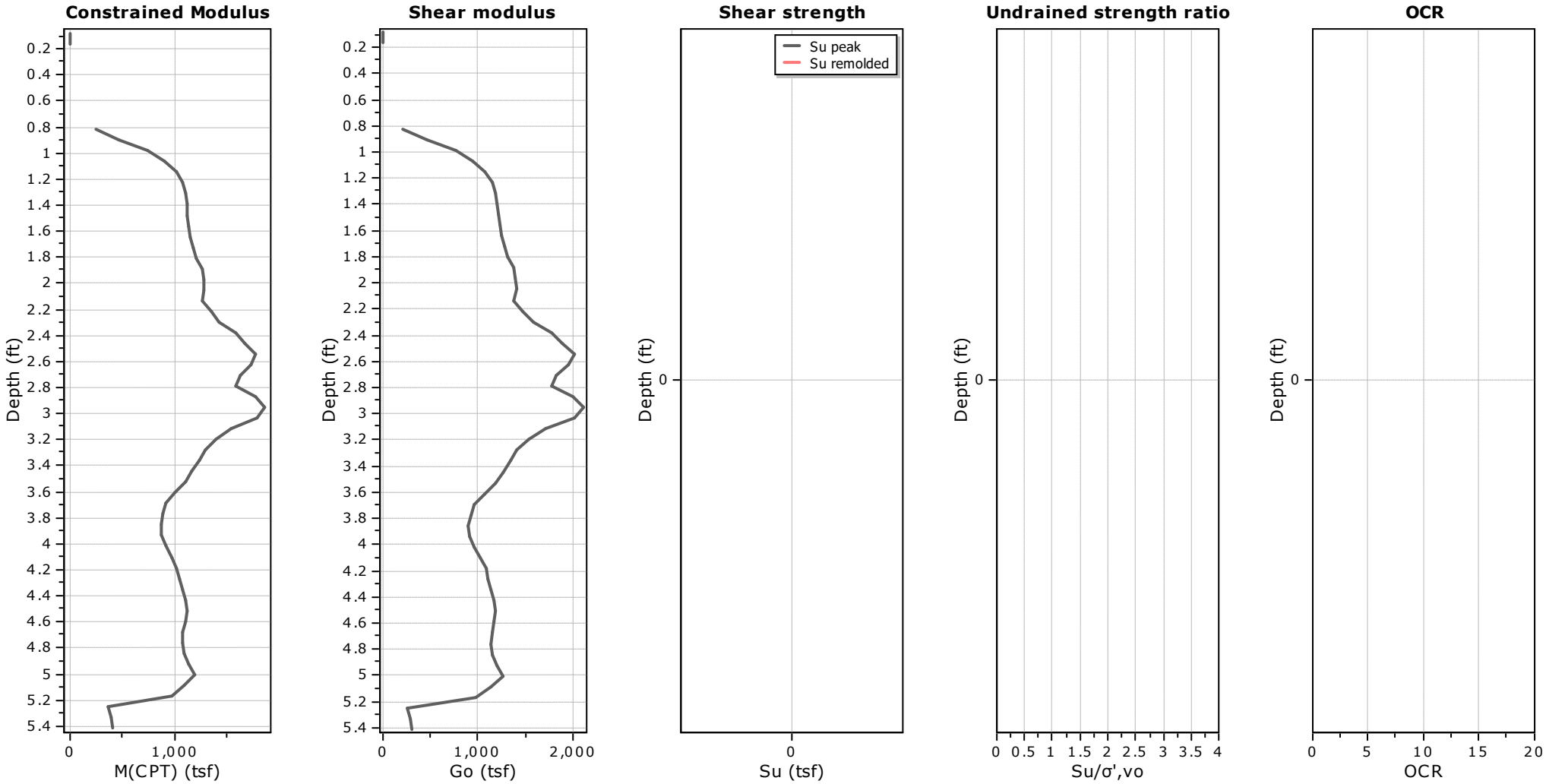
CPT: G-8
Total depth: 5.41 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



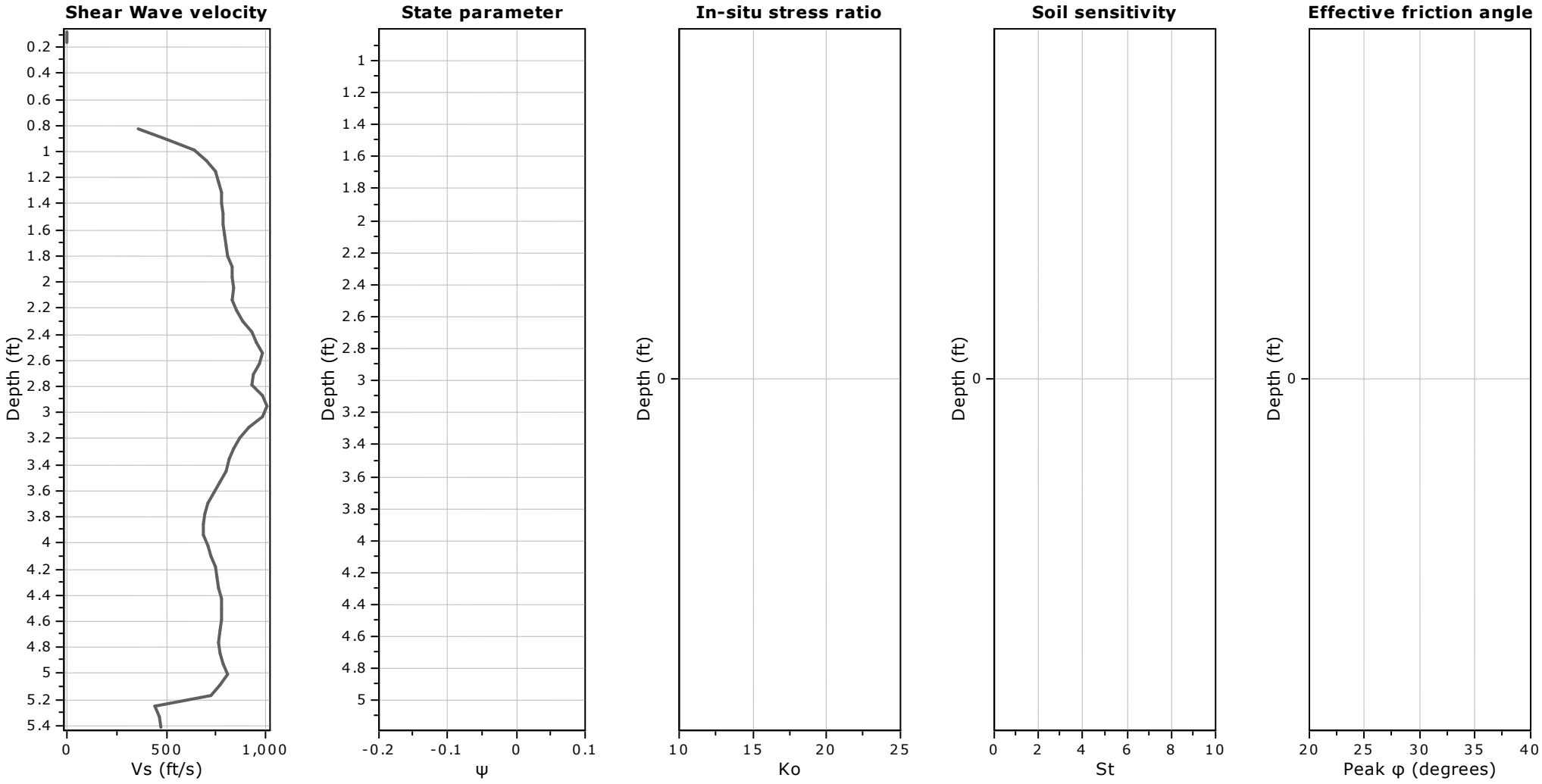
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

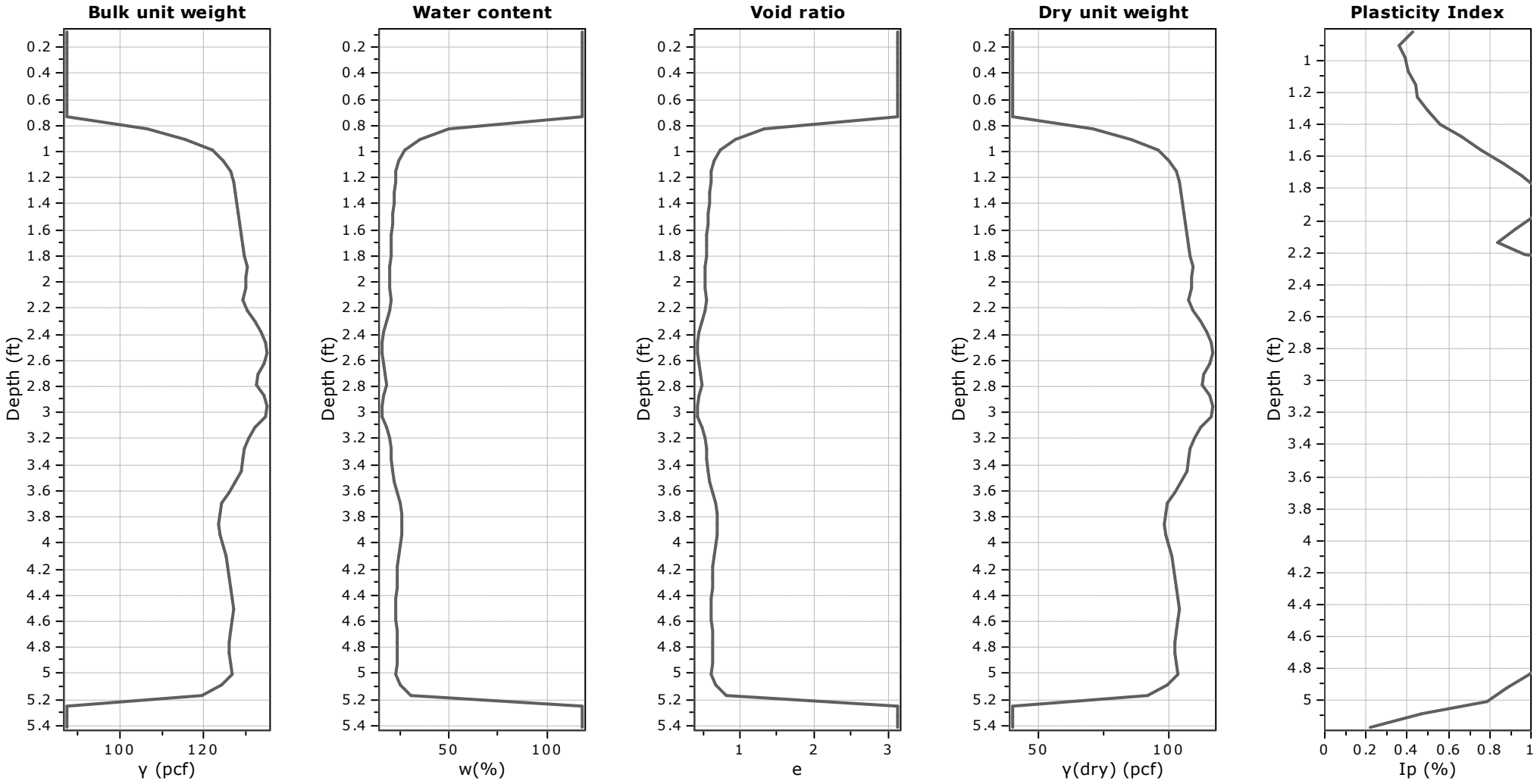


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: G-8
Total depth: 5.41 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
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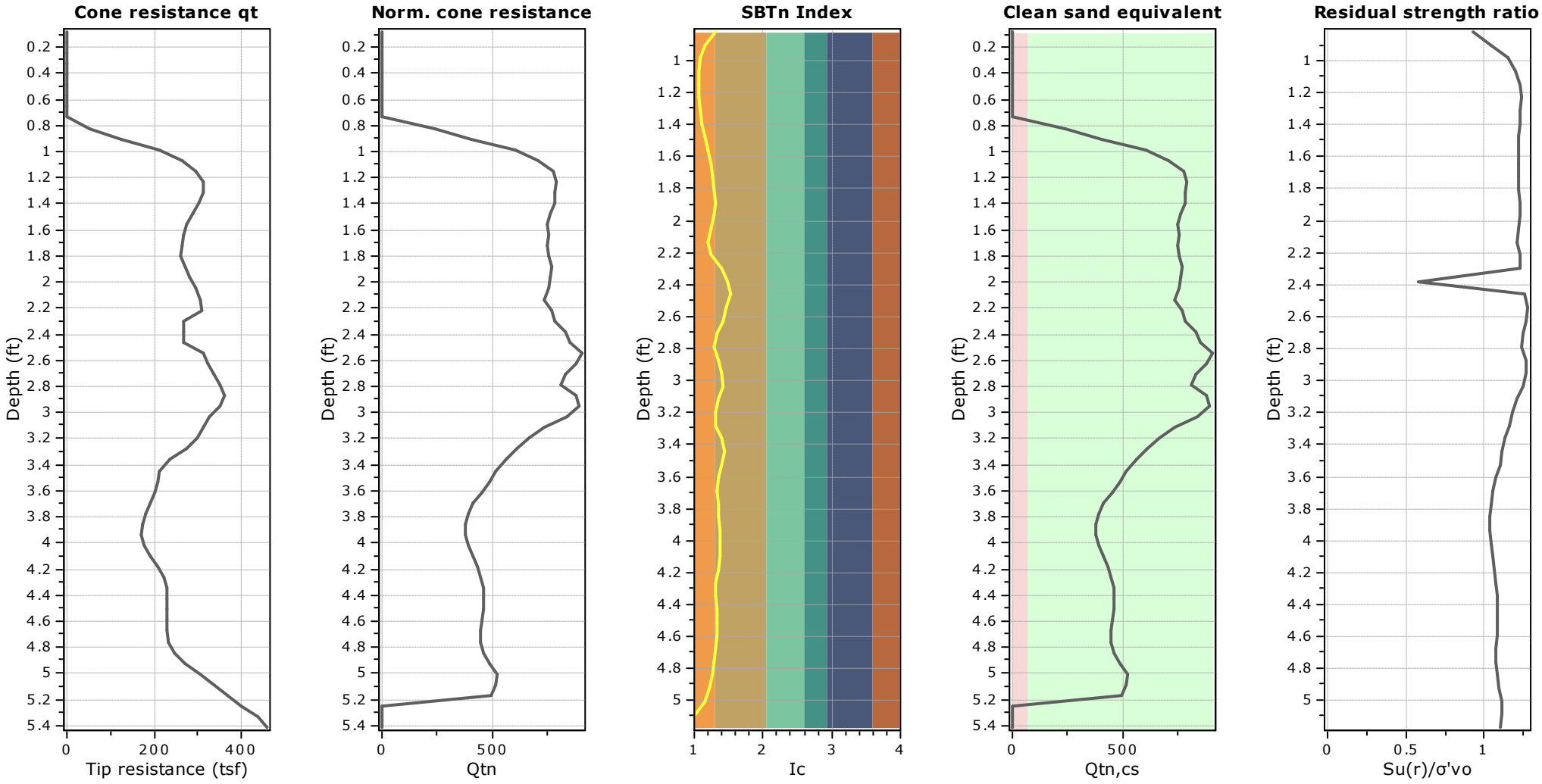
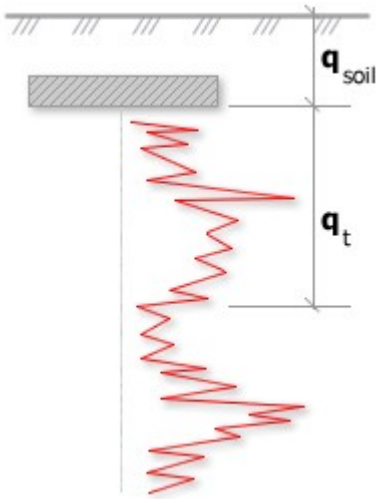
CPT: G-8
Total depth: 5.41 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

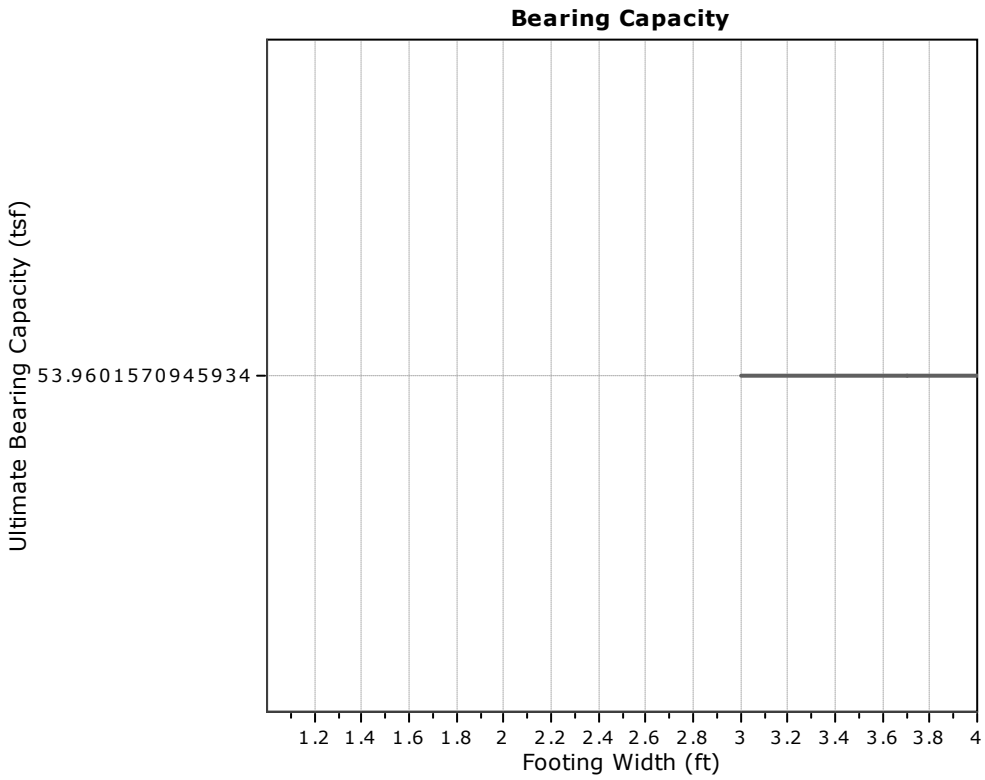




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

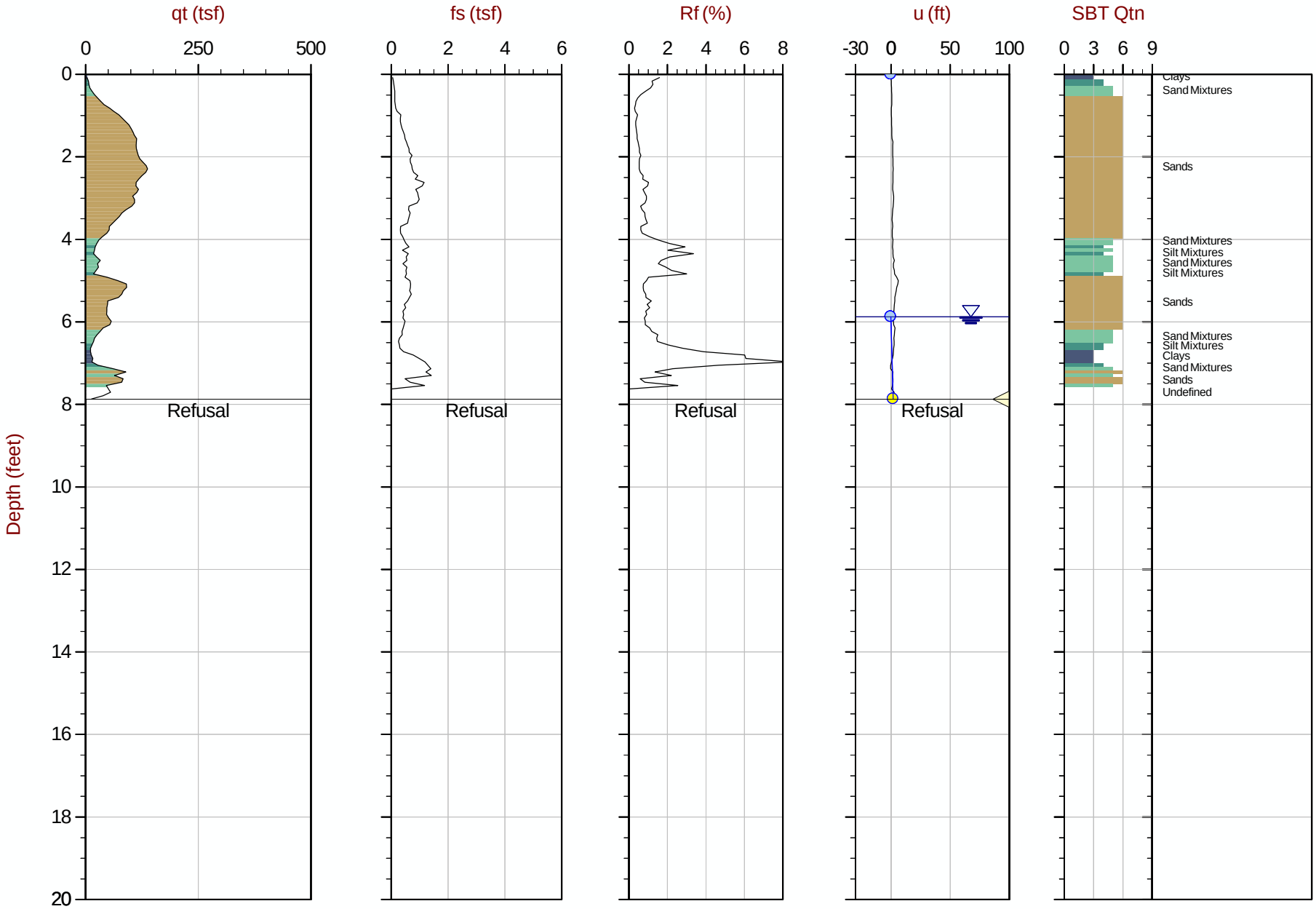
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	269.32	0.20	0.10	53.96
2	3.70	1.60	7.15	269.32	0.20	0.10	53.96
3	4.40	1.60	8.20	269.32	0.20	0.10	53.96
4	5.10	1.60	9.25	269.32	0.20	0.10	53.96
5	5.80	1.60	10.30	269.32	0.20	0.10	53.96
6	6.50	1.60	11.35	269.32	0.20	0.10	53.96
7	7.20	1.60	12.40	269.32	0.20	0.10	53.96
8	7.90	1.60	13.45	269.32	0.20	0.10	53.96
9	8.60	1.60	14.50	269.32	0.20	0.10	53.96
10	9.30	1.60	15.55	269.32	0.20	0.10	53.96
11	10.00	1.60	16.60	269.32	0.20	0.10	53.96
12	10.70	1.60	17.65	269.32	0.20	0.10	53.96
13	11.40	1.60	18.70	269.32	0.20	0.10	53.96
14	12.10	1.60	19.75	269.32	0.20	0.10	53.96
15	12.80	1.60	20.80	269.32	0.20	0.10	53.96

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 13:59
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-GG-9
Cone: 652:T1500F15U35



Max Depth: 2.400 m / 7.87 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPGG-9.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6239 Long: -70.9183

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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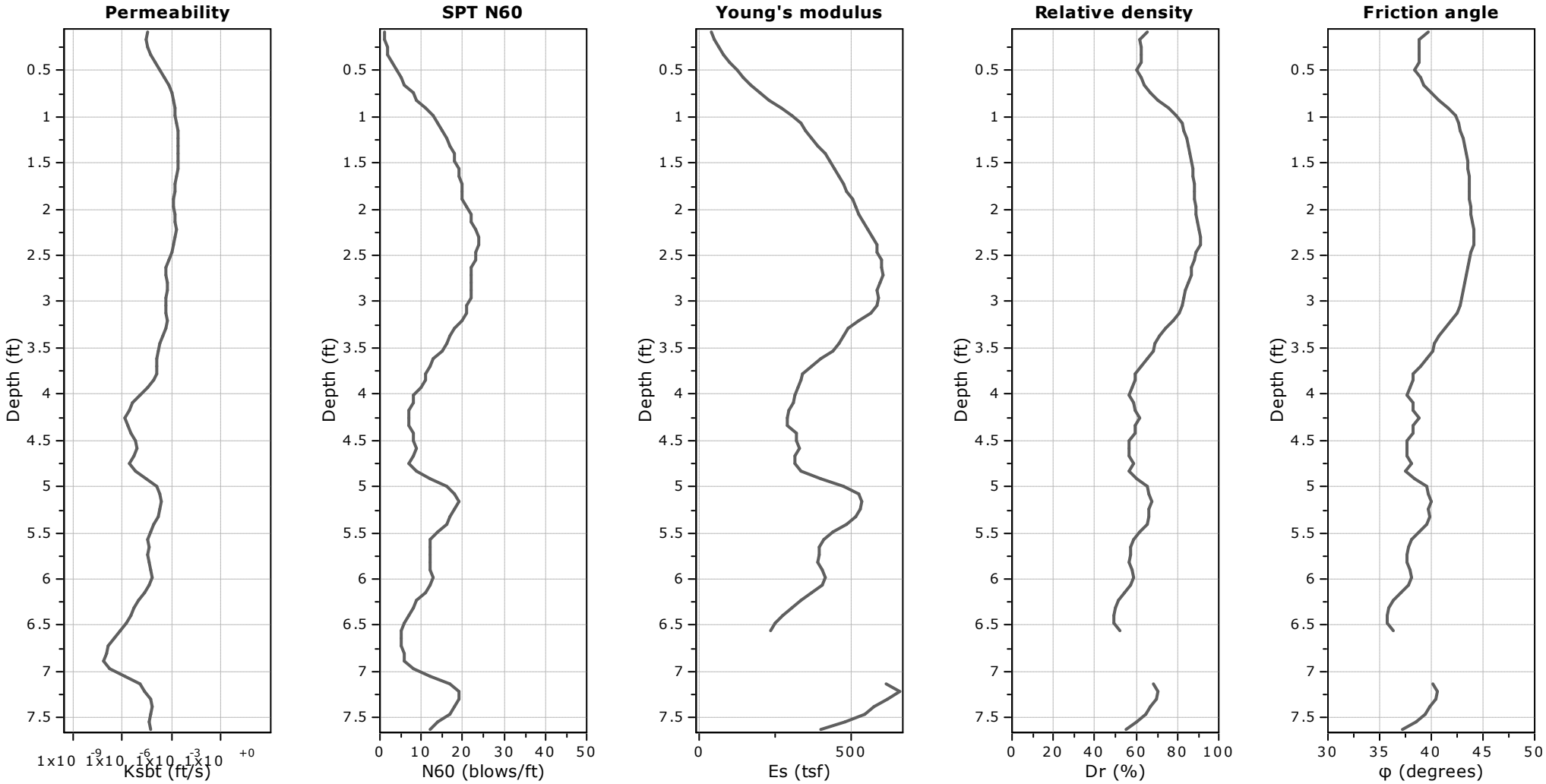
http://www.geologismiki.gr

CPT: GG-9
Total depth: 7.87 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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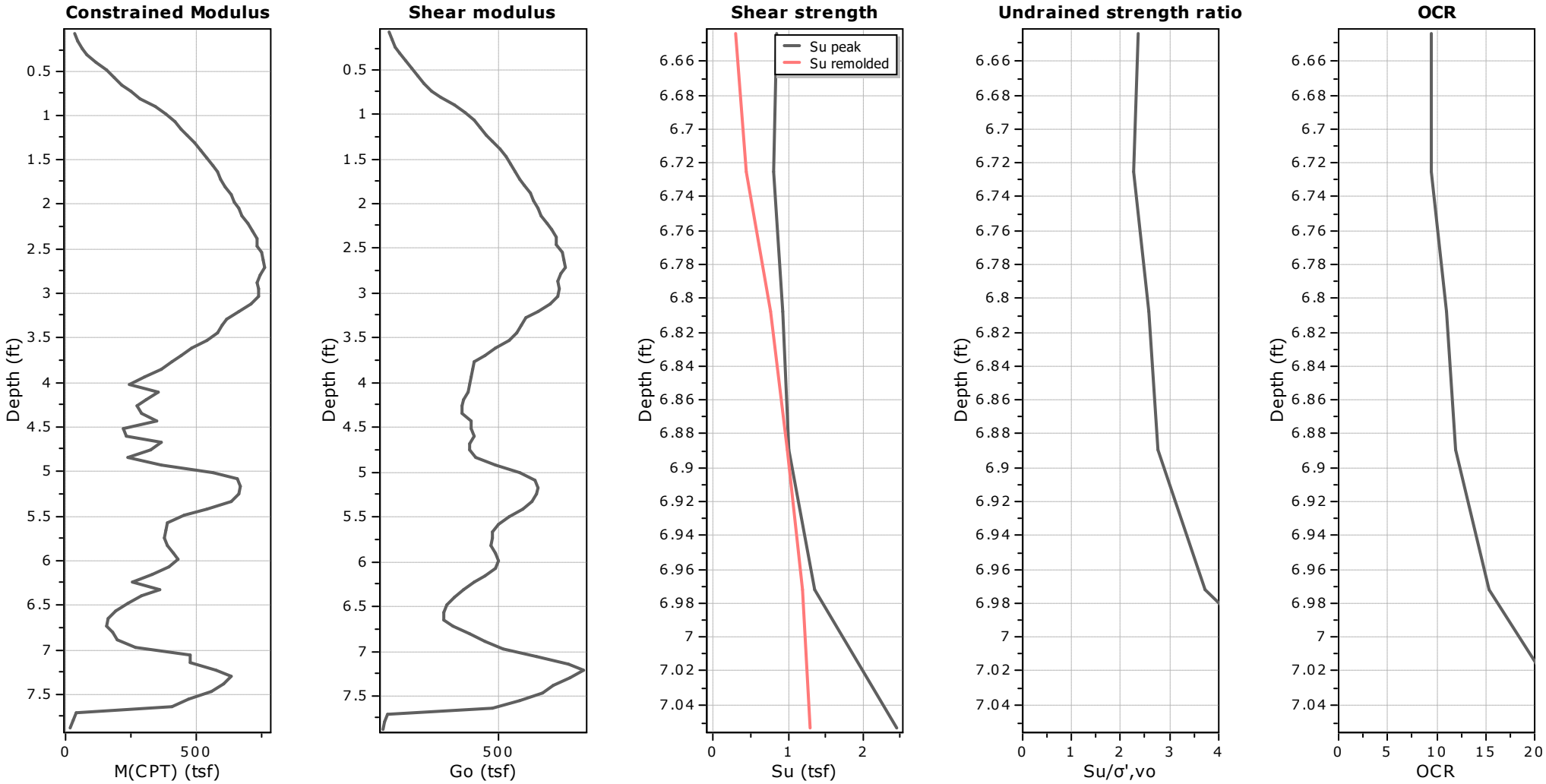
http://www.geologismiki.gr

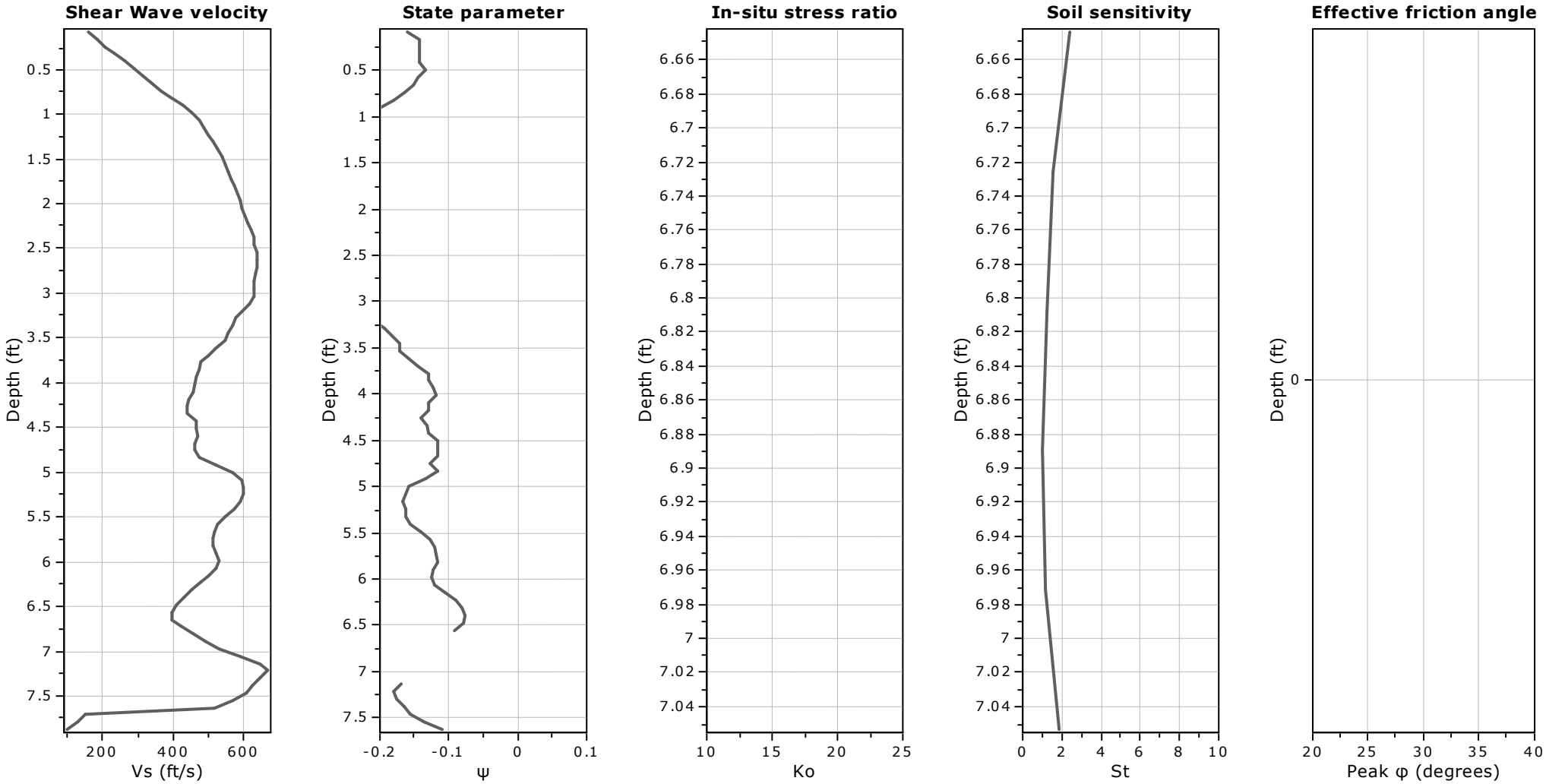
CPT: GG-9
Total depth: 7.87 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



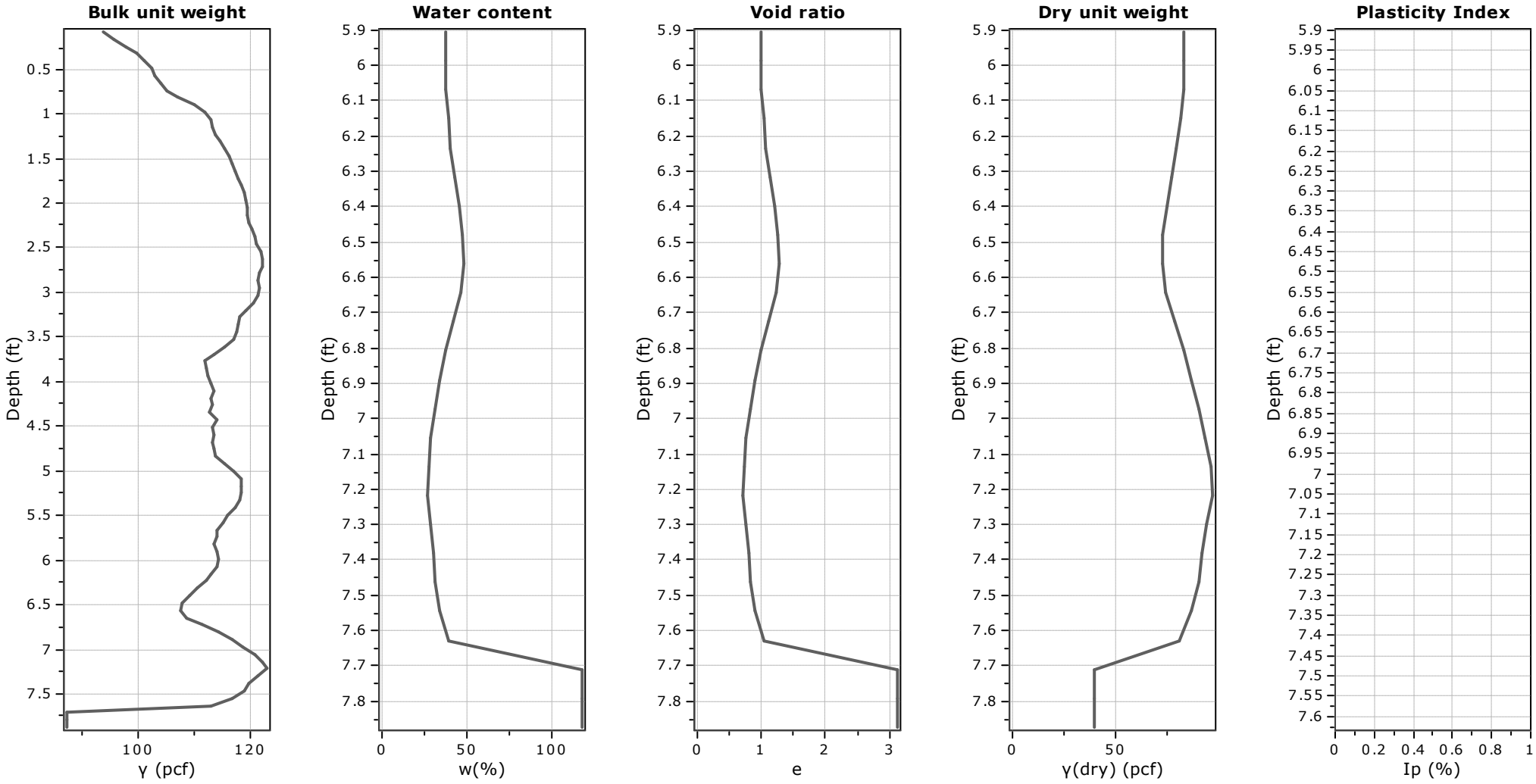
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: GG-9
Total depth: 7.87 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
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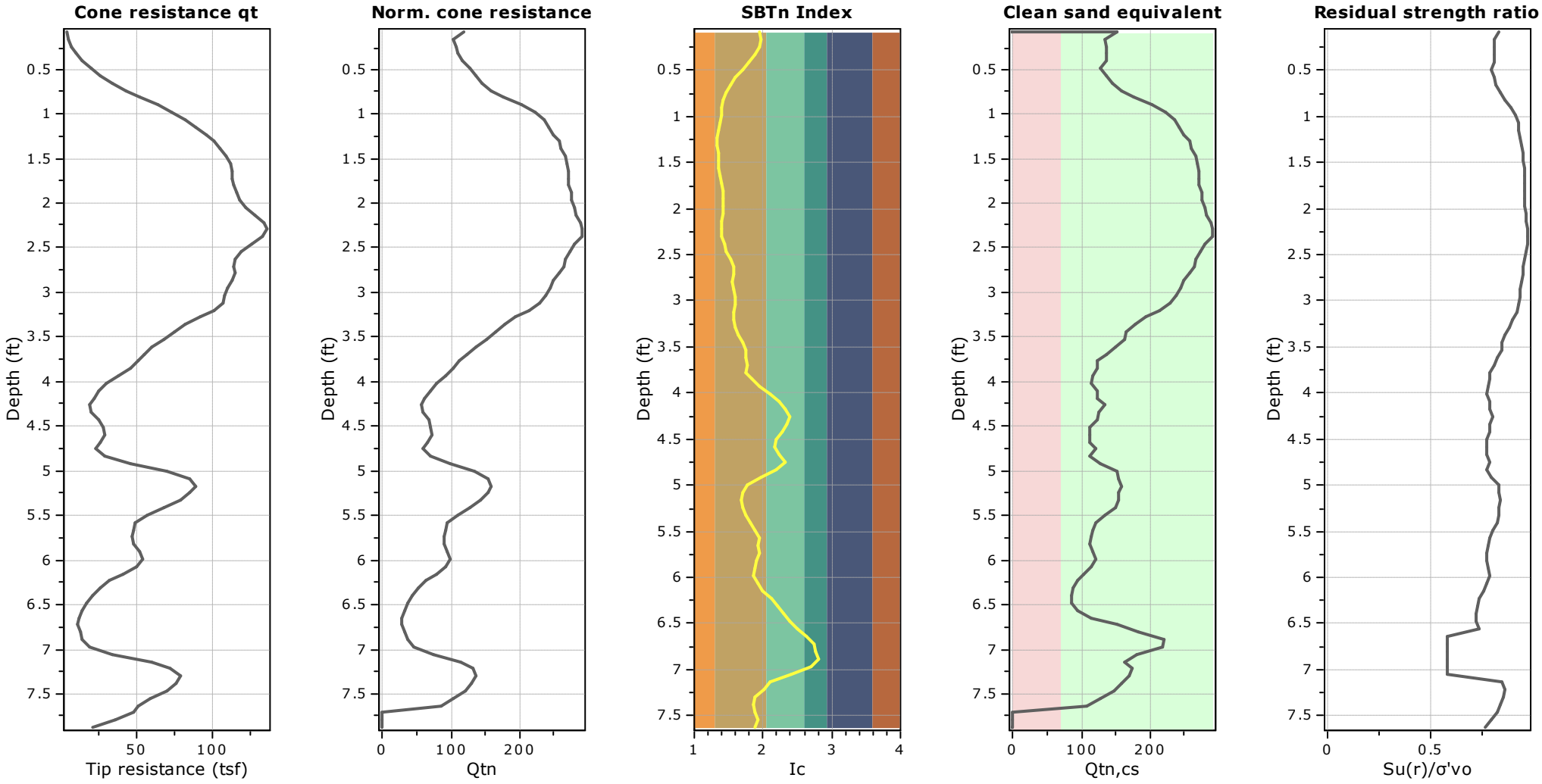
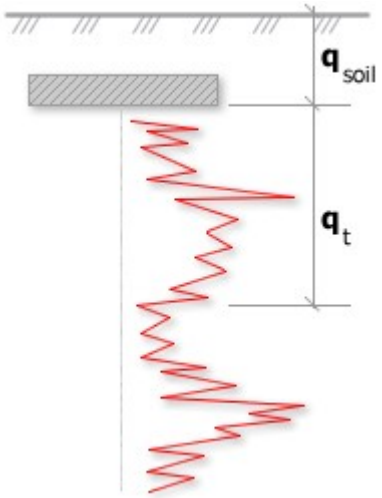
http://www.geologismiki.gr

CPT: GG-9
Total depth: 7.87 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

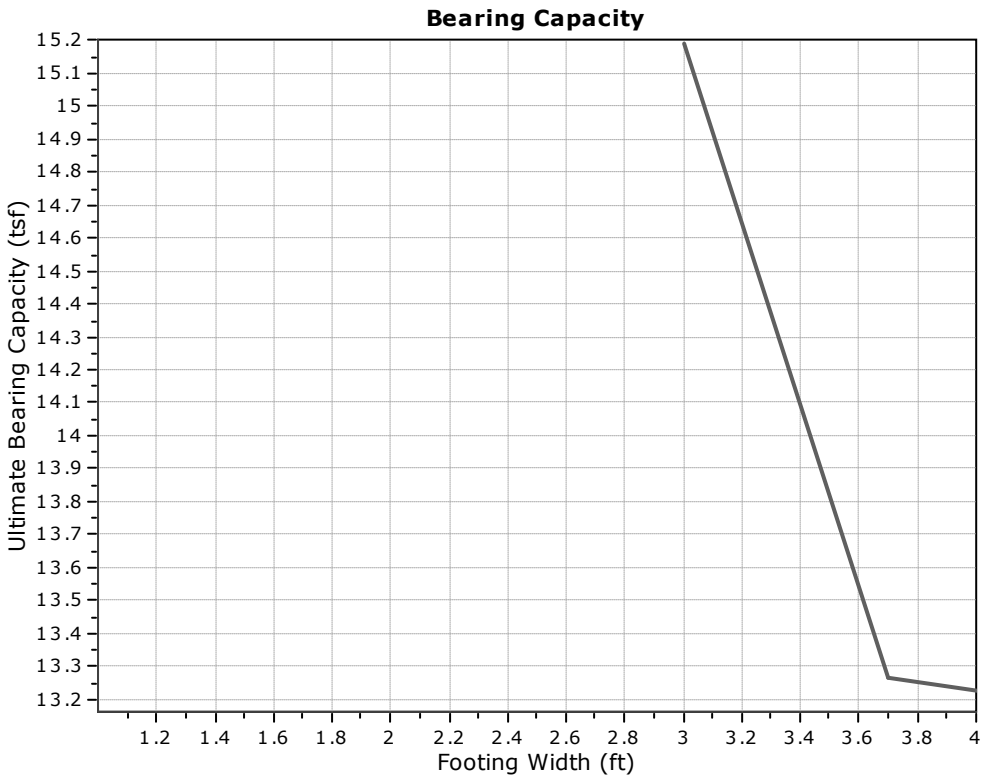




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

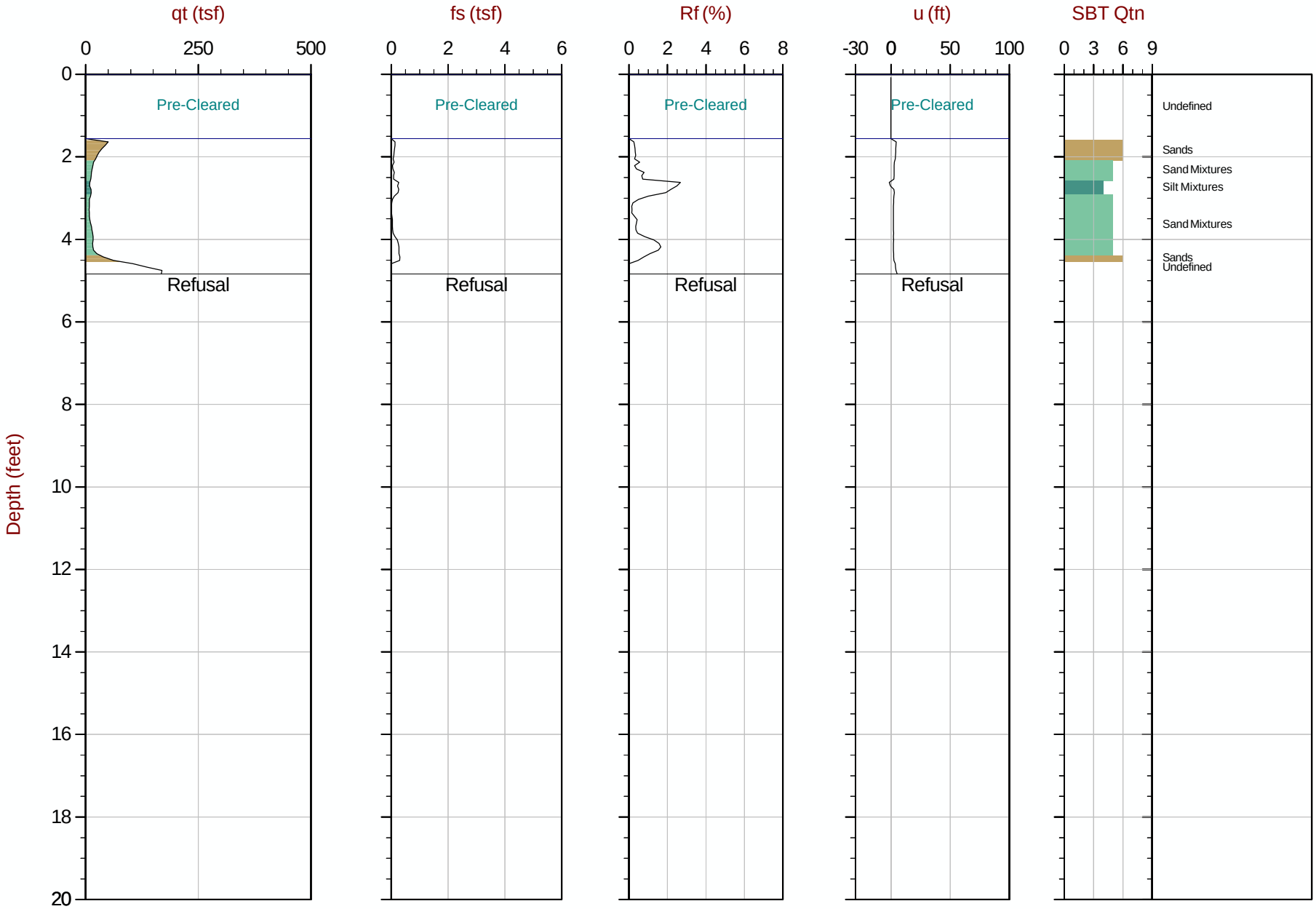
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	75.47	0.20	0.10	15.19
2	3.70	1.60	7.15	65.85	0.20	0.10	13.27
3	4.40	1.60	8.20	65.39	0.20	0.10	13.17
4	5.10	1.60	9.25	65.39	0.20	0.10	13.17
5	5.80	1.60	10.30	65.39	0.20	0.10	13.17
6	6.50	1.60	11.35	65.39	0.20	0.10	13.17
7	7.20	1.60	12.40	65.39	0.20	0.10	13.17
8	7.90	1.60	13.45	65.39	0.20	0.10	13.17
9	8.60	1.60	14.50	65.39	0.20	0.10	13.17
10	9.30	1.60	15.55	65.39	0.20	0.10	13.17
11	10.00	1.60	16.60	65.39	0.20	0.10	13.17
12	10.70	1.60	17.65	65.39	0.20	0.10	13.17
13	11.40	1.60	18.70	65.39	0.20	0.10	13.17
14	12.10	1.60	19.75	65.39	0.20	0.10	13.17
15	12.80	1.60	20.80	65.39	0.20	0.10	13.17

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-02 08:52
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-H-3
Cone: 845:T1000F10U35



Max Depth: 1.475 m / 4.84 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPH-3.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6238 Long: -70.9169

Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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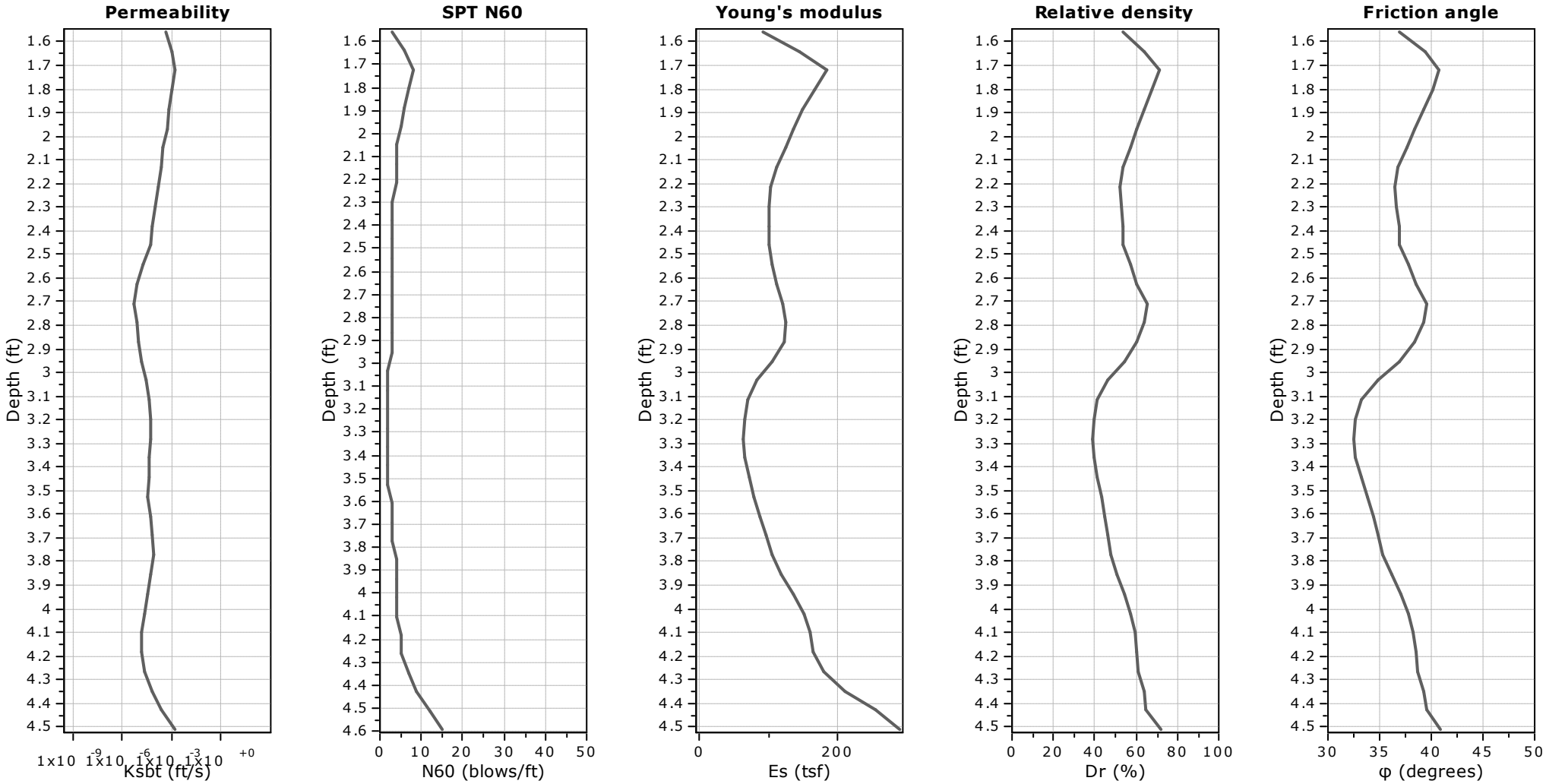
http://www.geologismiki.gr

CPT: H-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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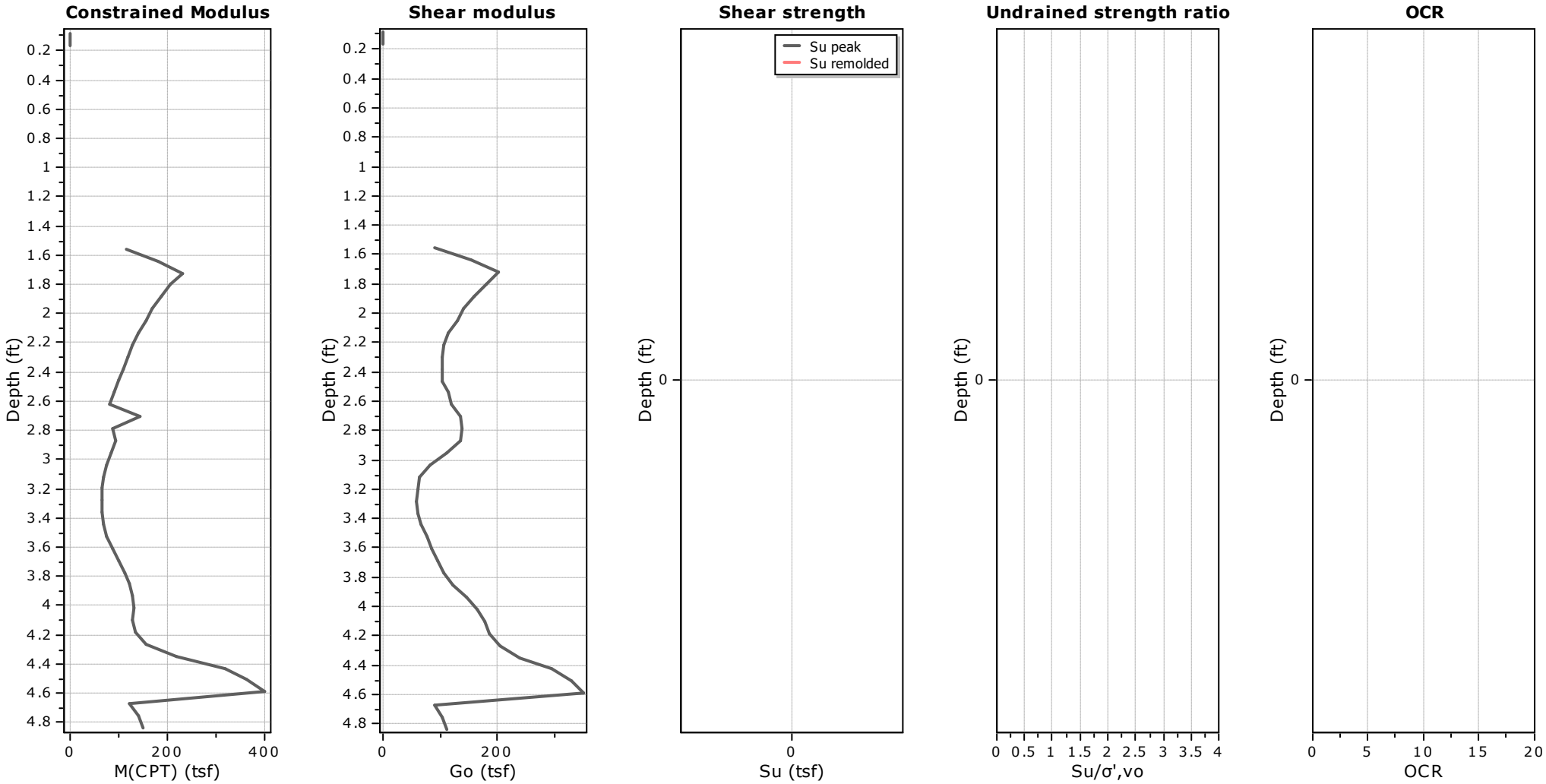
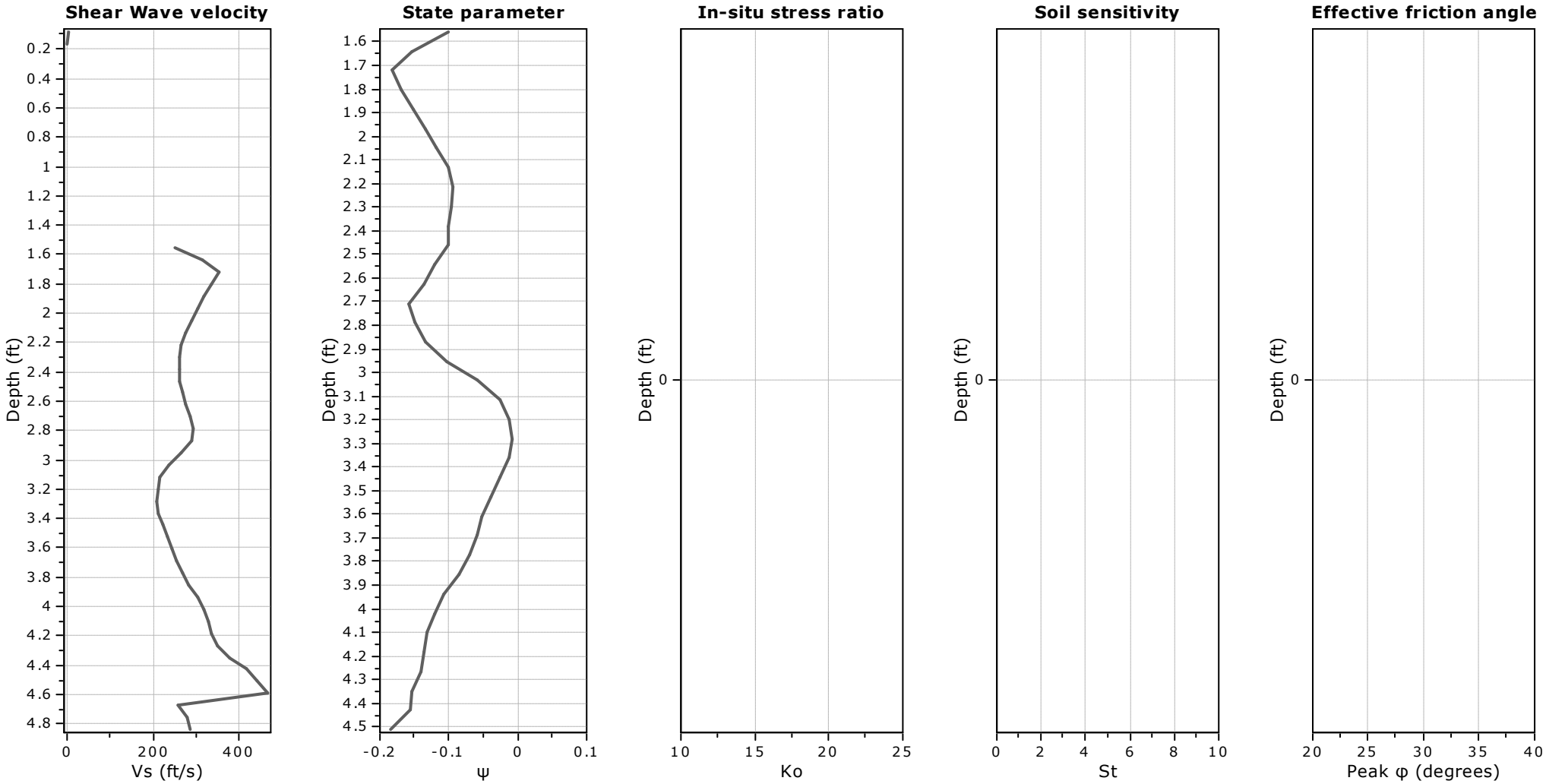
CPT: H-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

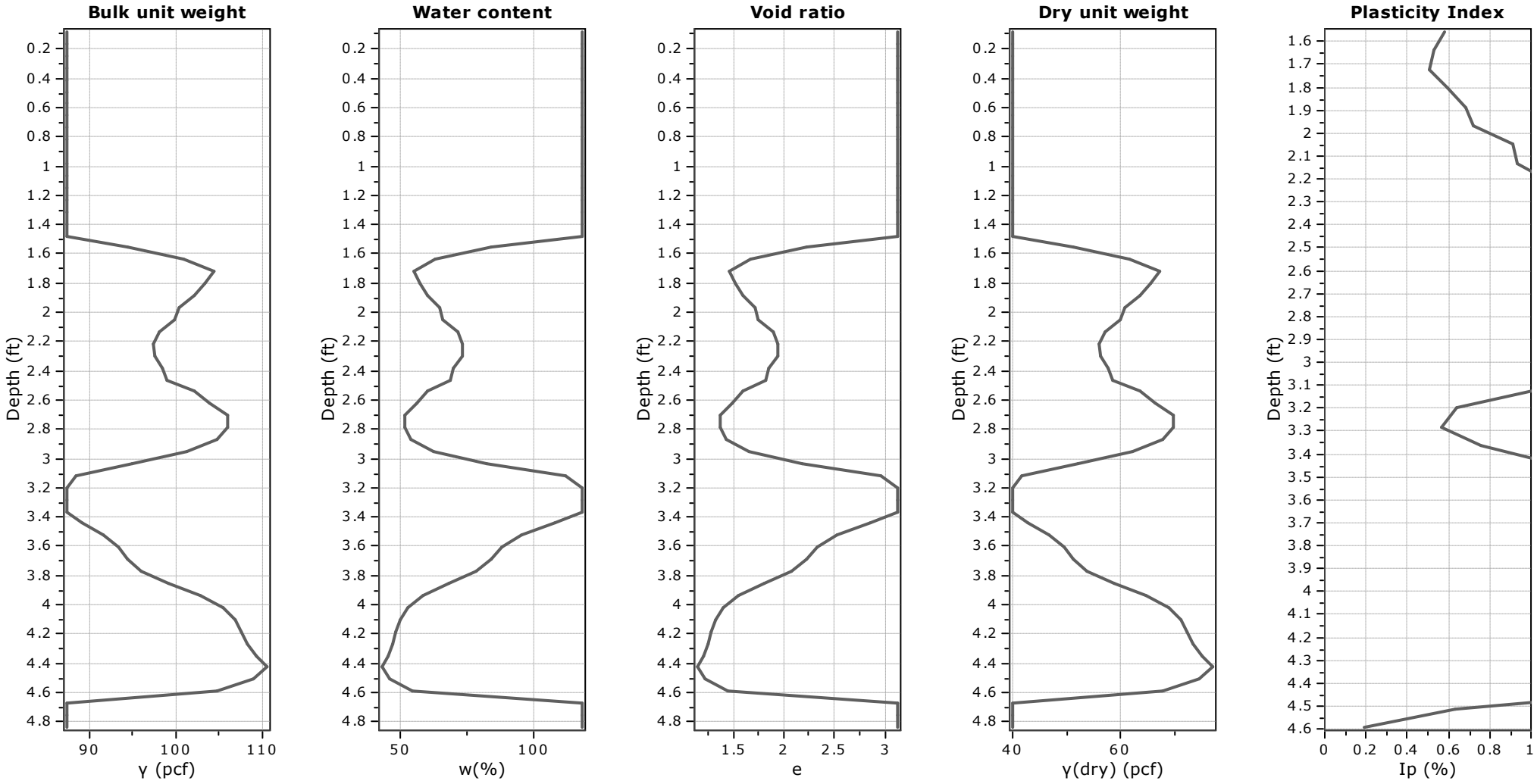


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: H-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



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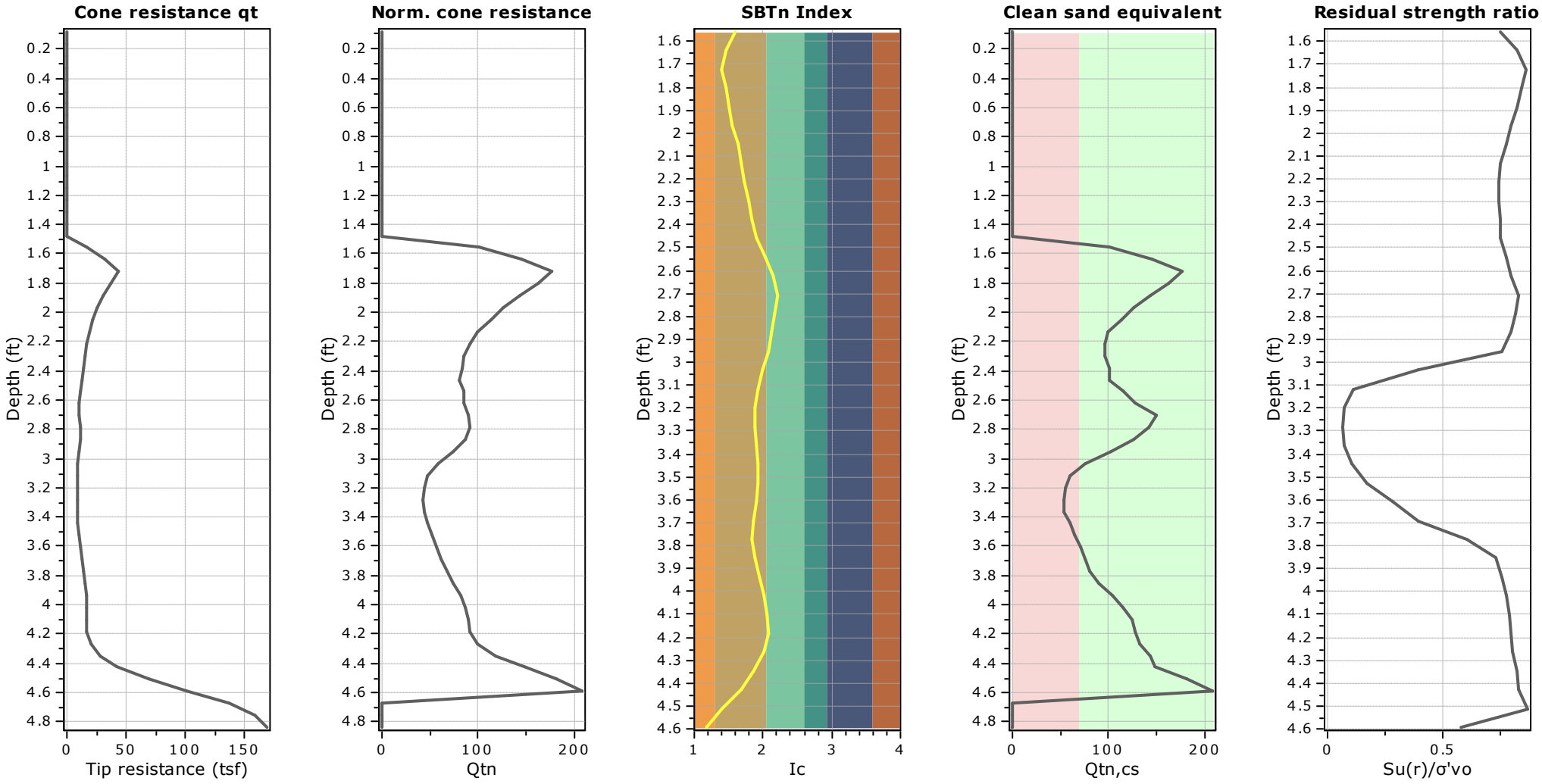
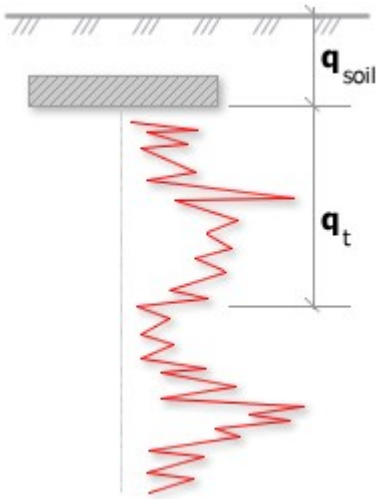
CPT: H-3
Total depth: 4.84 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

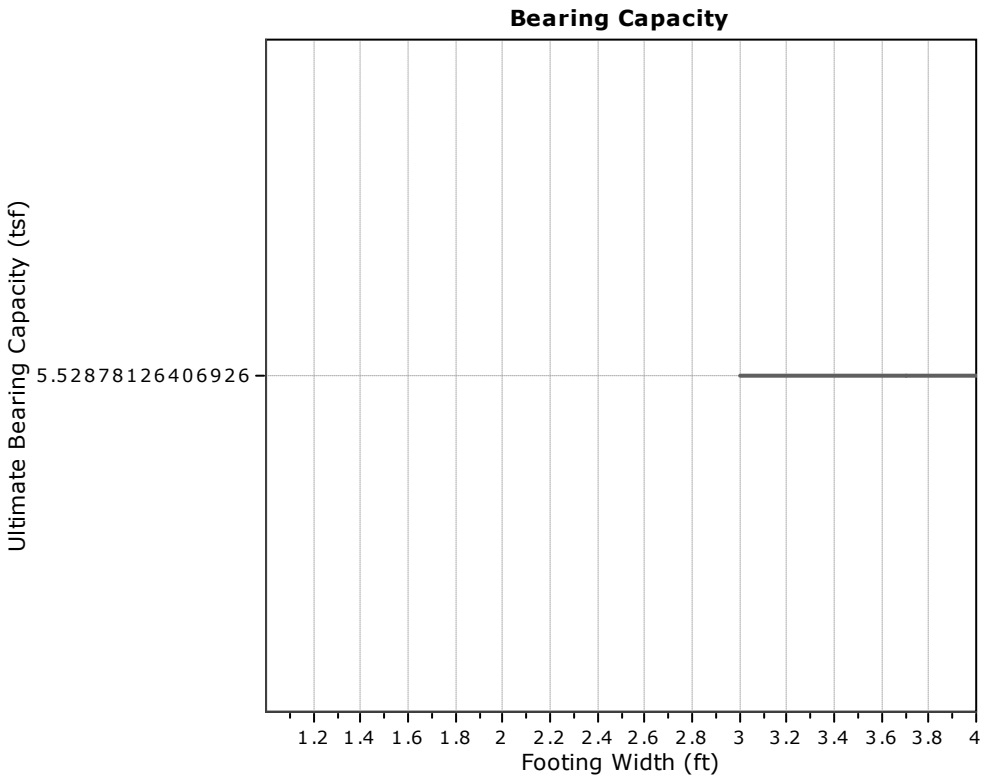




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

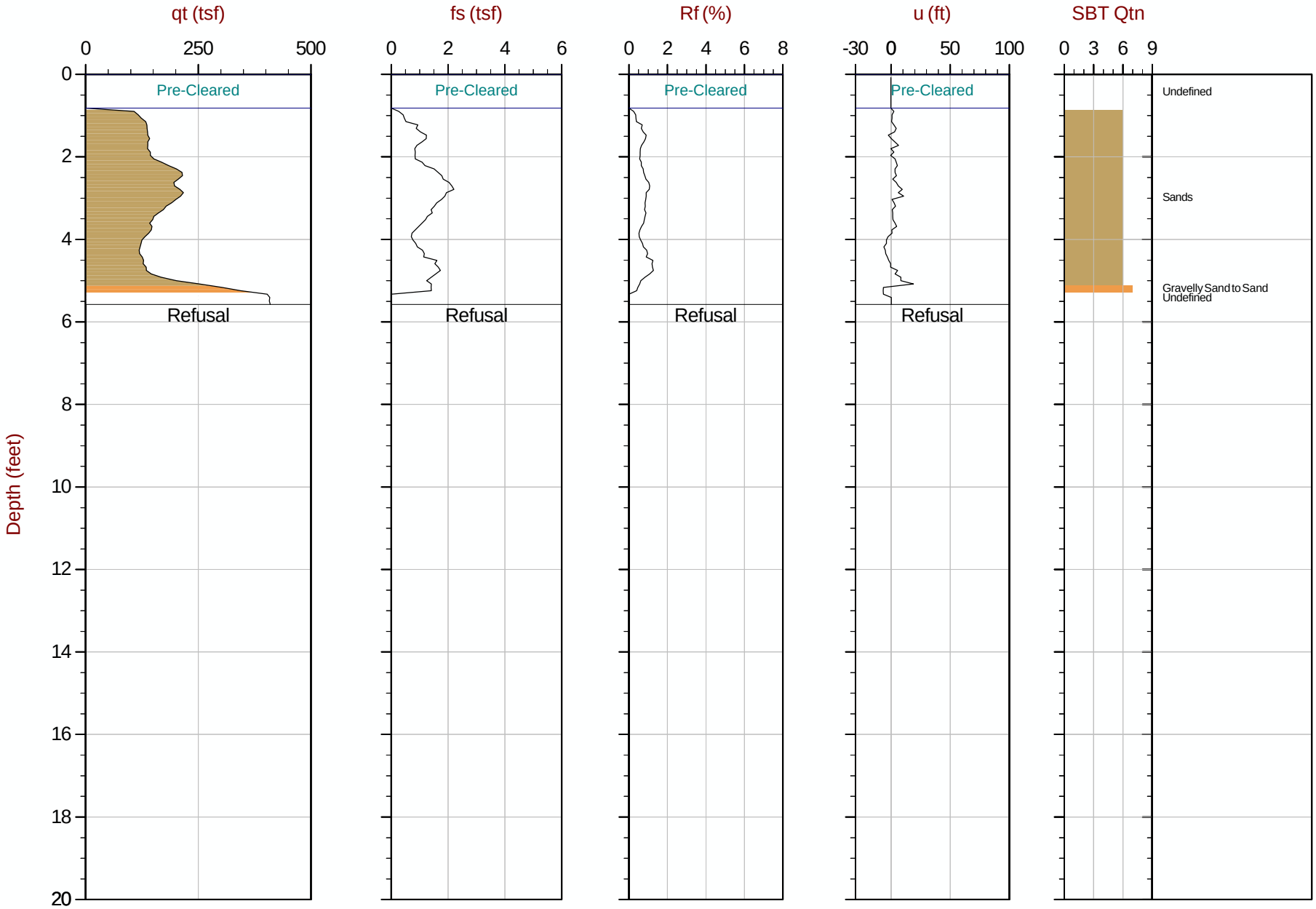
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	27.16	0.20	0.10	5.53
2	3.70	1.60	7.15	27.16	0.20	0.10	5.53
3	4.40	1.60	8.20	27.16	0.20	0.10	5.53
4	5.10	1.60	9.25	27.16	0.20	0.10	5.53
5	5.80	1.60	10.30	27.16	0.20	0.10	5.53
6	6.50	1.60	11.35	27.16	0.20	0.10	5.53
7	7.20	1.60	12.40	27.16	0.20	0.10	5.53
8	7.90	1.60	13.45	27.16	0.20	0.10	5.53
9	8.60	1.60	14.50	27.16	0.20	0.10	5.53
10	9.30	1.60	15.55	27.16	0.20	0.10	5.53
11	10.00	1.60	16.60	27.16	0.20	0.10	5.53
12	10.70	1.60	17.65	27.16	0.20	0.10	5.53
13	11.40	1.60	18.70	27.16	0.20	0.10	5.53
14	12.10	1.60	19.75	27.16	0.20	0.10	5.53
15	12.80	1.60	20.80	27.16	0.20	0.10	5.53

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 13:02
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-H-5
Cone: 652:T1500F15U35



Max Depth: 1.700 m / 5.58 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPH-5.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6239 Long: -70.9169

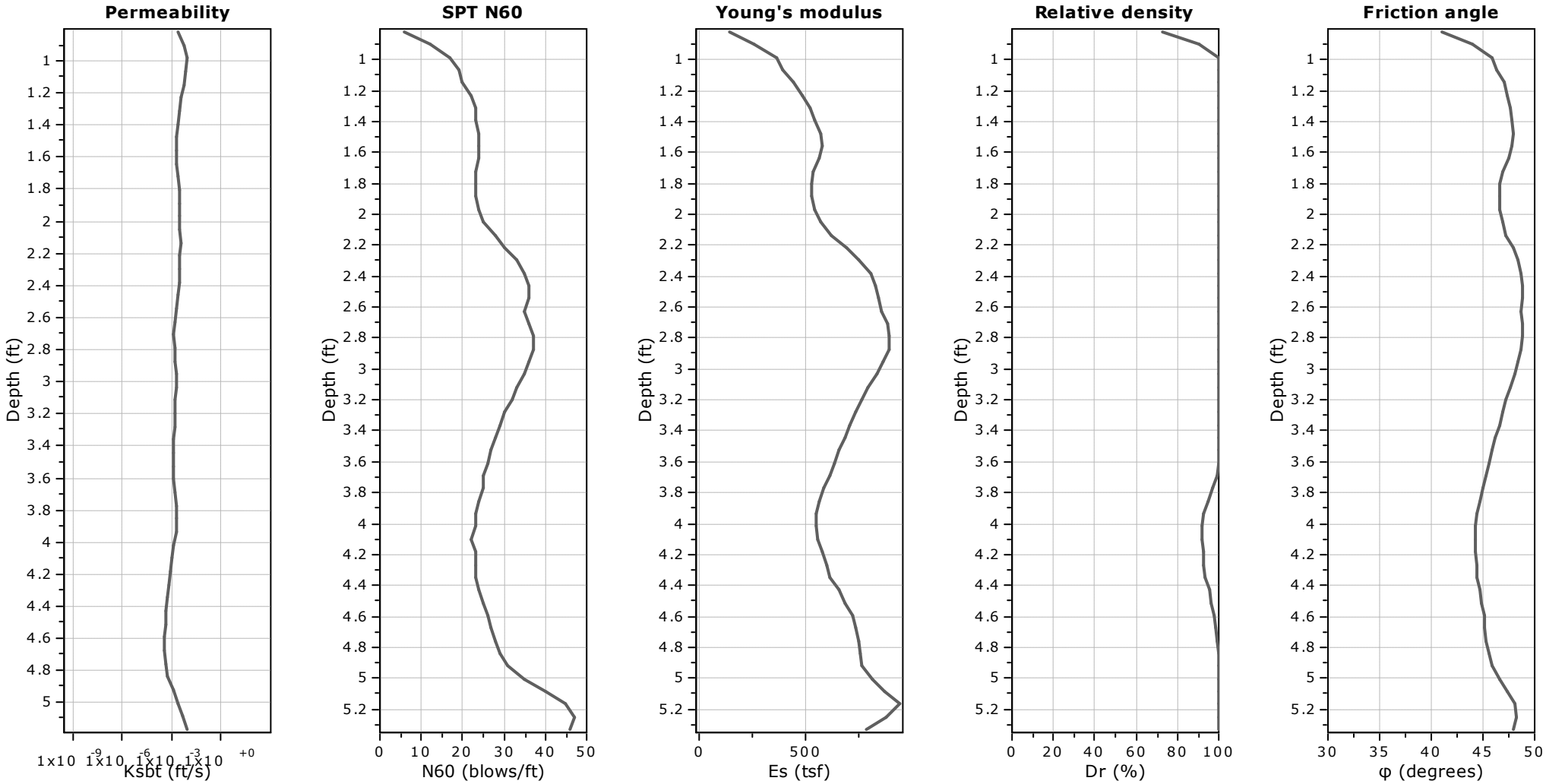
Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: H-5
Total depth: 5.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



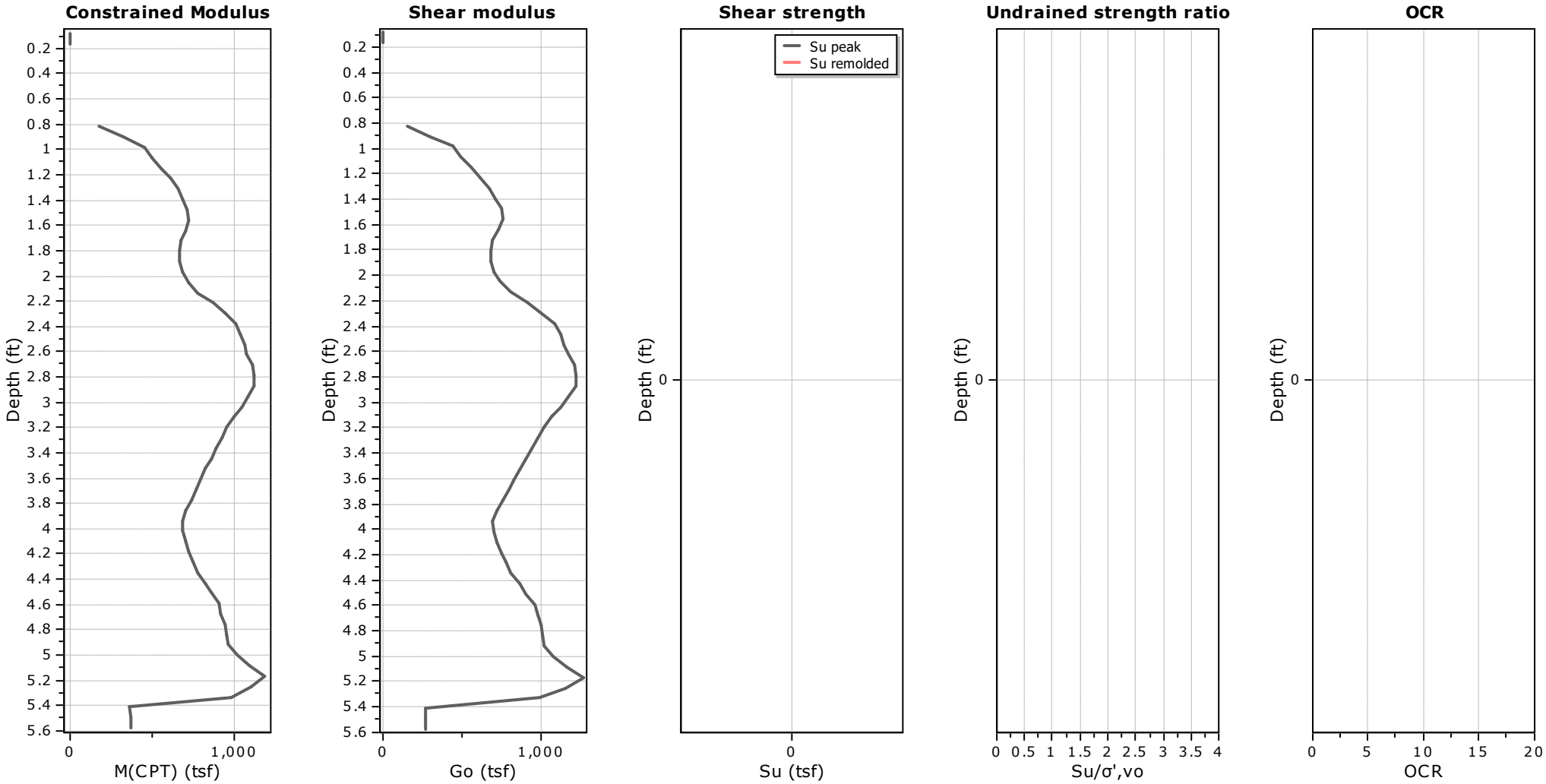
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: H-5
Total depth: 5.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



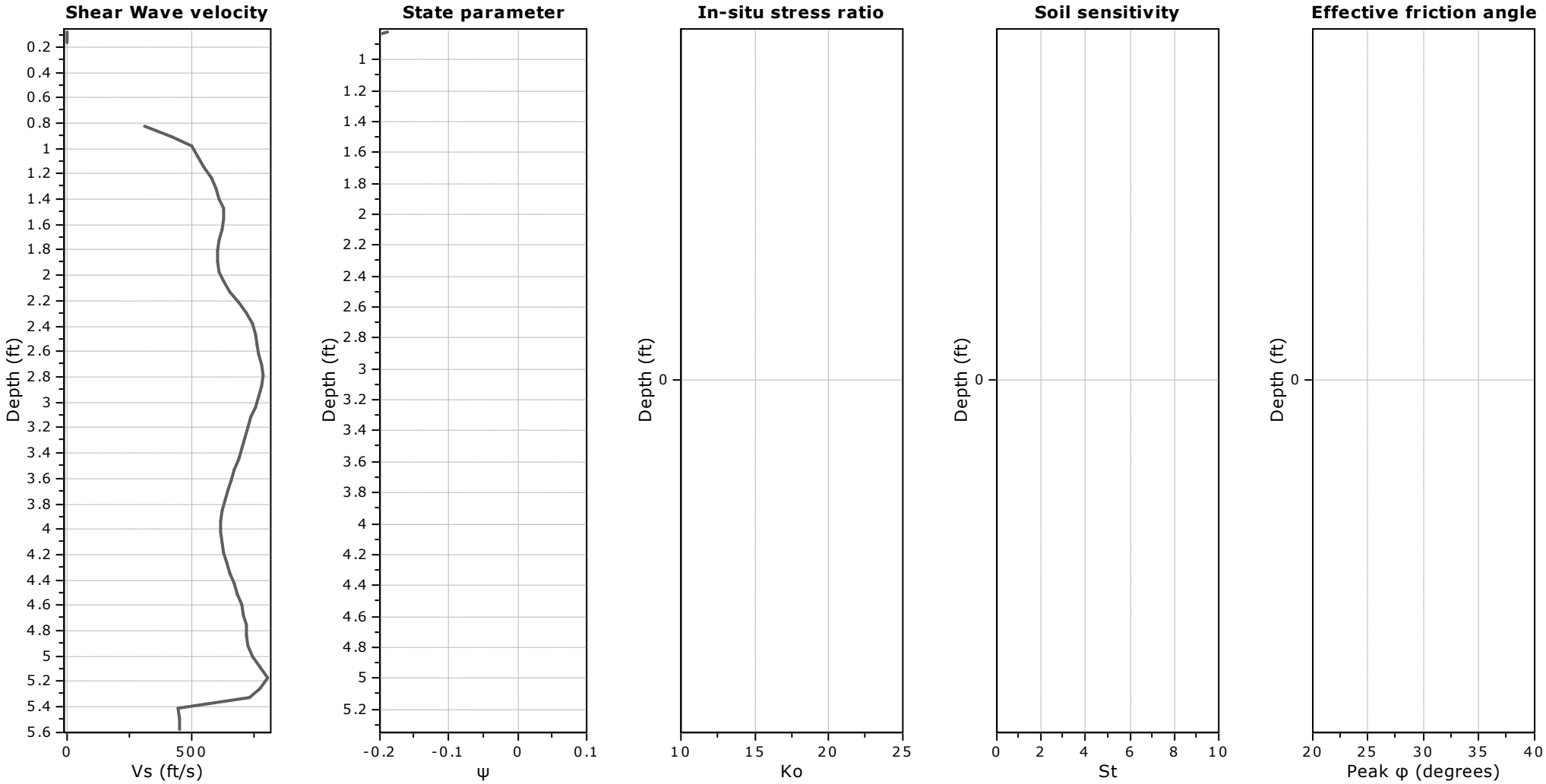
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

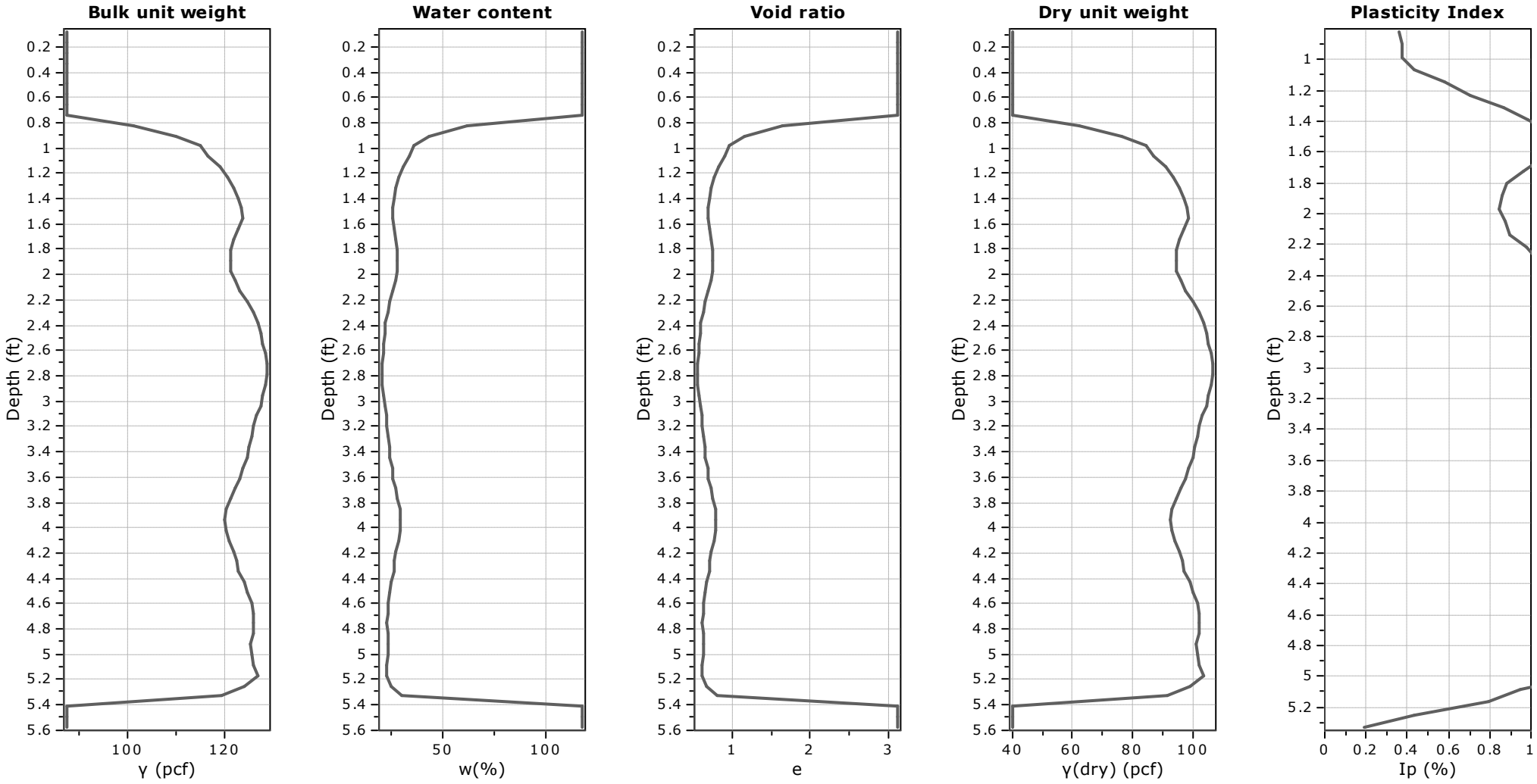
CPT: H-5
Total depth: 5.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Soil Sensitivity factor, N_S: 7.00


Bulk unit weight
Water content
Void ratio
Dry unit weight
Plasticity Index
Depth (ft)
γ (pcf)
w(%)
e
γ(dry) (pcf)
Ip (%)

GeoLogismiki
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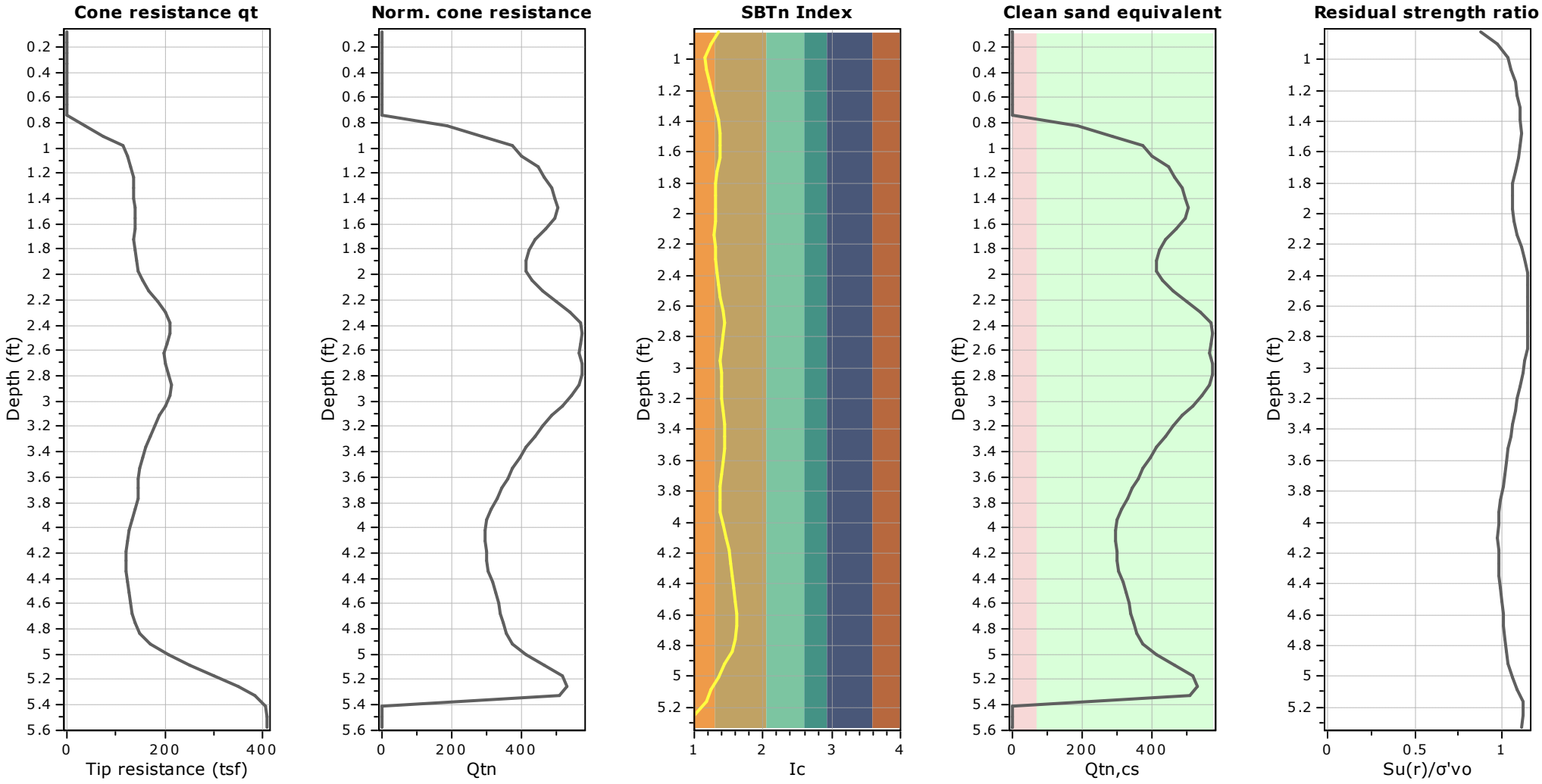
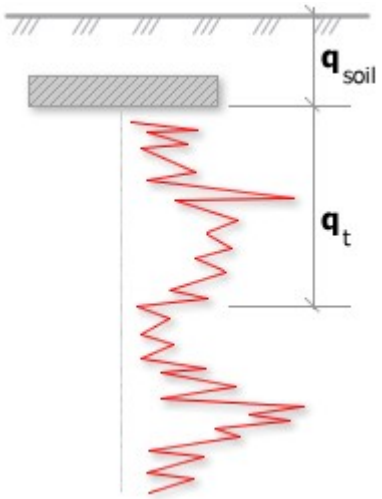
http://www.geologismiki.gr

CPT: H-5
Total depth: 5.58 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

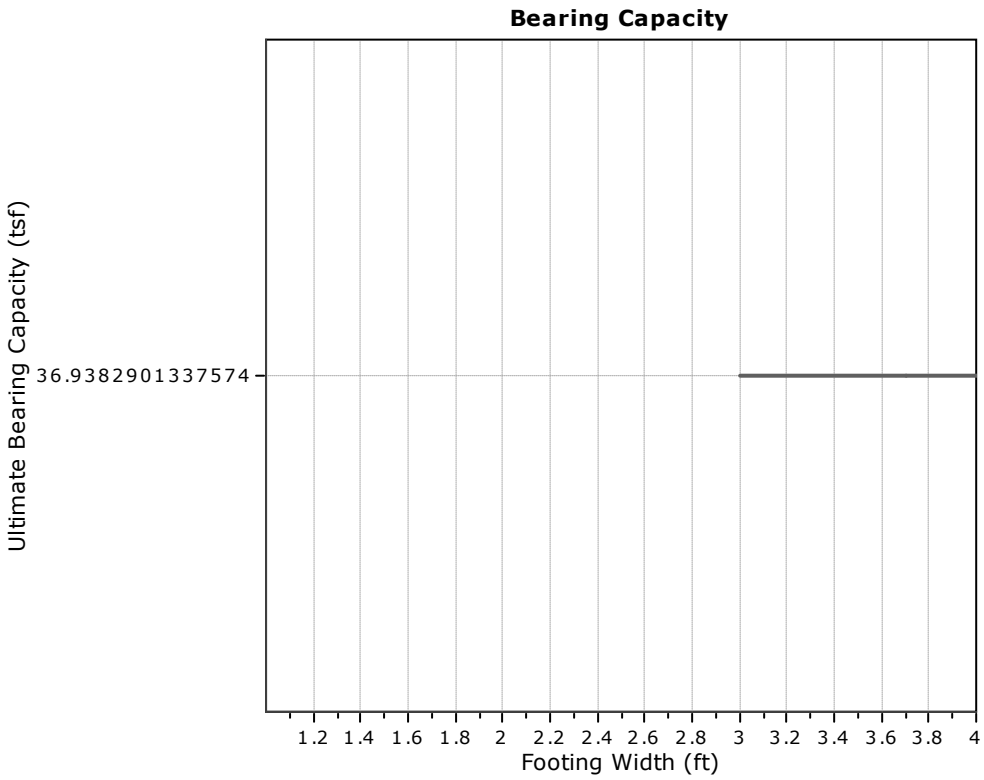




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

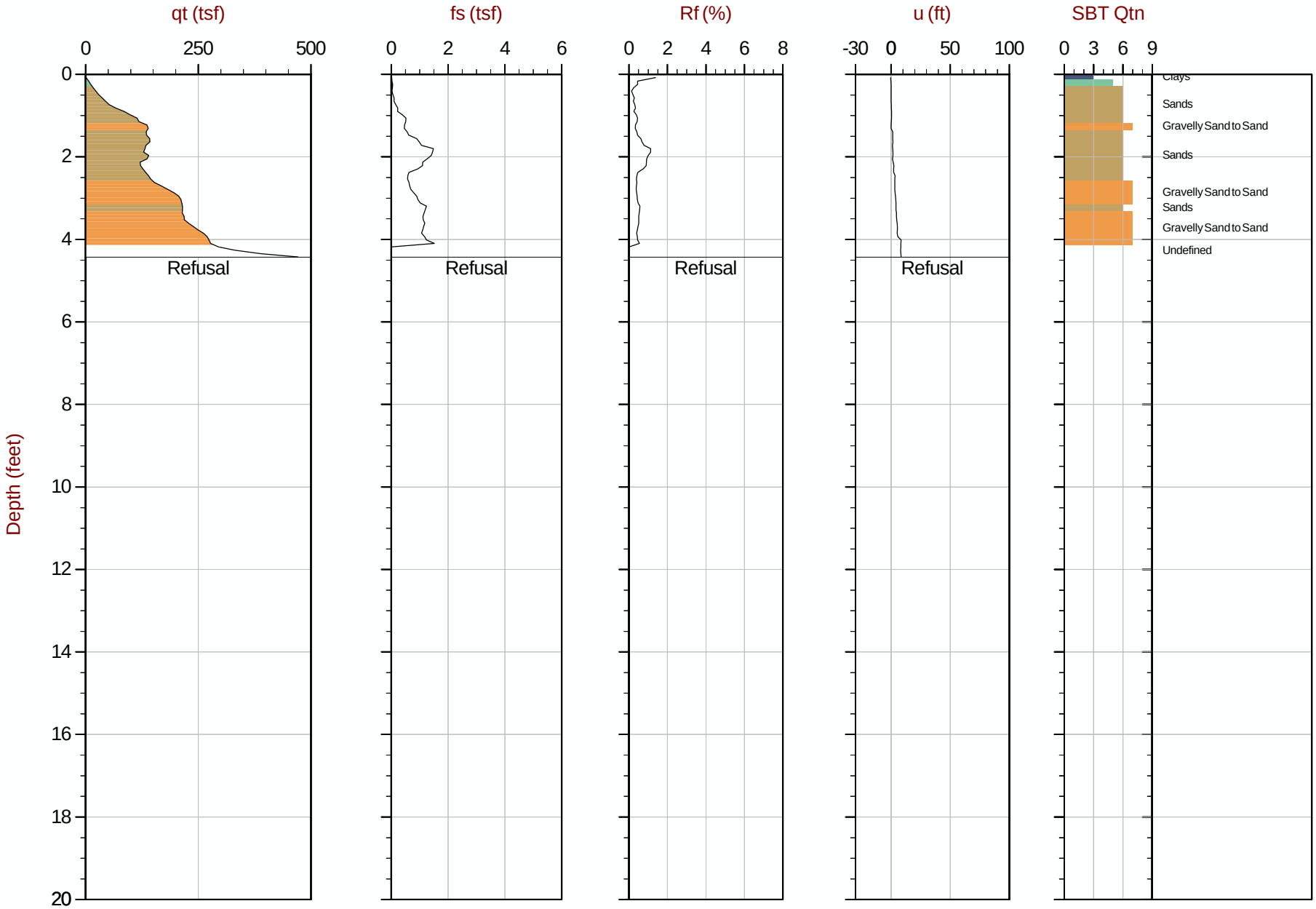
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	184.21	0.20	0.10	36.94
2	3.70	1.60	7.15	184.21	0.20	0.10	36.94
3	4.40	1.60	8.20	184.21	0.20	0.10	36.94
4	5.10	1.60	9.25	184.21	0.20	0.10	36.94
5	5.80	1.60	10.30	184.21	0.20	0.10	36.94
6	6.50	1.60	11.35	184.21	0.20	0.10	36.94
7	7.20	1.60	12.40	184.21	0.20	0.10	36.94
8	7.90	1.60	13.45	184.21	0.20	0.10	36.94
9	8.60	1.60	14.50	184.21	0.20	0.10	36.94
10	9.30	1.60	15.55	184.21	0.20	0.10	36.94
11	10.00	1.60	16.60	184.21	0.20	0.10	36.94
12	10.70	1.60	17.65	184.21	0.20	0.10	36.94
13	11.40	1.60	18.70	184.21	0.20	0.10	36.94
14	12.10	1.60	19.75	184.21	0.20	0.10	36.94
15	12.80	1.60	20.80	184.21	0.20	0.10	36.94

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 11:02
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-HH-3A
Cone: 652:T1500F15U35



Max Depth: 1.350 m / 4.43 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPHH-3A.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9183

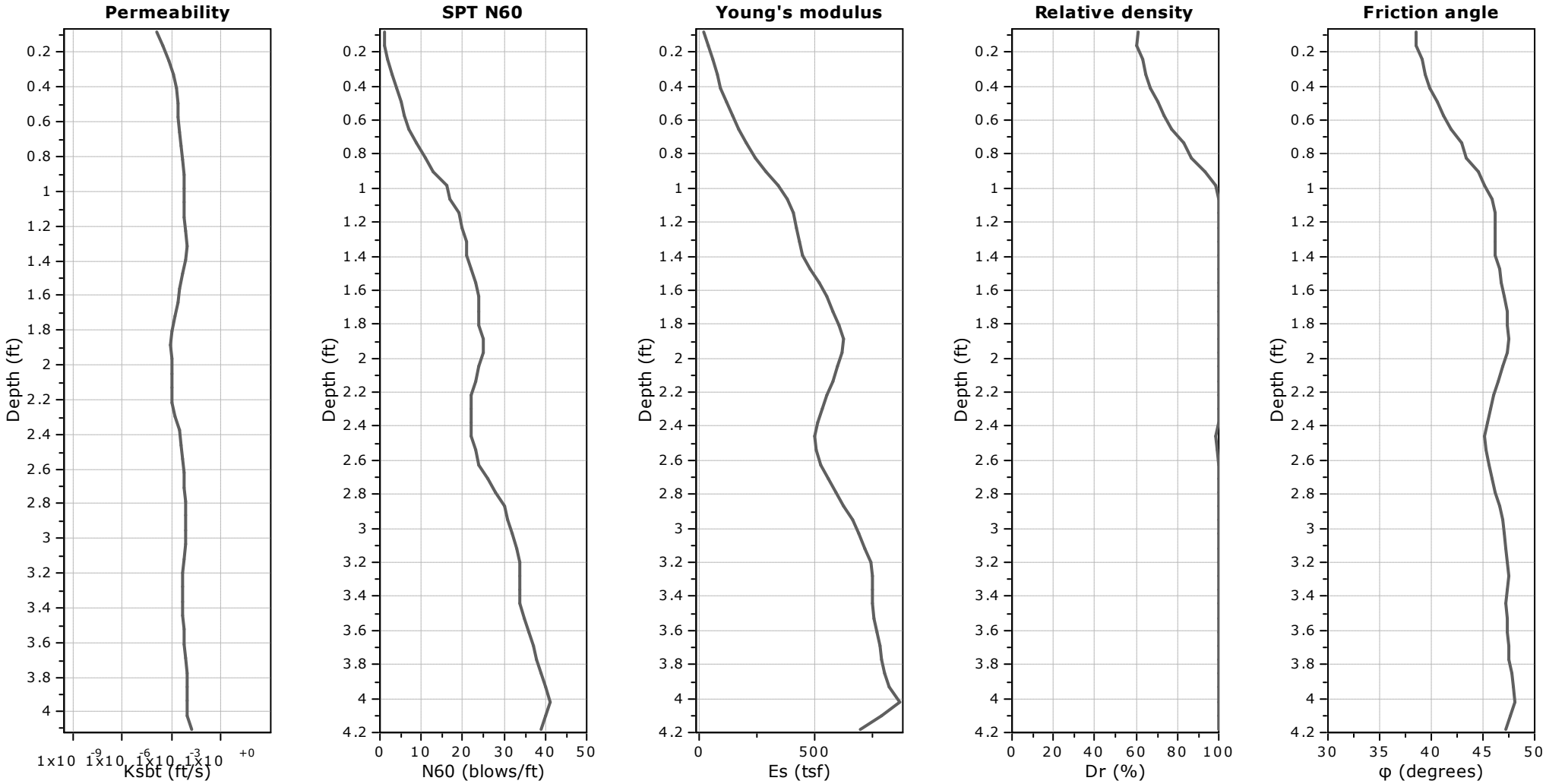
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: HH-3A
Total depth: 4.43 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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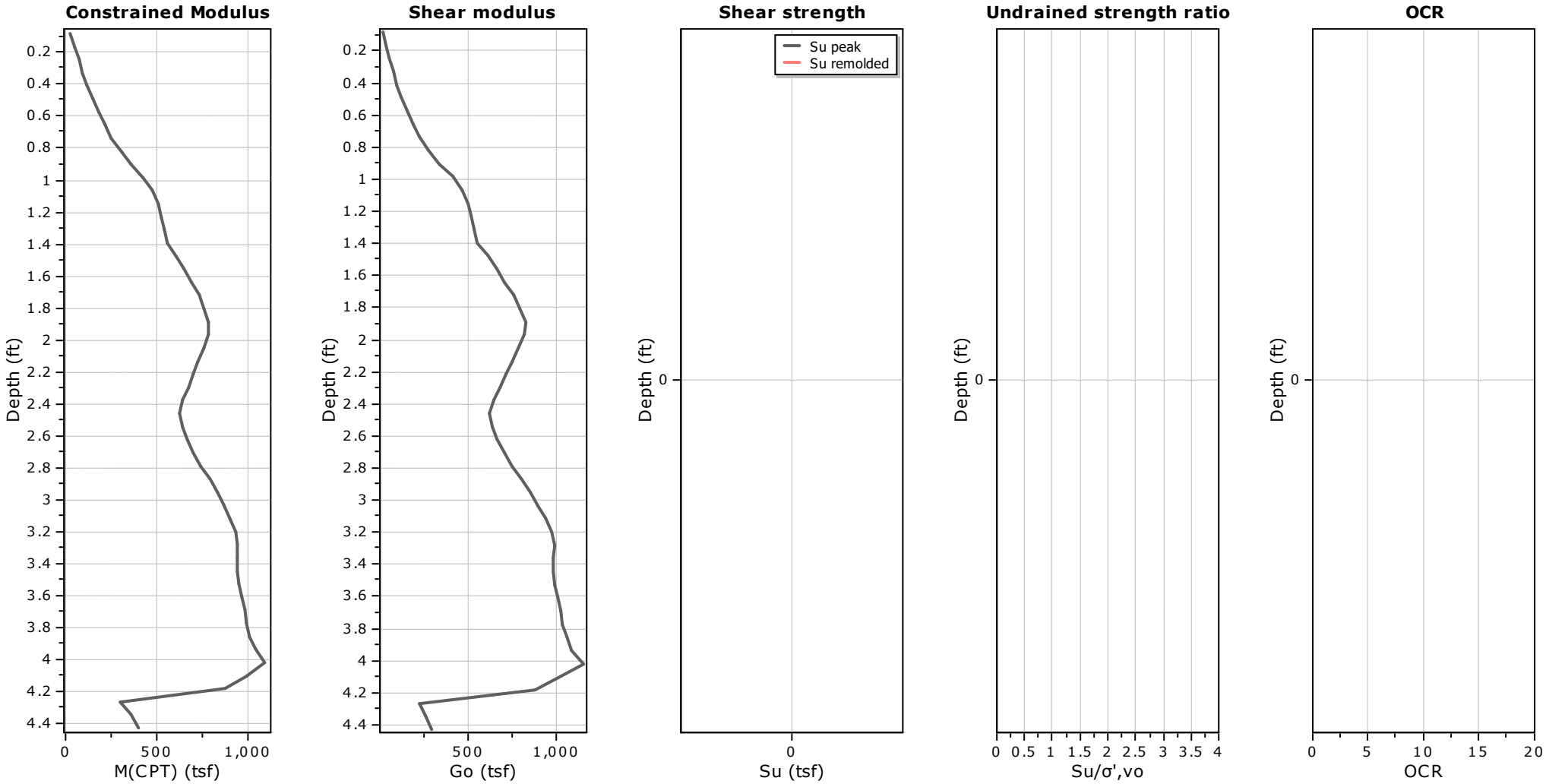
http://www.geologismiki.gr

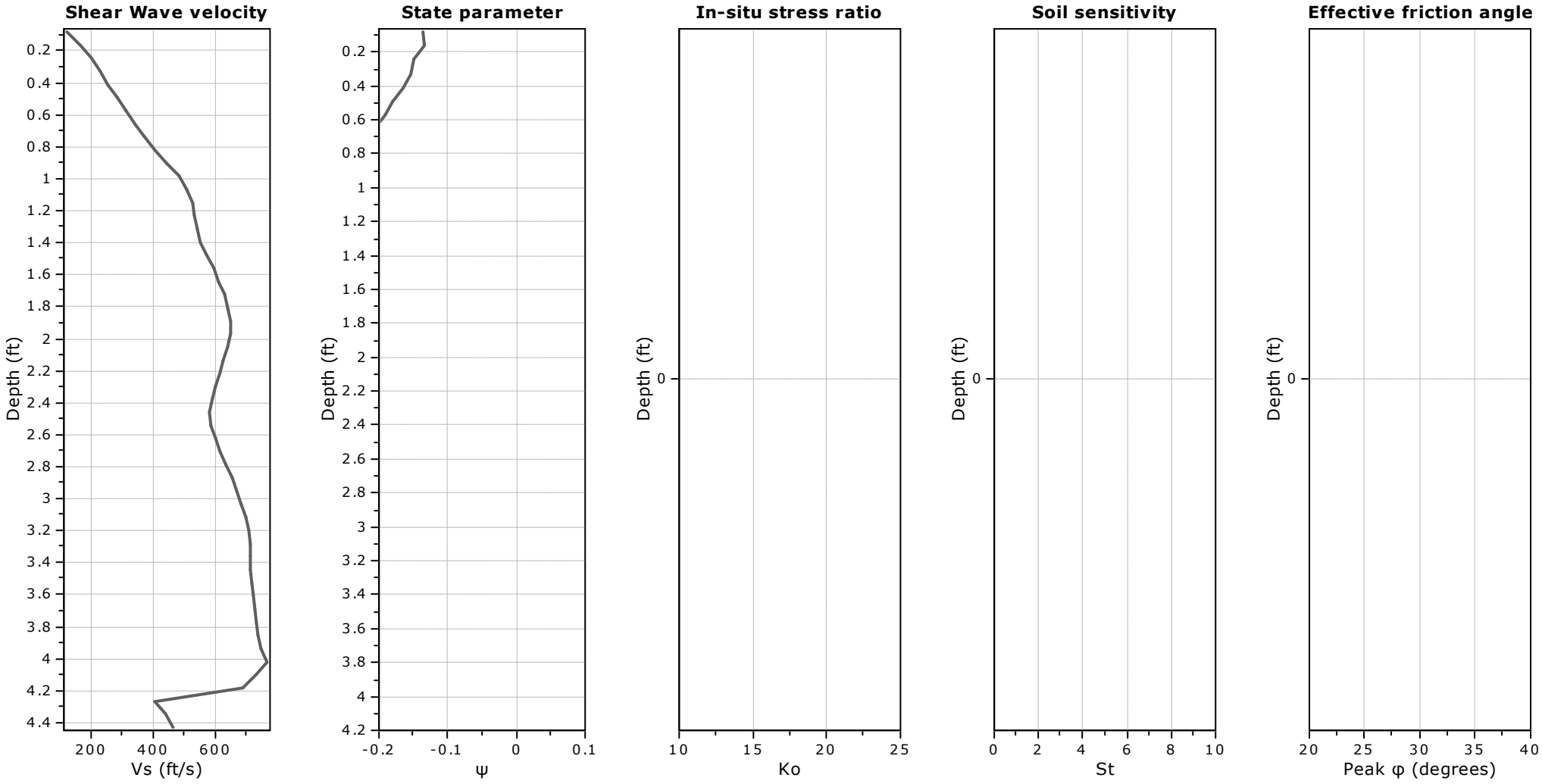
CPT: HH-3A
Total depth: 4.43 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

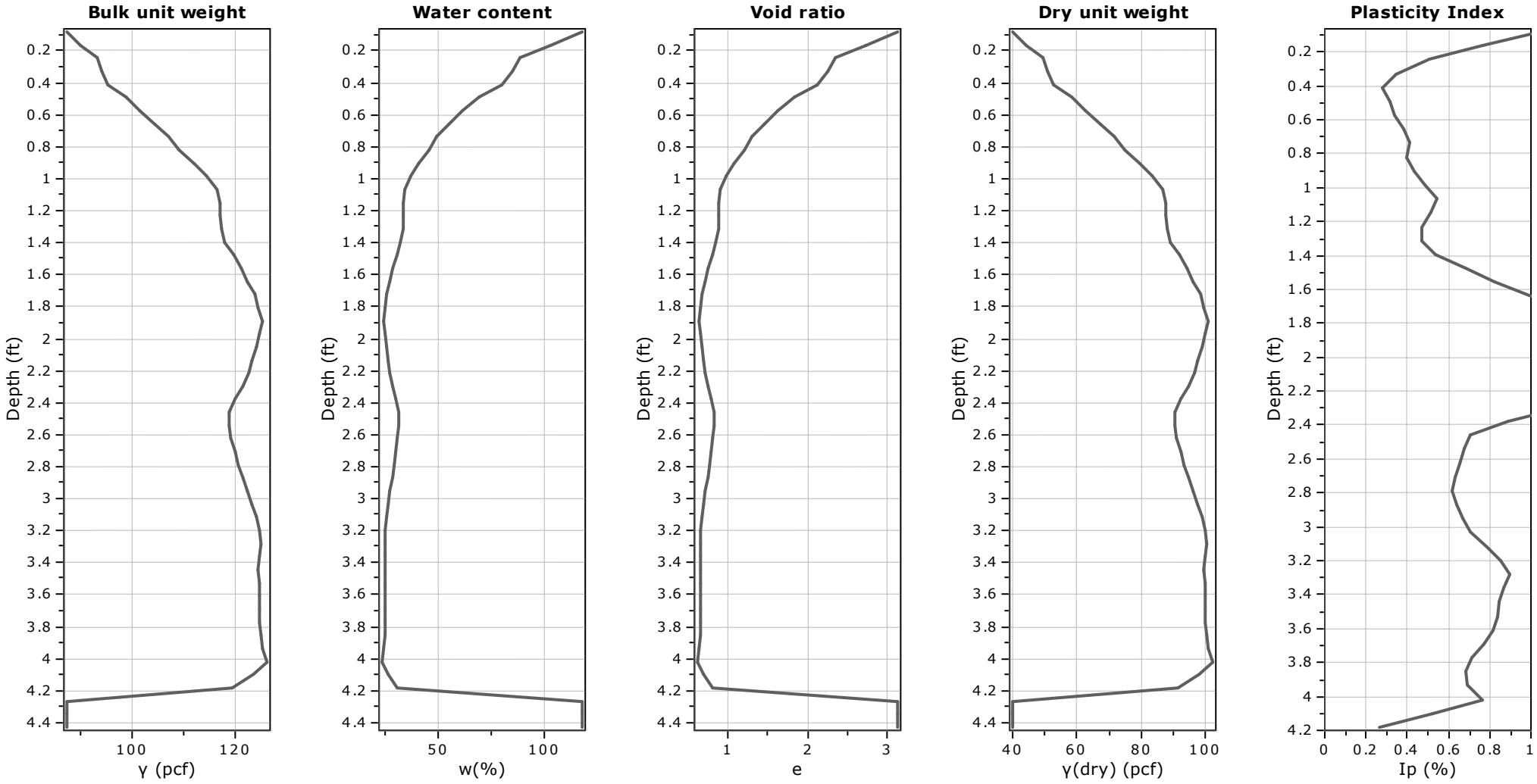


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: HH-3A
Total depth: 4.43 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

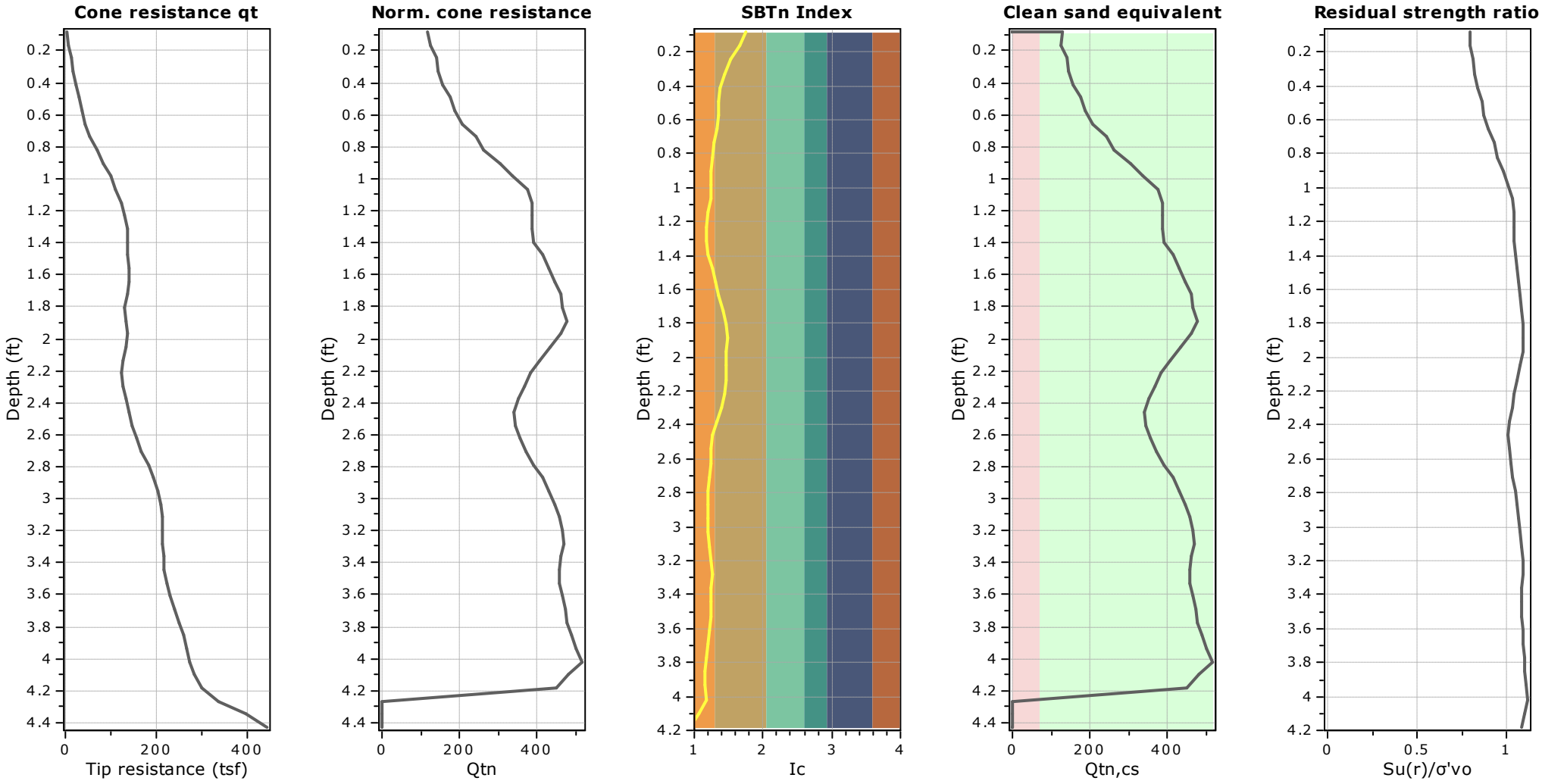
Project:
Location:

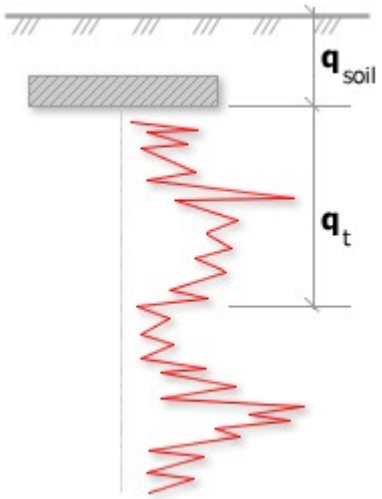


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: HH-3A
Total depth: 4.43 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

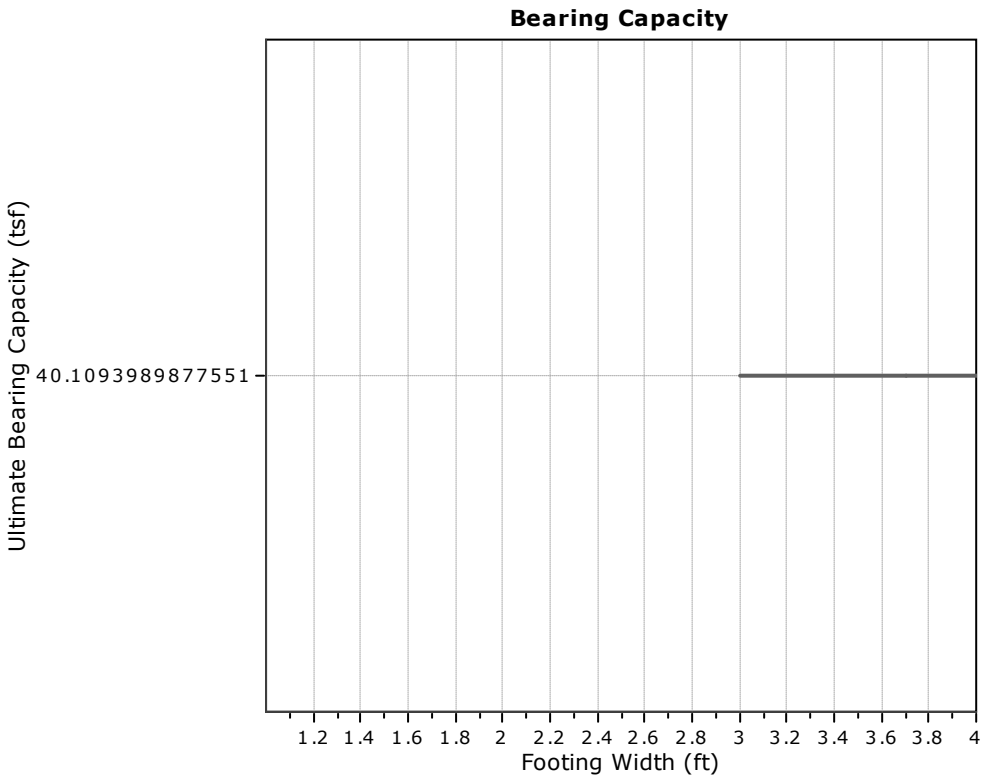




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

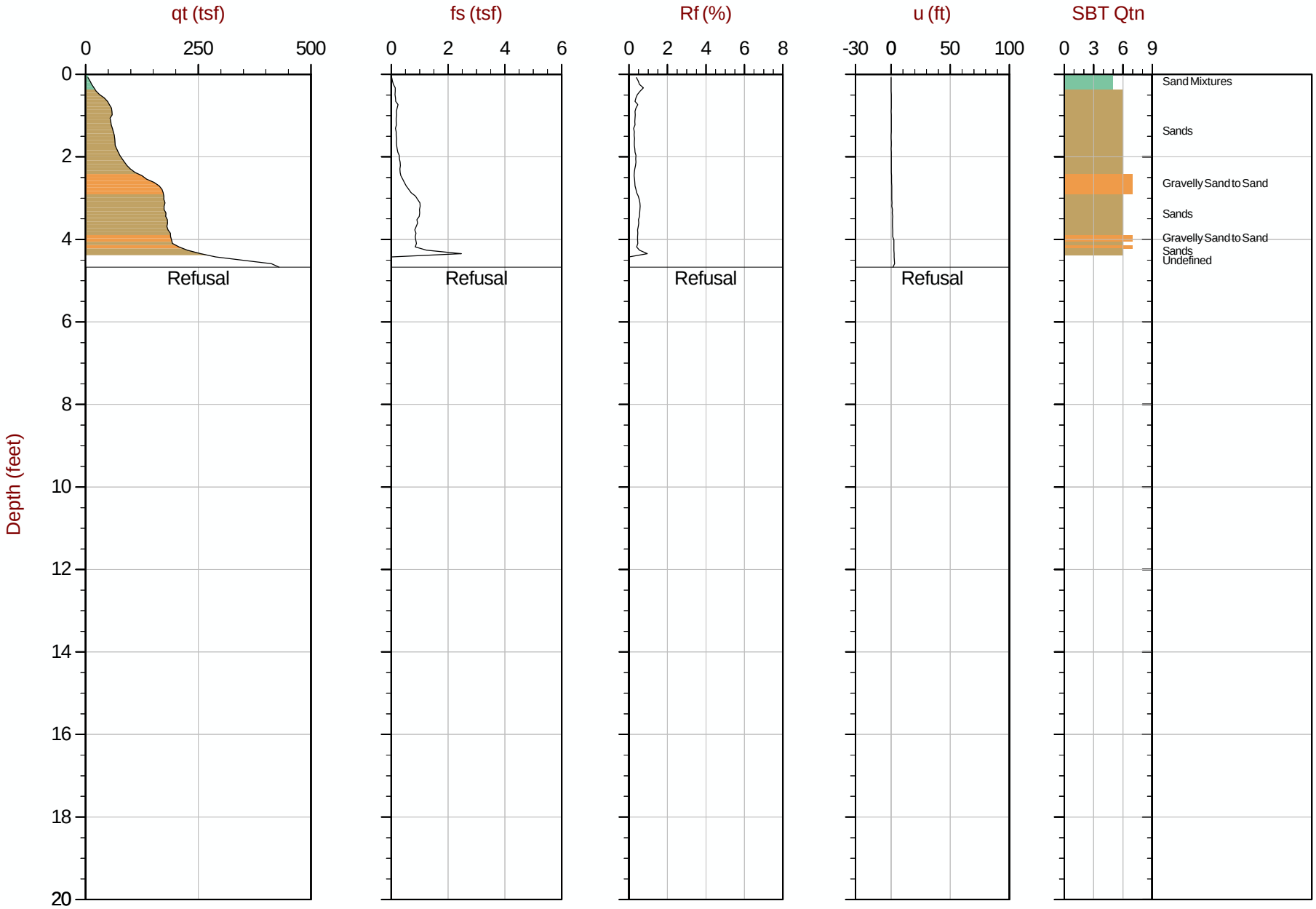
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	200.07	0.20	0.10	40.11
2	3.70	1.60	7.15	200.07	0.20	0.10	40.11
3	4.40	1.60	8.20	200.07	0.20	0.10	40.11
4	5.10	1.60	9.25	200.07	0.20	0.10	40.11
5	5.80	1.60	10.30	200.07	0.20	0.10	40.11
6	6.50	1.60	11.35	200.07	0.20	0.10	40.11
7	7.20	1.60	12.40	200.07	0.20	0.10	40.11
8	7.90	1.60	13.45	200.07	0.20	0.10	40.11
9	8.60	1.60	14.50	200.07	0.20	0.10	40.11
10	9.30	1.60	15.55	200.07	0.20	0.10	40.11
11	10.00	1.60	16.60	200.07	0.20	0.10	40.11
12	10.70	1.60	17.65	200.07	0.20	0.10	40.11
13	11.40	1.60	18.70	200.07	0.20	0.10	40.11
14	12.10	1.60	19.75	200.07	0.20	0.10	40.11
15	12.80	1.60	20.80	200.07	0.20	0.10	40.11

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 10:42
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-HH-3
Cone: 652:T1500F15U35



Max Depth: 1.425 m / 4.68 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPHH-3.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6235 Long: -70.9182

Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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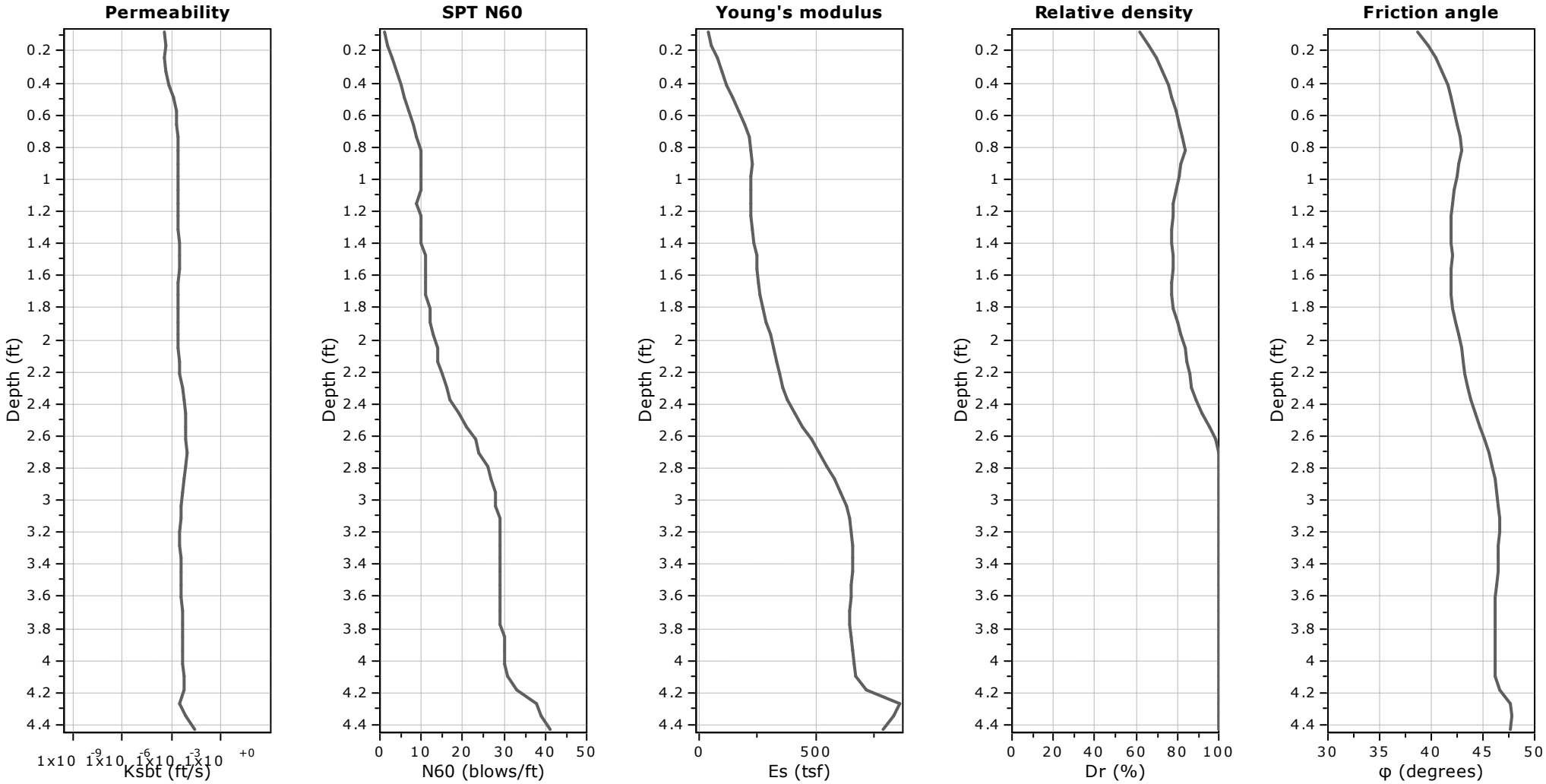
http://www.geologismiki.gr

CPT: HH-3
Total depth: 4.68 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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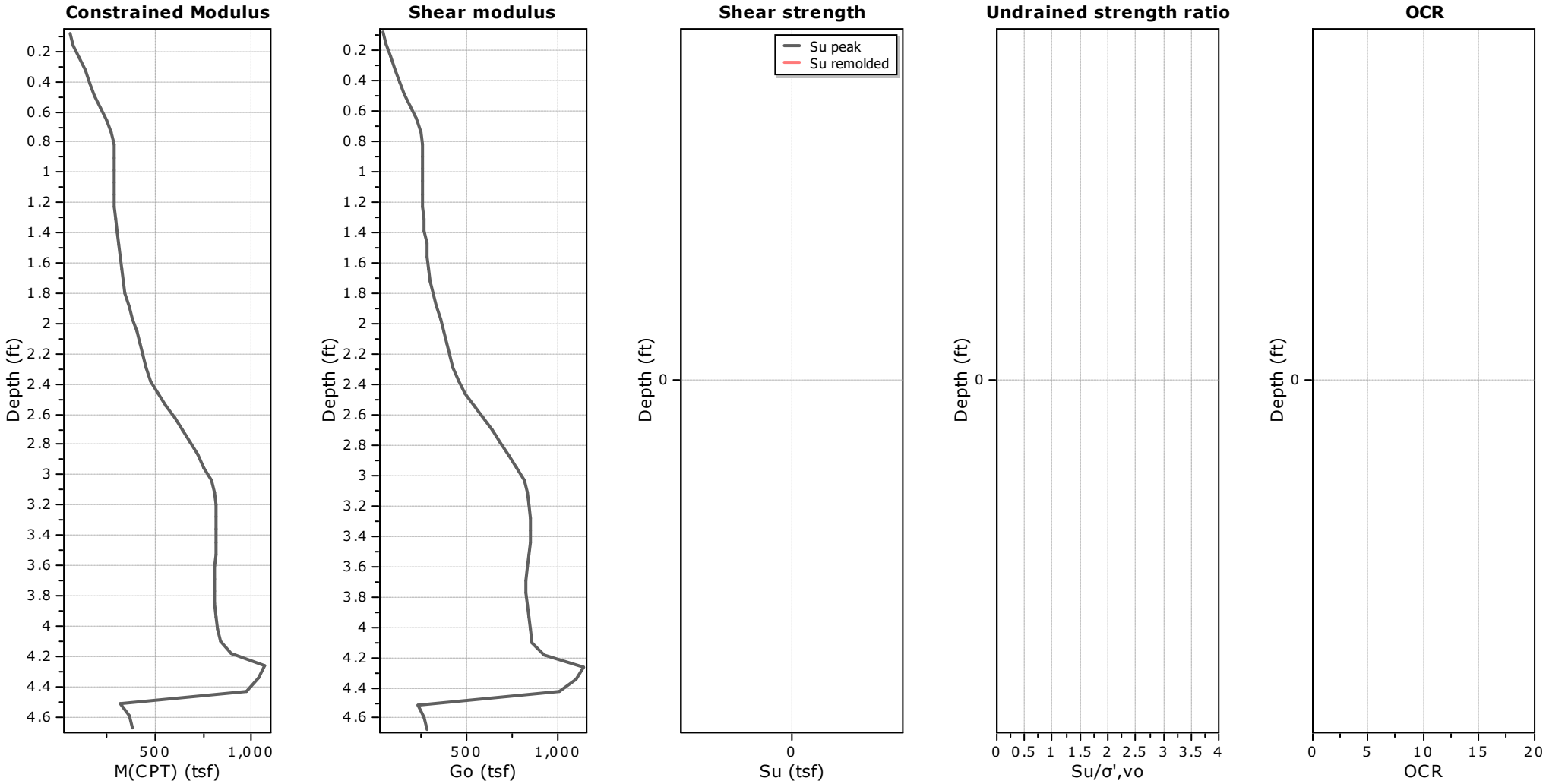
http://www.geologismiki.gr

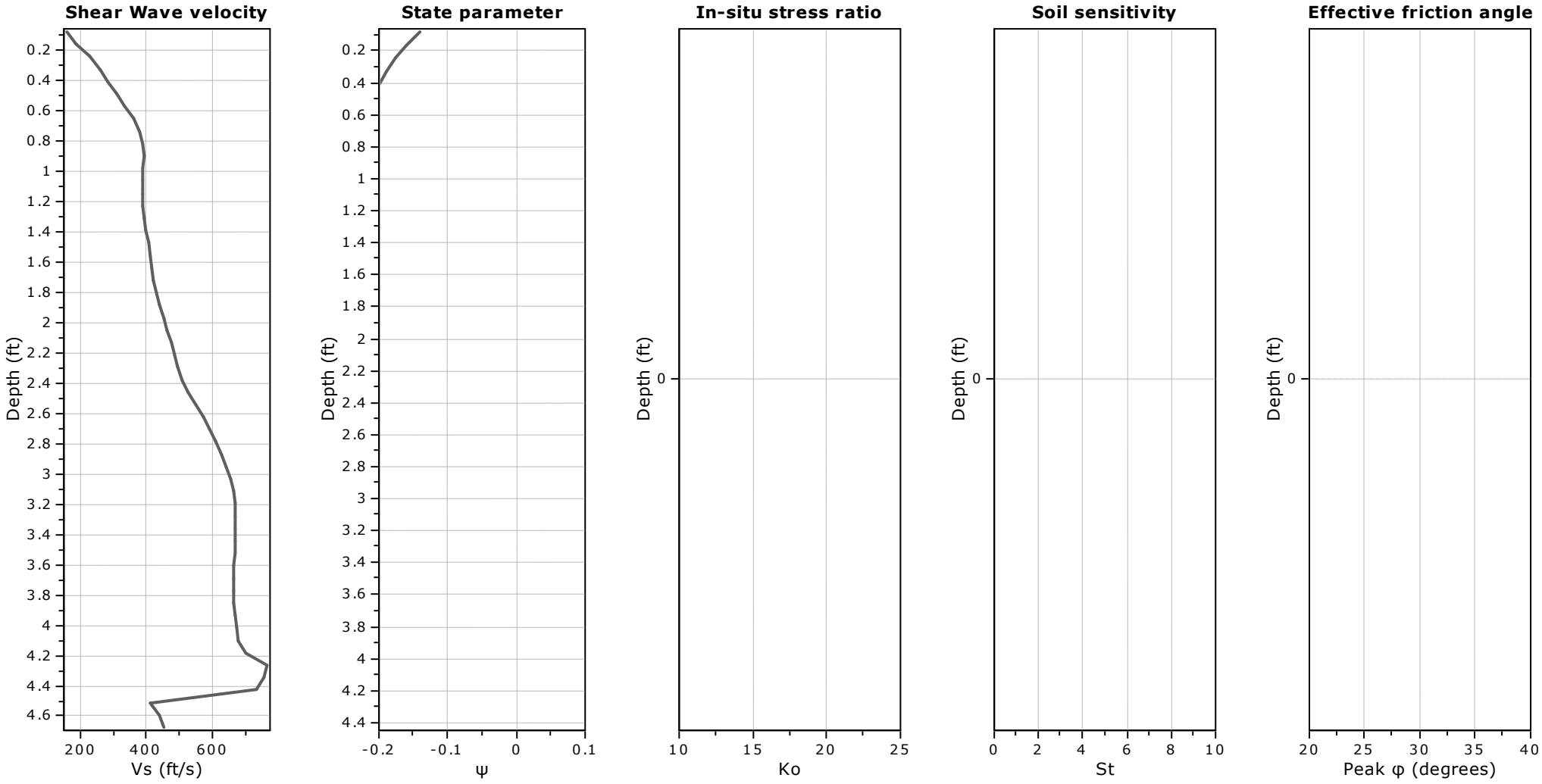
CPT: HH-3
Total depth: 4.68 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

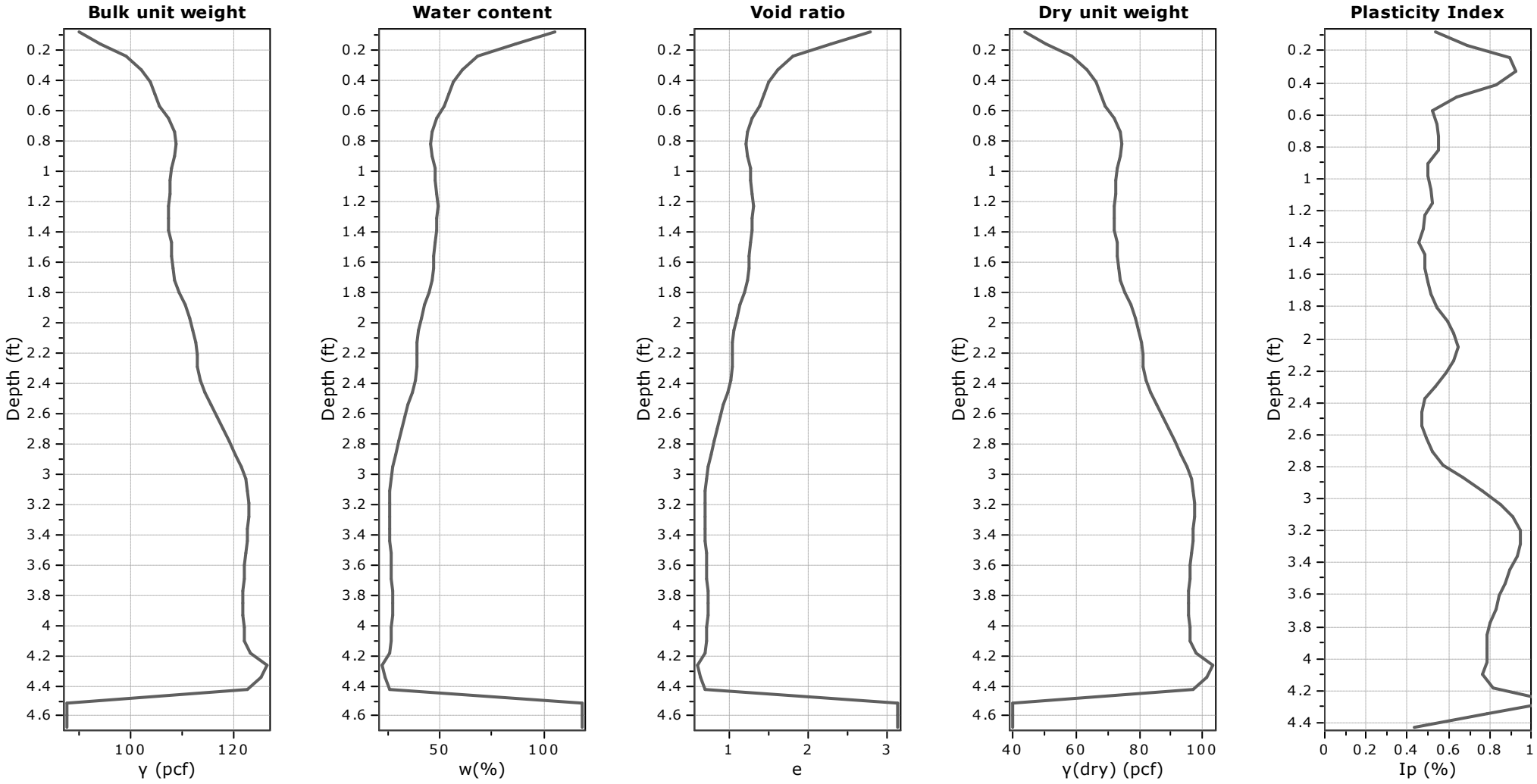


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: HH-3
Total depth: 4.68 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

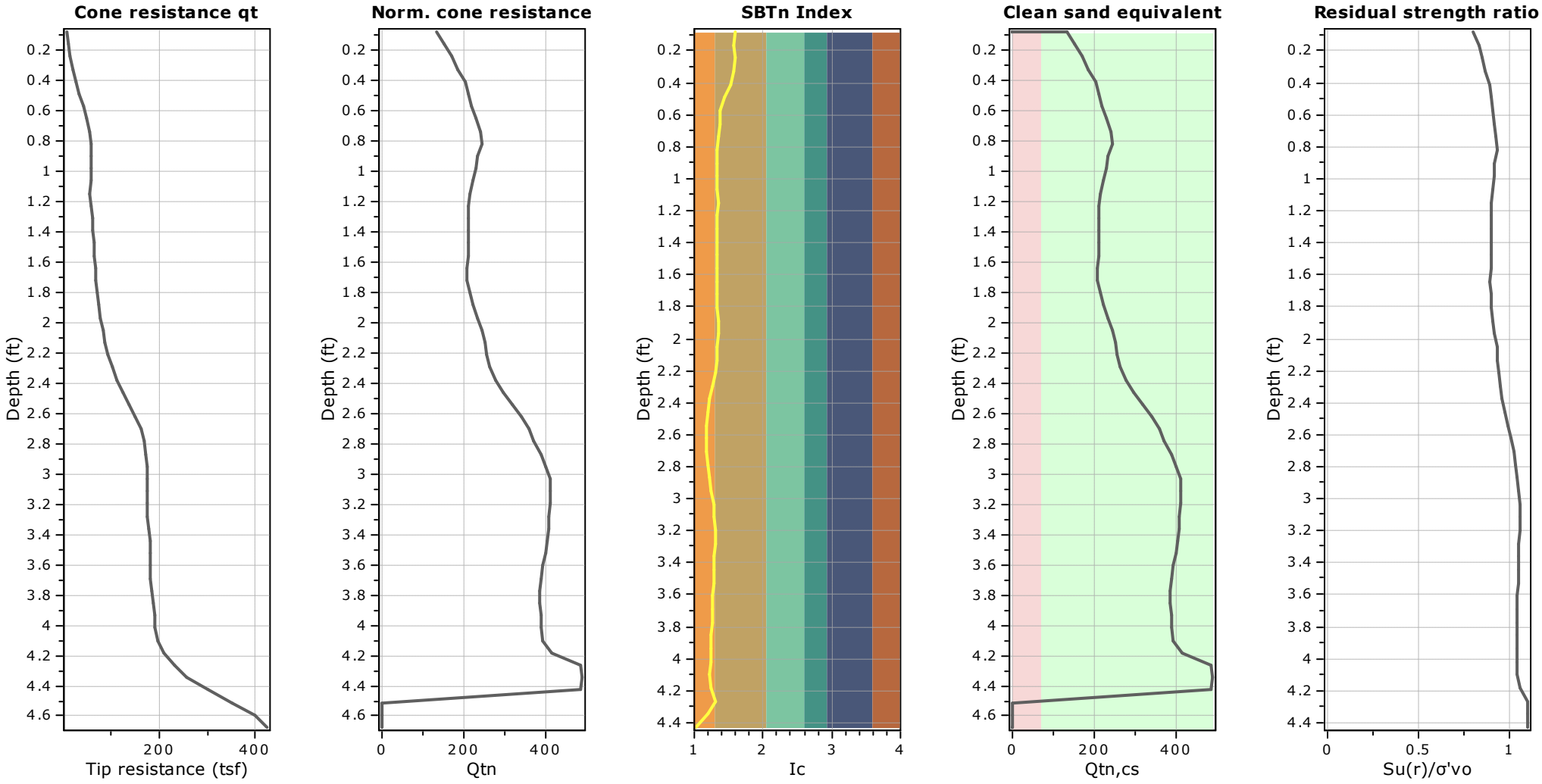
Project:
Location:

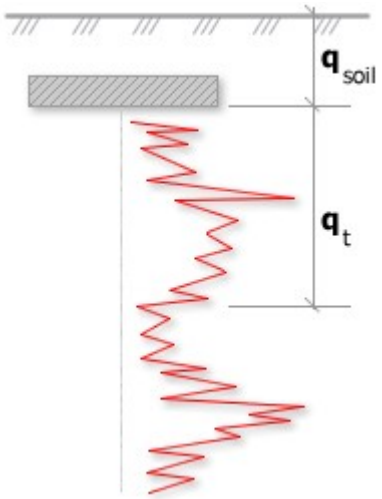


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: HH-3
Total depth: 4.68 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

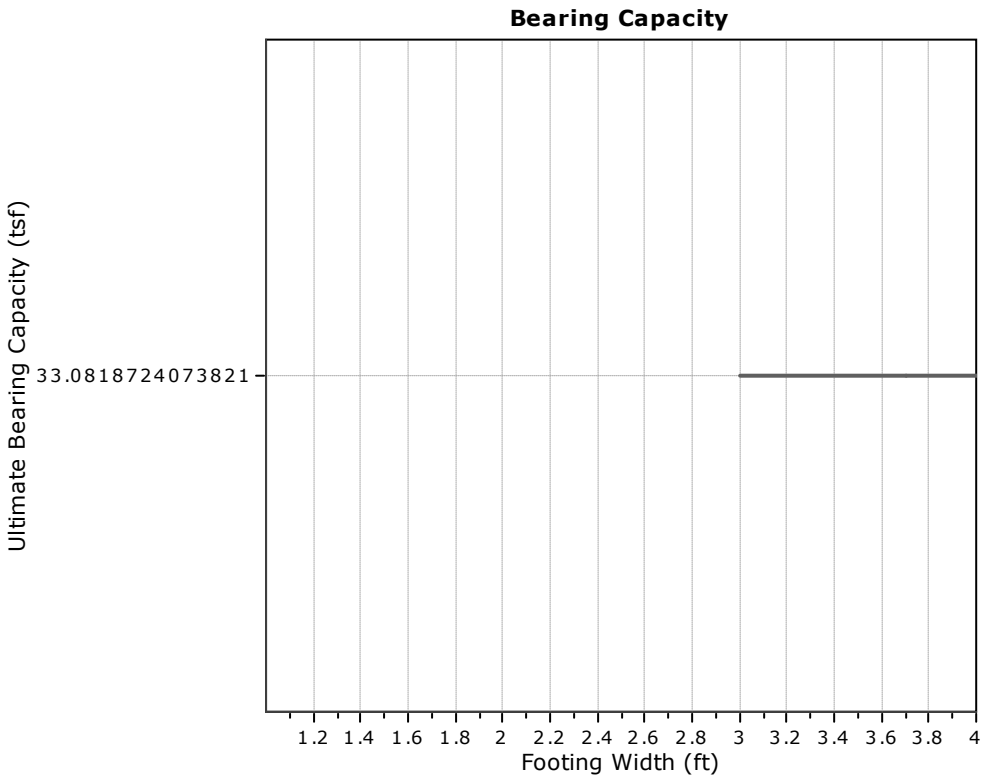




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

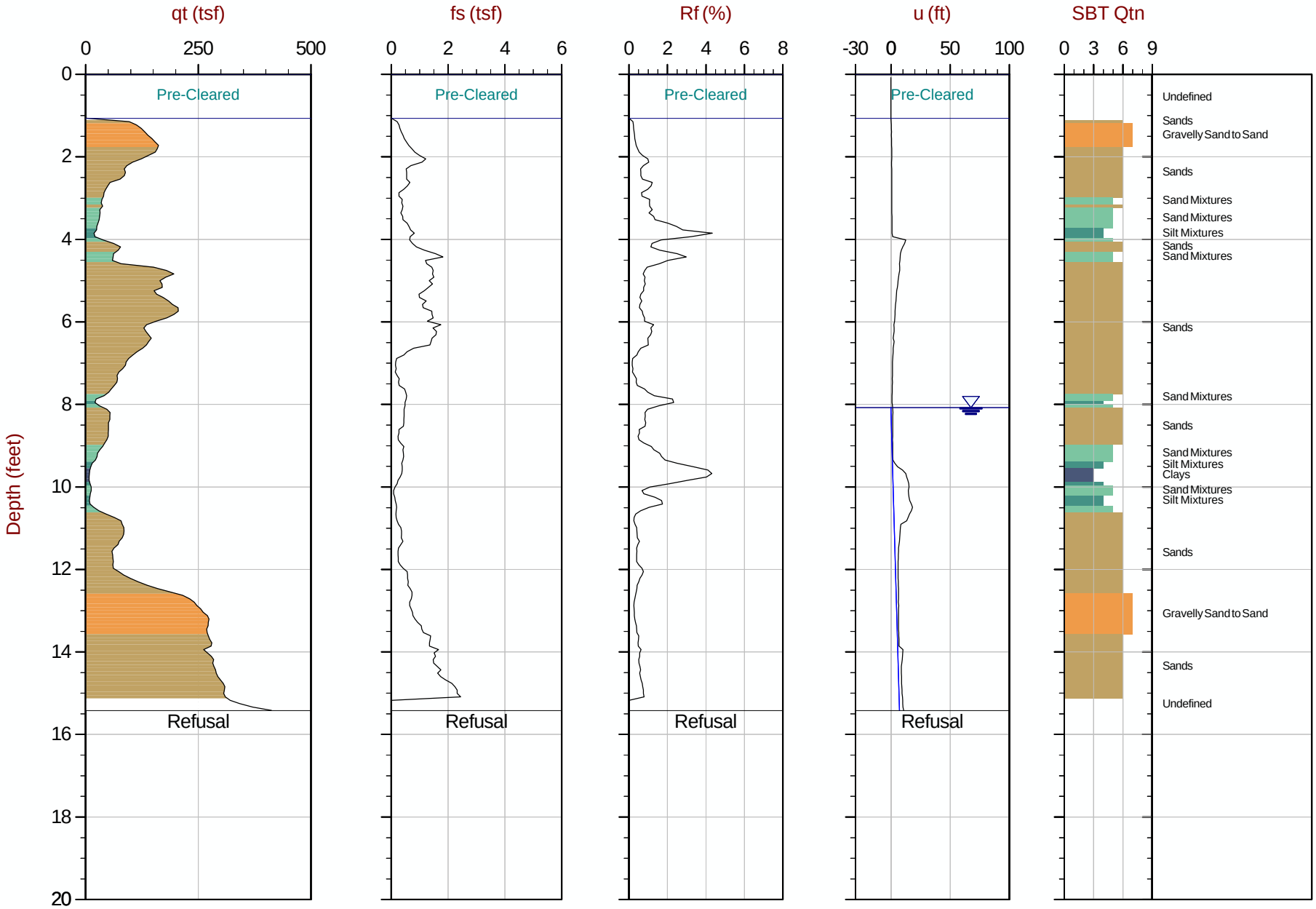
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	164.93	0.20	0.10	33.08
2	3.70	1.60	7.15	164.93	0.20	0.10	33.08
3	4.40	1.60	8.20	164.93	0.20	0.10	33.08
4	5.10	1.60	9.25	164.93	0.20	0.10	33.08
5	5.80	1.60	10.30	164.93	0.20	0.10	33.08
6	6.50	1.60	11.35	164.93	0.20	0.10	33.08
7	7.20	1.60	12.40	164.93	0.20	0.10	33.08
8	7.90	1.60	13.45	164.93	0.20	0.10	33.08
9	8.60	1.60	14.50	164.93	0.20	0.10	33.08
10	9.30	1.60	15.55	164.93	0.20	0.10	33.08
11	10.00	1.60	16.60	164.93	0.20	0.10	33.08
12	10.70	1.60	17.65	164.93	0.20	0.10	33.08
13	11.40	1.60	18.70	164.93	0.20	0.10	33.08
14	12.10	1.60	19.75	164.93	0.20	0.10	33.08
15	12.80	1.60	20.80	164.93	0.20	0.10	33.08

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 13:18
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-HH-7
Cone: 652:T1500F15U35



Max Depth: 4.700 m / 15.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPHH-7.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6238 Long: -70.9183

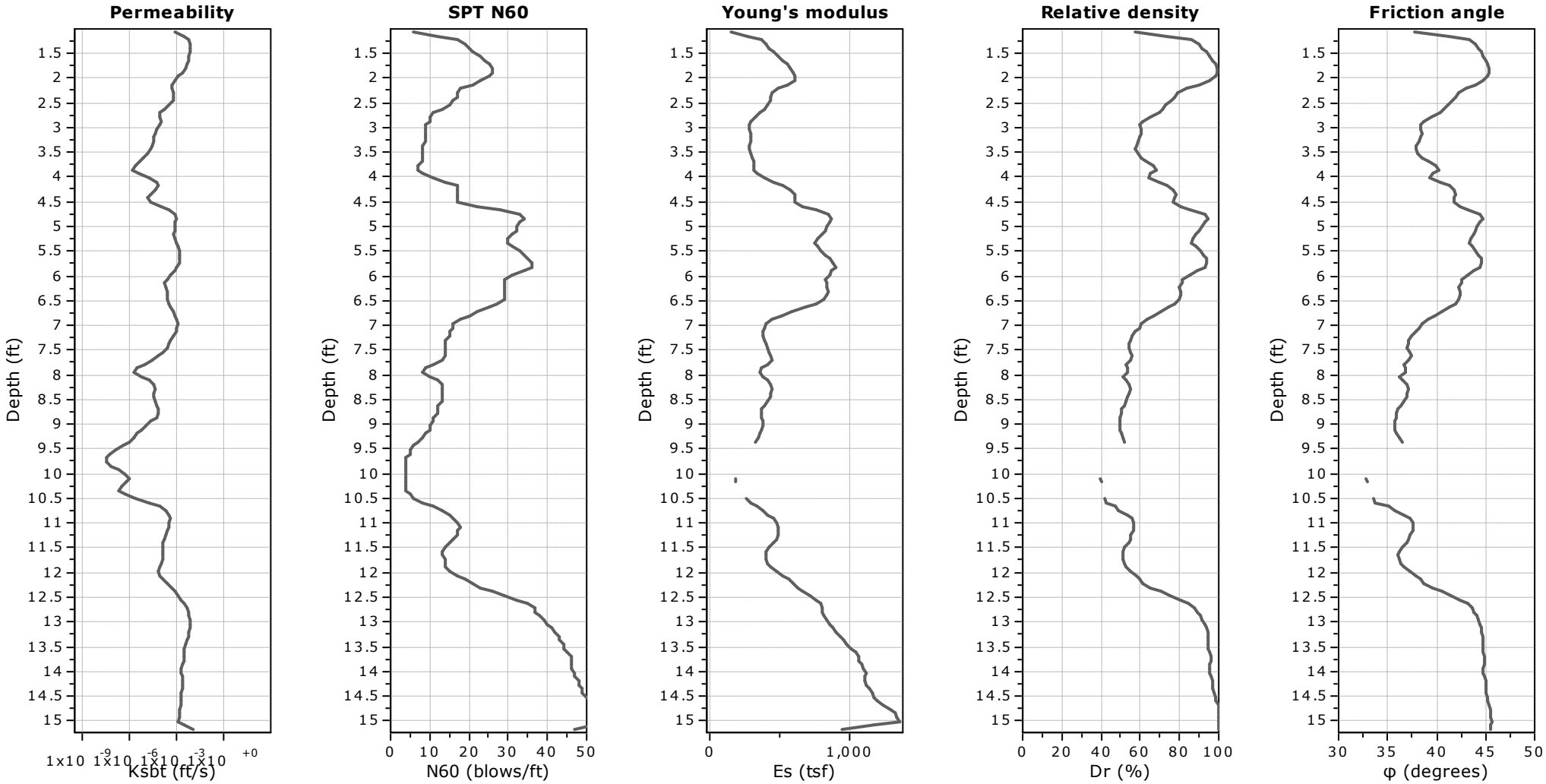
Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: HH-7
Total depth: 15.42 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



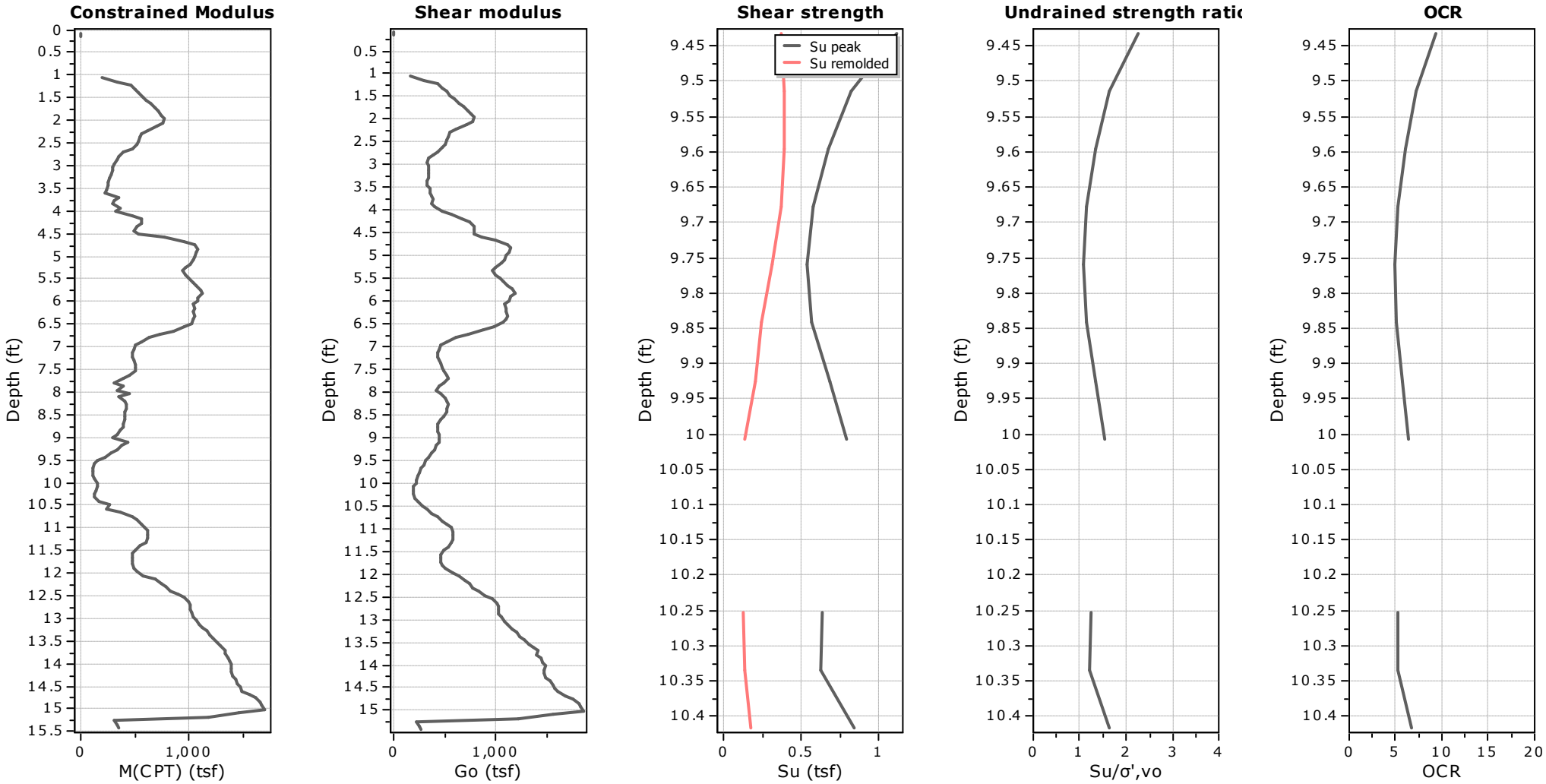
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

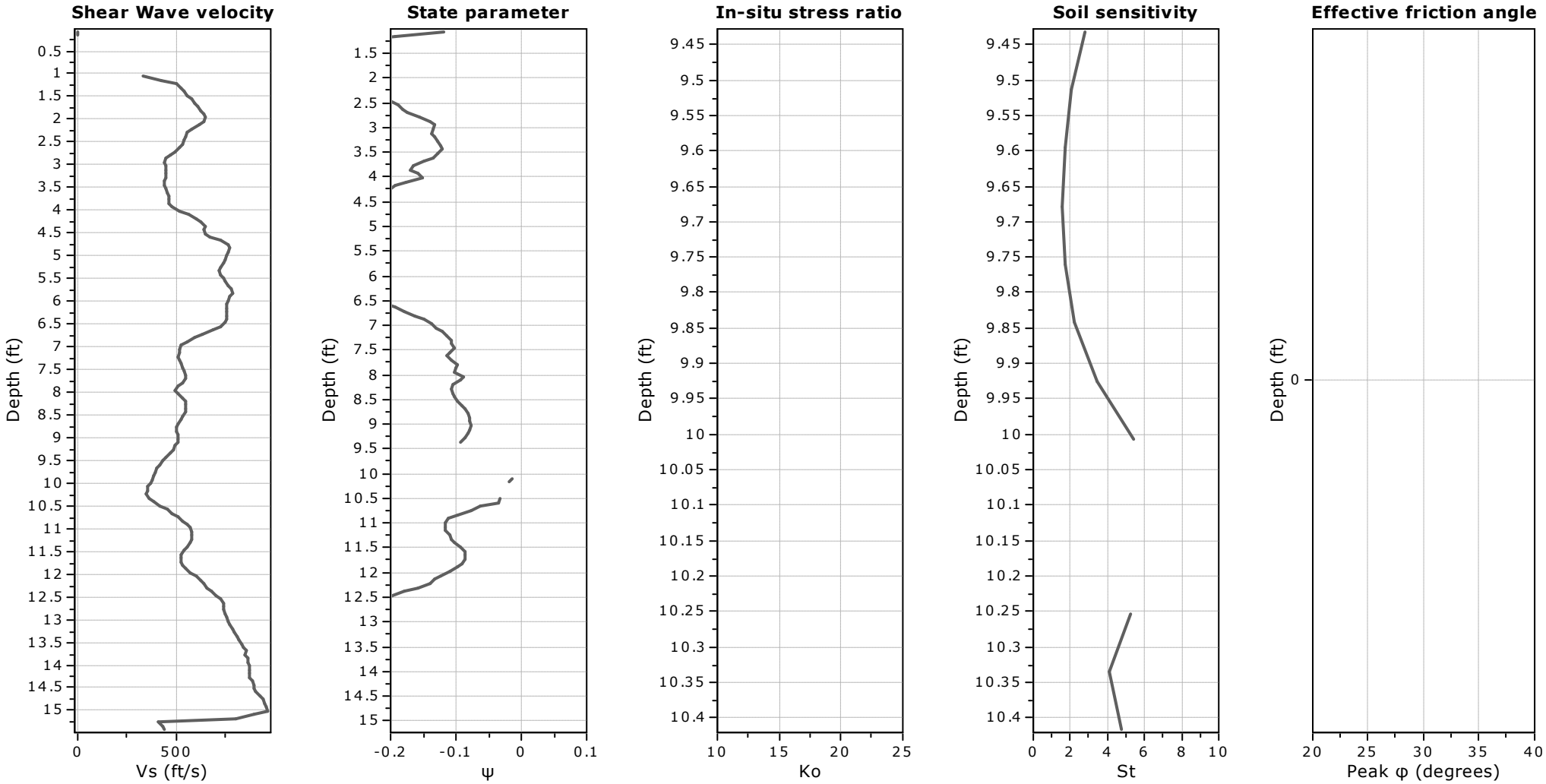
CPT: HH-7
Total depth: 15.42 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



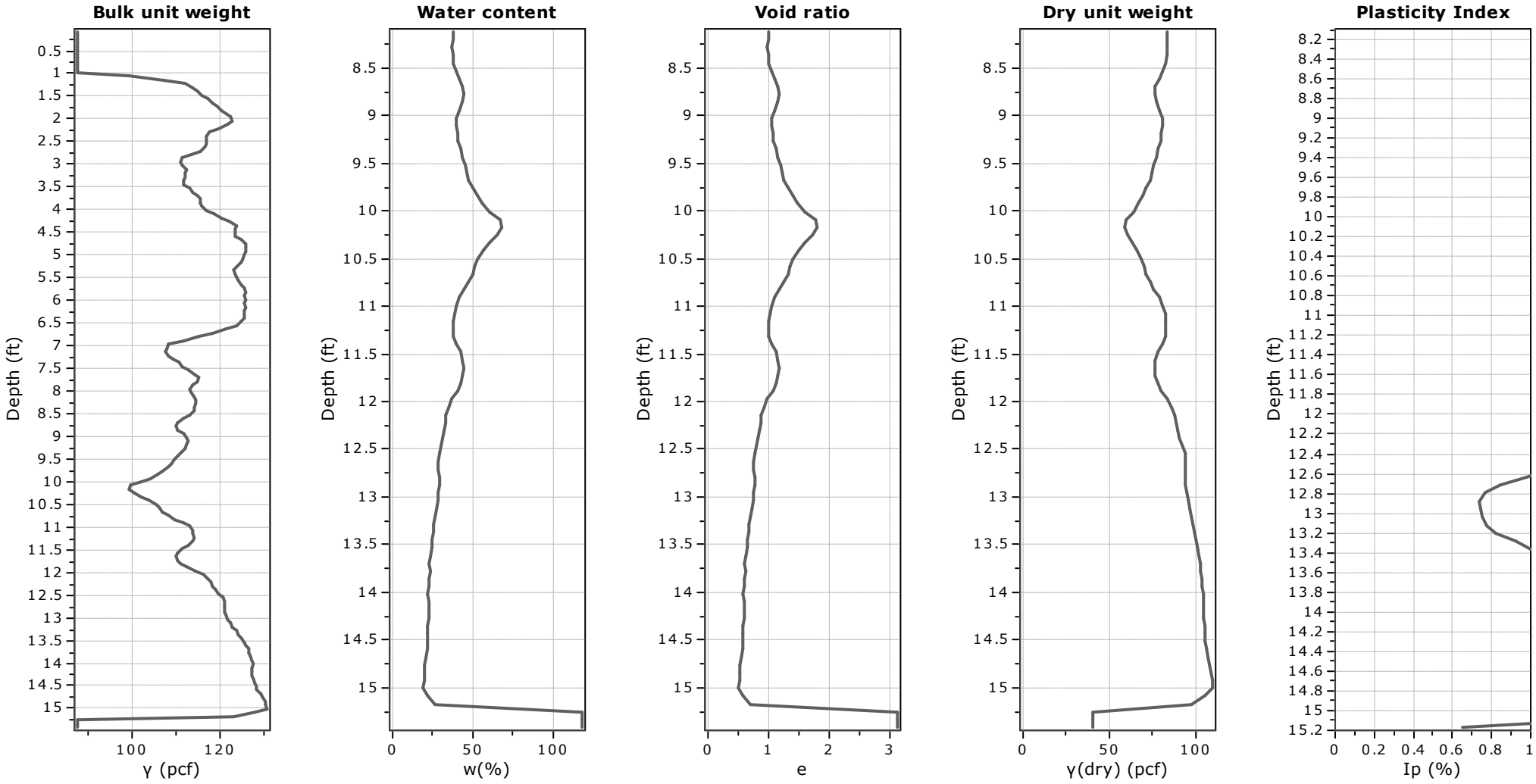
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: HH-7
Total depth: 15.42 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

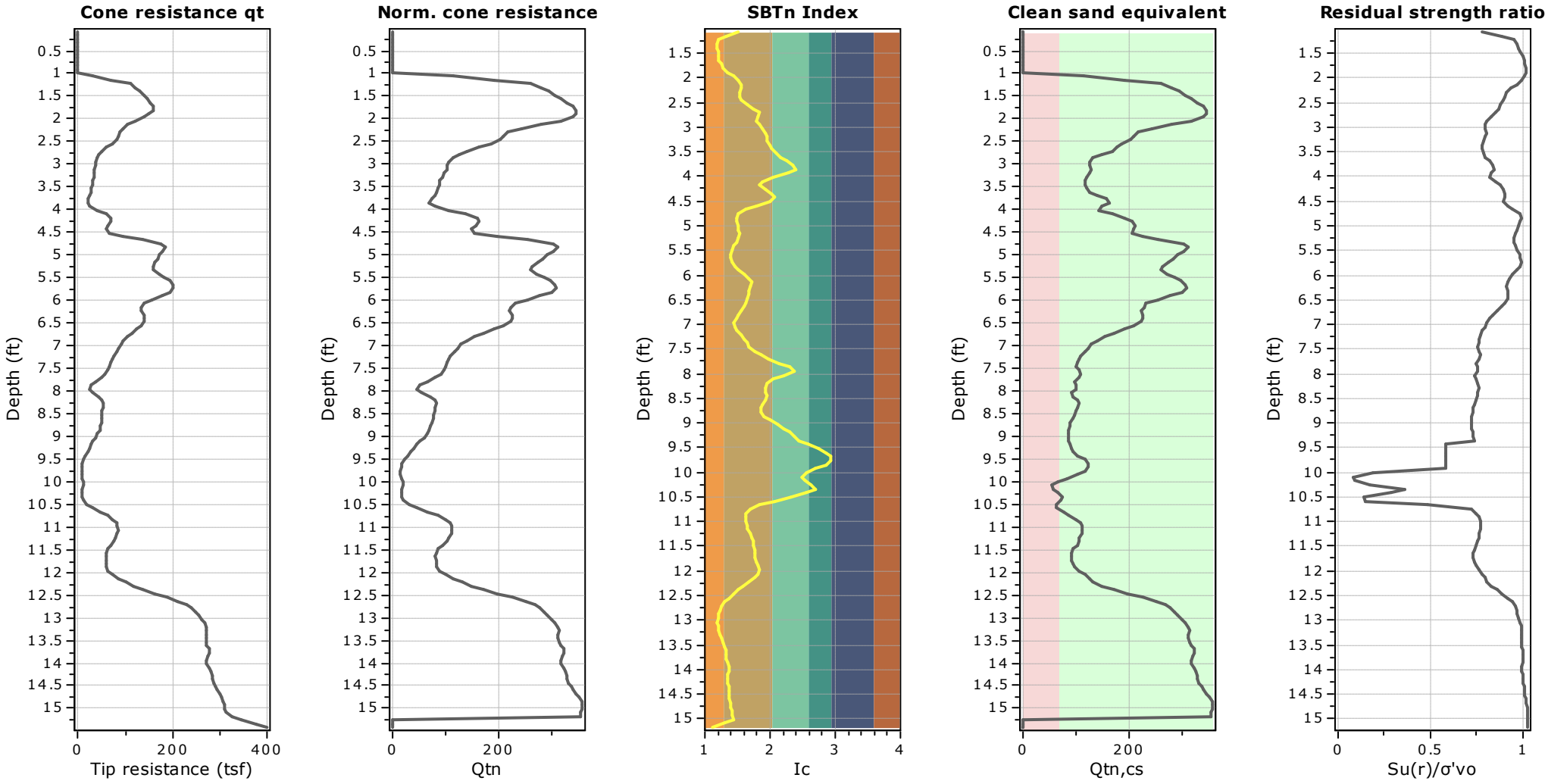
Project:
Location:

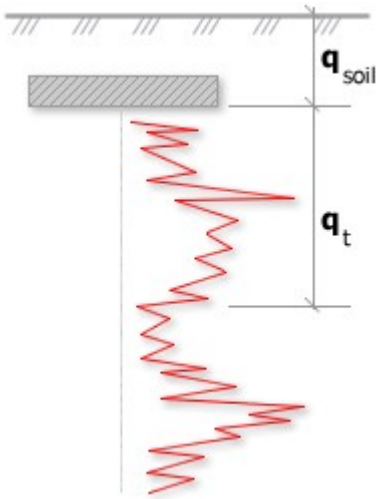


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: HH-7
Total depth: 15.42 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

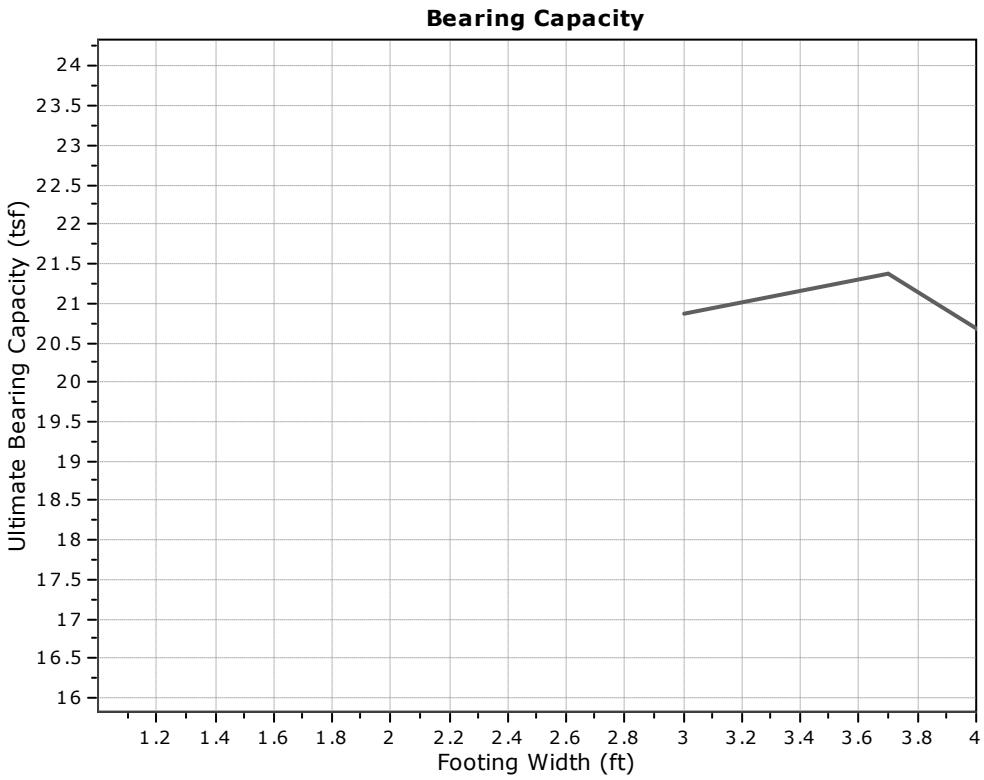




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

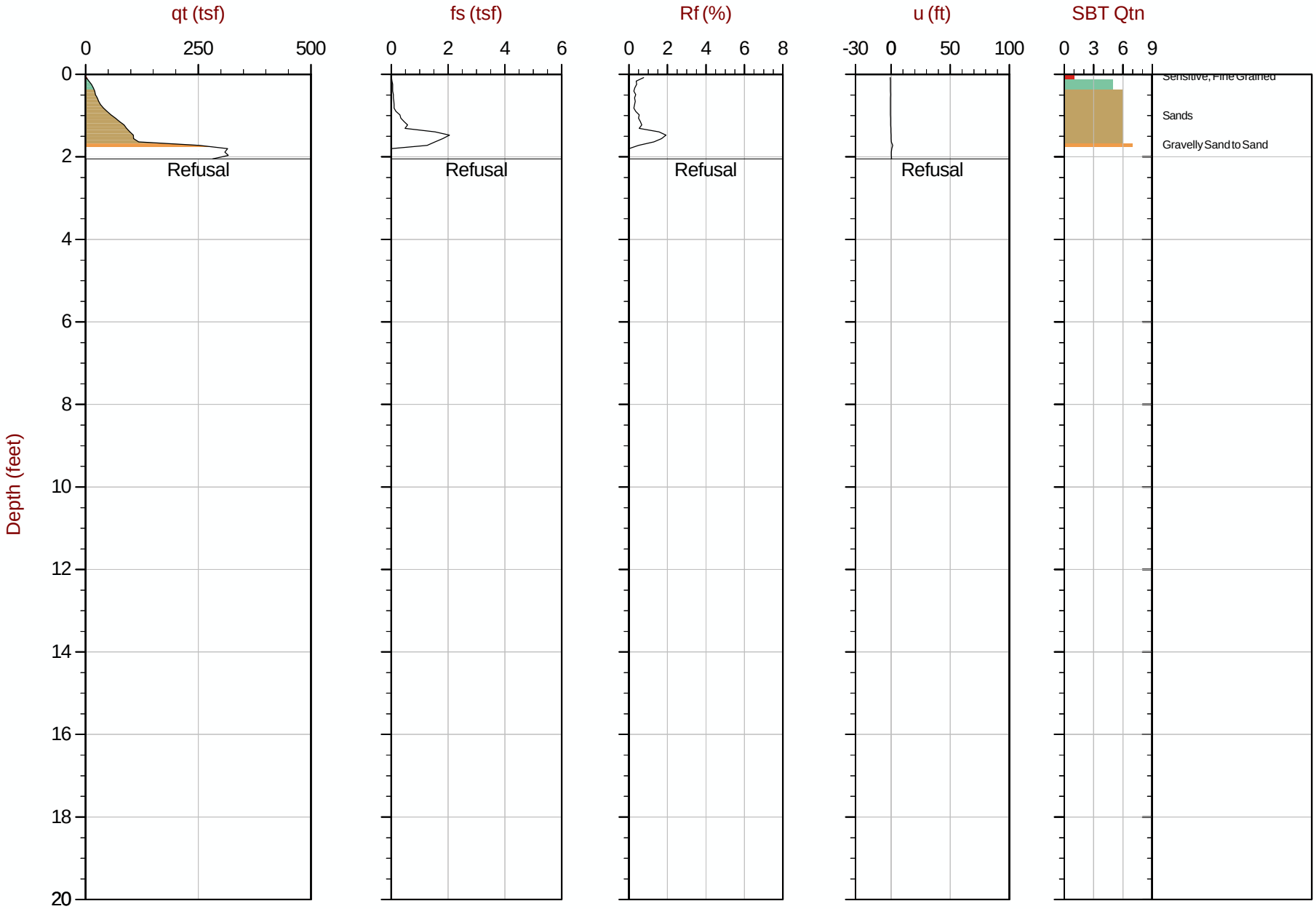
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	103.82	0.20	0.10	20.86
2	3.70	1.60	7.15	106.38	0.20	0.10	21.37
3	4.40	1.60	8.20	98.35	0.20	0.10	19.77
4	5.10	1.60	9.25	91.11	0.20	0.10	18.32
5	5.80	1.60	10.30	81.56	0.20	0.10	16.41
6	6.50	1.60	11.35	78.95	0.20	0.10	15.89
7	7.20	1.60	12.40	78.90	0.20	0.10	15.88
8	7.90	1.60	13.45	92.24	0.20	0.10	18.54
9	8.60	1.60	14.50	107.43	0.20	0.10	21.58
10	9.30	1.60	15.55	120.97	0.20	0.10	24.29
11	10.00	1.60	16.60	120.97	0.20	0.10	24.29
12	10.70	1.60	17.65	120.97	0.20	0.10	24.29
13	11.40	1.60	18.70	120.97	0.20	0.10	24.29
14	12.10	1.60	19.75	120.97	0.20	0.10	24.29
15	12.80	1.60	20.80	120.97	0.20	0.10	24.29

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 11:39
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-II-0
Cone: 652:T1500F15U35



Max Depth: 0.625 m / 2.05 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPII-0.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6233 Long: -70.9183

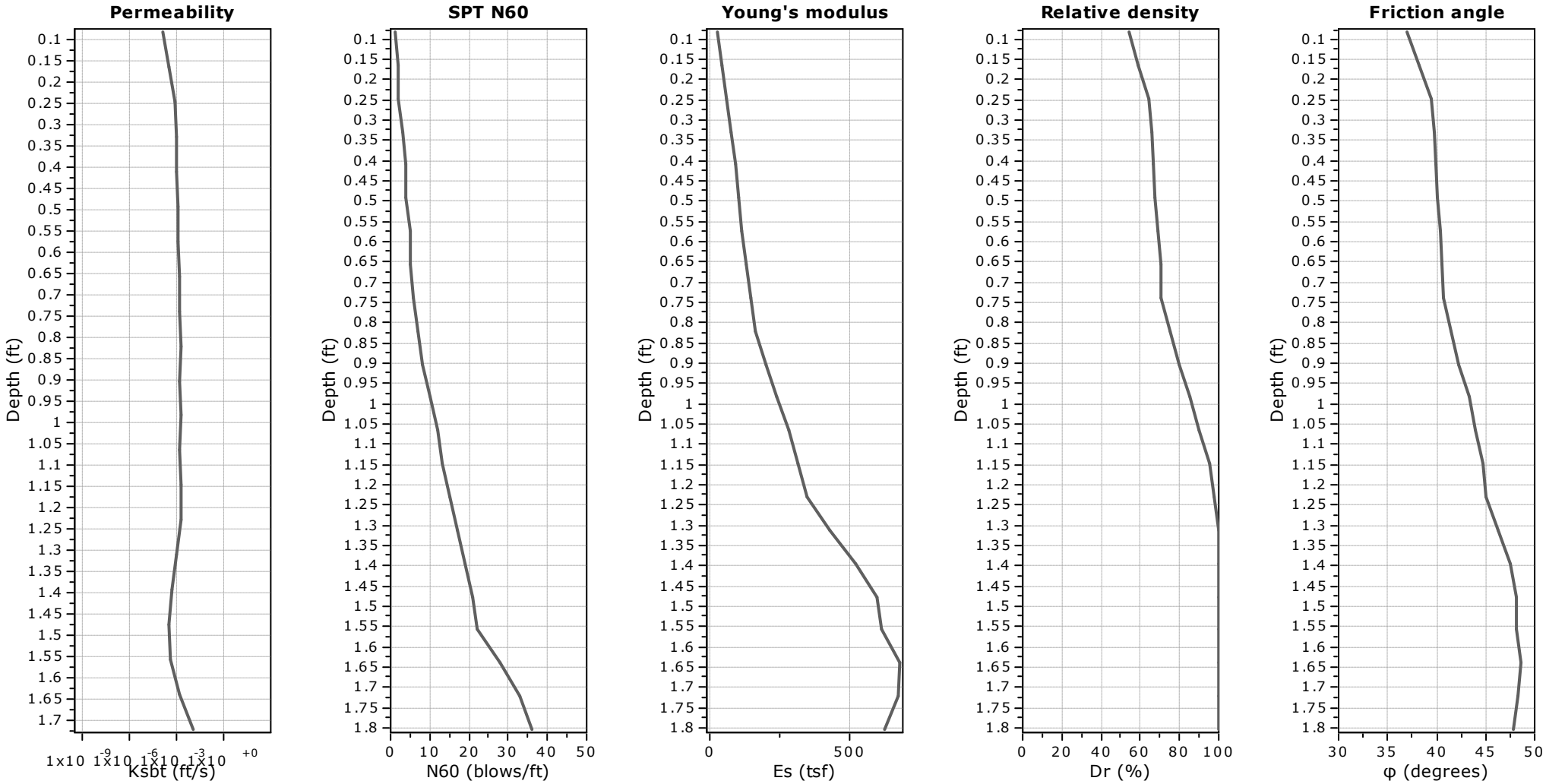
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

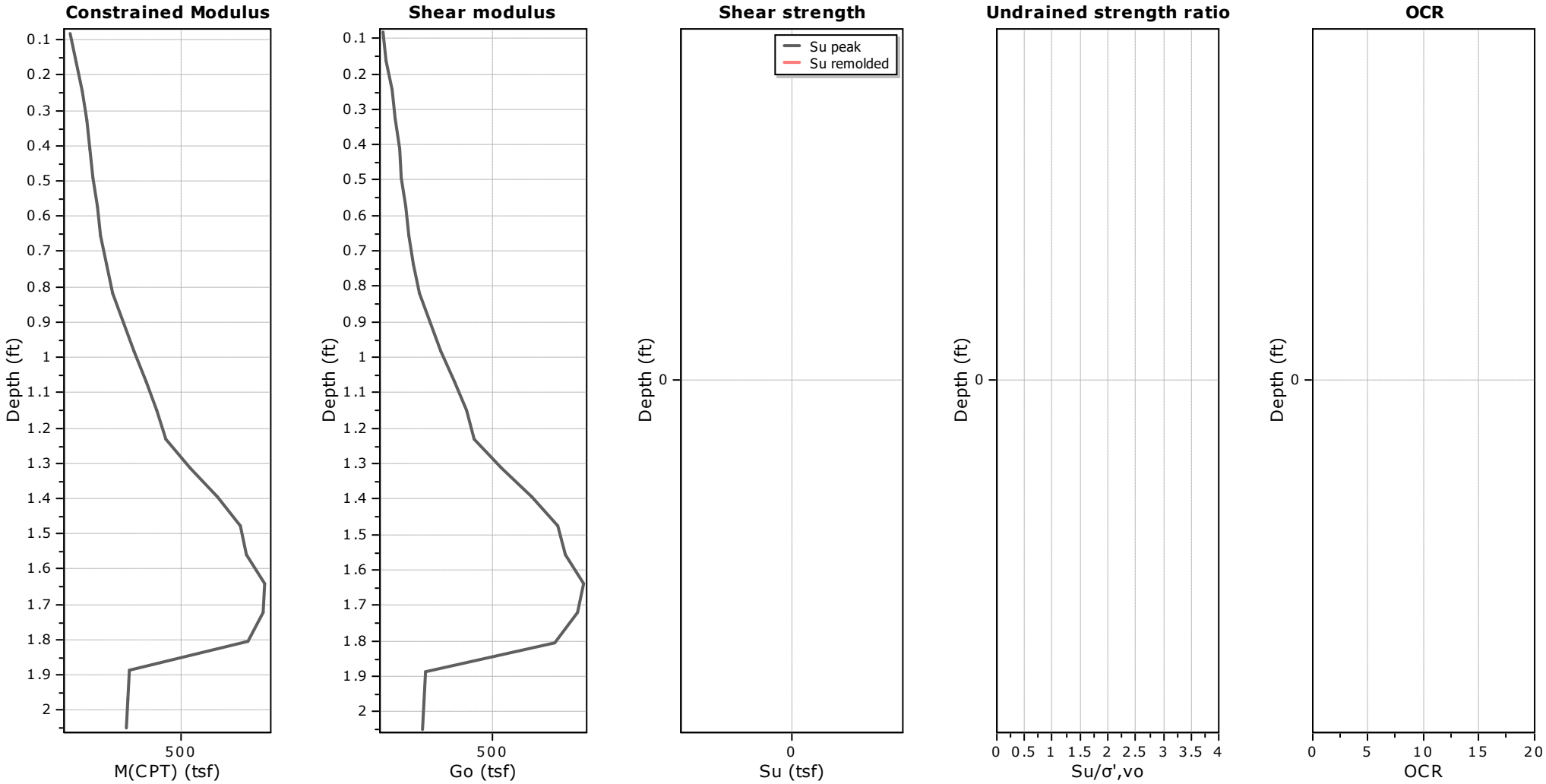
CPT: II-0
Total depth: 2.05 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

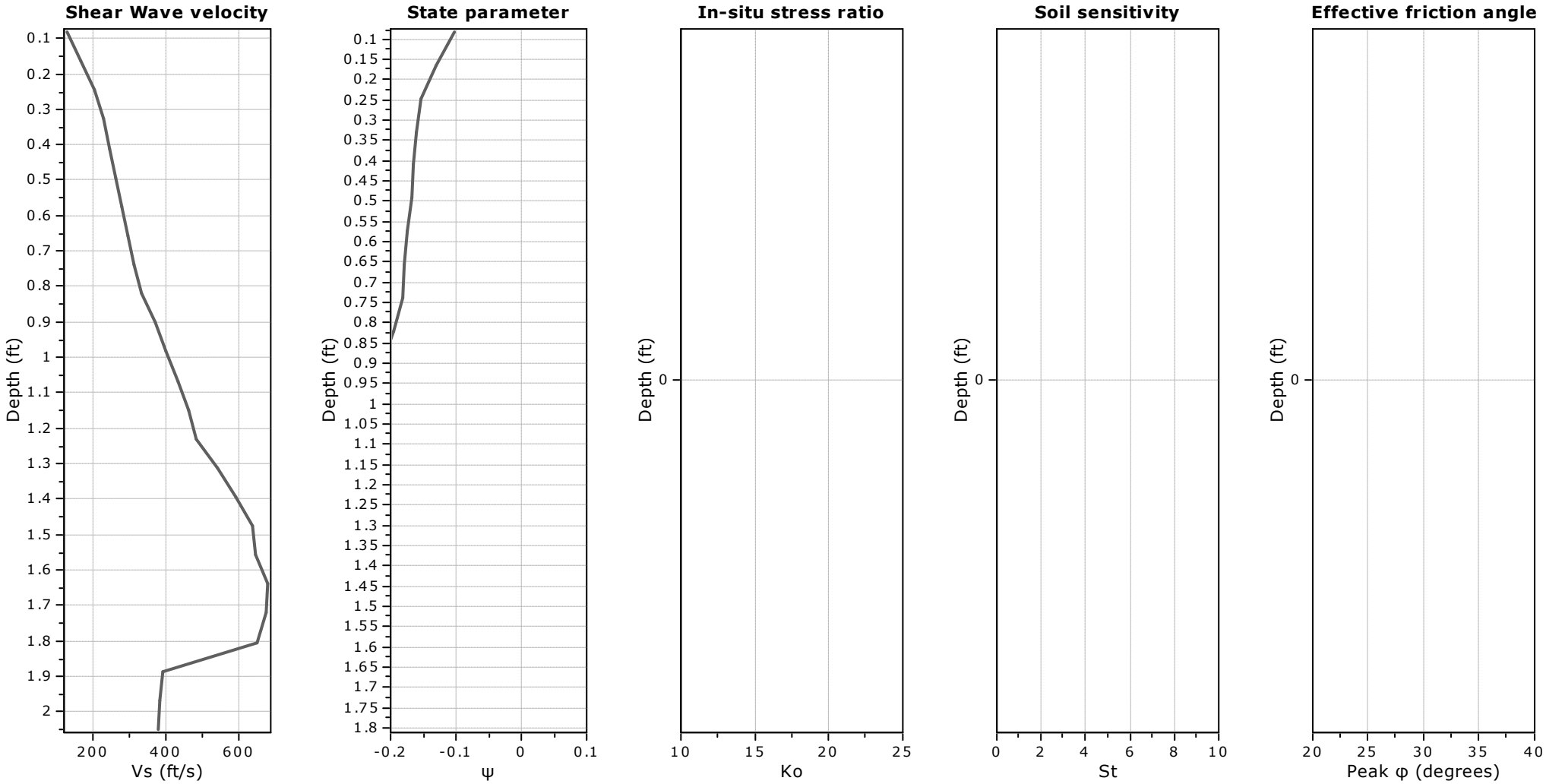


Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

CPT: II-0
Total depth: 2.05 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



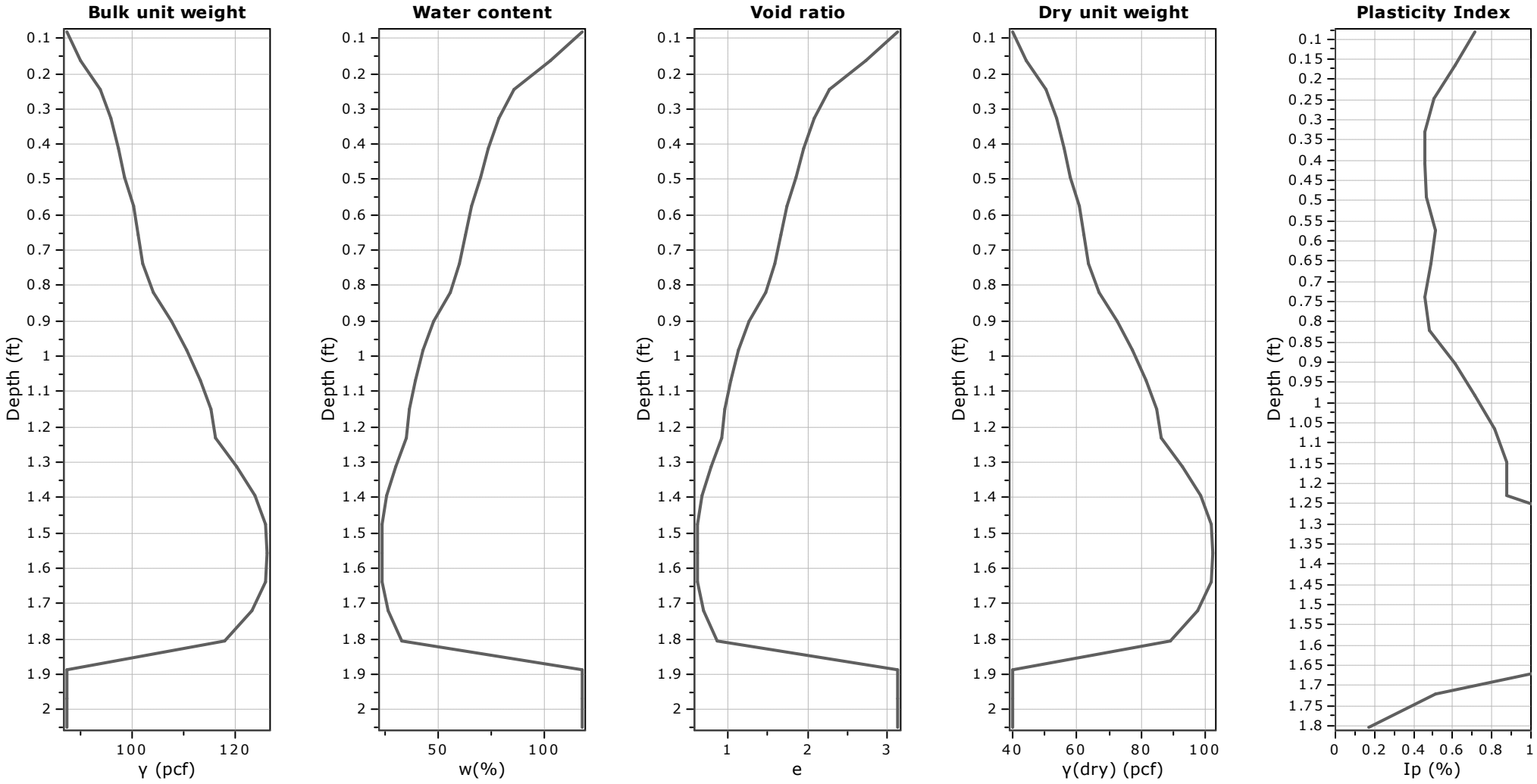
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: II-0
Total depth: 2.05 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

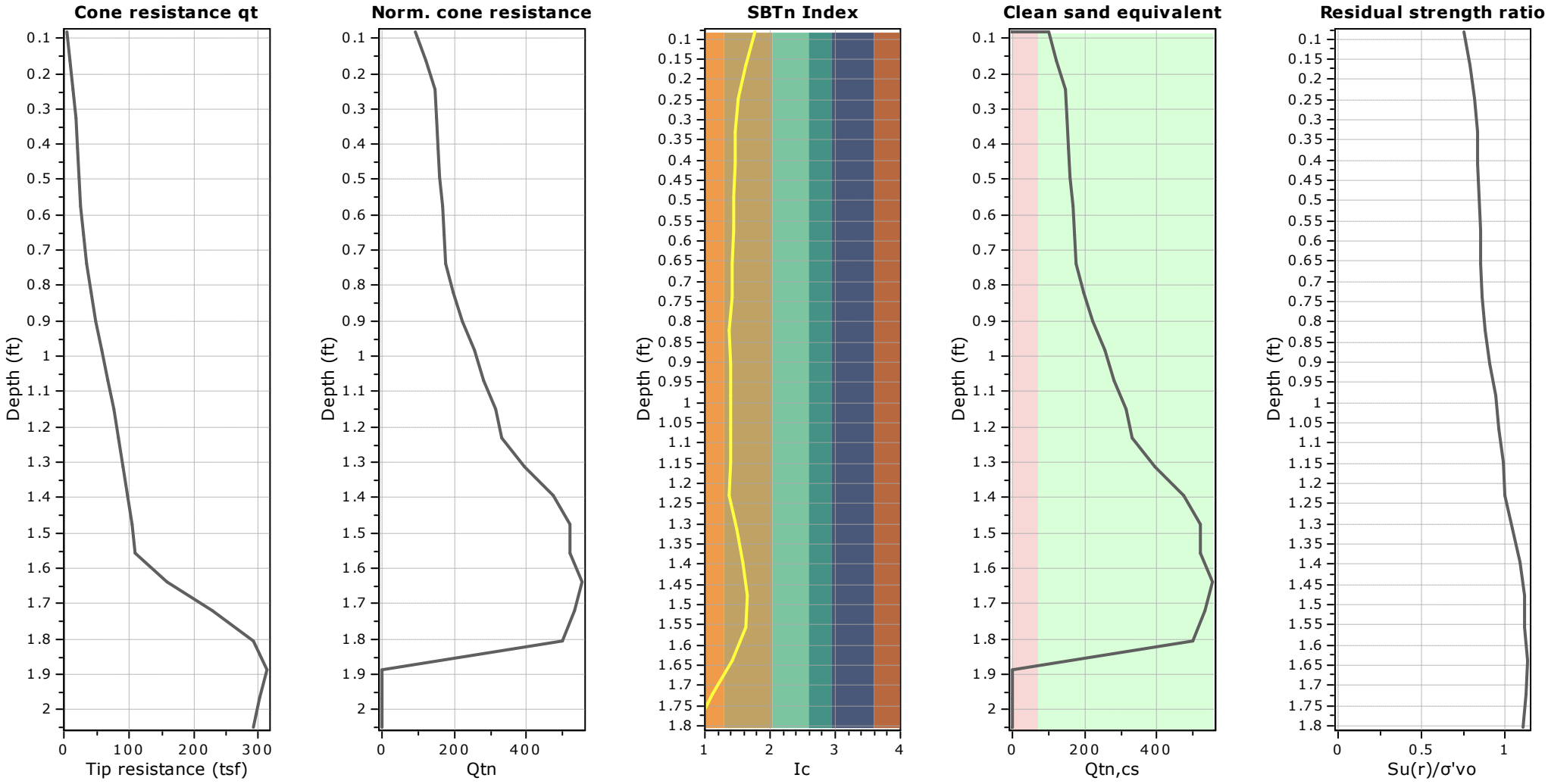
Project:
Location:

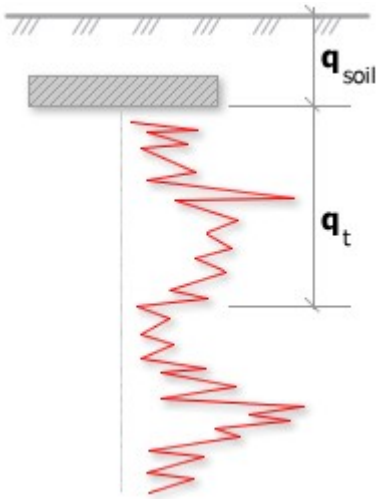


GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: II-0
Total depth: 2.05 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

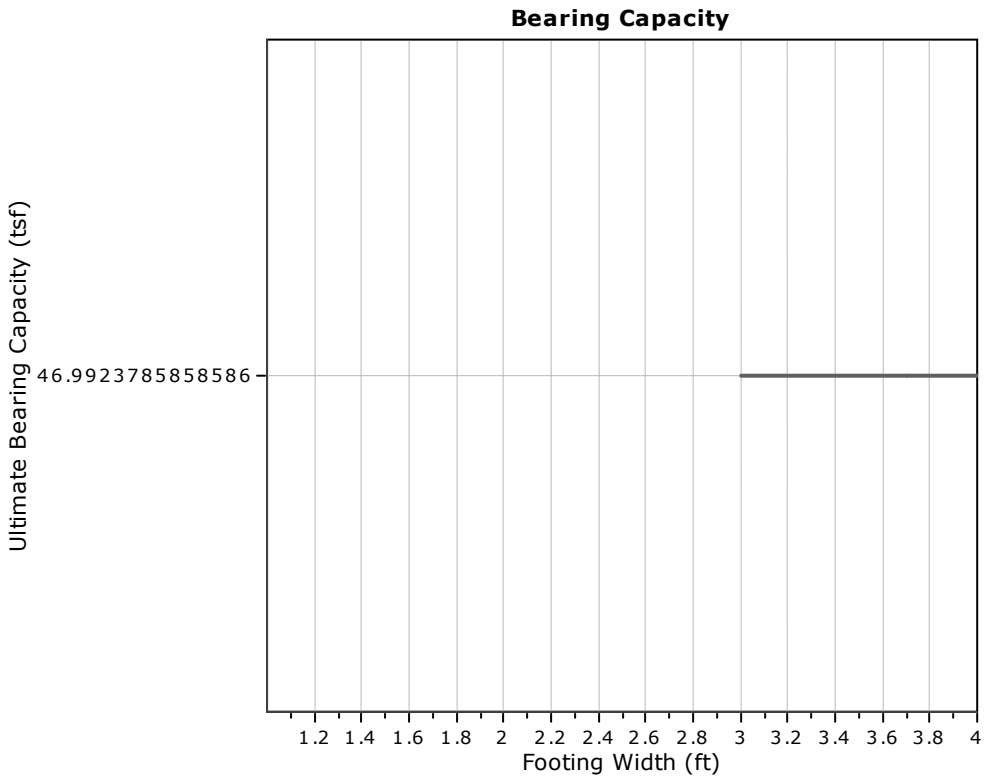




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

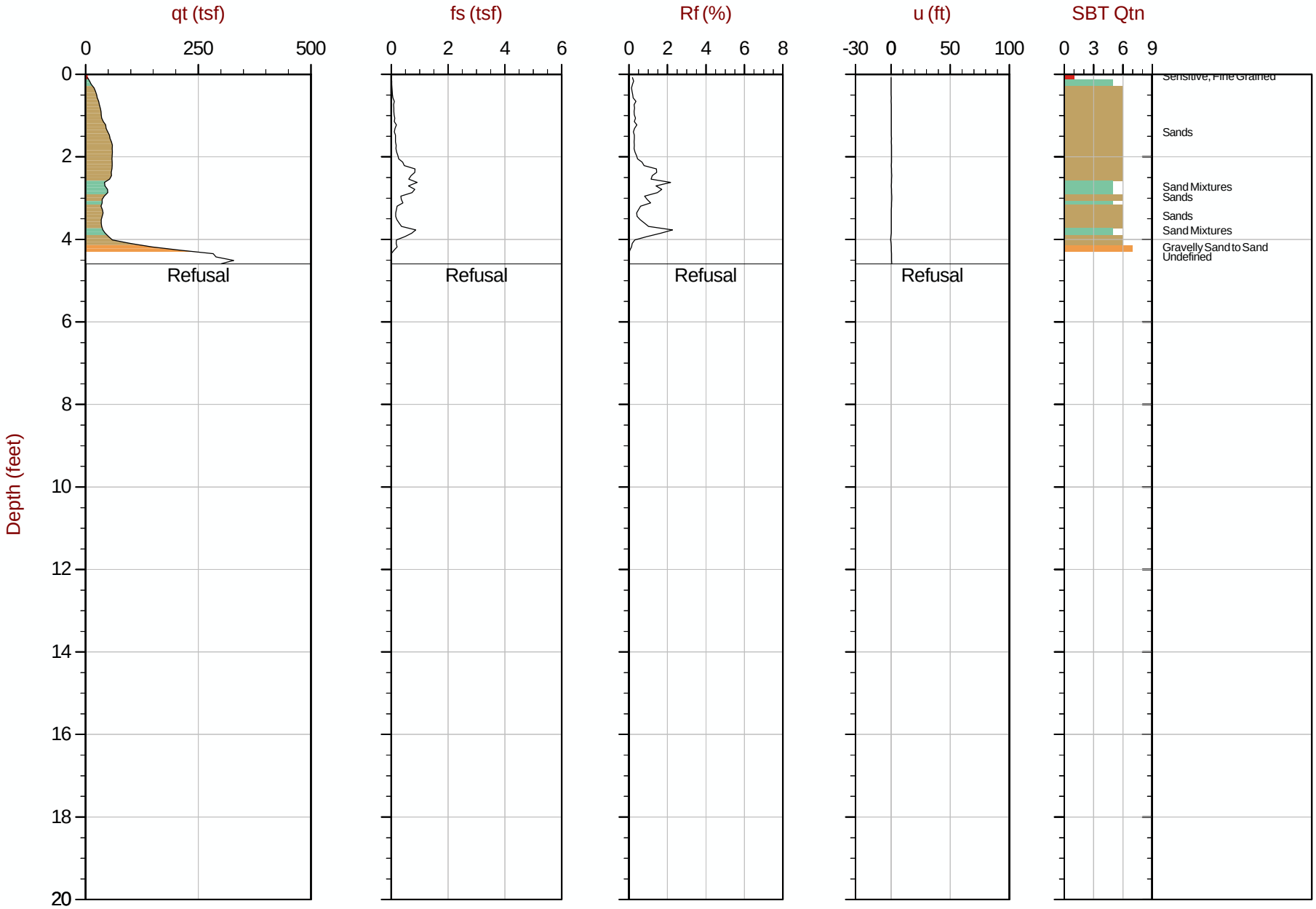
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	234.48	0.20	0.10	46.99
2	3.70	1.60	7.15	234.48	0.20	0.10	46.99
3	4.40	1.60	8.20	234.48	0.20	0.10	46.99
4	5.10	1.60	9.25	234.48	0.20	0.10	46.99
5	5.80	1.60	10.30	234.48	0.20	0.10	46.99
6	6.50	1.60	11.35	234.48	0.20	0.10	46.99
7	7.20	1.60	12.40	234.48	0.20	0.10	46.99
8	7.90	1.60	13.45	234.48	0.20	0.10	46.99
9	8.60	1.60	14.50	234.48	0.20	0.10	46.99
10	9.30	1.60	15.55	234.48	0.20	0.10	46.99
11	10.00	1.60	16.60	234.48	0.20	0.10	46.99
12	10.70	1.60	17.65	234.48	0.20	0.10	46.99
13	11.40	1.60	18.70	234.48	0.20	0.10	46.99
14	12.10	1.60	19.75	234.48	0.20	0.10	46.99
15	12.80	1.60	20.80	234.48	0.20	0.10	46.99

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 11:53
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-II-0A
Cone: 652:T1500F15U35



Max Depth: 1.400 m / 4.59 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPII-0A.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6233 Long: -70.9183

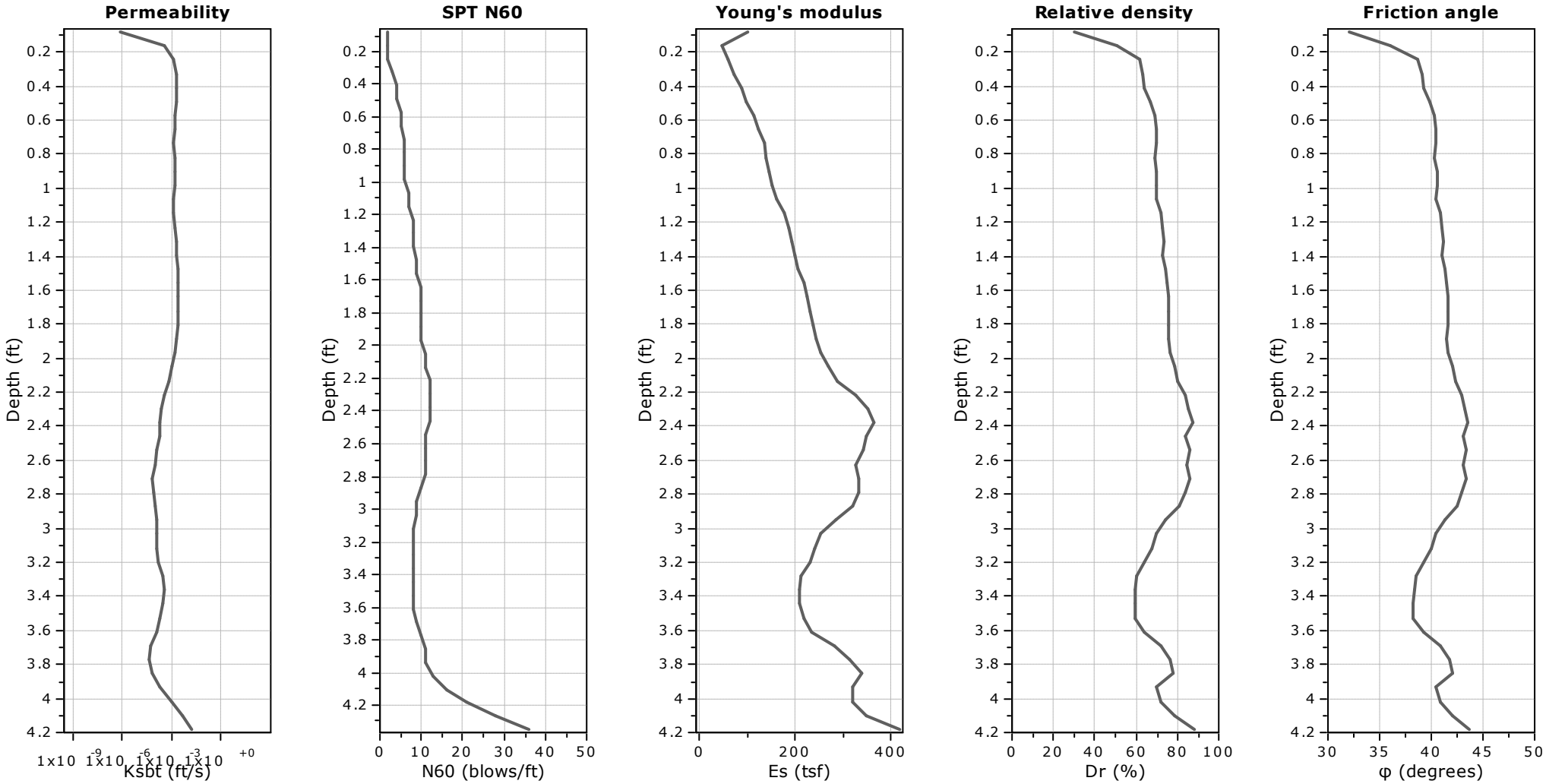
Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: II-0A
Total depth: 4.59 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
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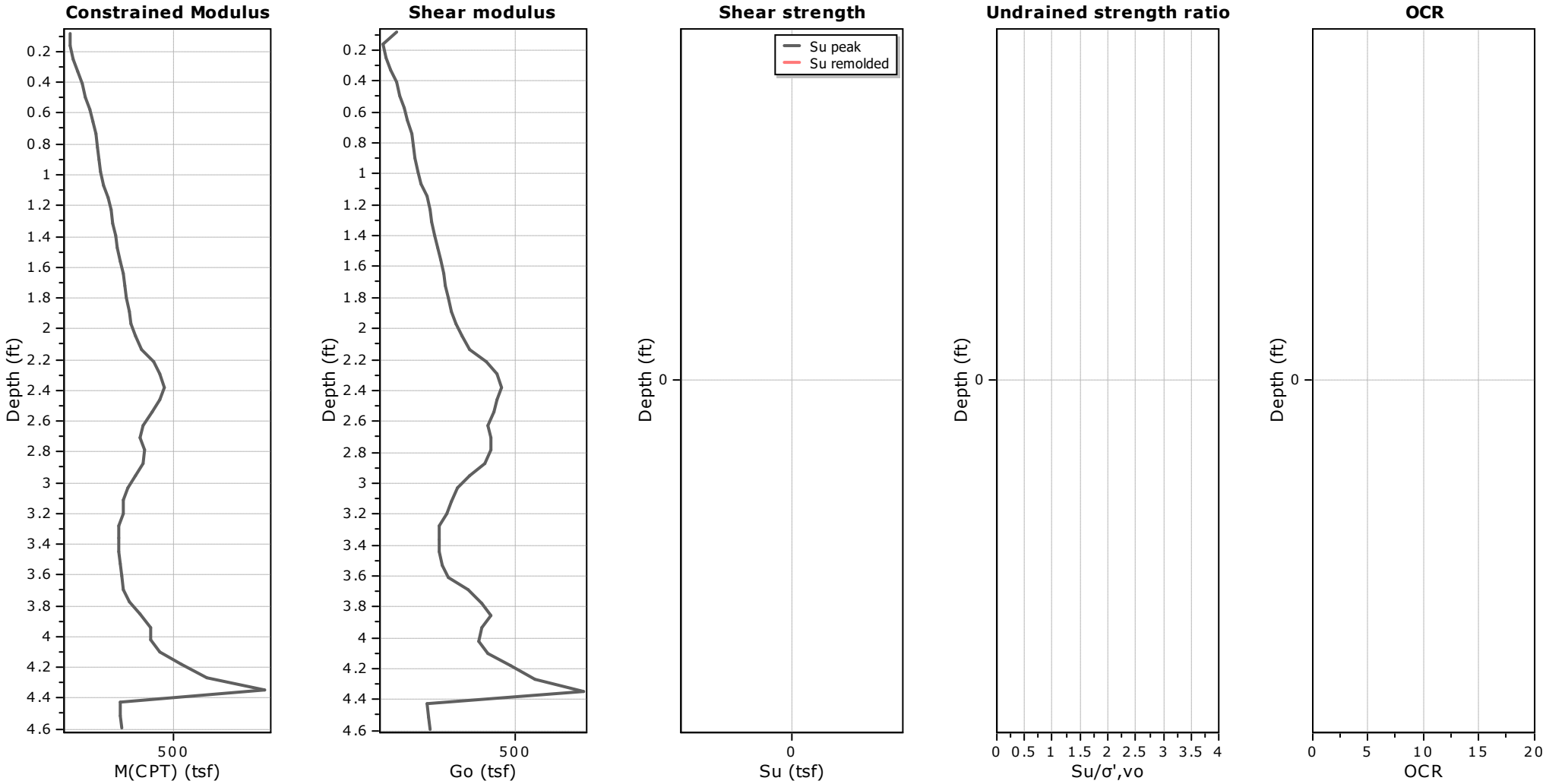
http://www.geologismiki.gr

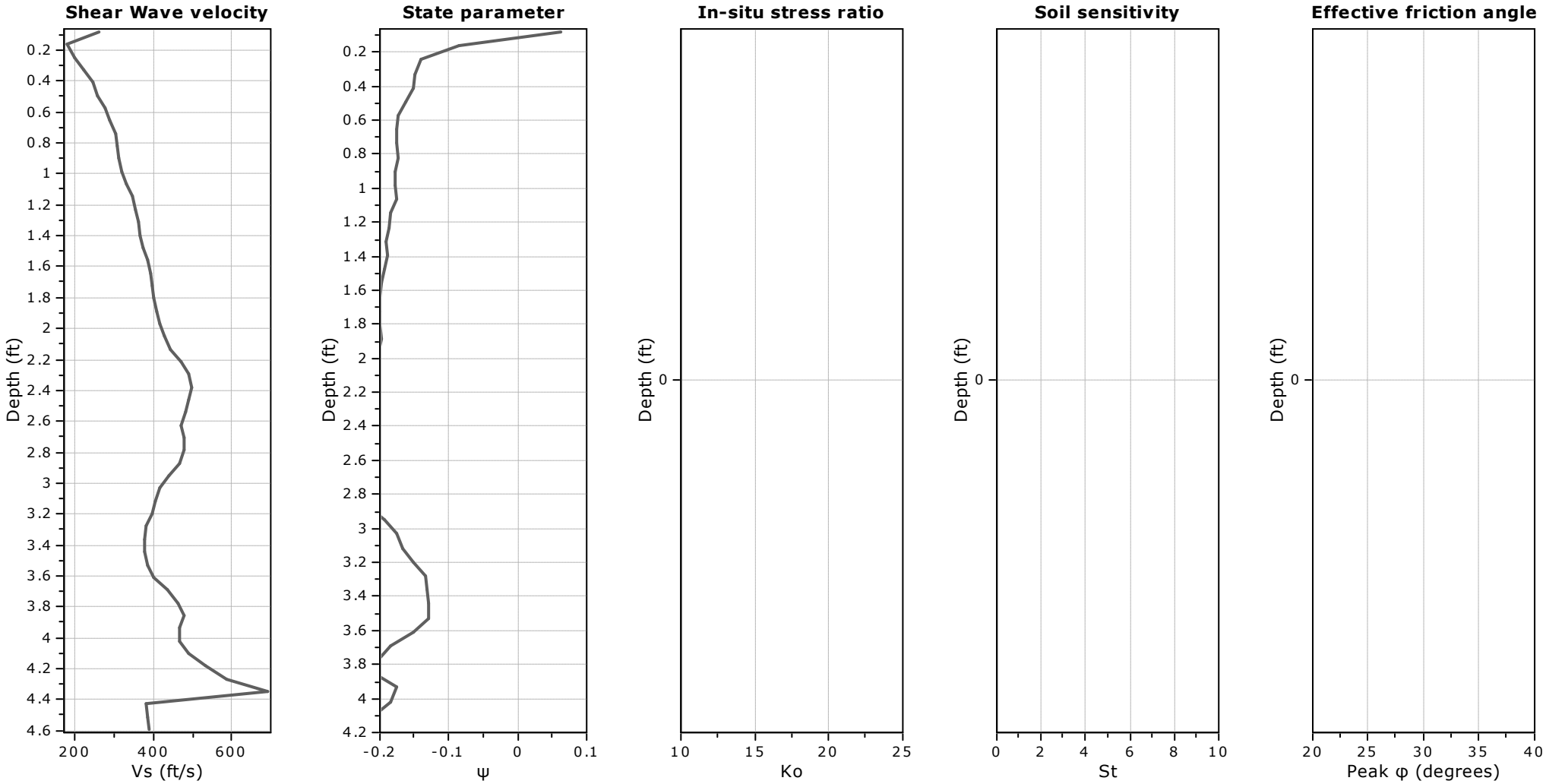
CPT: II-0A
Total depth: 4.59 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



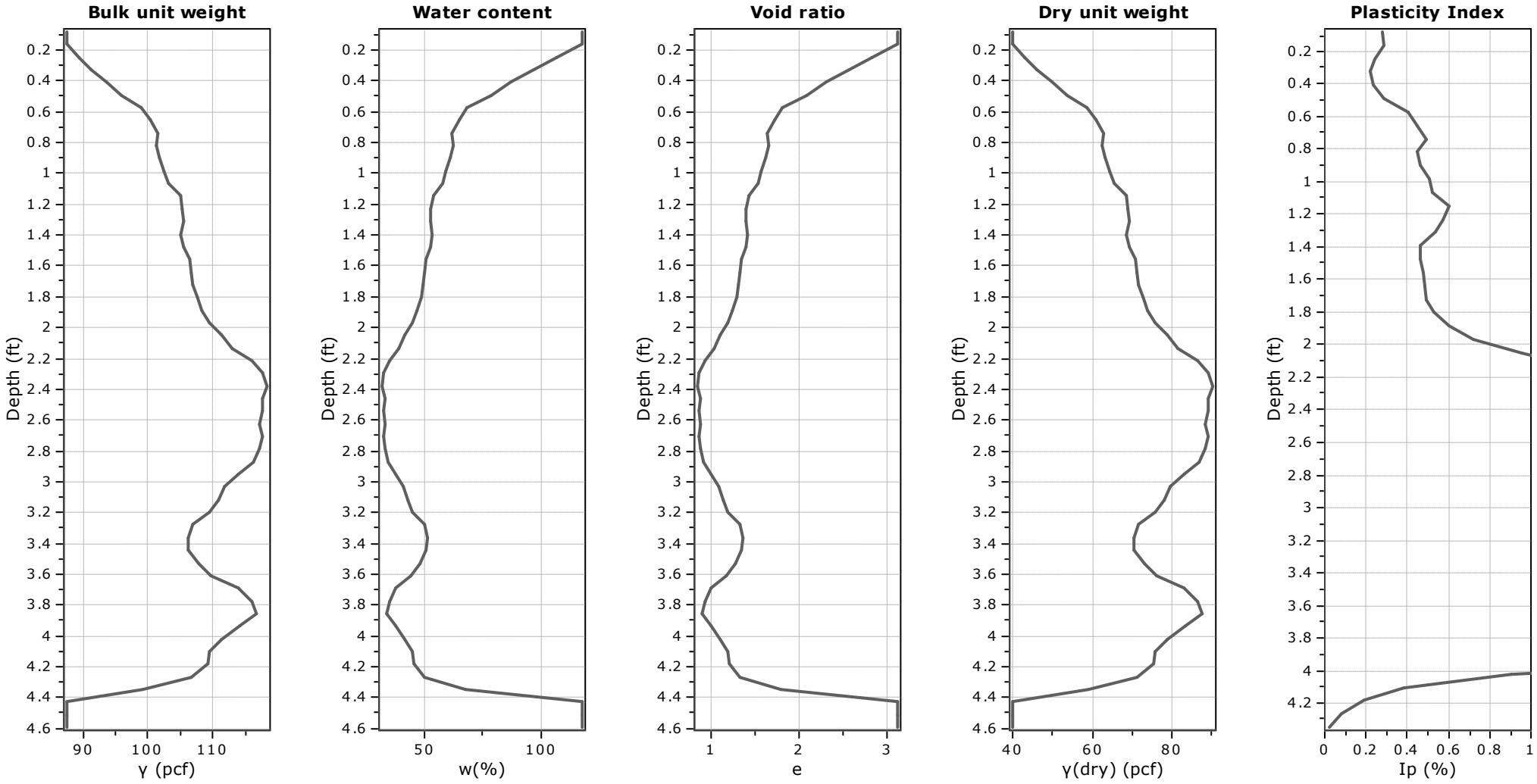
Calculation parameters

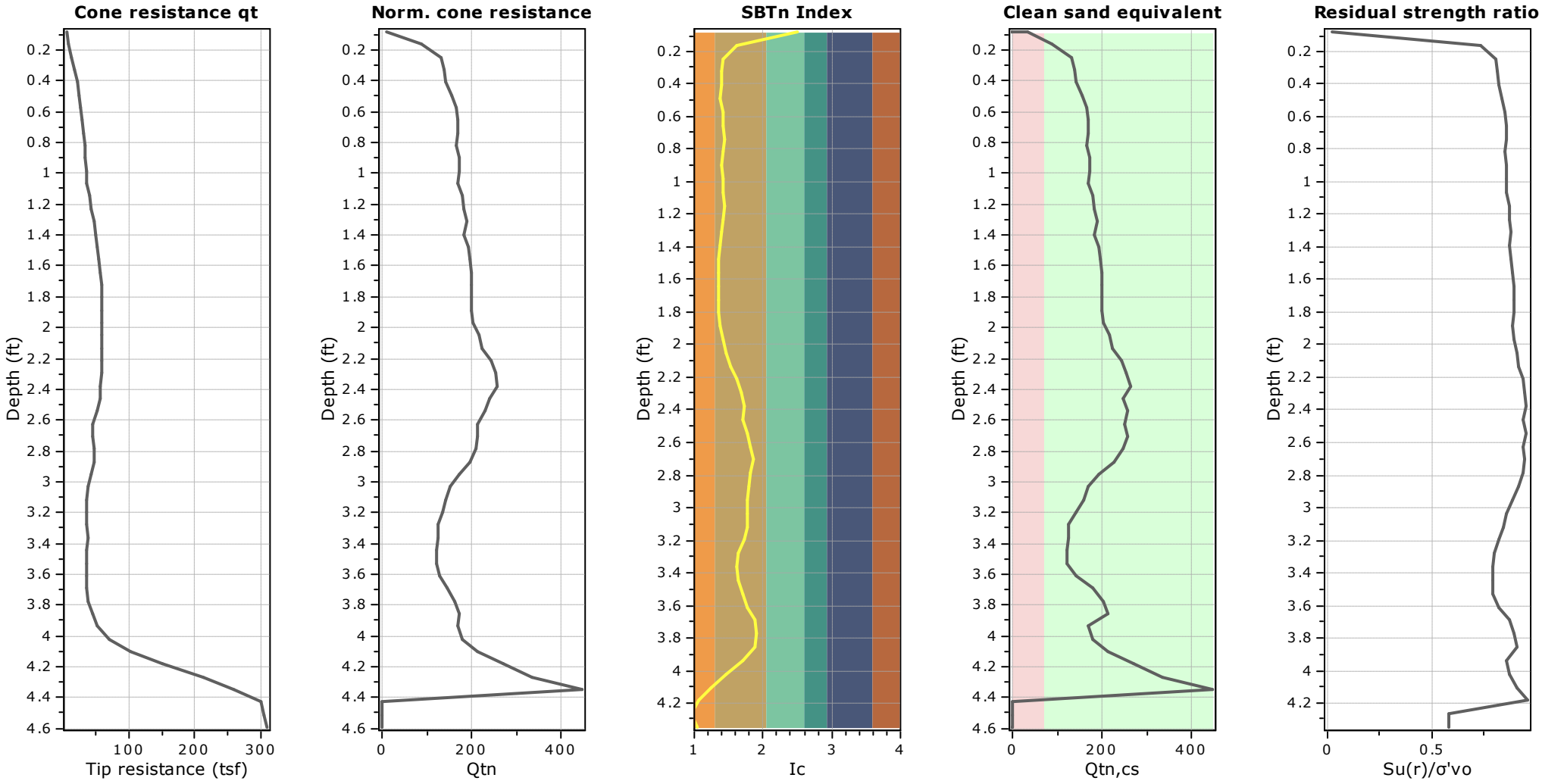
Soil Sensitivity factor, N_S: 7.00

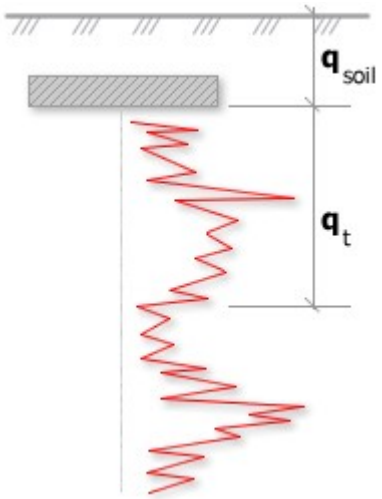
GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: II-0A
Total depth: 4.59 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



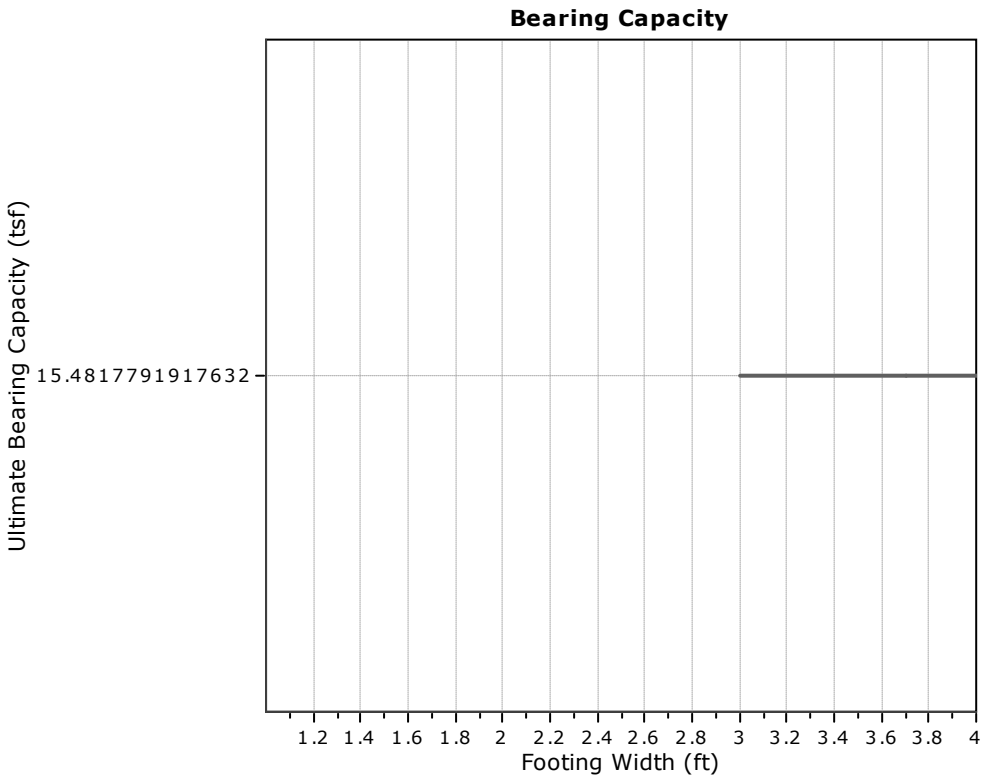

Cone resistance qt
Norm. cone resistance
SBTn Index
Clean sand equivalent
Residual strength ratio
Depth (ft)
Tip resistance (tsf)
Qtn
Ic
Qtn,cs
Su(r)/σ'vo



Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

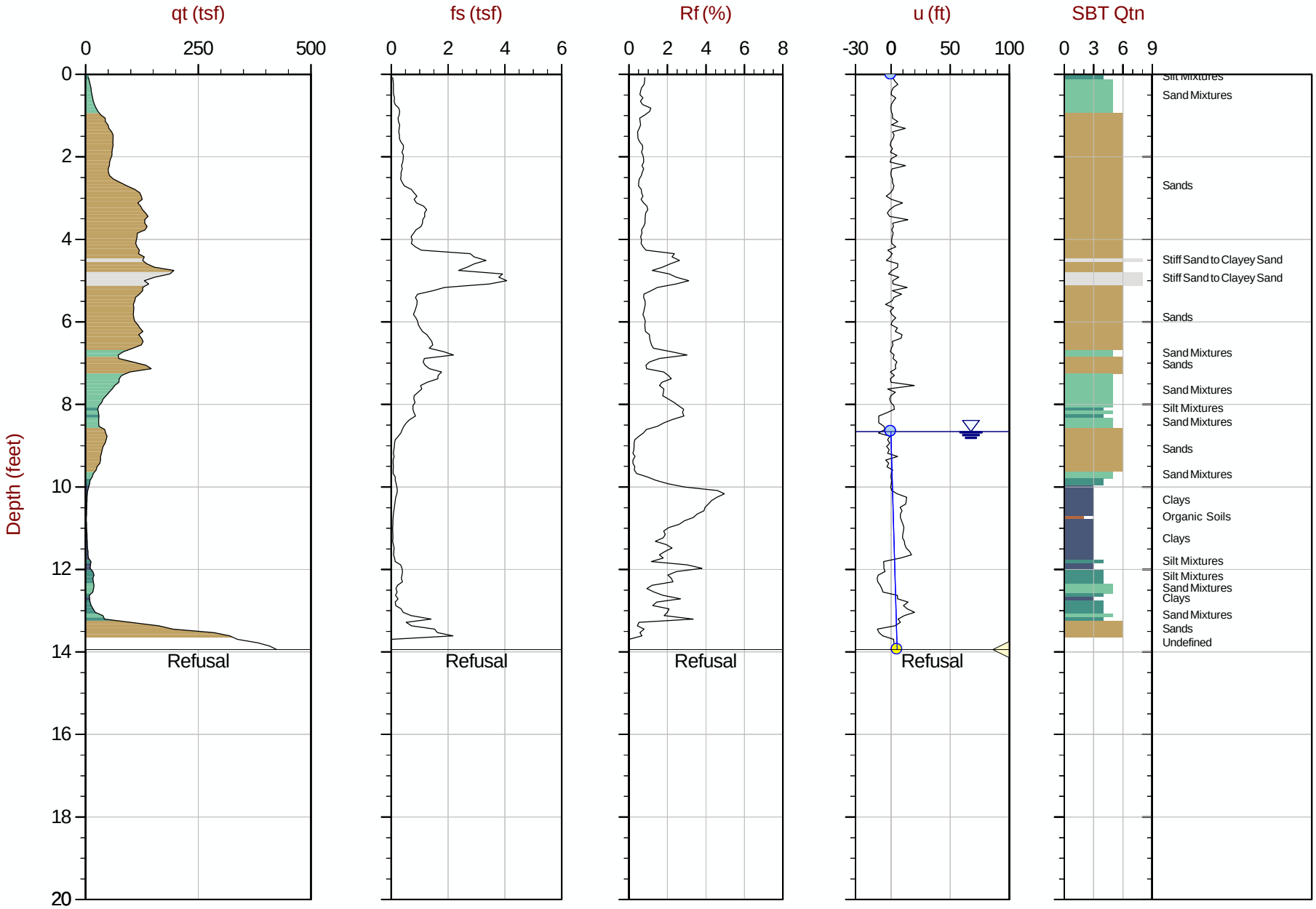
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	76.93	0.20	0.10	15.48
2	3.70	1.60	7.15	76.93	0.20	0.10	15.48
3	4.40	1.60	8.20	76.93	0.20	0.10	15.48
4	5.10	1.60	9.25	76.93	0.20	0.10	15.48
5	5.80	1.60	10.30	76.93	0.20	0.10	15.48
6	6.50	1.60	11.35	76.93	0.20	0.10	15.48
7	7.20	1.60	12.40	76.93	0.20	0.10	15.48
8	7.90	1.60	13.45	76.93	0.20	0.10	15.48
9	8.60	1.60	14.50	76.93	0.20	0.10	15.48
10	9.30	1.60	15.55	76.93	0.20	0.10	15.48
11	10.00	1.60	16.60	76.93	0.20	0.10	15.48
12	10.70	1.60	17.65	76.93	0.20	0.10	15.48
13	11.40	1.60	18.70	76.93	0.20	0.10	15.48
14	12.10	1.60	19.75	76.93	0.20	0.10	15.48
15	12.80	1.60	20.80	76.93	0.20	0.10	15.48

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 10:40
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-J-0
Cone: 652:T1500F15U35



Max Depth: 4.250 m / 13.94 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPJ-0.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9167

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

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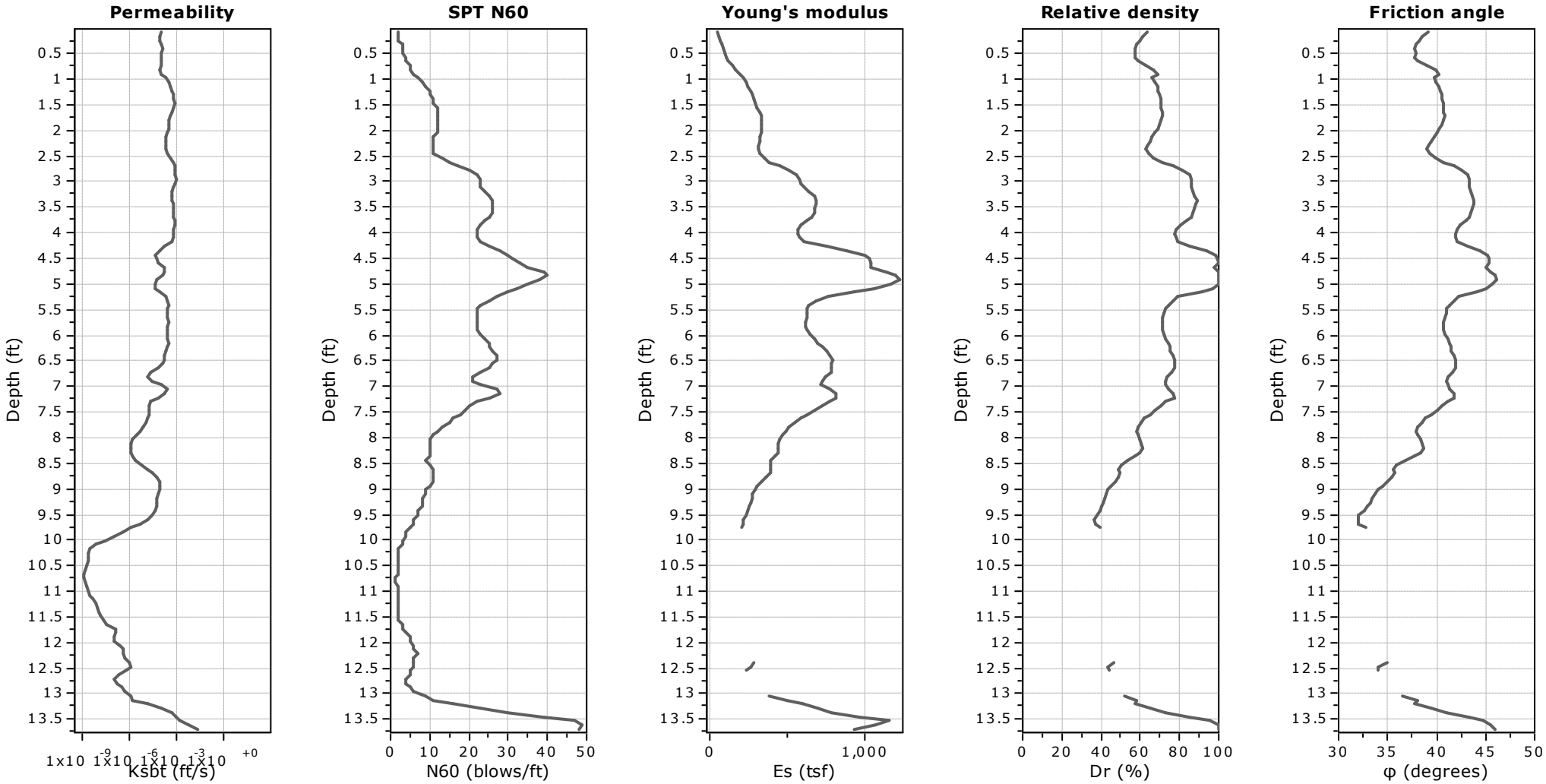
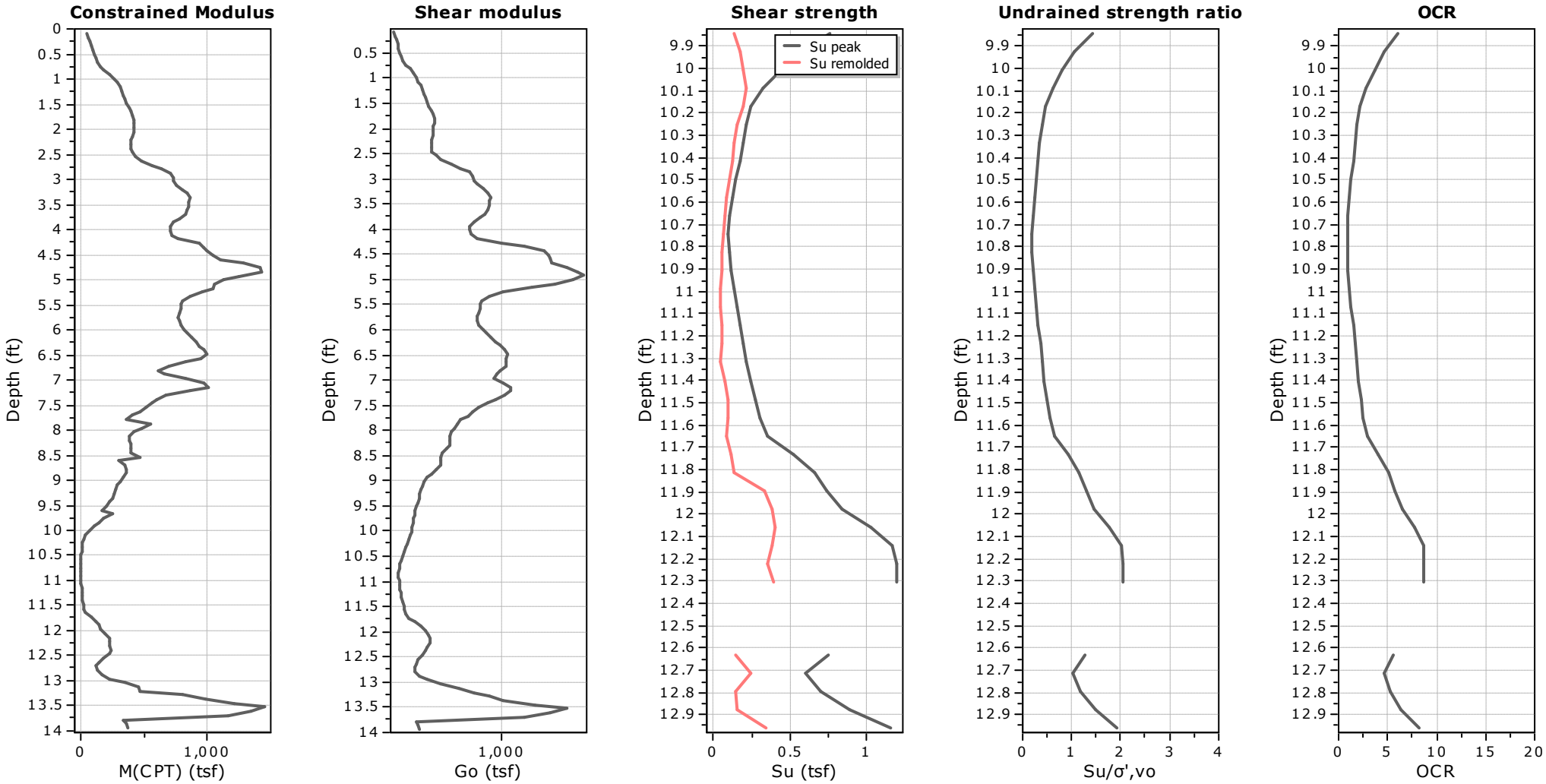
CPT: J-0
Total depth: 13.94 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

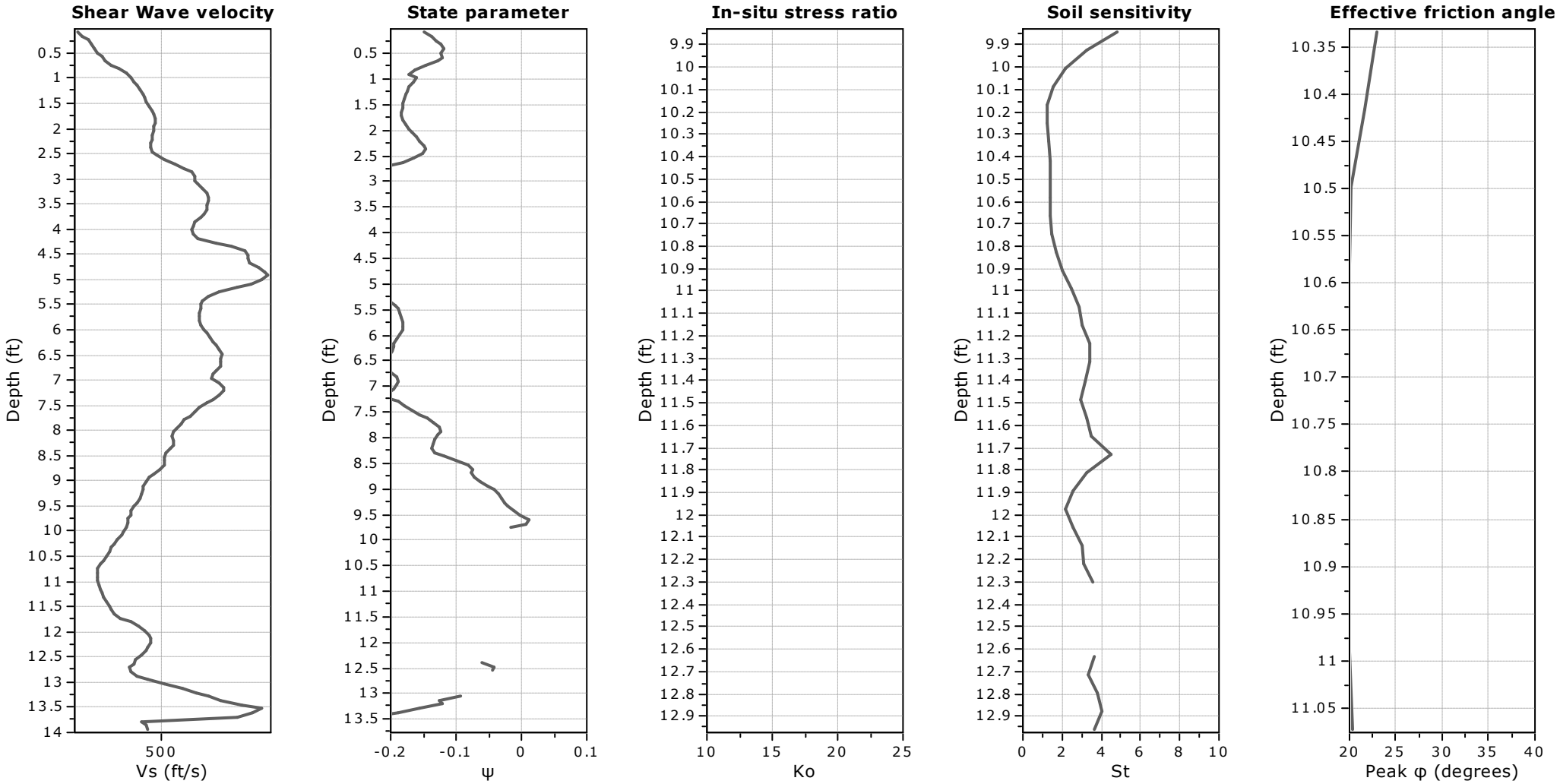
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

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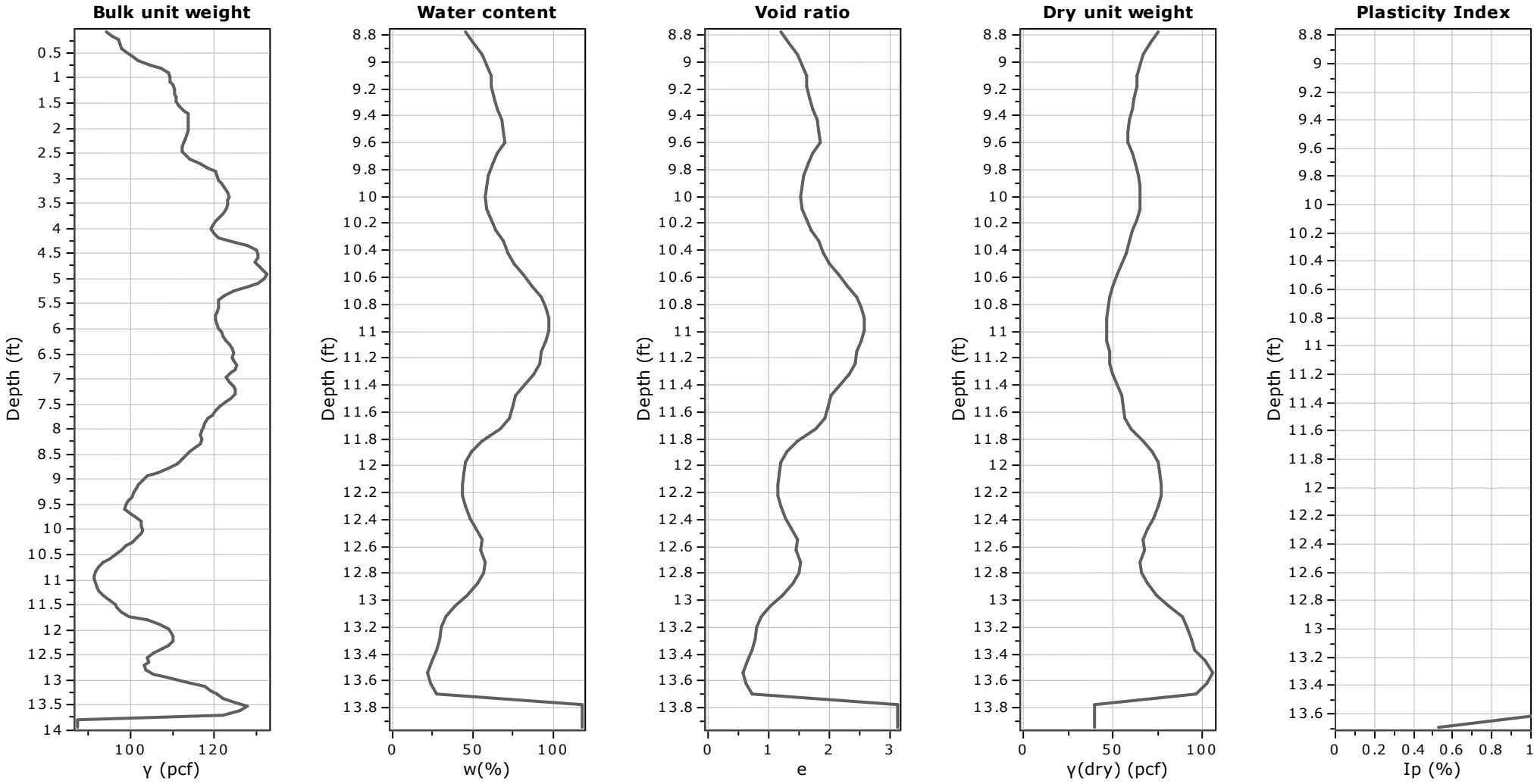
CPT: J-0
Total depth: 13.94 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
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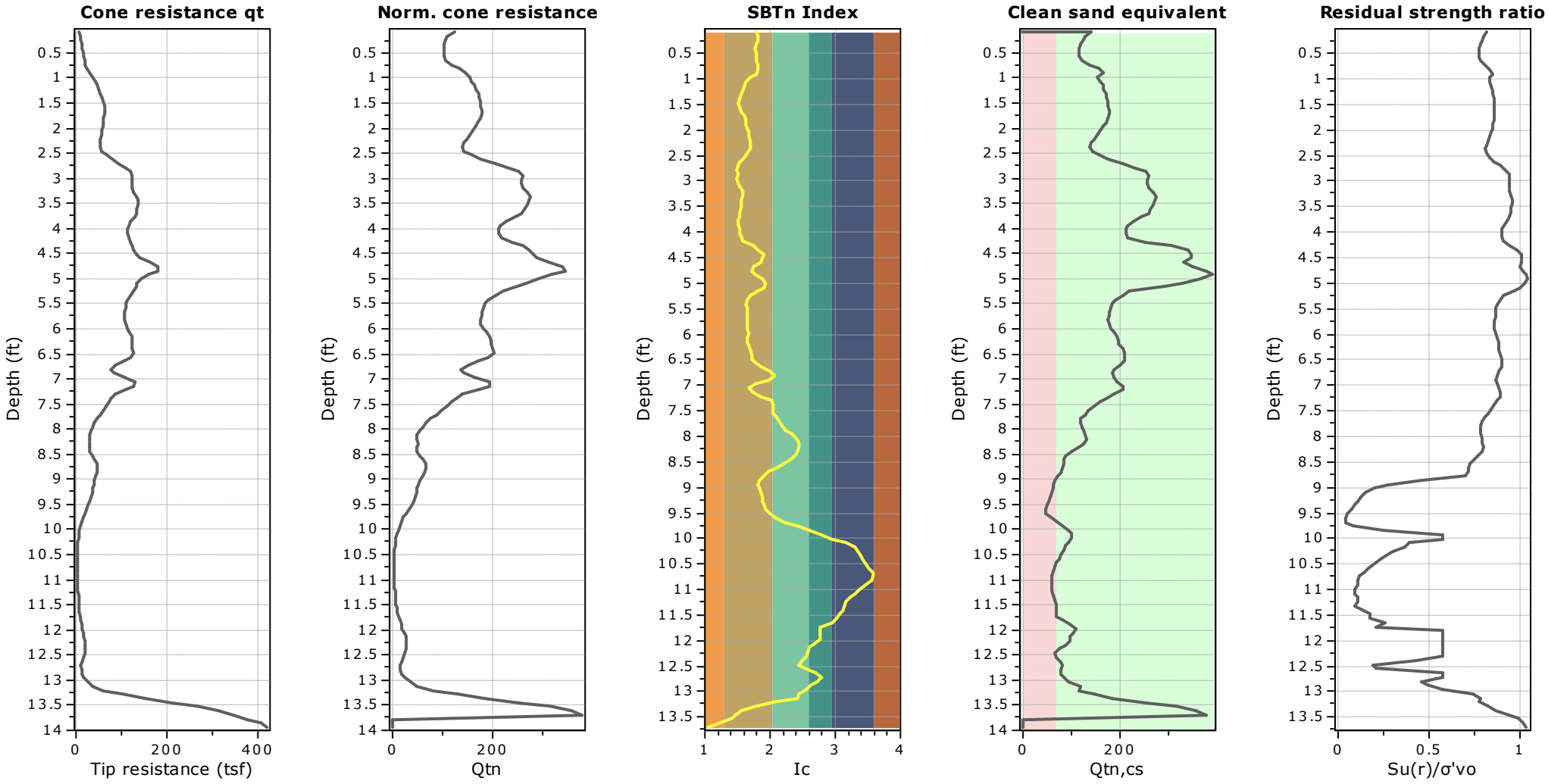
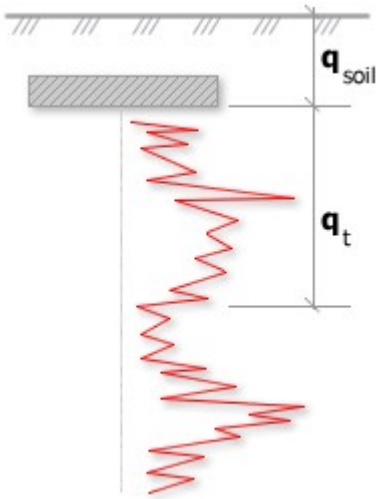
CPT: J-0
Total depth: 13.94 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

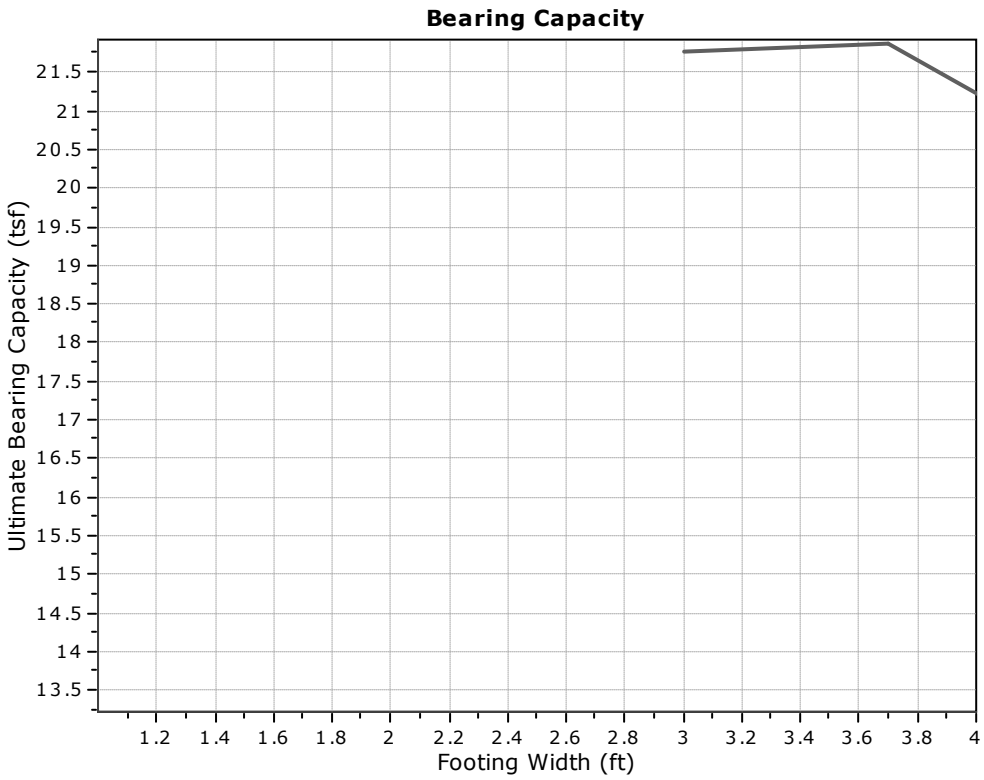




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

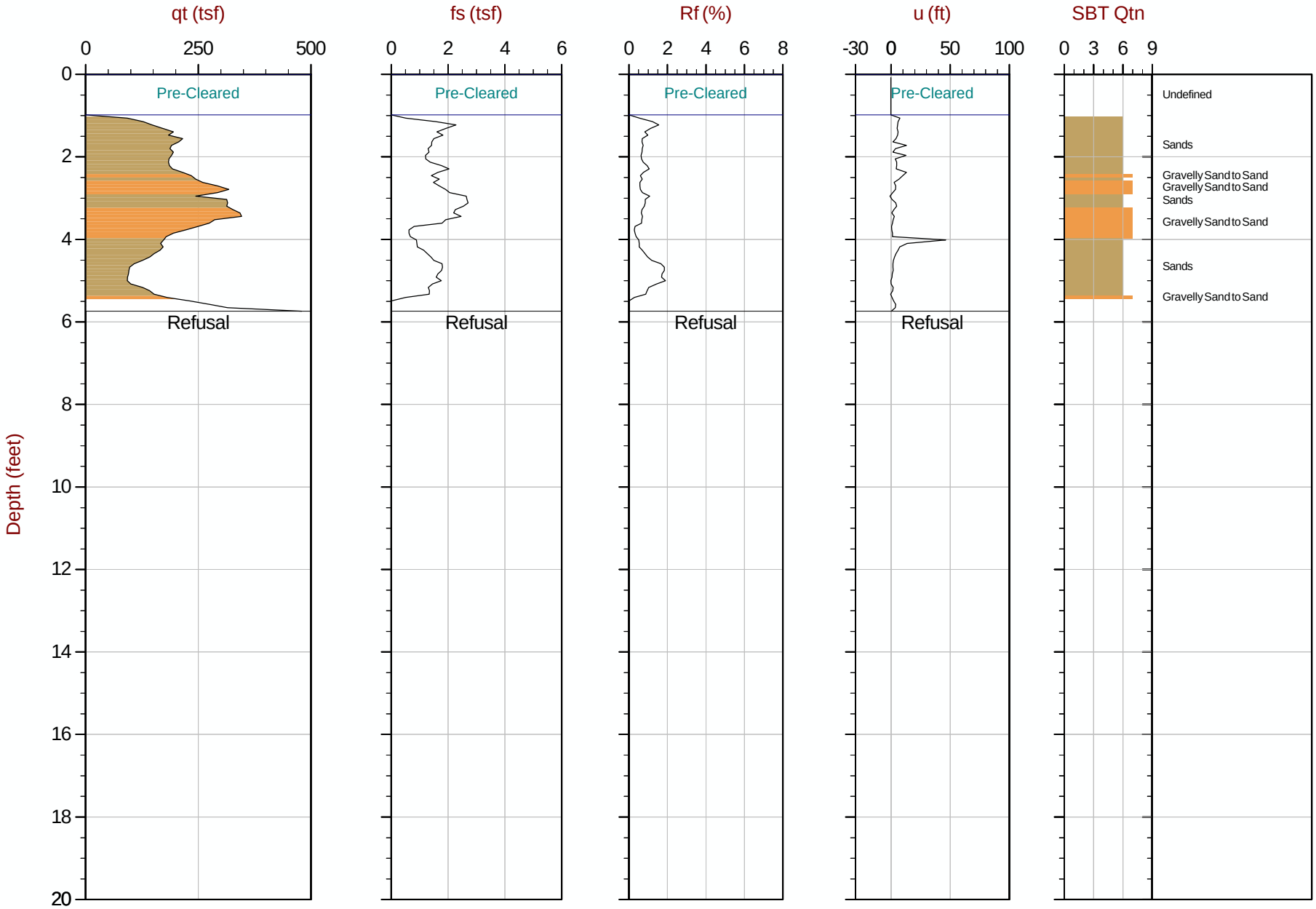
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	108.36	0.20	0.10	21.77
2	3.70	1.60	7.15	108.86	0.20	0.10	21.87
3	4.40	1.60	8.20	101.34	0.20	0.10	20.36
4	5.10	1.60	9.25	92.45	0.20	0.10	18.59
5	5.80	1.60	10.30	83.25	0.20	0.10	16.75
6	6.50	1.60	11.35	74.53	0.20	0.10	15.00
7	7.20	1.60	12.40	68.34	0.20	0.10	13.76
8	7.90	1.60	13.45	65.90	0.20	0.10	13.28
9	8.60	1.60	14.50	76.00	0.20	0.10	15.30
10	9.30	1.60	15.55	76.00	0.20	0.10	15.30
11	10.00	1.60	16.60	76.00	0.20	0.10	15.30
12	10.70	1.60	17.65	76.00	0.20	0.10	15.30
13	11.40	1.60	18.70	76.00	0.20	0.10	15.30
14	12.10	1.60	19.75	76.00	0.20	0.10	15.30
15	12.80	1.60	20.80	76.00	0.20	0.10	15.30

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 15:15
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-J-6
Cone: 652:T1500F15U35



Max Depth: 1.750 m / 5.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPJ-6.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6240 Long: -70.9168

Overplot Item: Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

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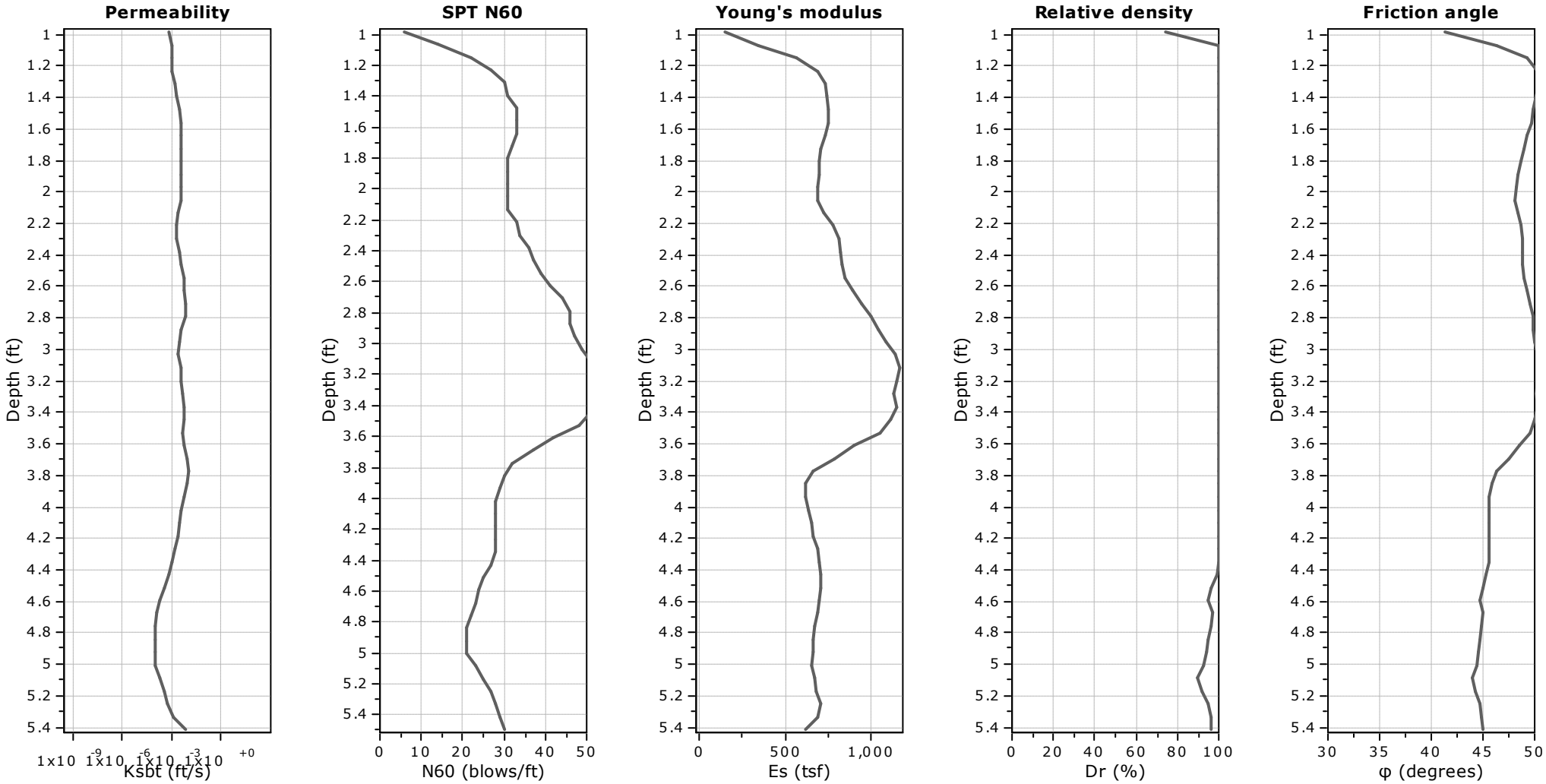
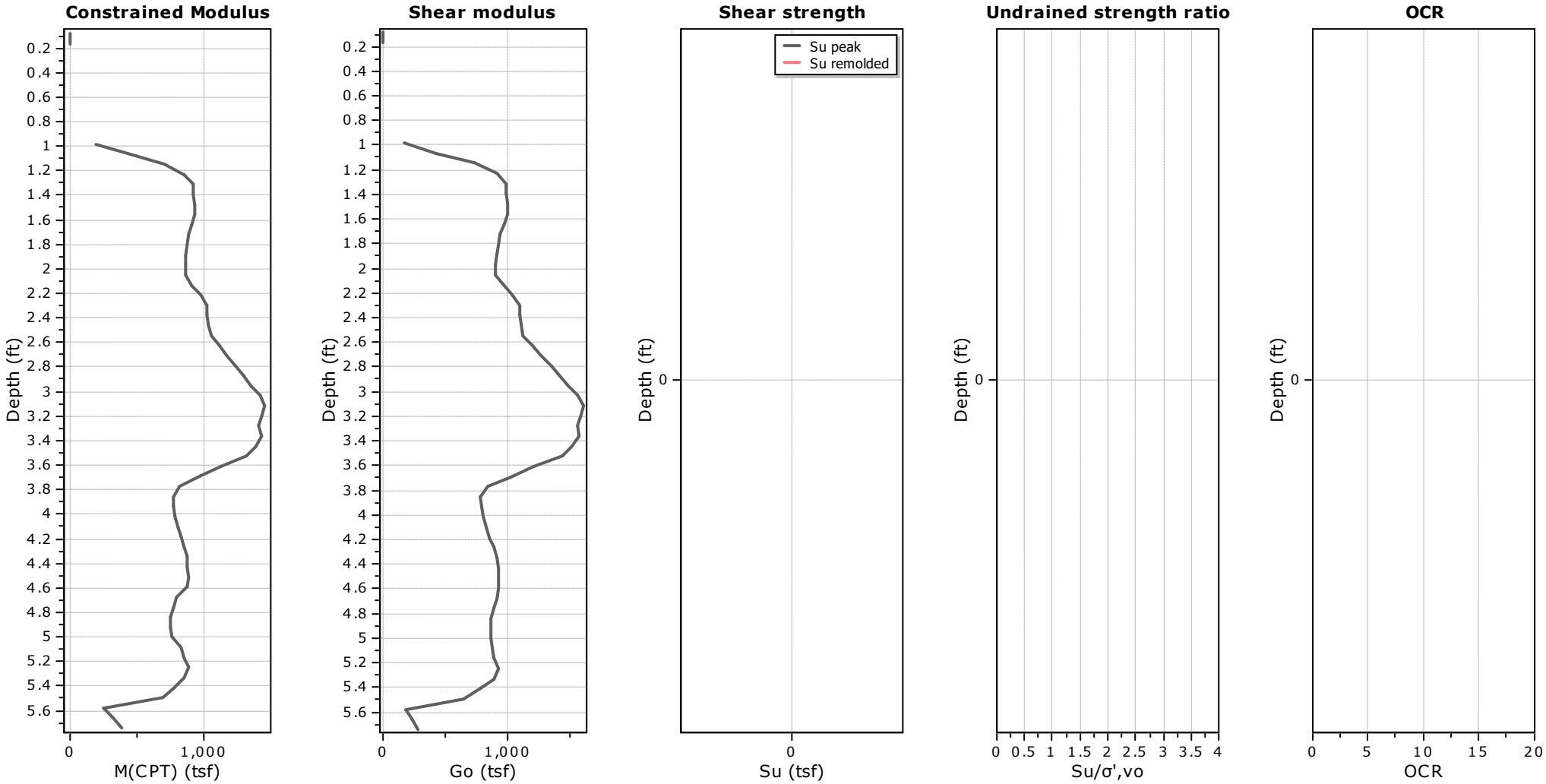
CPT: J-6
Total depth: 5.74 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

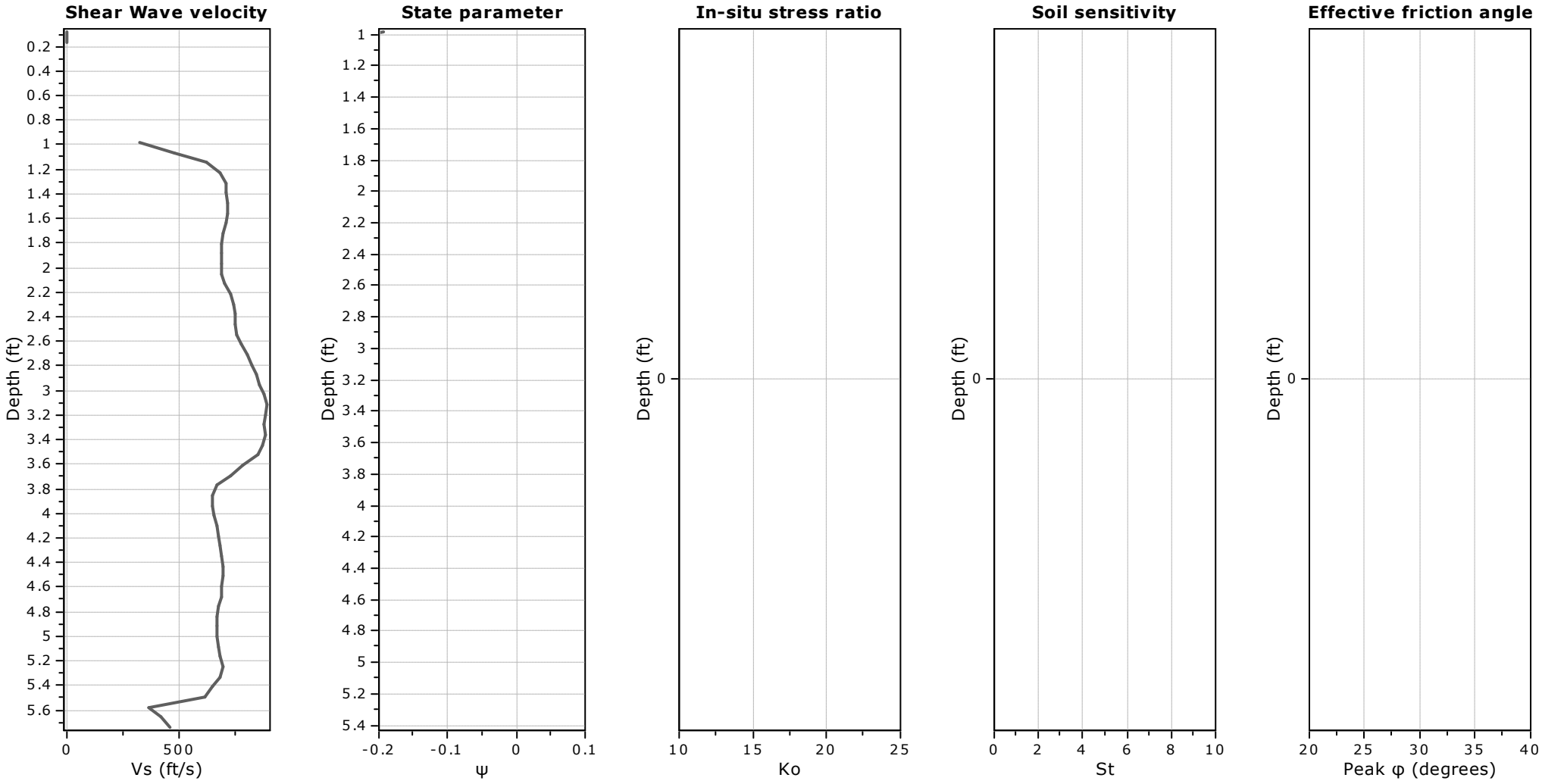
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)



Calculation parameters

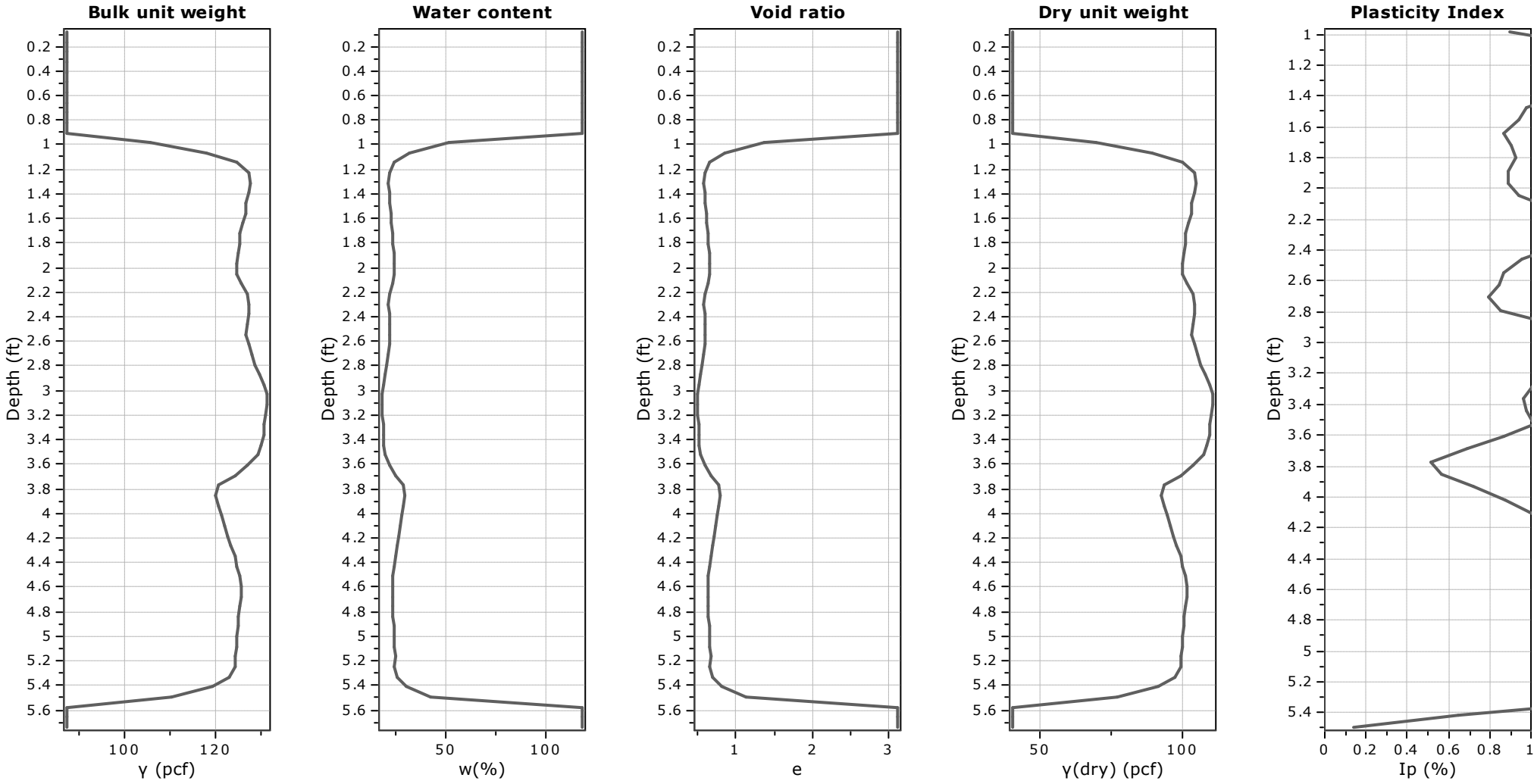
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00


Bulk unit weight
Water content
Void ratio
Dry unit weight
Plasticity Index
Depth (ft)
γ (pcf)
w(%)
e
γ(dry) (pcf)
Ip (%)

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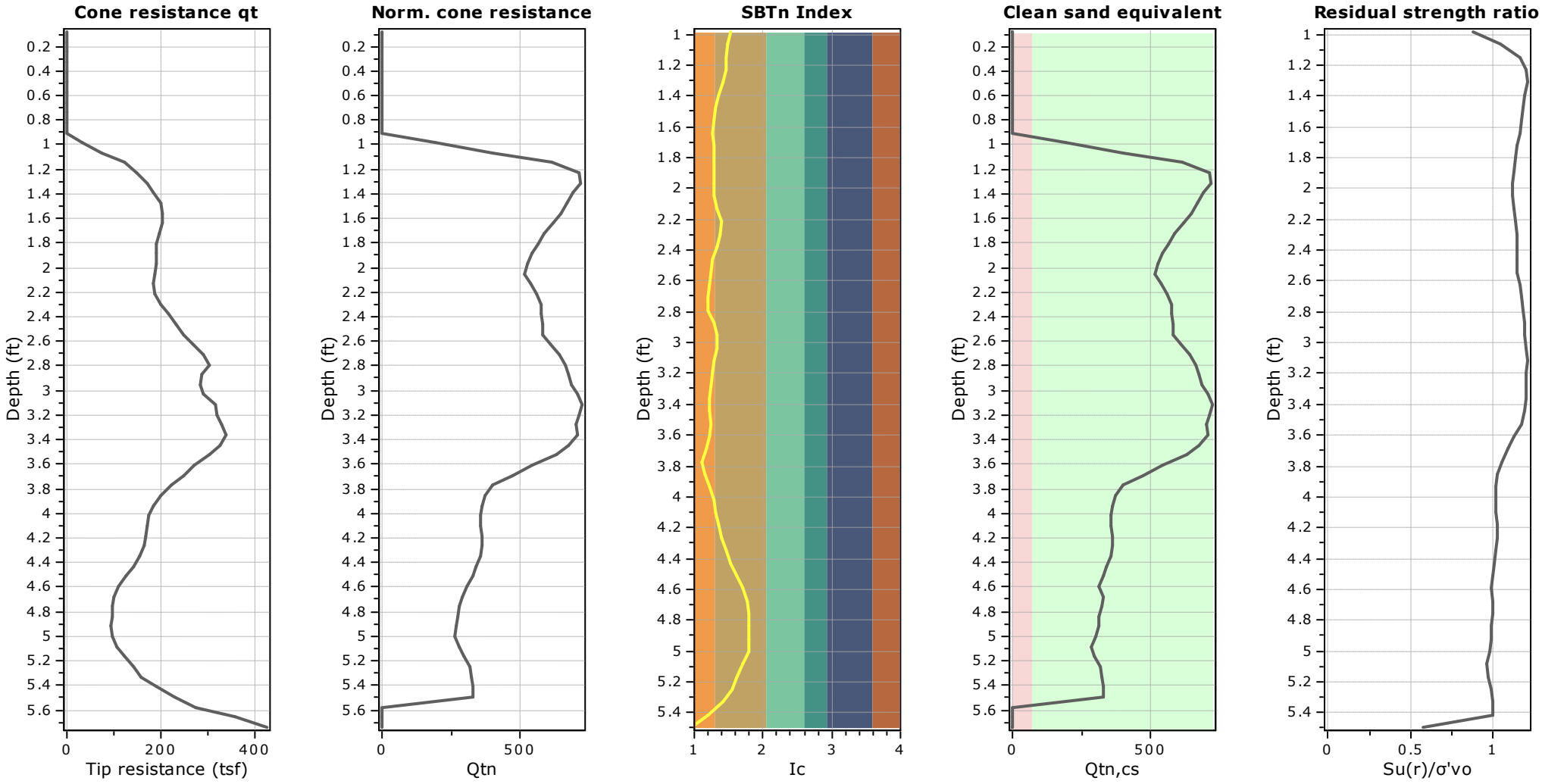
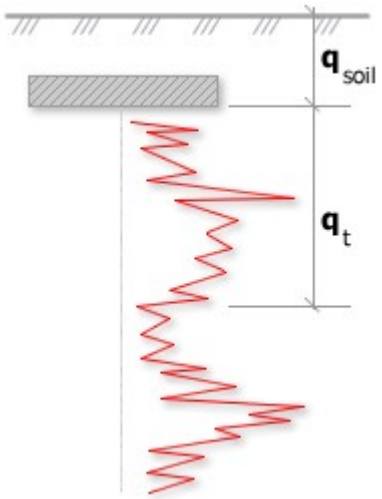
CPT: J-6
Total depth: 5.74 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

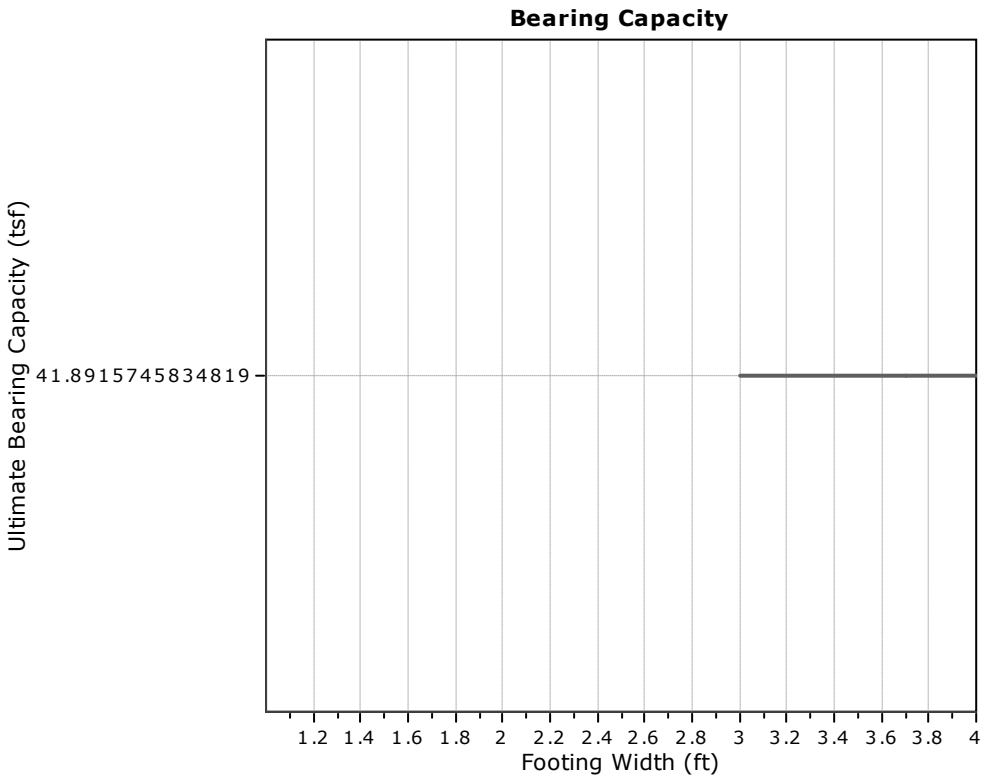




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

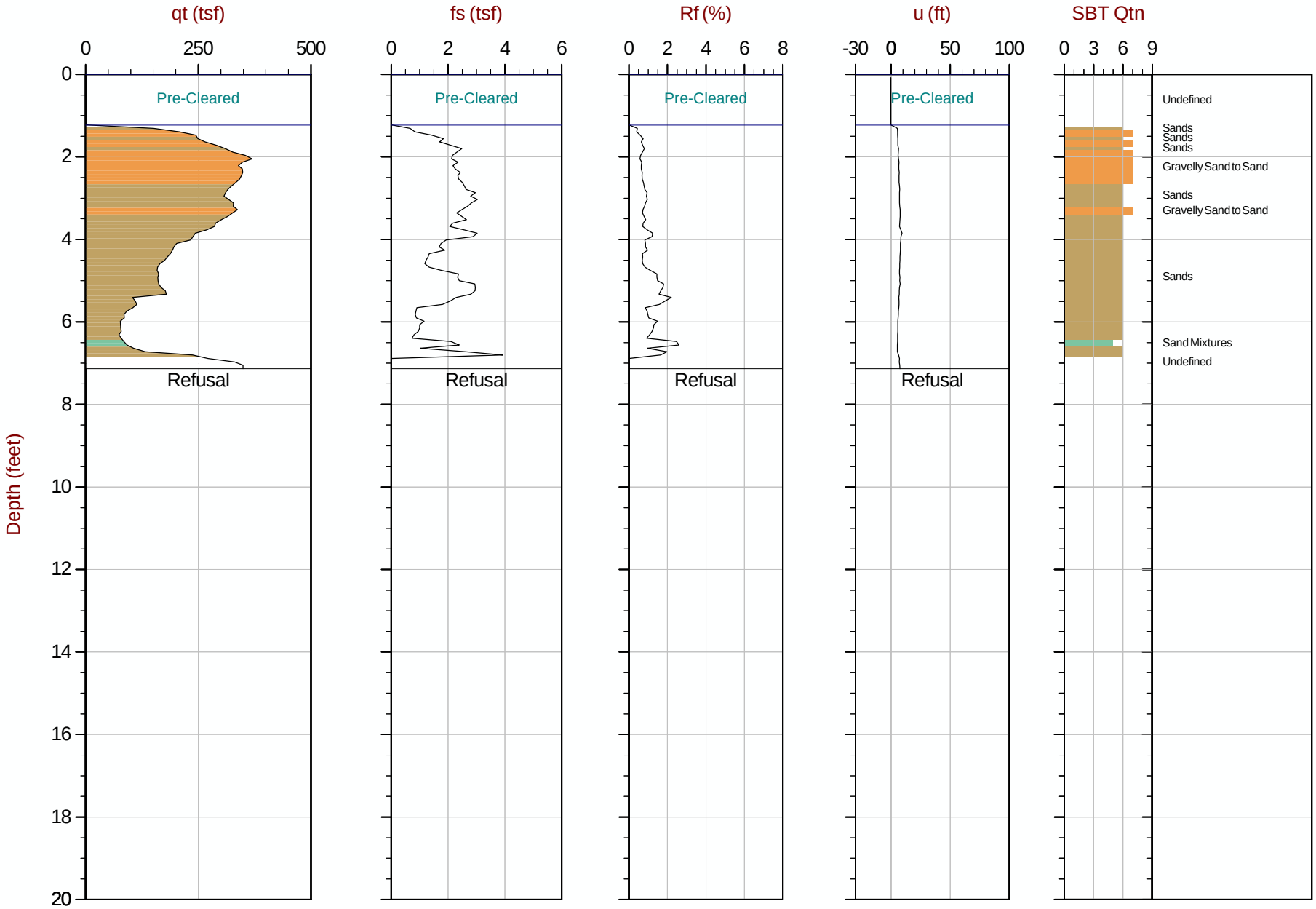
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	208.98	0.20	0.10	41.89
2	3.70	1.60	7.15	208.98	0.20	0.10	41.89
3	4.40	1.60	8.20	208.98	0.20	0.10	41.89
4	5.10	1.60	9.25	208.98	0.20	0.10	41.89
5	5.80	1.60	10.30	208.98	0.20	0.10	41.89
6	6.50	1.60	11.35	208.98	0.20	0.10	41.89
7	7.20	1.60	12.40	208.98	0.20	0.10	41.89
8	7.90	1.60	13.45	208.98	0.20	0.10	41.89
9	8.60	1.60	14.50	208.98	0.20	0.10	41.89
10	9.30	1.60	15.55	208.98	0.20	0.10	41.89
11	10.00	1.60	16.60	208.98	0.20	0.10	41.89
12	10.70	1.60	17.65	208.98	0.20	0.10	41.89
13	11.40	1.60	18.70	208.98	0.20	0.10	41.89
14	12.10	1.60	19.75	208.98	0.20	0.10	41.89
15	12.80	1.60	20.80	208.98	0.20	0.10	41.89

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-05-01 14:45
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-J-9
Cone: 652:T1500F15U35



Max Depth: 2.175 m / 7.14 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPJ-9.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6241 Long: -70.9169

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

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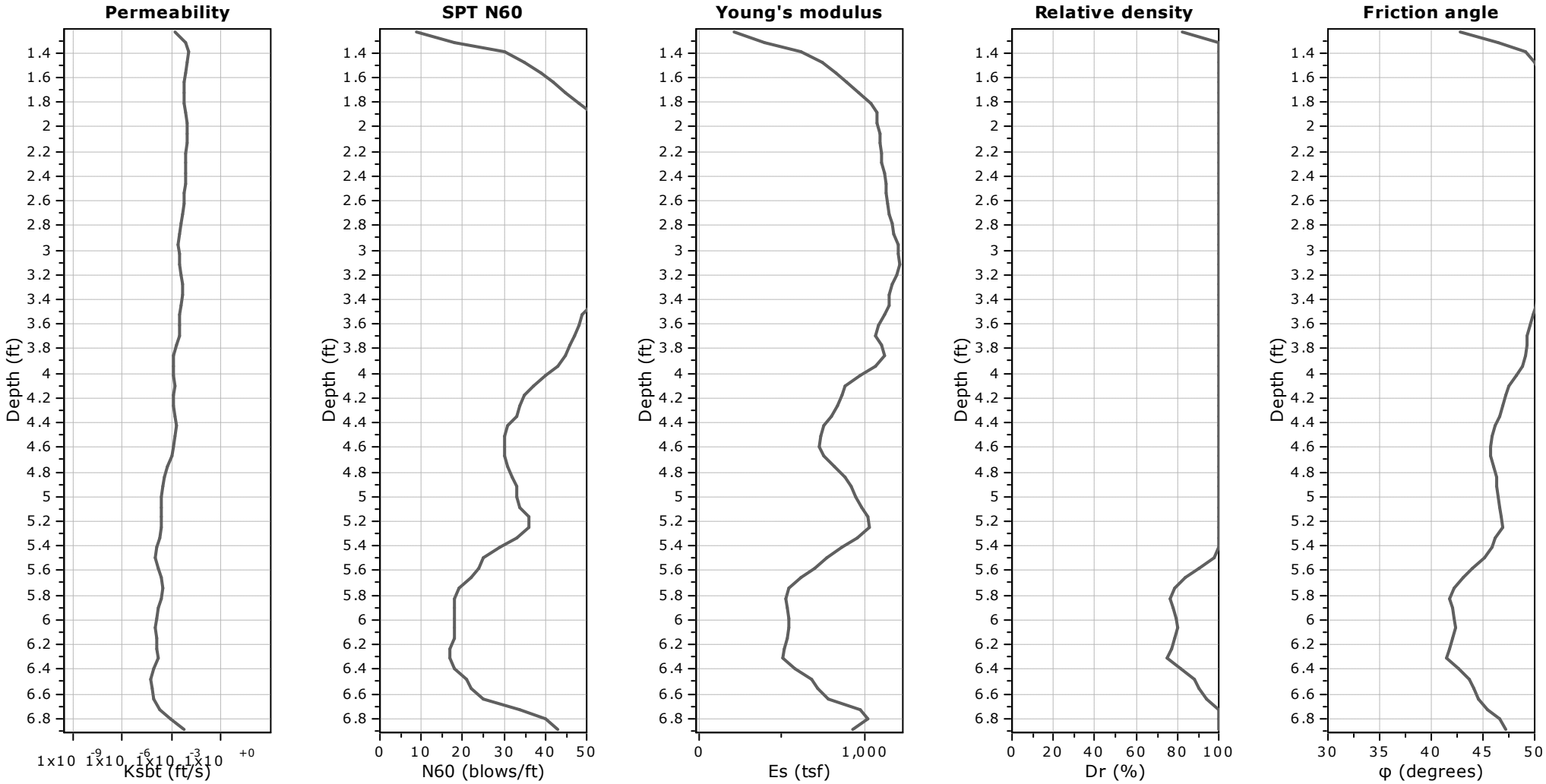
CPT: J-9
Total depth: 7.14 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

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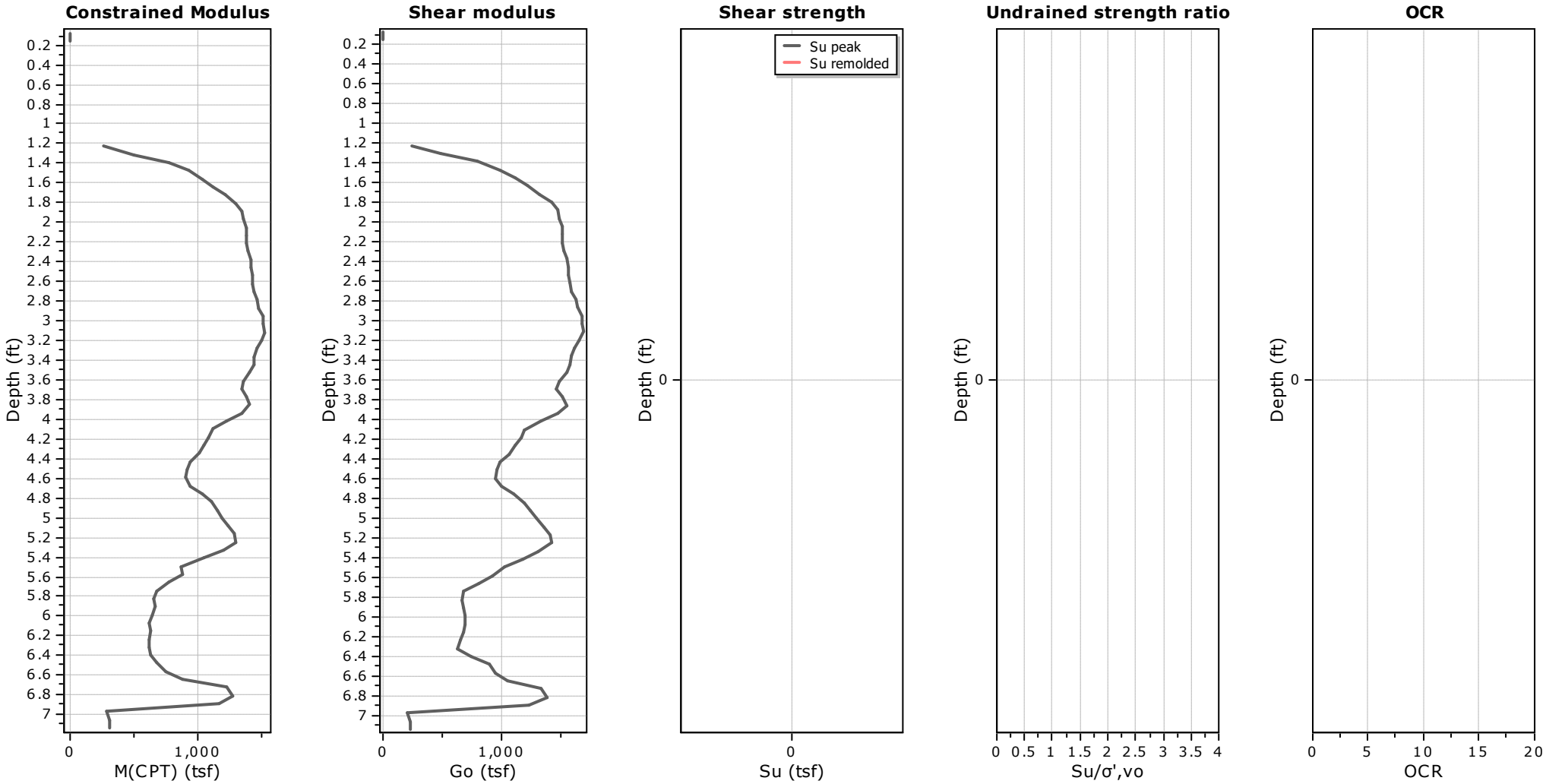
CPT: J-9
Total depth: 7.14 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

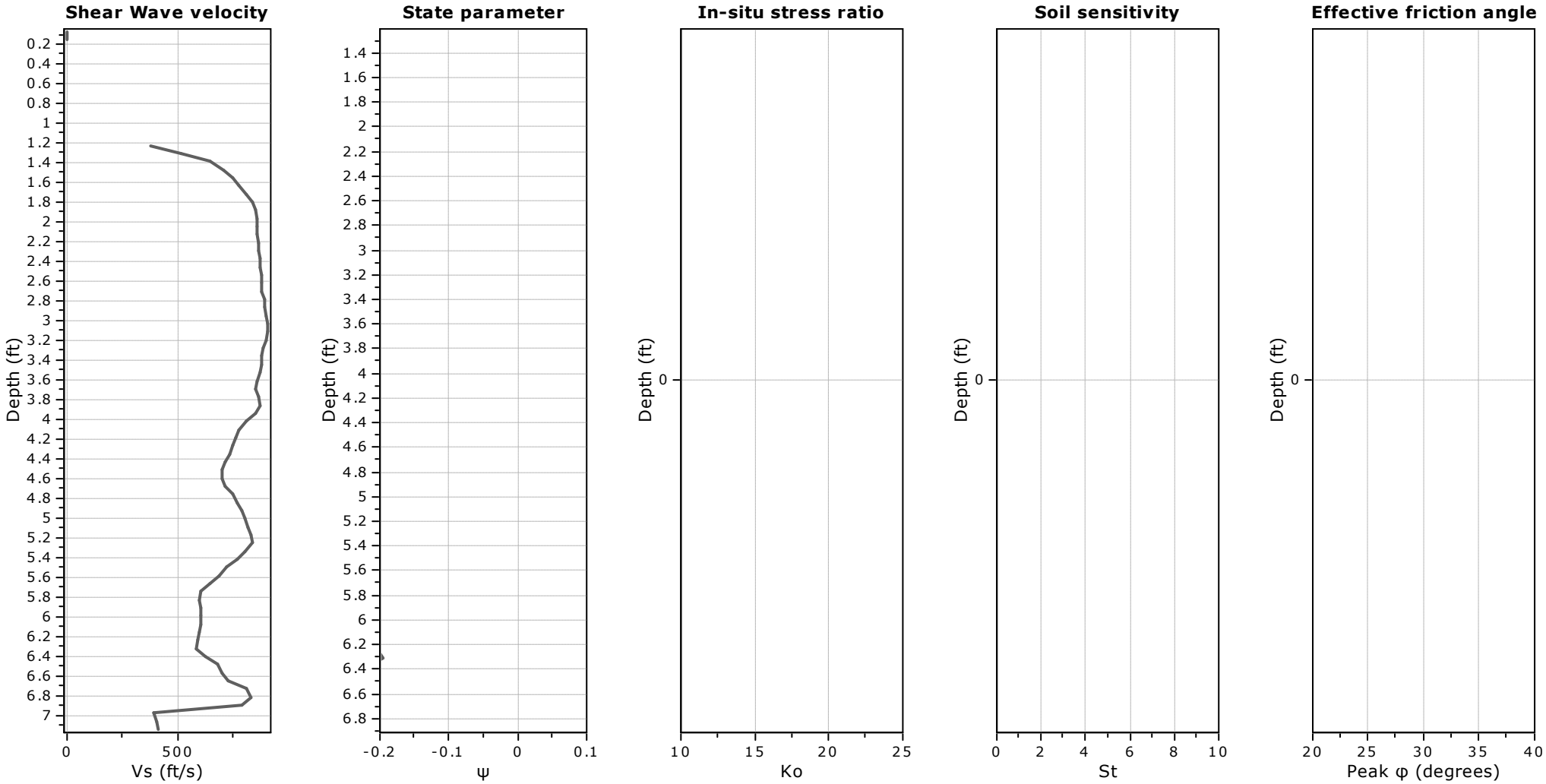
Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

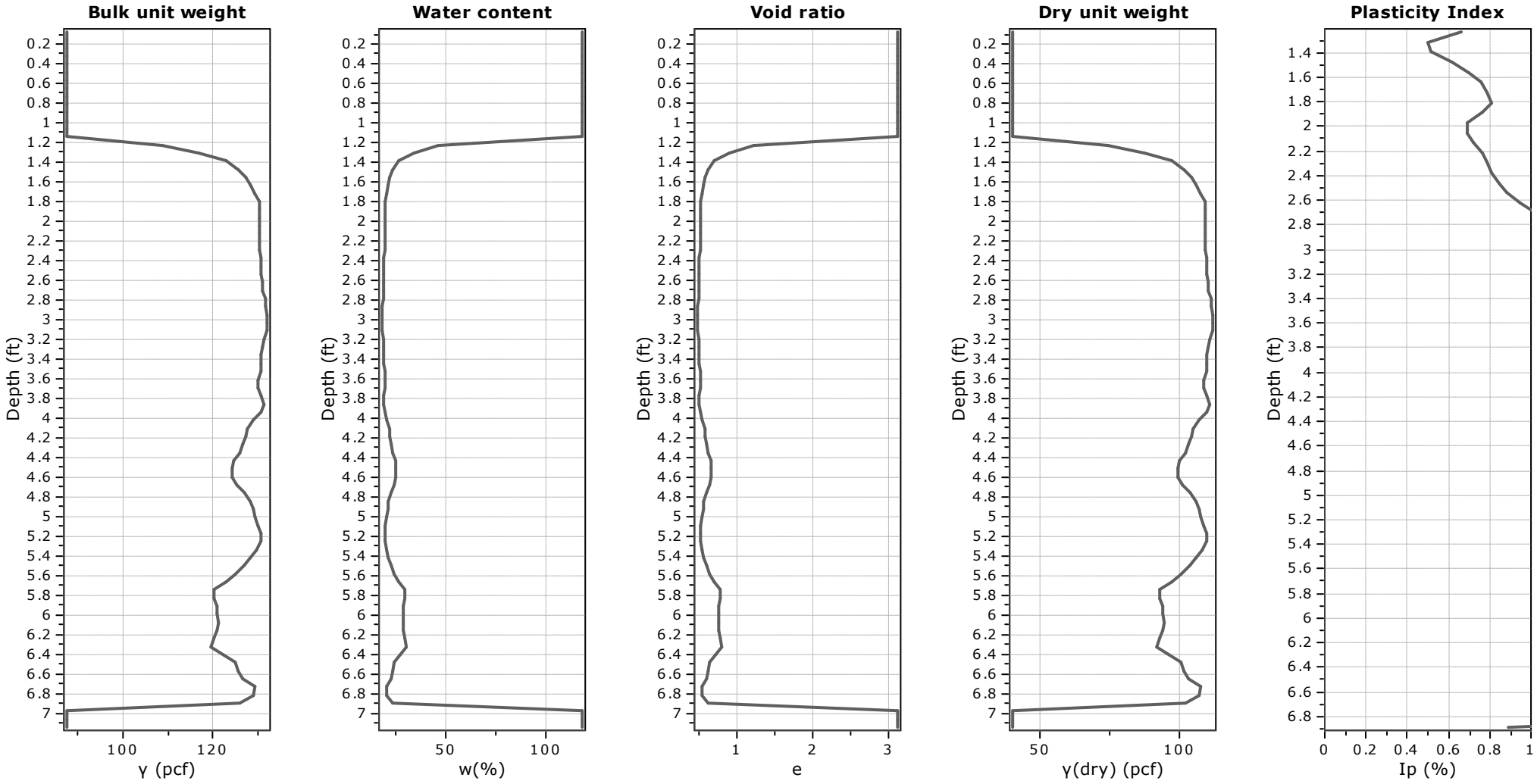


Calculation parameters

Soil Sensitivity factor, N_S: 7.00

CPT: J-9
Total depth: 7.14 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



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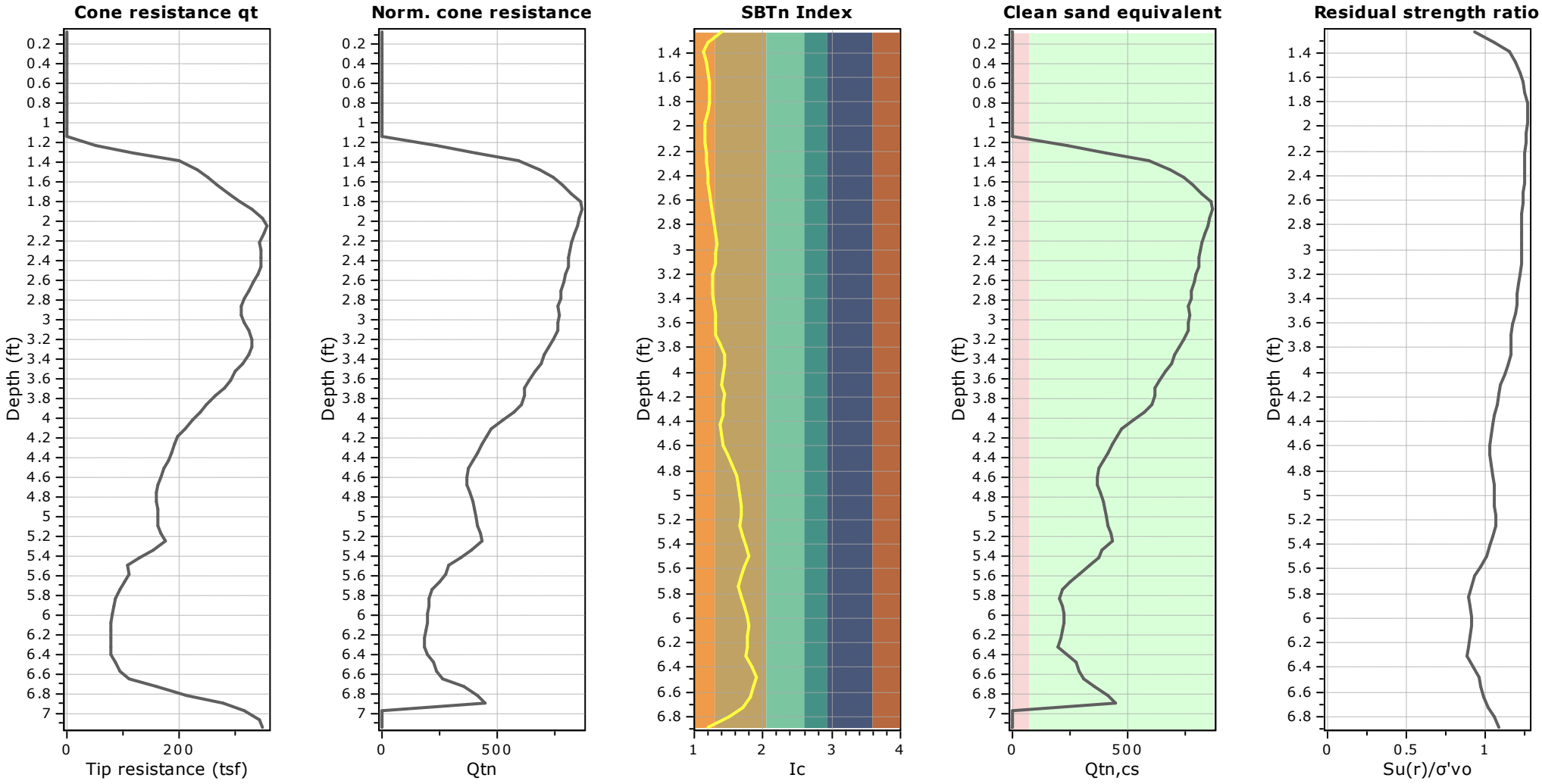
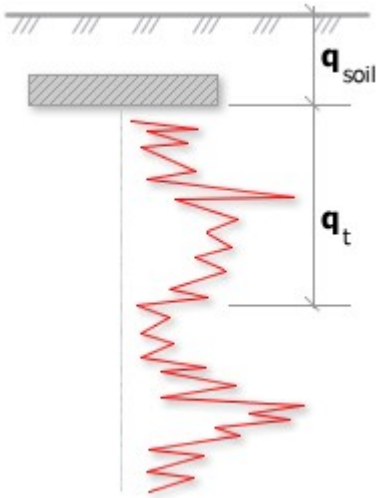
CPT: J-9
Total depth: 7.14 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

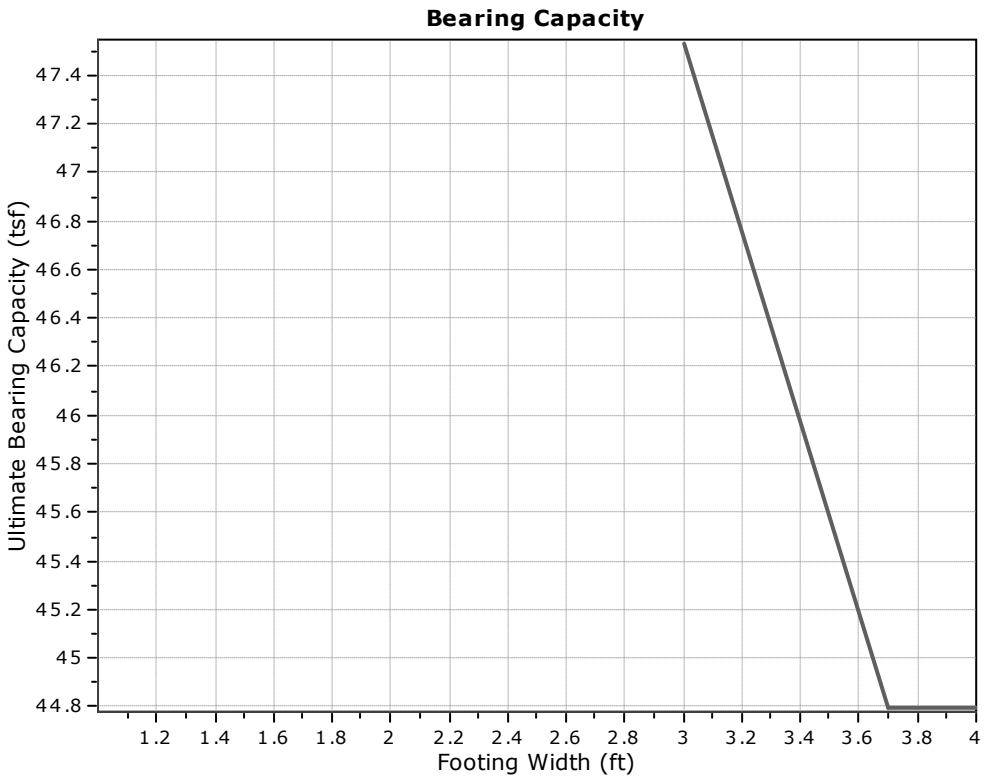




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

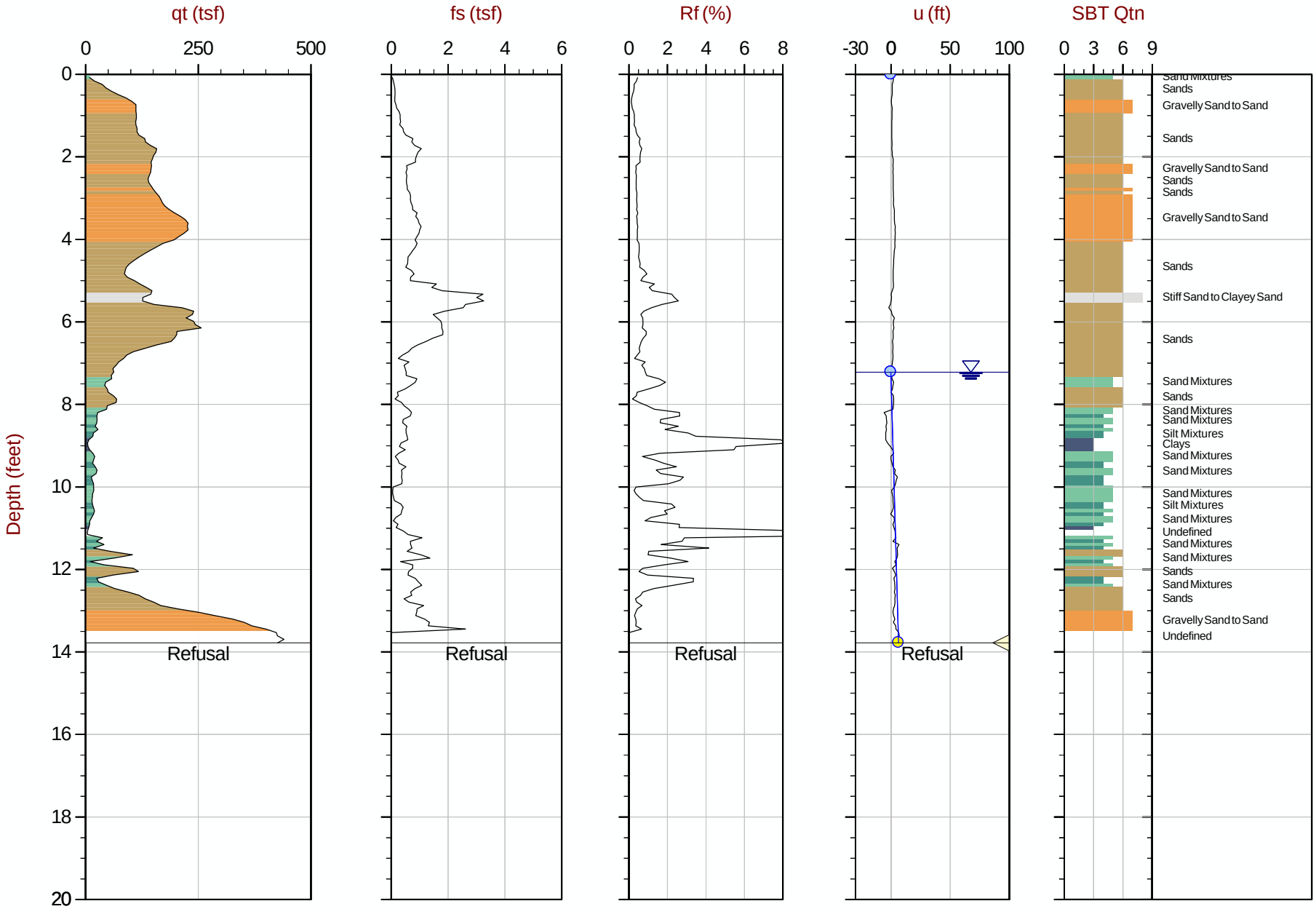
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	237.17	0.20	0.10	47.53
2	3.70	1.60	7.15	223.50	0.20	0.10	44.80
3	4.40	1.60	8.20	223.50	0.20	0.10	44.80
4	5.10	1.60	9.25	223.50	0.20	0.10	44.80
5	5.80	1.60	10.30	223.50	0.20	0.10	44.80
6	6.50	1.60	11.35	223.50	0.20	0.10	44.80
7	7.20	1.60	12.40	223.50	0.20	0.10	44.80
8	7.90	1.60	13.45	223.50	0.20	0.10	44.80
9	8.60	1.60	14.50	223.50	0.20	0.10	44.80
10	9.30	1.60	15.55	223.50	0.20	0.10	44.80
11	10.00	1.60	16.60	223.50	0.20	0.10	44.80
12	10.70	1.60	17.65	223.50	0.20	0.10	44.80
13	11.40	1.60	18.70	223.50	0.20	0.10	44.80
14	12.10	1.60	19.75	223.50	0.20	0.10	44.80
15	12.80	1.60	20.80	223.50	0.20	0.10	44.80

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 09:46
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-JJ-5
Cone: 652:T1500F15U35



Max Depth: 4.200 m / 13.78 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPJJ-5.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6236 Long: -70.9185

Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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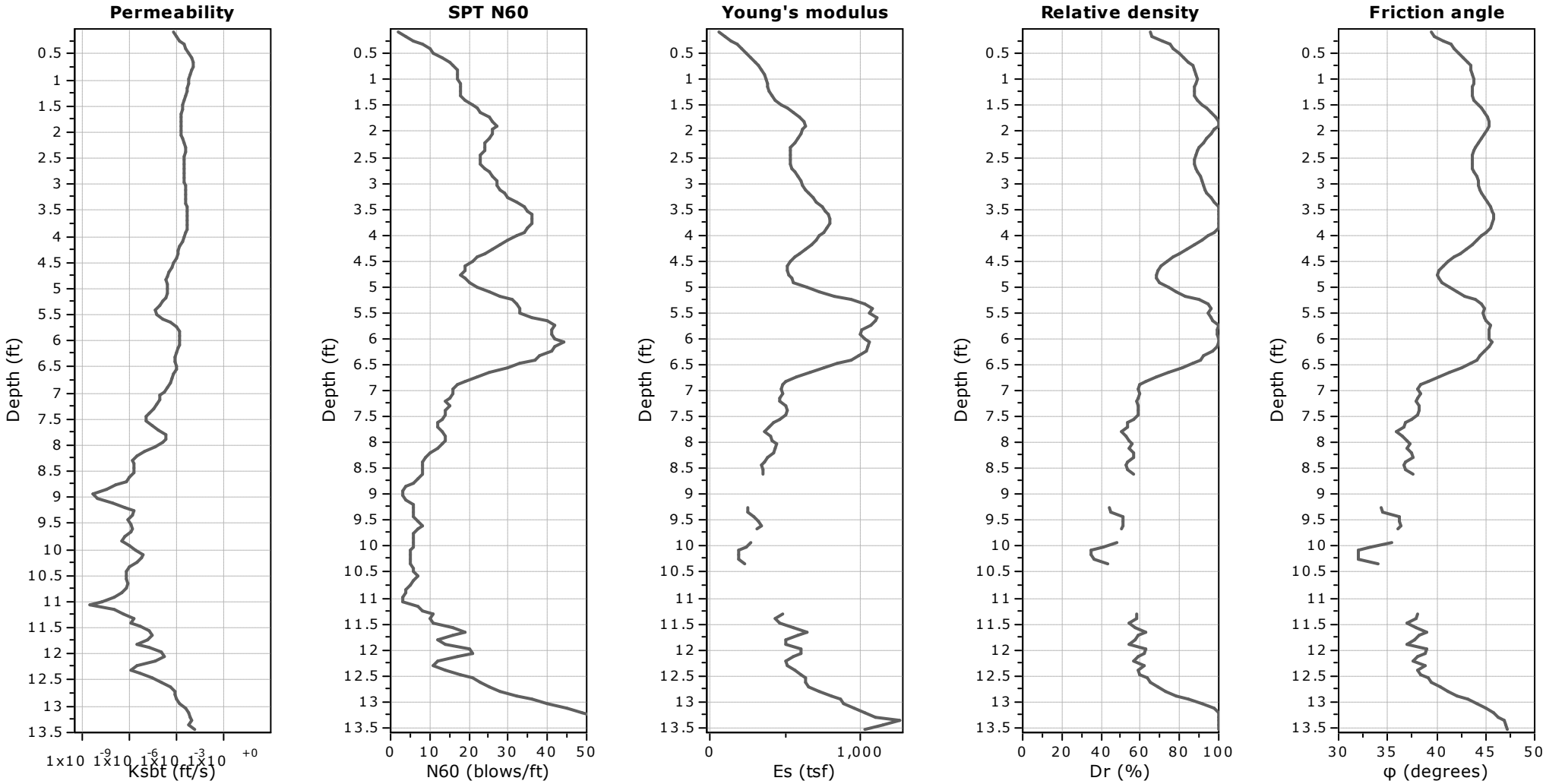
http://www.geologismiki.gr

CPT: JJ-5
Total depth: 13.78 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



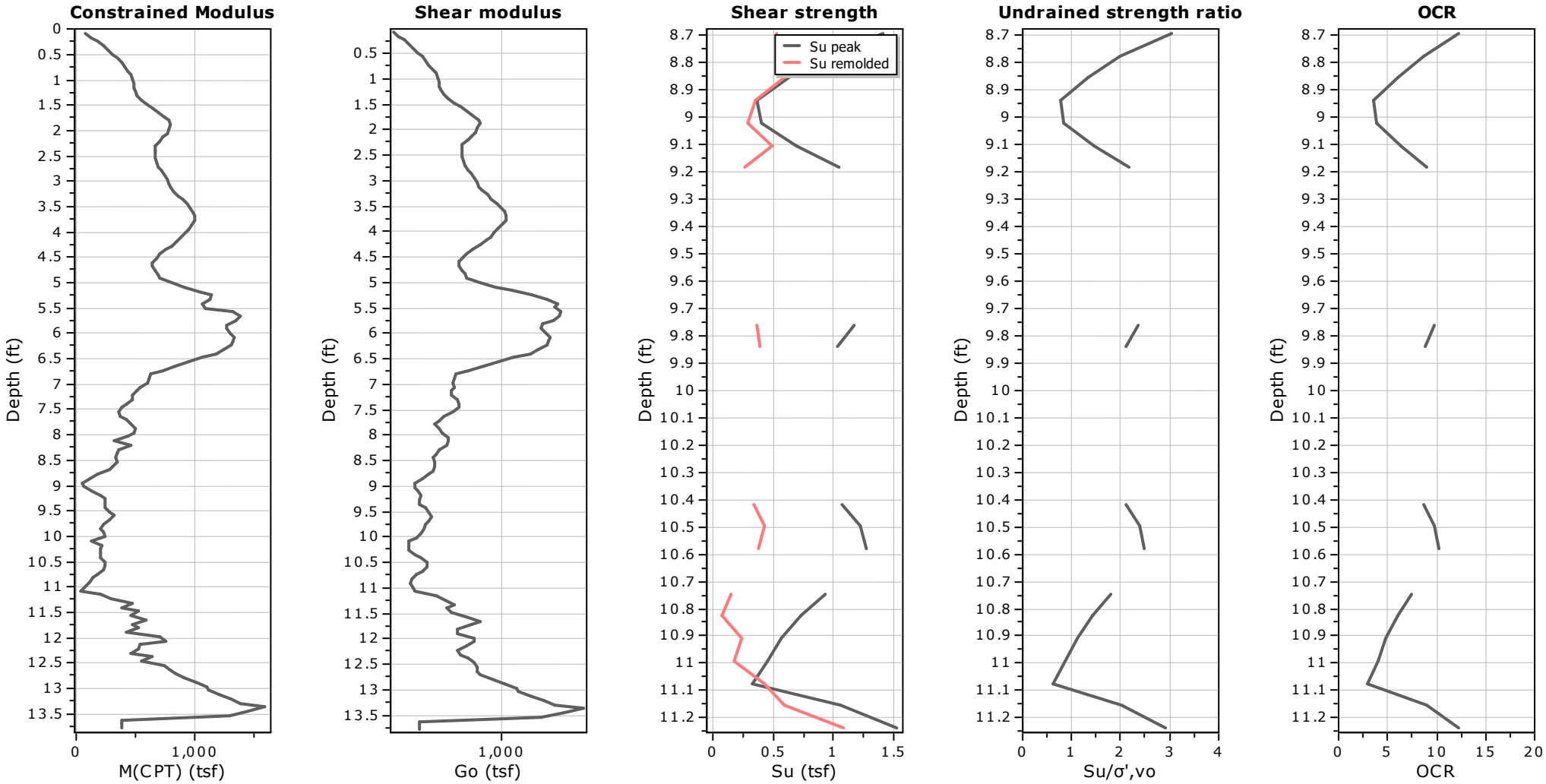
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: JJ-5
Total depth: 13.78 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

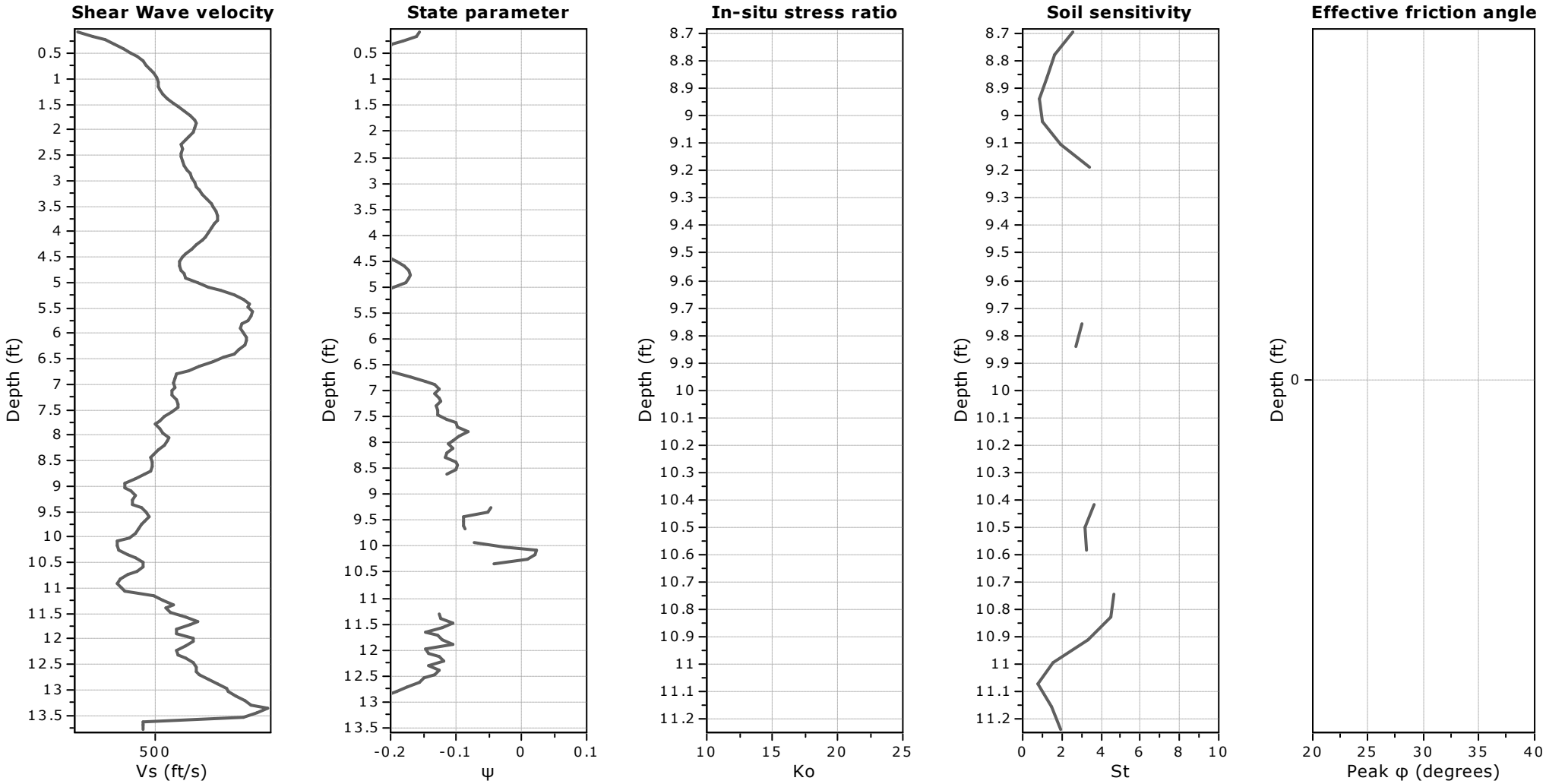
Project:
Location:



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

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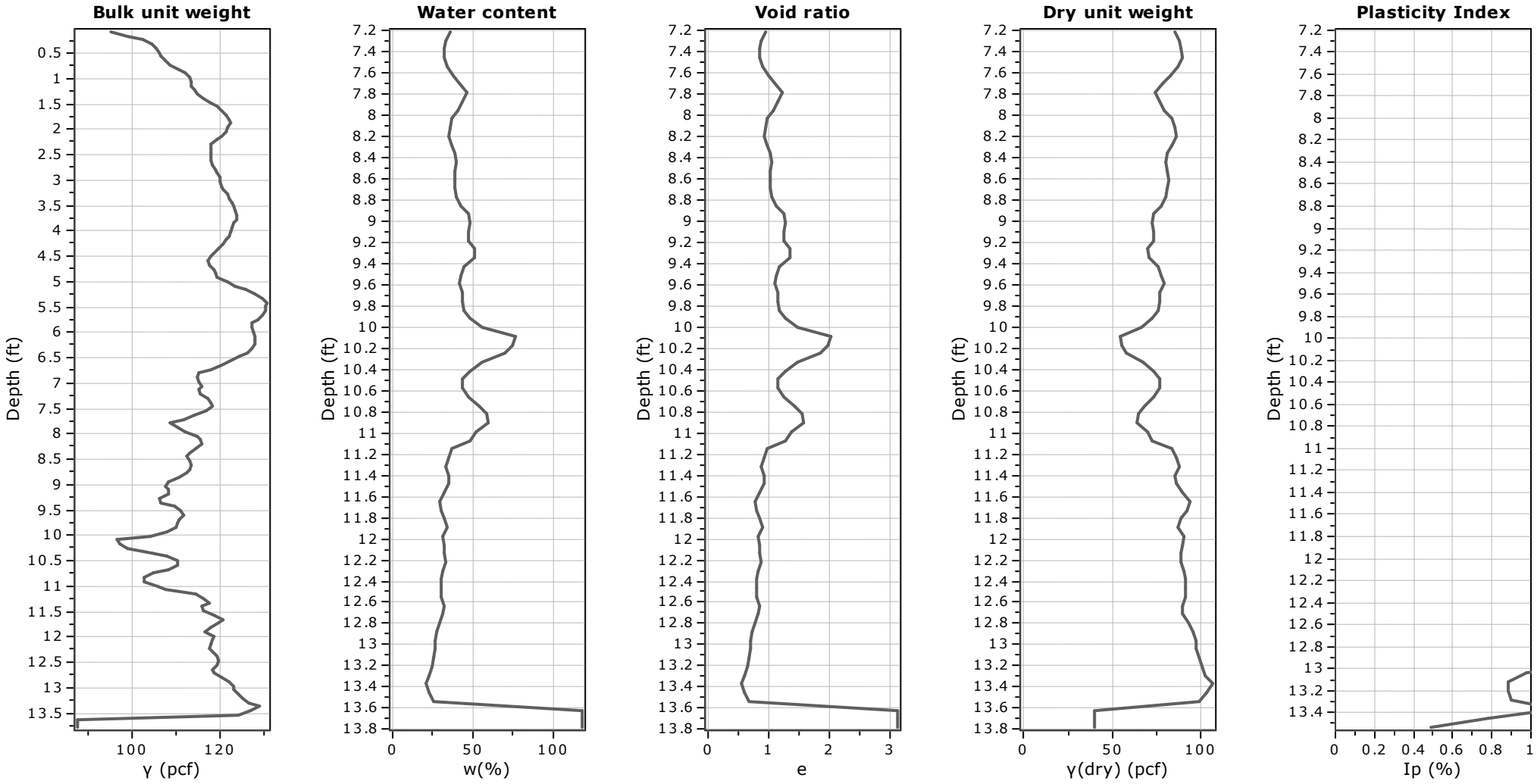
CPT: JJ-5
Total depth: 13.78 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
Geotechnical Engineers
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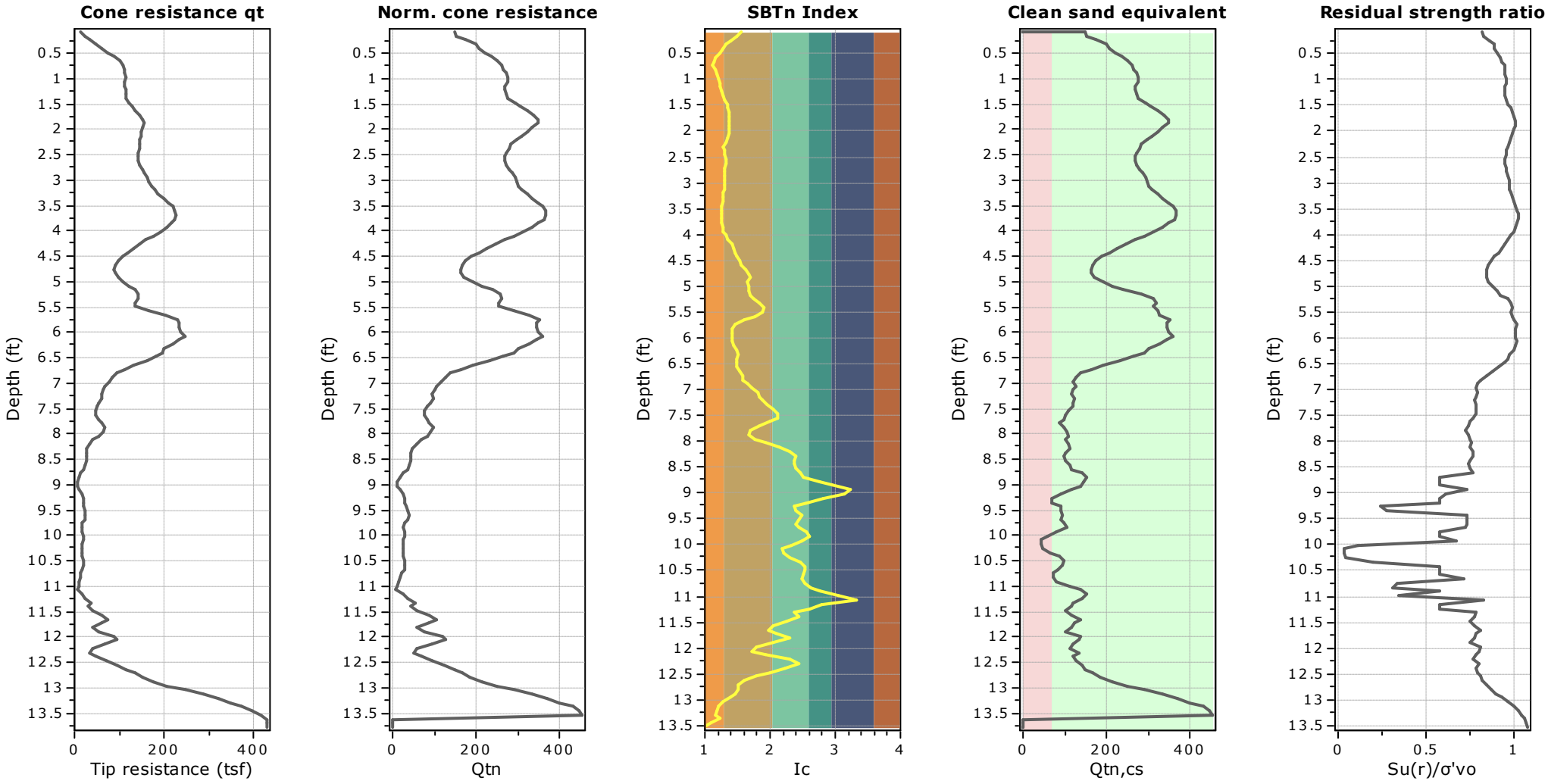
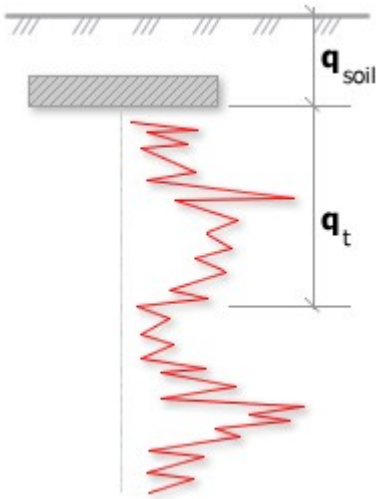
http://www.geologismiki.gr

CPT: JJ-5
Total depth: 13.78 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:

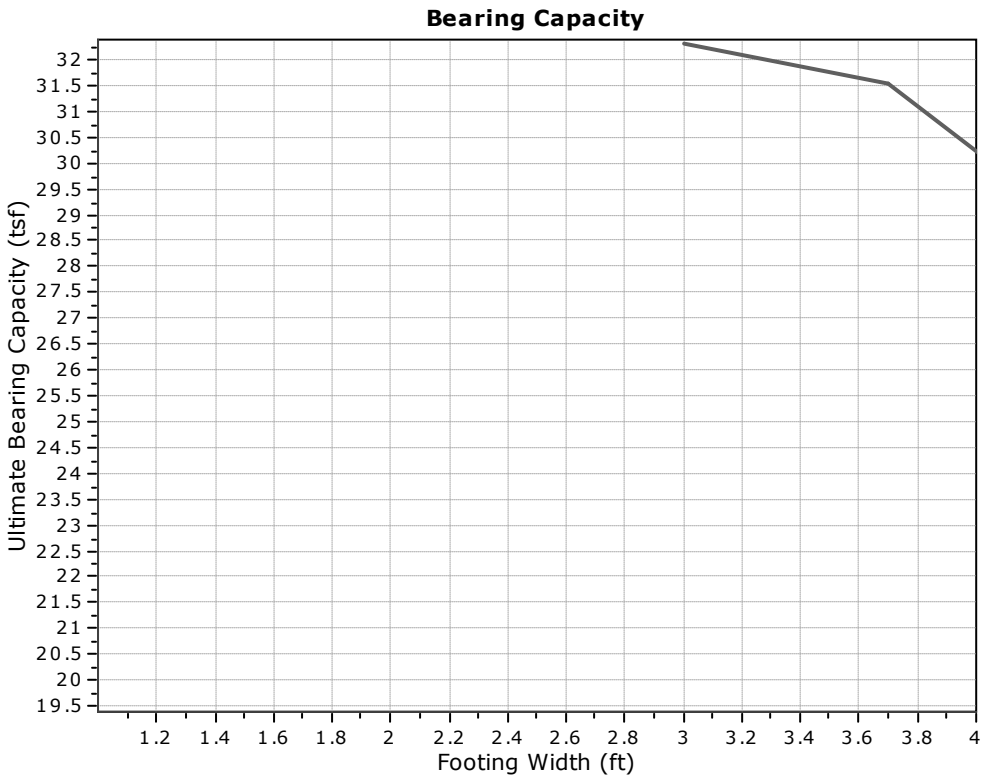




Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

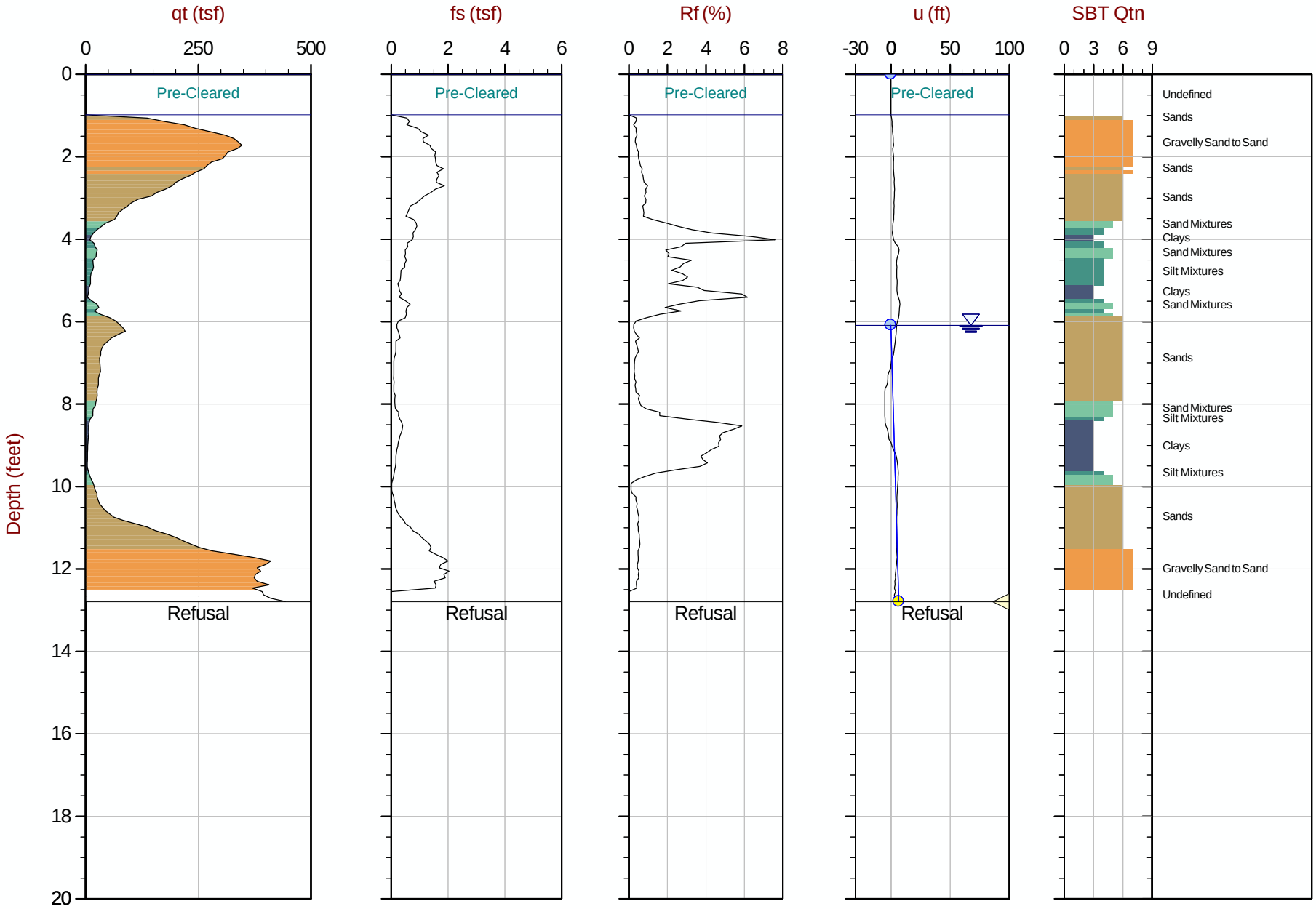
No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	161.07	0.20	0.10	32.31
2	3.70	1.60	7.15	157.12	0.20	0.10	31.52
3	4.40	1.60	8.20	141.86	0.20	0.10	28.47
4	5.10	1.60	9.25	124.75	0.20	0.10	25.05
5	5.80	1.60	10.30	111.79	0.20	0.10	22.45
6	6.50	1.60	11.35	101.35	0.20	0.10	20.37
7	7.20	1.60	12.40	96.84	0.20	0.10	19.46
8	7.90	1.60	13.45	106.23	0.20	0.10	21.34
9	8.60	1.60	14.50	114.62	0.20	0.10	23.02
10	9.30	1.60	15.55	114.62	0.20	0.10	23.02
11	10.00	1.60	16.60	114.62	0.20	0.10	23.02
12	10.70	1.60	17.65	114.62	0.20	0.10	23.02
13	11.40	1.60	18.70	114.62	0.20	0.10	23.02
14	12.10	1.60	19.75	114.62	0.20	0.10	23.02
15	12.80	1.60	20.80	114.62	0.20	0.10	23.02

CONETEC

Civil & Environmental Consultants

Job No: 24-53-27586
Date: 2024-04-29 12:33
Site: MassCEC Expansion - New Bedford, MA

Sounding: CPT24-JJ-9
Cone: 652:T1500F15U35



Max Depth: 3.900 m / 12.80 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-53-27586_CPJJ-9.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 41.6239 Long: -70.9185

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

GeoLogismiki
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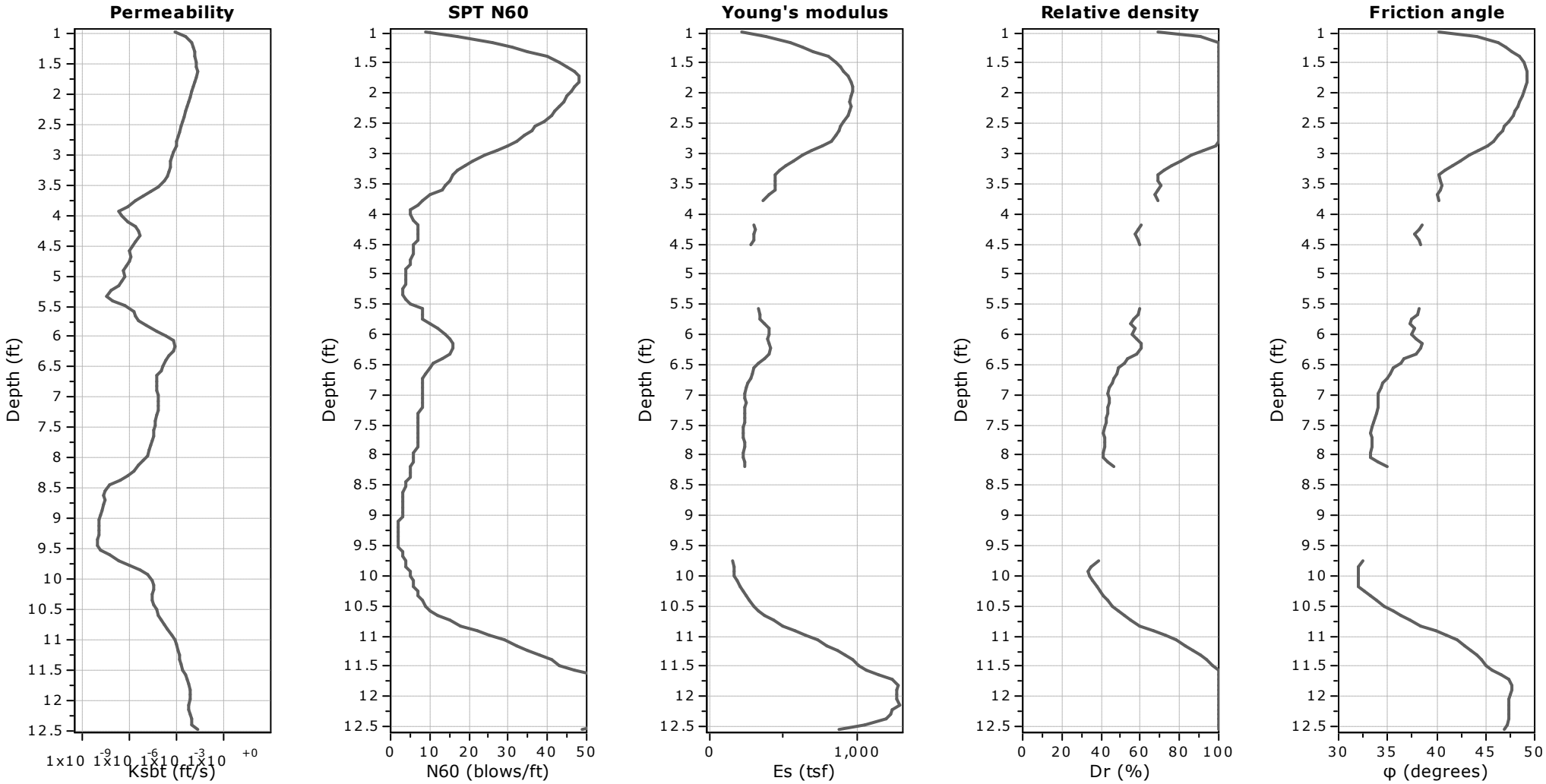
http://www.geologismiki.gr

CPT: JJ-9
Total depth: 12.80 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
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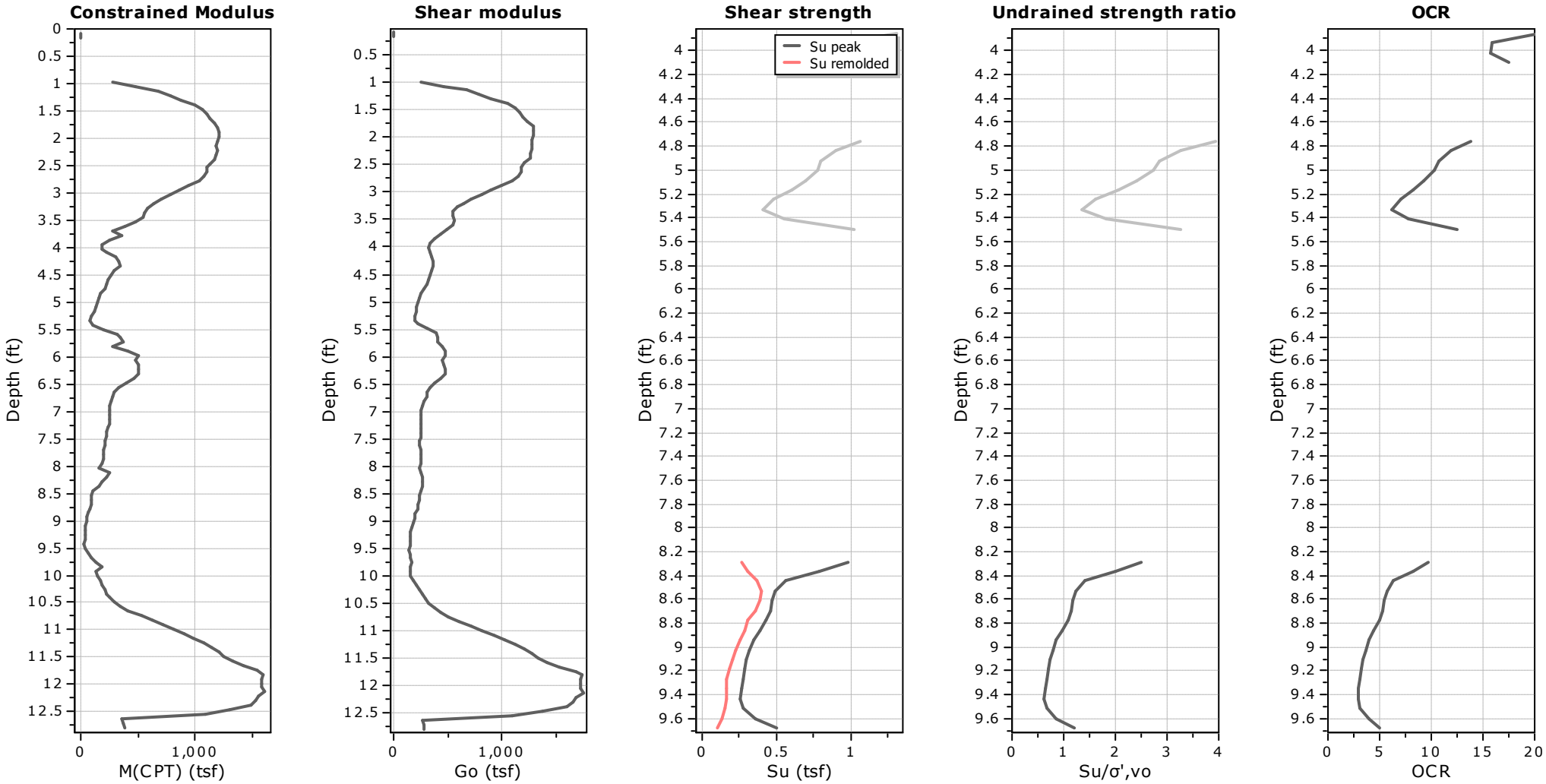

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OCR factor for clays, N_{kt}: 0.33
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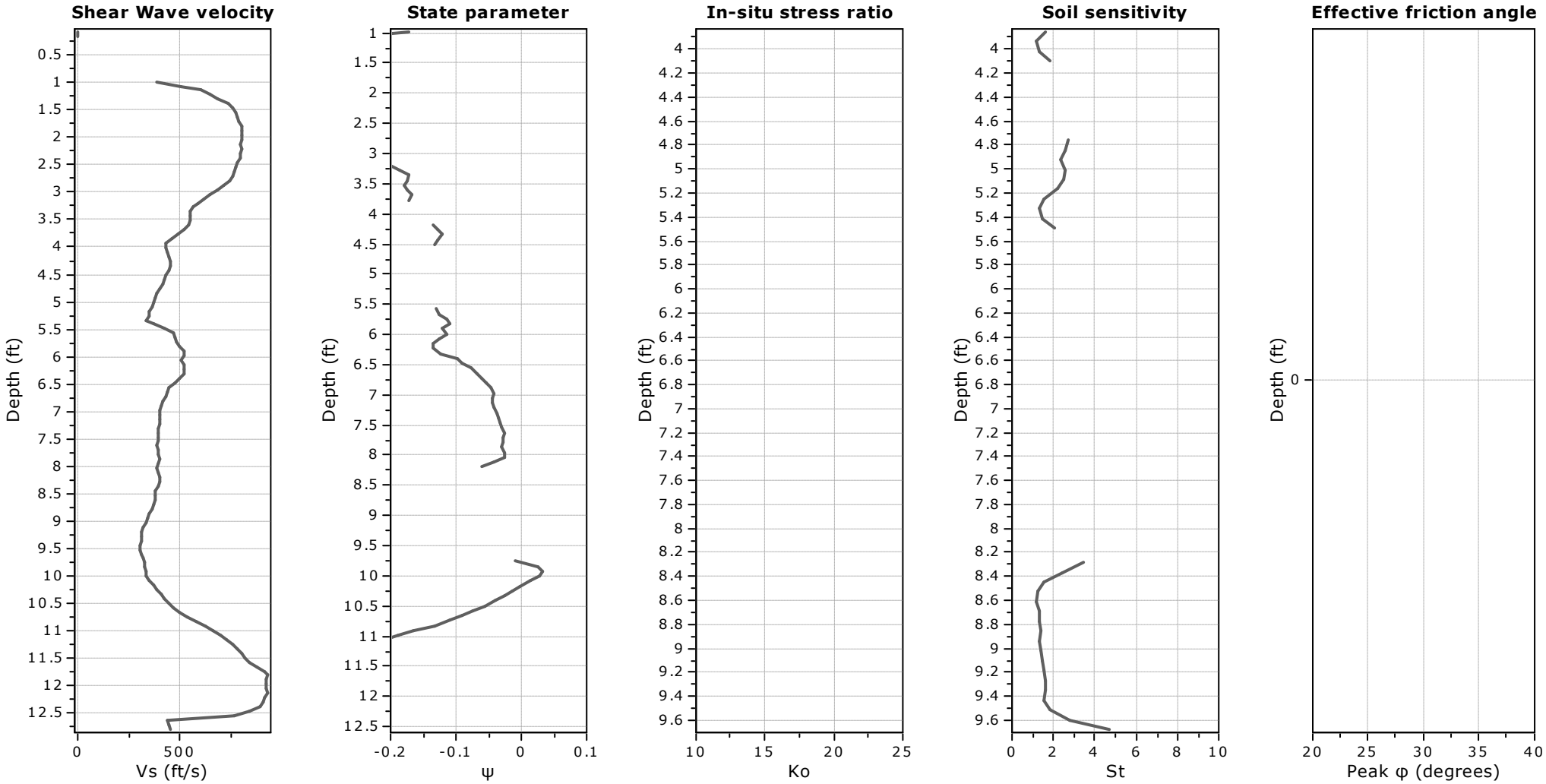

Calculation parameters

Soil Sensitivity factor, N_S: 7.00

GeoLogismiki
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Merarhias 56
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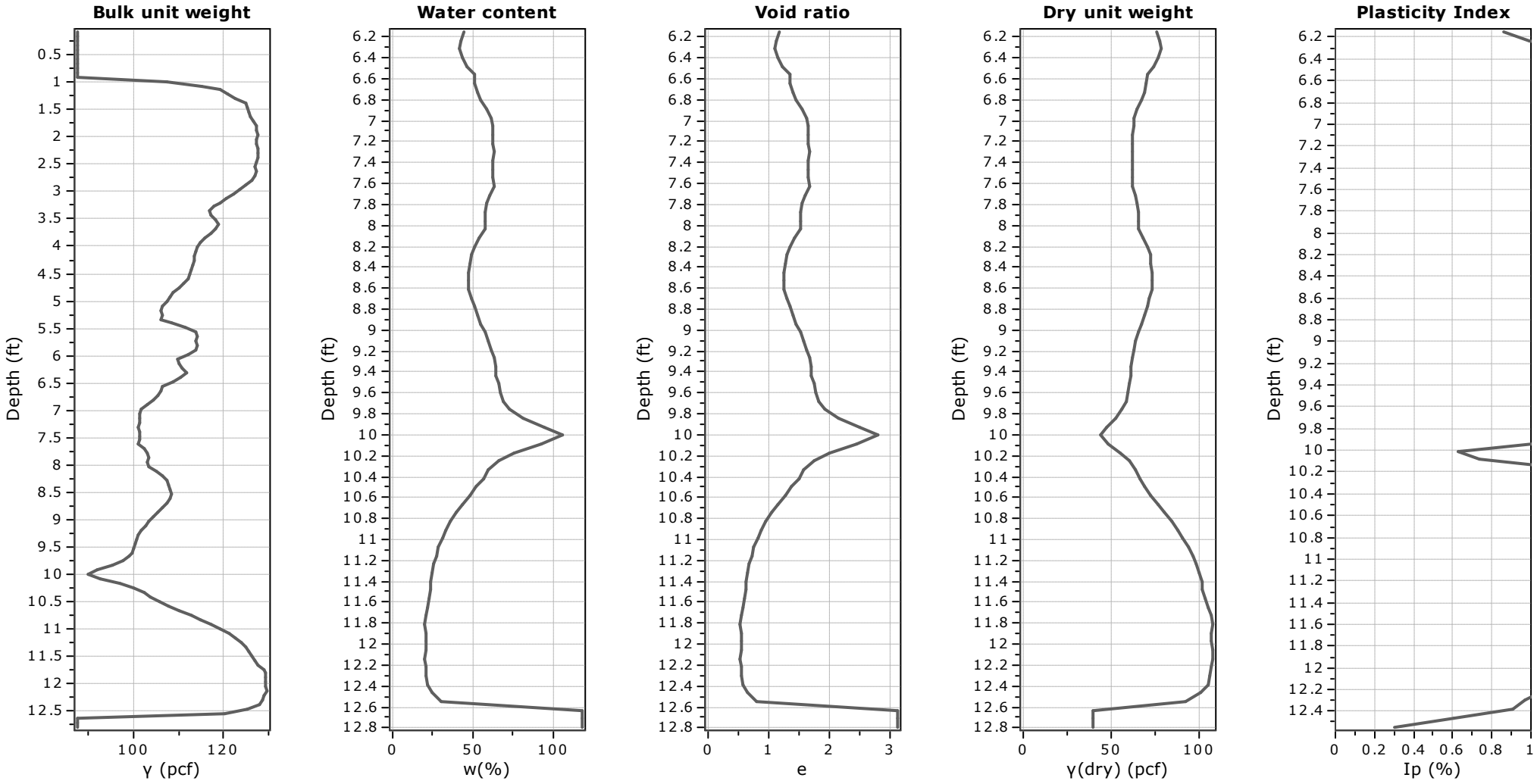
CPT: JJ-9
Total depth: 12.80 ft, Date: 5/15/2024
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



GeoLogismiki
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CPT: JJ-9
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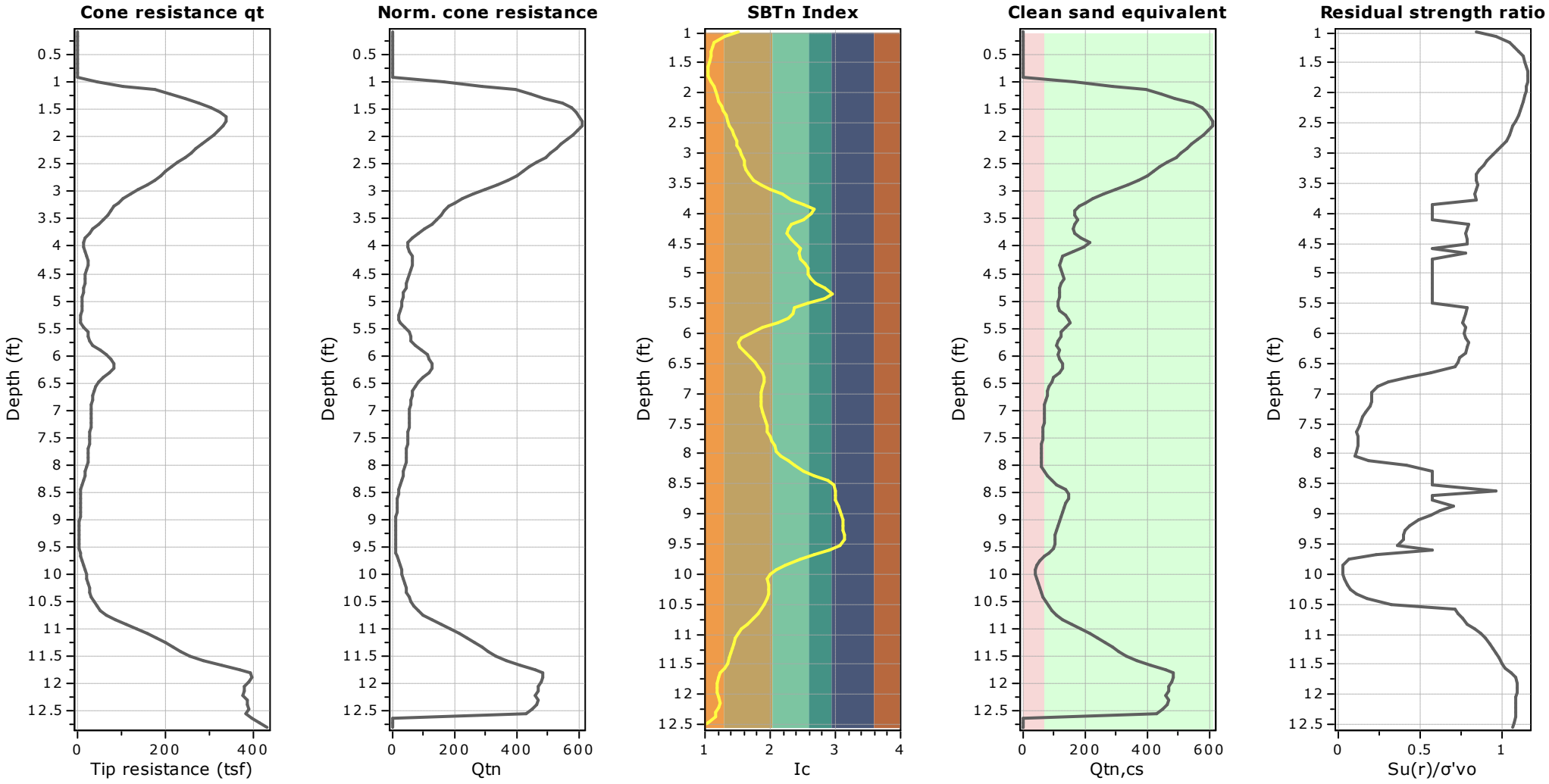
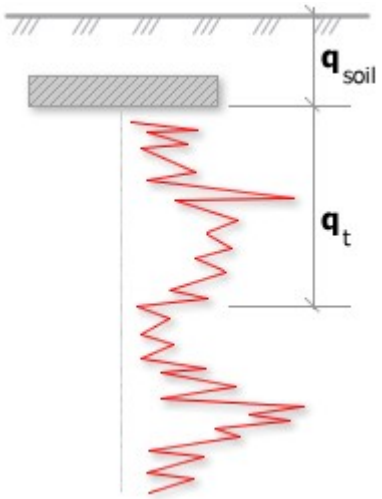
Cone Operator:

Project:
Location:





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where:
R_k: Bearing capacity factor
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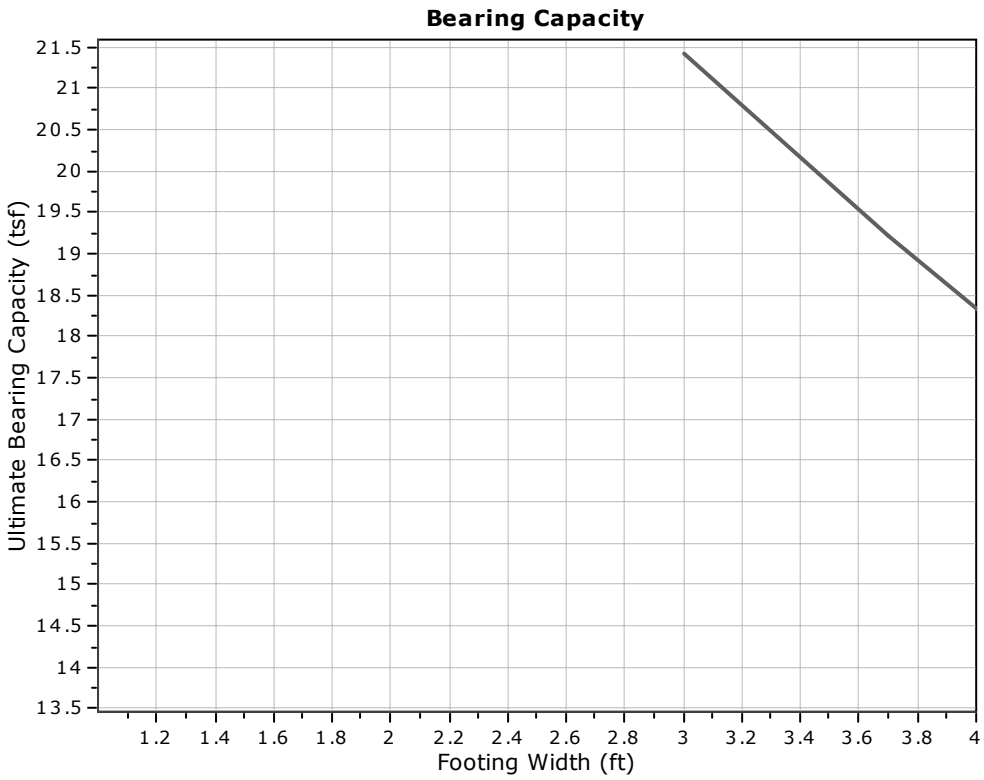


:: Tabular results ::

No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	106.63	0.20	0.10	21.42
2	3.70	1.60	7.15	95.57	0.20	0.10	19.21
3	4.40	1.60	8.20	85.29	0.20	0.10	17.15
4	5.10	1.60	9.25	74.60	0.20	0.10	15.02
5	5.80	1.60	10.30	67.06	0.20	0.10	13.51
6	6.50	1.60	11.35	71.01	0.20	0.10	14.30
7	7.20	1.60	12.40	98.46	0.20	0.10	19.79
8	7.90	1.60	13.45	107.21	0.20	0.10	21.54
9	8.60	1.60	14.50	107.21	0.20	0.10	21.54
10	9.30	1.60	15.55	107.21	0.20	0.10	21.54
11	10.00	1.60	16.60	107.21	0.20	0.10	21.54
12	10.70	1.60	17.65	107.21	0.20	0.10	21.54
13	11.40	1.60	18.70	107.21	0.20	0.10	21.54
14	12.10	1.60	19.75	107.21	0.20	0.10	21.54
15	12.80	1.60	20.80	107.21	0.20	0.10	21.54

ATTACHMENT 4
TEST BORING LOGS

Rock Types

Rock Name	Characteristics	Symbol
Claystone	Clay sized particles that are consolidated, lacking fissility.	
Coal	Black and shiny, can break into cubes or conchoidally.	
Conglomerate	Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular.	
Limestone	Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils).	
Sandstone	Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse.	
Shale	Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature.	
Siltstone	Composed of silt, normally breaks as irregular chunks.	

Rock Quality Descriptions

Weathering

Completely Weathered: All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

Highly Weathered: More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

Moderately Weathered: Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

Slightly Weathered: Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

Fresh: No visible signs of rock material weathering.

RQD

Descriptor	%
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	>90

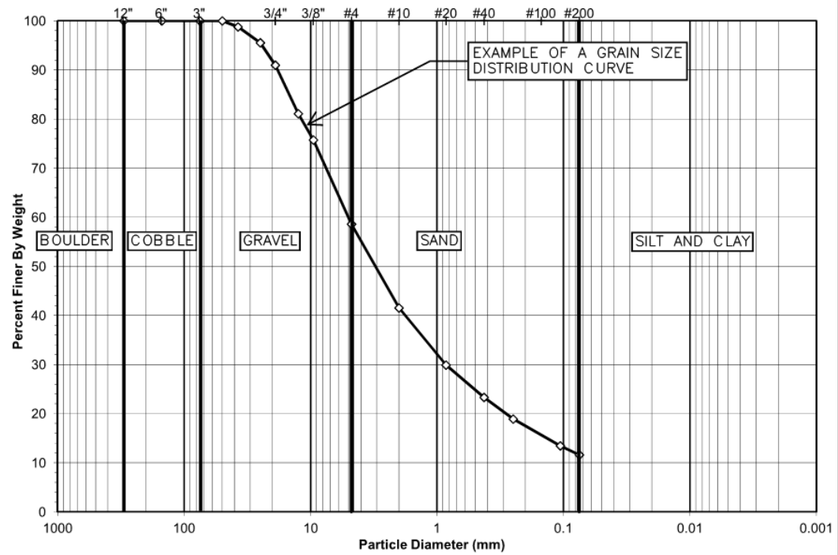
Brokenness

Descriptor	Fracture Spacing (in & ft)
Very Broken	<1 (<0.08)
Broken	1-3 (0.08-0.25)
Moderately Broken	3-6 (0.25-0.5)
Slightly Broken	>6 (>0.5)

Rock Hardness

Descriptor	Field Criterion	Relative Unconfined Compressive Strength
Very Hard	Difficult to break w/ Hammer	> 30,000 psi
Hard	Hand-held sample breaks w/ Hammer	8,000 to 30,000 psi
Medium Hard	Cannot scrape surface w/ knife	2,000 to 8,000 psi
Soft	Cutting or scraping w/ knife difficult	500 to 2,000 psi
Very Soft	Can be cut w/ knife	< 500 psi

Grain Size Distribution Curve



UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

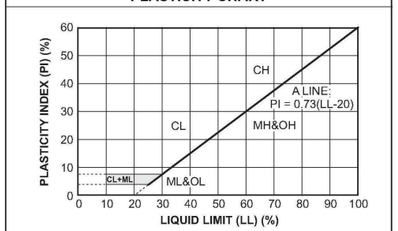
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



Glossary

Alluvial Soil or Alluvium: Soil deposited by water in a river, stream, floodplain, or delta.

Bedrock: Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

Colluvial Soil or Colluvium: Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

Fill: Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

Glacial Outwash: Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

Glacial Till: Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

N-Value: The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

Pocket Pen (PP): Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

Recovery %: Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

Refusal: The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

Residual Soil or Residuum: Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

Rock Quality Designation (RQD): The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

Shelby Tube: A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

Split Spoon Sampler: A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

Standard Penetration Test (SPT) ASTM D1586 : Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

Weathered Rock: Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

N-Value Rating

Fine-Grained Soils (Silt and Clay)

Consistency	Blows/ft	PP (tsf)
Very Soft	0-2	<0.25
Soft	3-4	0.25-0.5
Medium Stiff	5-8	0.5-1
Stiff	9-15	1-2
Very Stiff	16-32	2-4
Hard	>32	>4

Coarse-Grained Soils (Sand and Gravel)

Relative Density	Blows/ft
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

Unconsolidated Material

Term	Grain Size in mm (in)	Approximate Example Size
Clay and Silt	<.075	can't see grains to barely visible
Fine Sand	0.075-0.4	table salt to sugar
Med. Sand	0.4-2.0 (~<1/16)	openings in a window screen
Coarse Sand	2.0-4.75 (~1/16-1/8)	sidewalk salt
Gravel	4.75-75 (~1/8-3)	pea to tennis ball
Cobble	75-300 (3-12)	tennis ball to basketball
Boulder	>300 (>12)	larger than a basketball

Other Features – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

Term	%
Trace	< 5
Few	5-15
Some	15-45

Moisture Content

Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

Civil & Environmental Consultants, Inc.

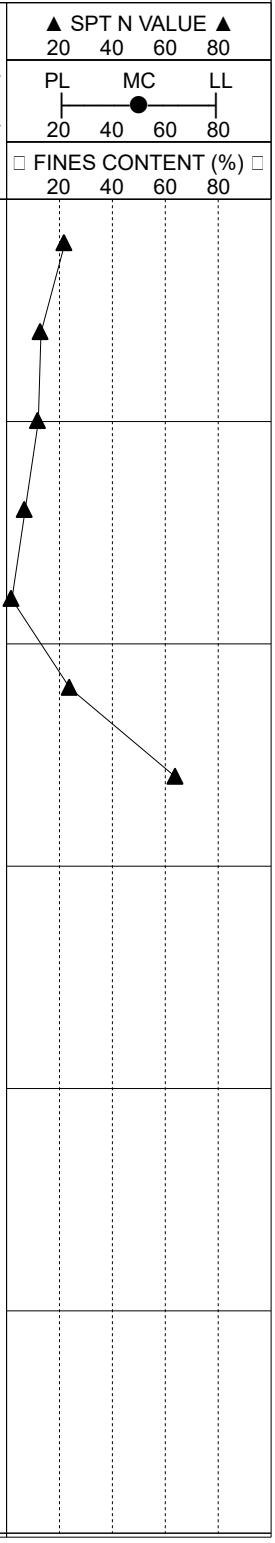
Definitions of Standard Terms and Symbols

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-1-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	10.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623886 **LONGITUDE** -70.918409
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 7.5 ft / Elev 2.5 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon refusal at 14' bgs.	0.2 ft 3" Asphalt	9.8					
			Tan to Gray, Silty Sand, Trace Gravel, Medium Dense, SM, **(FILL)**		SS S-1	100	9-10-12-8 (22)		0.1
			2.0 ft Black to Brown, Slightly Organic Silty Sand, Trace Gravel, Coal, Dry, Medium Dense, Slightly Organic Odor, SM, **(FILL)**	8.0	SS S-2	75	4-5-8-9 (13)		1.4
			4.0 ft Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	6.0	SS S-3	50	7-8-4-6 (12)		0.6
5			6.0 ft Black, Slightly Organic Silt with Sand and Gravel, Trace Wood, Damp, Medium Stiff, Slightly Organic Odor, ML, **(FILL)**	4.0	SS S-4	12	5-3-4-2 (7)		0.7
			7.5 ft ▽ 8.0 ft Gray, Silty Sand, Few Cinders, Wet, Loose, SM, **(FILL)**	2.5 / 2.0					0.6
			9.5 ft Brown, Fibrous PEAT, Damp, Soft, PT, Organic Content 42.4%, **(Organics)**	0.5	SS S-5	88	WOH-WOH-2-2 (2)		0.3
10			11.0 ft Gray, Silty Sand with Gravel, Trace Roots/ Wood, Wet, Very Loose to Medium Dense, SM, **(OUTWASH)**	-1.0	SS S-6	80	3-7-17-17 (24)		0.2
			Brown, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)**		SS S-7	75	13-34-30-50 (64)		0.9
			14.0 ft End of boring at 14.0 feet	-4.0					0.8
15									
20									
25									
30									



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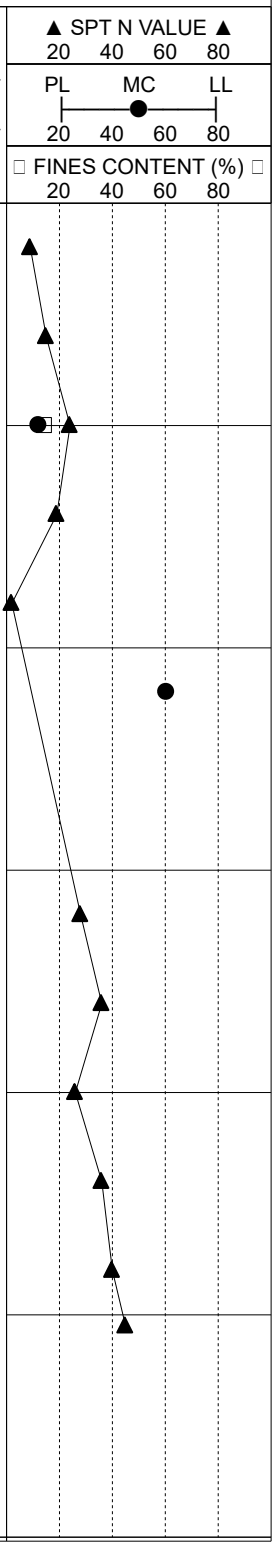
BORING NUMBER CEC-2-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623973 **LONGITUDE** -70.917976
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 12.0 ft / Elev -1.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Tan, Silty Sand with Gravel, Dry, Loose, SM, **(FILL)**	11	SS S-1	75	3-3-6-6 (9)		0.1
2.0 ft		Light Brown, Silty Sand, Moist, Medium Dense, SM, **(FILL)**	9.0	SS S-2	100	4-5-10-12 (15)		0.2
5.0 ft		Dark Brown, SLIGHTLY ORGANIC SILTY SAND WITH GRAVEL, Trace Brick, Roots, Moist, Medium Dense, SM, Organic Content 2.1%, **(FILL)**	6.0	SS S-3	100	8-13-11-12 (24)		0.3
				SS S-4	90	10-11-8-9 (19)		0.3
8.0 ft		Tan, Silty Sand, Trace Gravel, Dry, Very Loose, SM, **(FILL)**	3.0					
8.8 ft		Dark Brown, Organic Silt with Sand, Trace Roots, Dry, Soft, OL, **(ORGANICS)**	2.2	SS S-5	65	2-1-1-2 (2)		0.3
10.0 ft		Black, Organic Sand with Silt, Moist, Very Soft, OL, Organic Content 9.7%, **(ORGANICS)**	1.0	SS S-6	100	--		0.1
12.0 ft		Dark Brown, Slightly Organic Silty Sand, Trace Roots, Moist, Loose, SM, **(ORGANICS)**	-1.0	SS S-7	100	--		0.6
14.0 ft		Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)**	-3.0	SS S-8	70	11-11-17-21 (28)		0.6
15.0 ft		Gray, Silty Sand with Gravel, Wet, Dense, SM, **(OUTWASH)**	-4.0	SS S-9	95	10-15-21-18 (36)		0.5
17.0 ft		Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)**	-6.0	SS S-10	60	12-14-12-15 (26)		0.2
19.0 ft		Gray, Silty Sand with Gravel, Wet, Dense, GM, **(TILL)**	-8.0	SS S-11	40	11-15-21-22 (36)		0.3
21.0 ft			-10.0	SS S-12	25	6-16-24-21 (40)		0.2
25.0 ft	Split Spoon Refusal at 25.5' bgs	No Recovery	-14.0	SS S-13	0	45 (45)		
25.5 ft		End of boring at 25.5 feet	-14.5					



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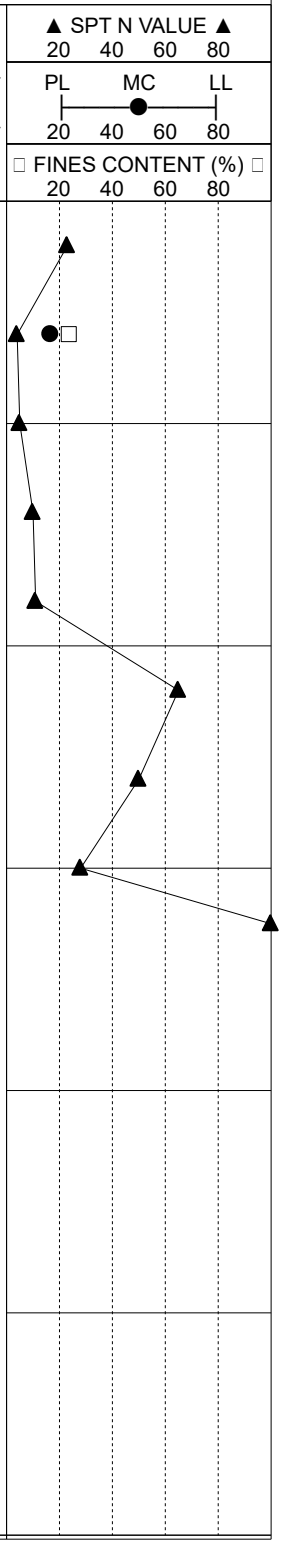
BORING NUMBER CEC-3-1

CLIENT Foth Infrastructure & Environment, LLC
PROJECT NAME MassCEC Expansion
PROJECT NUMBER 332-344
PROJECT LOCATION New Bedford, MA
DATE STARTED 11/10/2023 **DATE COMPLETED** 11/10/2023
GROUND ELEVATION 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR Geosearch, Inc.
LATITUDE 41.623423 **LONGITUDE** -70.917839
SAMPLING METHOD 4-1/4-in Hollow Stem Auger + SPT
WATER LEVELS AT END OF SOIL SAMPLING: 11/10/2023 8.0 ft / Elev 3.0 ft; AT END OF CORING: N/A; 24 HRS AFTER DRILLING: N/A
CEC REP D Barboza **CHECKED BY** T. Sousa, P.E.
NOTES Property 1 (54 Wright St. New Bedford, MA)

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Dark Brown, Silty Sand, Trace Roots, Dry, Medium Dense, SM, **(FILL)**	11	SS S-1	38	2-14-9-5 (23)		0.3
2.0 ft		Brown, SILTY SAND, Dry, Loose, SM, **(FILL)**	9.0	SS S-2	65	3-2-2-3 (4)		0.2
4.0 ft		Tan to Brown, Silty Sand, Dry, Loose, SM, **(FILL)**	7.0	SS S-3	95	2-2-3-3 (5)		0.2
5.5 ft		Brown to Black, Silty Sand with Gravel, Trace Brick, Trace Roots, Dry to Moist, Medium Dense, SM, **(FILL)**	5.5	SS S-4	50	6-6-4-4 (10)		0.8
8.0 ft	3" spoon driven after 2" spoon to obtain additional soil recovery.	Brown, Silty Gravel with Sand, Wet, Medium Dense, GM, **(OUTWASH)**	3.0	SS S-5	25	5-6-5-4 (11)		0.2
10.0 ft		Tan to Gray, Silty Sand with Gravel, Wet, Very Dense to Medium Dense, SM, **(TILL)**	1.0	SS S-6	65	10-30-35-28 (65)		0.2
	Split spoon refusal at 13' bgs			SS S-7	50	22-50		0.5
				SS S-8	55	11-14-14-17 (28)		0.3
16.0 ft	Split spoon refusal at 16.5' bgs		-5.0					
16.5 ft		No Recovery	-5.5	SS S-9	--	50		0.5
		End of boring at 16.5 feet						



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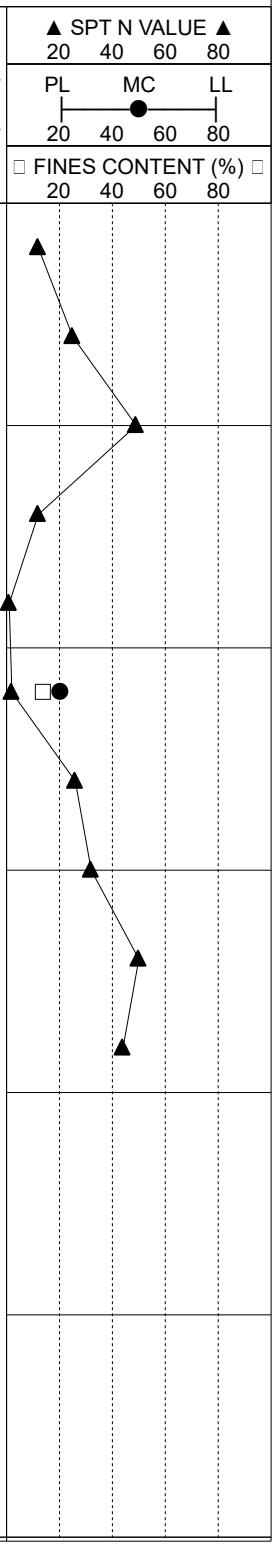
BORING NUMBER CEC-4-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/09/2023 **DATE COMPLETED** 11/09/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623573 **LONGITUDE** -70.918352
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/09/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0.5 ft	Tan, Poorly-Graded Sand with Silt and Gravel, Trace Roots, Dry, Medium Dense, SP-SM, **(FILL)**	10.5	SS S-1	95	5-6-6-5 (12)		10.0
	Brown, Silty Sand, Trace Gravel, Dry, Medium Dense to Dense, SM, **(FILL)**		SS S-2	80	9-11-14-11 (25)		0.2
4.5 ft	Light Brown, Well-Graded Sand with Silt and Gravel, Dry, Dense, SW-SM, **(FILL)**	6.5	SS S-3	90	6-17-32-21 (49)		0.3
6.5 ft	Dark Brown, Slightly Organic Silt with Sand and Gravel, Trace Bricks, Damp, Stiff, Slightly Organic Odor, ML, **(FILL)**	4.5	SS S-4	95	13-3-9-9 (12)		0.3
8.0 ft	Brown, Slightly Organic Silty Sand with Gravel, Trace Roots, Wet, Very Loose, SM, **(Organics)**	3.0	SS S-5	60	1-WOH-WOH-WOH (1)		1.7
10.0 ft	Brown, SILTY SAND, FEW GRAVEL, Trace Roots, Wet, Very Loose, SM, **(OUTWASH)**	1.0	SS S-6	50	WOH-WOH-2-13 (2)		0.1
12.0 ft	Light Brown, Well-Graded Sand with Silt and Gravel, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-1.0	SS S-7	75	13-15-11-17 (26)		0.3
14.0 ft	Brown, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)**	-3.0	SS S-8	70	12-15-17-10 (32)		0.2
			SS S-9	100	12-22-28-30 (50)		0.3
18.0 ft	No Recovery	-7.0	SS S-10	--	11-24-20-50 (44)		
20.0 ft	End of boring at 20.0 feet	-9.0					

REMARKS: Sample S-11 was abandoned in the boring after snapping off of drill rods.



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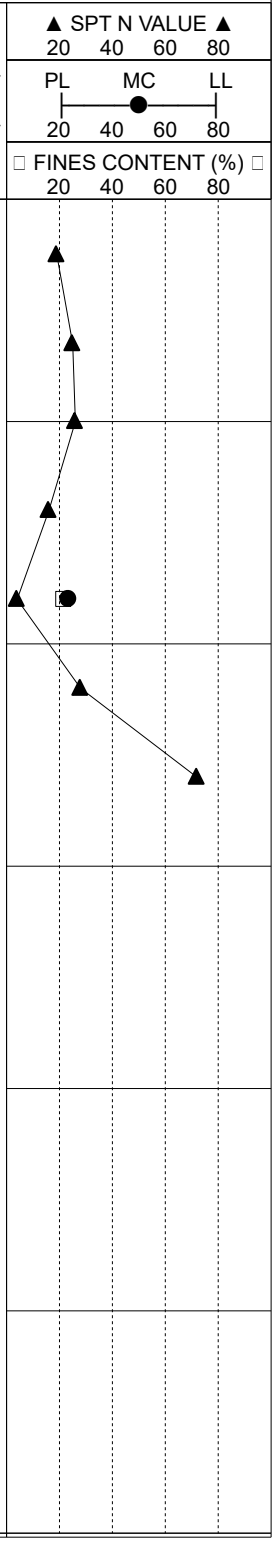
BORING NUMBER CEC-5-1

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	11/10/2023 **DATE COMPLETED** 11/10/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623647 **LONGITUDE** -70.918060
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 11/10/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 1 (54 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0			0.2 ft 3" Asphalt	10.8					
			Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)**		SS S-1	95	17-9-10-3 (19)		0.1
			2.0 ft Light Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	9.0	SS S-2	90	8-14-11-8 (25)		0.1
5			5.5 ft Gray To Black, Silty Sand with Gravel, Trace Wood/Brick, Moist, Medium Dense, SM, **(FILL)**	5.5	SS S-3	85	6-10-16-16 (26)		0.3
			8.0 ft	3.0	SS S-4	50	9-10-6-4 (16)		0.5
			Dark Brown, Slightly Organic SILTY SAND, FEW GRAVEL, Wet, Loose, SM, Organic Content 1.9%, **(ORGANICS)**		SS S-5	80	3-2-2-2 (4)		0.3
10			10.0 ft Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(TILL)**	1.0	SS S-6	90	10-14-14-18 (28)		0.2
			12.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(TILL)**	-1.0	SS S-7	75	12-22-50 (72)		0.1
		Split spoon refusal at 13.5' bgs.	13.5 ft End of boring at 13.5 feet	-2.5					
15									
20				-9					
25									
30				-19					



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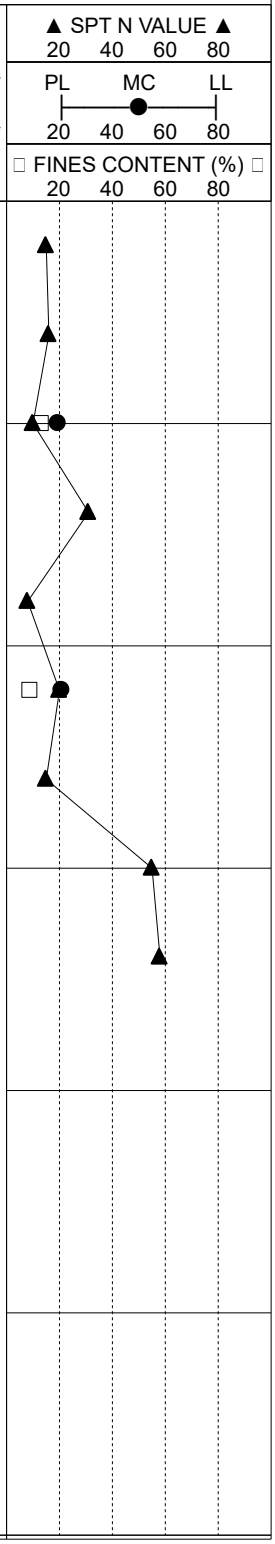
BORING NUMBER CEC-1-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623895 **LONGITUDE** -70.917636
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/05/2023 4.0 ft / Elev 7.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0	No recovery, with 2" spoon, recovered 5" with 3" spoon.	0.5 ft: Brown, Silty Sand with Gravel, Trace Roots, Dry, Medium Dense, SM, **(FILL)**	10.5	SS S-1	95	3-7-8-9 (15)		0.2
		2.0 ft: Tan, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)**	9.0	SS S-2	75	14-11-5-3 (16)		0.6
		Brown, Silty Sand with Gravel, Moist, Medium Dense, Slight Petroleum Odor, SM, **(FILL)**						
		4.5 ft: Dark Brown, Slightly Organic SILTY SAND WITH GRAVEL, Trace Roots/Wood, Trace Brick, Debris, Moist, Medium Dense, SM, Organic Content 4.5%, **(FILL)**	6.5	SS S-3	90	3-4-6-28 (10)		1.0
5		6.0 ft: Brown, Silty Sand with Gravel, Few Bricks, Wet, Dense, SM, **(FILL)**	5.0	SS S-4	55	25-15-16-10 (31)		0.0
		8.0 ft: Red to Brown, Poorly-Graded Gravel/Brick Debris, Few Sand, Wet, Loose, Petroleum Odor, GP, **(FILL)**	3.0	SS S-5	20	7-4-4-4 (8)		0.0
10		10.0 ft: Brown, Slightly Organic POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Brick, Roots, Wet, Medium Dense, Slight Organic / Petroleum Odor, SP-SM, **(FILL)**	1.0	SS S-6	65	2-5-15-15 (20)		
		12.0 ft: Dark Brown, Slightly Organic Silty Sand with Gravel, Trace Brick, Roots, Wet, Medium Dense, Slight Organic / Petroleum Odor, SM, **(FILL)**	-1.0	SS S-7	90	7-5-10-11 (15)		0.2
15		13.0 ft: Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)**	-2.0	SS S-8	75	34-30-25-38 (55)		0.2
				SS S-9	100	21-23-35-34 (58)		0.3
		18.0 ft: End of boring at 18.0 feet	-7.0					
20			-9					
25								
30			-19					



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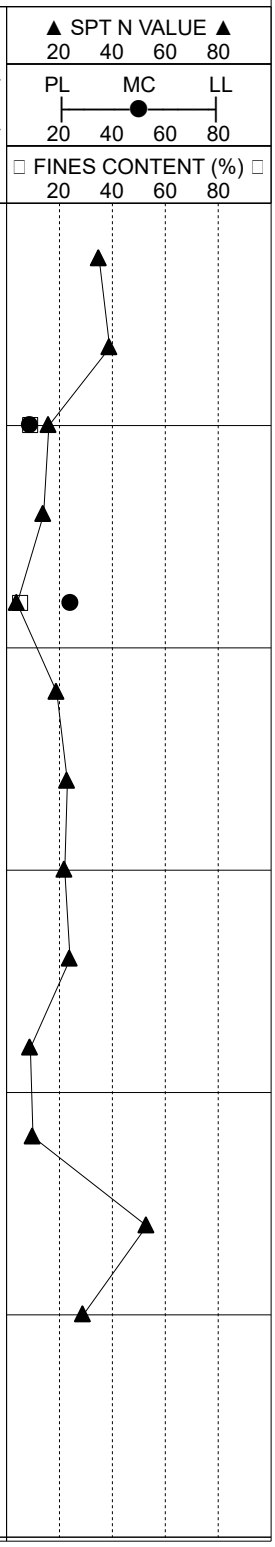
BORING NUMBER CEC-2-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	8.70 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624047 **LONGITUDE** -70.917329
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/06/2023 6.0 ft / Elev 2.7 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0.2 ft		3" Asphalt	8.4					
		Tan to Brown, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)**		SS S-1	60	11-13-22-17 (35)		0.3
2.2 ft		Brown to Black, Poorly-Graded Gravel / Asphalt with Sand and Silt, Dry, Dense, GP, **(FILL)**	6.4	SS S-2	750	27-26-13-10 (39)		1.2
3.8 ft / 4.0 ft		Tan, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)**	5.0 / 4.7	SS S-3	70	10-8-8-7 (16)		1.0
6.0 ft		Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Few Debris / Roots, Dry, Medium Dense, SP-SM, **(FILL)**	2.7	SS S-4	65	7-8-6-6 (14)		0.1
8.0 ft		Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense, SP-SM, **(FILL)**	0.7	SS S-5	45	3-2-2-4 (4)		1.3
10.0 ft		Gray, POORLY-GRADED SAND WITH SILT, Trace Shells, Wet, Loose, Slight Petroleum Odor, SP-SM, **(FILL)**	-1.3	SS S-6	70	5-5-14-16 (19)		1.9
11.0 ft		Black to Gray, Silty Sand with Gravel, Trace Shells, Wet, Medium Dense, Petroleum Odor, SM, **(FILL)**	-2.3	SS S-7	75	16-12-11-13 (23)		0.2
12.5 ft		Gray, Silty Gravel with Sand, Trace Shells, Wet, Medium Dense, GM, **(OUTWASH)**	-3.8	SS S-8	40	9-9-13-12 (22)		0.0
14.0 ft		Grayish Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)**	-5.3	SS S-9	55	7-12-12-11 (24)		0.2
16.0 ft		Tan, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(OUTWASH)**	-7.3	SS S-10	45	6-5-4-6 (9)		0.4
18.0 ft	Black, Slightly Organic Sand Seam at 18' bgs.	Tan, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-9.3	SS S-11	60	2-4-6-20 (10)		0.8
20.0 ft		Orange, Silty Sand with Gravel, Wet, Loose, SM, **(OUTWASH)**	-11.3	SS S-12	60	12-36-17-50 (53)		0.2
22.0 ft		Orange / Brown, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)**	-13.3	SS S-13	45	11-12-17-17 (29)		0.5
26.0 ft		Orange / Brown, Silty Gravel with Sand, Wet, Medium Dense to Very Dense, GM, **(TILL)**	-17.3					
		End of boring at 26.0 feet						



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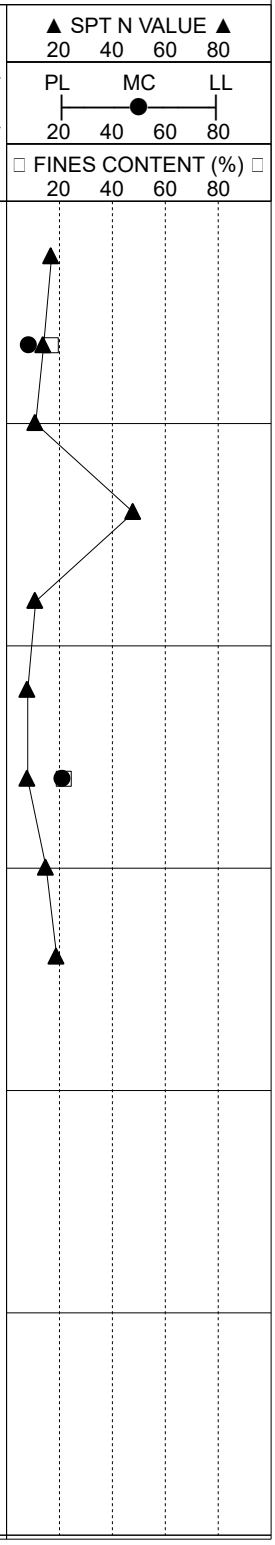
BORING NUMBER CEC-3-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	9.60 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.624116 **LONGITUDE** -70.916931
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/06/2023 8.0 ft / Elev 1.6 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0.2 ft	3" Asphalt	9.4					
	Tan, Silty Sand, Dry, Medium Dense, SM, **(FILL)**		SS S-1	55	4-6-11-12 (17)		0.0
2.2 ft	Brown, SILTY SAND, FEW GRAVEL, Dry, Medium Dense, SM, **(FILL)**	7.4	SS S-2	50	5-8-6-6 (14)		1.0
4.2 ft	Brown to Dark Brown, Silty Sand with Gravel, Dry, Medium Dense to Dense, SM, **(FILL)**	5.4	SS S-3	50	7-5-6-22 (11)		0.0
			SS S-4	50	25-24-24-17 (48)		0.3
8.0 ft	Brown to Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense to Loose, SP-SM, **(OUTWASH)**	1.6	SS S-5	55	4-6-5-4 (11)		0.2
			SS S-6	55	3-4-4-4 (8)		0.9
12.0 ft	Gray, Slightly Organic SILTY SAND, FEW GRAVEL, Trace Shells, Wet, Loose, Slight Organic Odor, SM, Organic Content 1.1%, **(OUTWASH)**	-2.4	SS S-7	75	5-3-5-9 (8)		1.2
14.0 ft	Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(OUTWASH)**	-4.4	SS S-8	60	5-7-8-7 (15)		0.2
			SS S-9	75	7-10-9-7 (19)		0.3
18.0 ft	End of boring at 18.0 feet	-8.4					

REMARKS

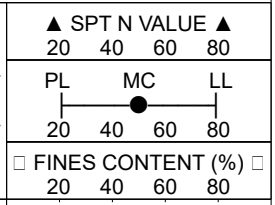


Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-4-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623463 **LONGITUDE** -70.917509
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon refusal at 5.75' bgs; Augers grinding 5.75-6'. Auger and split spoon refusal at 6.5'.	0.5 ft Dark Brown, Organic Silty Sand, Few Roots, Dry, Loose, SM, **(FILL)**	10.5	SS S-1	60	1-3-3-3 (6)		0.2
			2.0 ft Tan, Silty Sand with Gravel, Trace Glass, Dry, Loose, SM, **(FILL)**	9.0	SS S-2	80	3-2-2-2 (4)		0.1
			4.0 ft Brown, SILTY SAND, FEW GRAVEL, Dry, Loose, SM, **(FILL)**	7.0	SS S-3	74	2-5-7-45/0.3' (12)		0.3
5			5.8 ft Light Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)**	5.2	SS S-4	0	50-WOH/0.2' (50)		--
			6.5 ft No Recovery	4.5					
			End of boring at 6.5 feet						
10				1					
15									
20				-9					
25									
30				-19					



Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-5-2

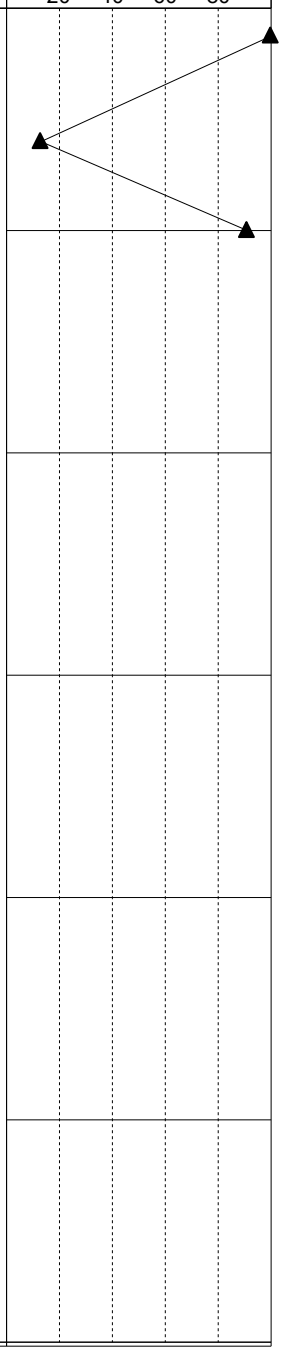
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	8.80 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623533 **LONGITUDE** -70.916969
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon and auger refusal at 1.25' bgs, offset 6' north.	Brown, Silty Sand with Gravel / Concrete, Trace Roots, Dry, Very Dense, SM, **(FILL)**		SS S-1	56	3-24-50/0.2'		
			2.0 ft — 6.8						
			Tan to Brown, Silty Sand with Gravel, Dry to Moist, Medium Dense to Very Dense, SM, **(FILL)**		SS S-2	70	5-6-7-9 (13)		
5		Split spoon refusal at 5.5' bgs	5.5 ft — 3.3		SS S-3	55	5-10-81 (91)		
			End of boring at 5.5 feet						
10				-1					
15									
20				-11					
25									
30				-21					

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80

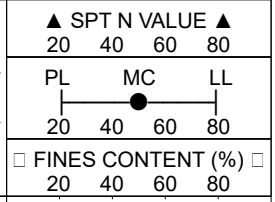


Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-6-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/06/2023 **DATE COMPLETED** 12/06/2023	**GROUND ELEVATION**	9.10 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623677 **LONGITUDE** -70.916698
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** N/A
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon refusal at 7.75' bgs	0.5 ft Dark Brown, Organic Silty Sand, Few Roots, Dry, Medium Dense, SM, **(FILL)**	8.6	SS S-1	65	2-5-5-8 (10)		
			Brown, Silty Sand with Gravel, Trace Debris, Roots, Dry, Medium Dense, SM, **(FILL)**		SS S-2	70	7-8-9-7 (17)		
5			5.0 ft Black, Silty Sand with Gravel, Some Concrete/Brick/Wood, Dry to Moist, Medium Dense, SM, **(FILL)**	4.1	SS S-3	90	7-8-14-11 (22)		
			6.0 ft Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Some Concrete/Brick/Wood, Moist, Medium Dense, SP-SM, **(FILL)**	3.1	SS S-4	74	11-10-16-50 /0.3' (26)		
			7.8 ft End of boring at 7.8 feet	1.4					
10				0					
15				-10					
20				-20					
25									
30									

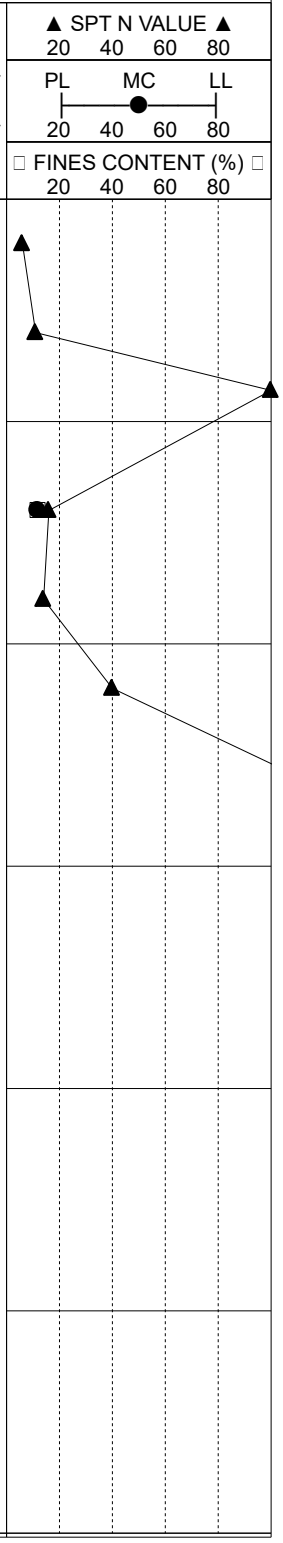


Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-7-2

CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623464 **LONGITUDE** -70.917548
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/05/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon refusal at 4.6'. Augers grinding from 4.6-6' bgs through possible boulder or concrete.	0.5 ft – Brown, Silty Sand with Gravel, Trace Roots, Dry, Loose, SM, **(FILL)**	10.5					
			Tan, Silty Sand, Dry, Loose, SM, **(FILL)**		SS S-1	88	2-2-4-6 (6)		0.1
			2.0 ft – Brown, Silty Sand with Gravel, Dry, Medium Dense to Very Dense, SM, **(FILL)**	9.0					
					SS S-2	20	4-6-5-4 (11)		0.7
					SS S-3	100	4-50/0.1'		0.1
5			6.0 ft – Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Debris, Moist to Wet, Medium Dense, SP-SM, **(FILL)**	5.0					
					SS S-4	45	4-5-11-15 (16)		0.0
			8.0 ft – Dark Brown, Silty Sand with Gravel, Trace Debris, Wet, Medium Dense, SM, **(FILL)**	3.0					
					SS S-5	50	4-6-8-16 (14)		0.1
10			10.0 ft – Brown/Gray, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)**	1.0					
					SS S-6	55	5-14-26-53 (40)		0.7
		Split spoon and auger refusal at 13.8' bgs.			SS S-7	87	14-47-55 (102)		0.5
			13.8 ft – End of boring at 13.8 feet	-2.8					
15									
20									
25									
30									



Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

BORING NUMBER CEC-8-2

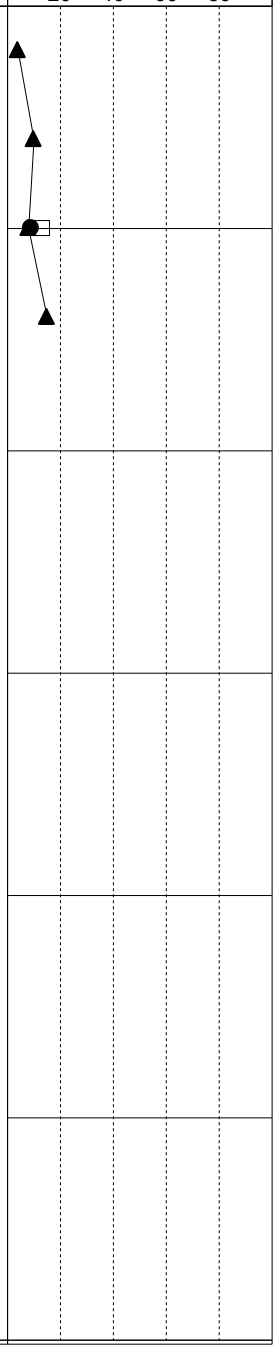
CLIENT	Foth Infrastructure & Environment, LLC	**PROJECT NAME**	MassCEC Expansion
PROJECT NUMBER	332-344	**PROJECT LOCATION**	New Bedford, MA
DATE STARTED	12/05/2023 **DATE COMPLETED** 12/05/2023	**GROUND ELEVATION**	11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
SAMPLING CONTRACTOR	Geosearch, Inc.	**LATITUDE**	41.623469 **LONGITUDE** -70.917443
SAMPLING METHOD	4-1/4-in Hollow Stem Auger + SPT	**WATER LEVELS**	**AT END OF SOIL SAMPLING** 12/05/2023 8.0 ft / Elev 3.0 ft
CEC REP	D Barboza **CHECKED BY** T. Sousa, P.E.		**AT END OF CORING** N/A
NOTES	Property 2 (18 Wright St. New Bedford, MA)		**24 HRS AFTER DRILLING** N/A

DEPTH (ft)	GRAPHIC LOG	REMARKS	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOWS COUNTS (N VALUES)	POCKET PEN. (tsf)	PID (PPM)
0		Split spoon and auger refusal at 8' bgs on possible concrete slab.	Dark Brown, Organic Silty Sand with Gravel, Few Roots, Dry, Loose, SM, **(FILL)** (1.0 ft)	11	SS S-1	60	1-1-3-7 (4)		0.1
			Tan, Silty Sand, Dry, Loose, SM, **(FILL)** (2.0 ft)	10.0					
			Brown, Poorly-Graded Sand with Silt and Gravel, Trace Debris, Dry, Medium Dense, SP-SM, **(FILL)** (4.0 ft)	9.0	SS S-2	70	5-5-5-4 (10)		0.1
			Brown, SILTY SAND WITH GRAVEL, Dry, Loose, Petroleum Odor at 5', SM, **(FILL)** (6.0 ft)	7.0	SS S-3	50	4-4-4-28 (8)		0.8
			Dark Brown, Silty Sand with Gravel, Trace Shells/Brick/Asphalt/Glass, Wet, Medium Dense, SM, **(FILL)** (8.0 ft)	5.0	SS S-4	50	9-8-7-25 (15)		0.9
			End of boring at 8.0 feet	3.0					
5									
10				1					
15									
20				-9					
25									
30				-19					

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80



ATTACHMENT 5
LABORATORY TEST RESULTS

Thielsch DIVISION OF THE RISE GROUP	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 cts.thielsch.com *Let's Build a Solid Foundation*	Client Information: Civil & Environmental Consultants Raynham, MA 02767 Project Manager: Tony Sousa Assigned By: Tony Sousa Collected By: Client	Project Information: **MassCEC Expansion** **New Bedford, MA** Project Number: 332-344 Summary Page: 1 of 1 Report Date: 12.05.23

LABORATORY TESTING DATA SHEET, Report No.: 7423-L-214

Boring No.	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Rcvd Moisture Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	pH	g_d MAX (pcf) W_{opt} (%)	g_d MAX (pcf) W_{opt} (%) (Corr.)	Dry unit wt. (pcf)	Test Moisture Content %	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913			D2974	D4792	D1557								
CEC-1-1	S-6	8-9.5	23-S-4754	260						42.4										Organic Content Only
CEC-2-1	S-3A	5-6	23-S-4755	12.2			20.8	64.9	14.3	2.1										Dark Brown Organic silty sand with gravel
CEC-2-1	S-6	10-12	23-S-4756	60.5						9.7										Organic Content Only
CEC-3-1	S-2	2-4	23-S-4757	16.7			1.3	75.0	23.7											Brown silty sand
CEC-4-1	S-6	10-12	23-S-4758	20.5			12.6	73.5	13.9											Brown silty sand
CEC-5-1	S-5	8-10	23-S-4759	23.5			9.8	68.6	21.6	1.9										Dark Brown silty clayey sand
CEC-2-3	S-1	0-2	23-S-4760	6.9			17.0	60.5	22.5											Brown silty sand with gravel
CEC-4-3	S-1	0-2	23-S-4761	5.7			28.0	61.5	10.5											Brown poorly graded sand with silt and gravel
CEC-5-3	S-1	0-2	23-S-4762	7.7			31.0	56.6	12.4											Brown silty sand with gravel
CEC-1-4	S-1	0-2	23-S-4763	3.5			53.5	37.1	9.4											Brown poorly graded gravel with silt and sand
CEC-1-4	S-3	4-6	23-S-4764	11.3			19.7	63.6	16.7											Dark Brown silty sand with gravel
CEC-2-4	S-5	8-10	23-S-4765	21.7						1.7										Organic Content Only

Date Received: **11.27.23** Reviewed By: Date Reviewed: **12.05.23**

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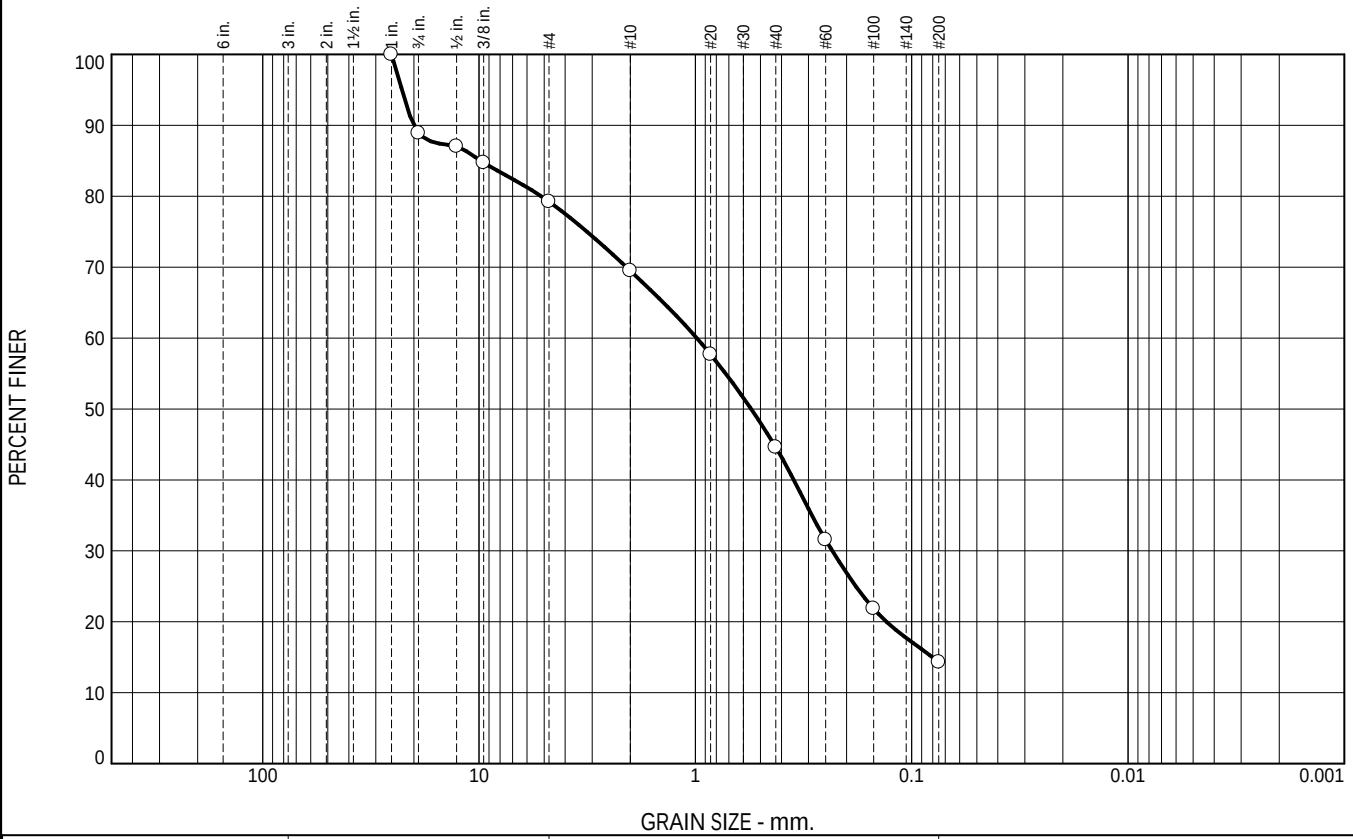
This report shall not be reproduced, except in full, without prior written approval from the Agency, as defined in ASTM E329.

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.1	9.7	9.7	24.9	30.3	14.3	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	88.9		
1/2"	87.0		
3/8"	84.7		
#4	79.2		
#10	69.5		
#20	57.7		
#40	44.6		
#60	31.5		
#100	21.8		
#200	14.3		

* (no specification provided)

Soil Description

Dark Brown Organic silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 20.0616 D_{85}= 9.8327 D_{60}= 0.9850
D_{50}= 0.5523 D_{30}= 0.2328 D_{15}= 0.0802
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: Boring Depth: 5-6'
Sample Number: CEC-2-1 / S-3A Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Fig. 23-S-4755

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	1.4	10.7	62.9	23.7	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.5		
#4	98.7		
#10	97.3		
#20	93.9		
#40	86.6		
#60	71.7		
#100	47.6		
#200	23.7		

* (no specification provided)

Soil Description

Brown silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.5297 D_{85}= 0.3926 D_{60}= 0.1942
D_{50}= 0.1585 D_{30}= 0.0905 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: Boring Depth: 2-4'
Sample Number: CEC-3-1 / S-2 Date: 12.1.23

Thielsch Engineering Inc.	Client: Civil & Environmental Consultants, Inc
Cranston, RI	Project: MassCEC Expansion New Bedford, MA
	Project No: 332-344 Fig. 23-S-4757

Tested By: RB Checked By: Kris Roland

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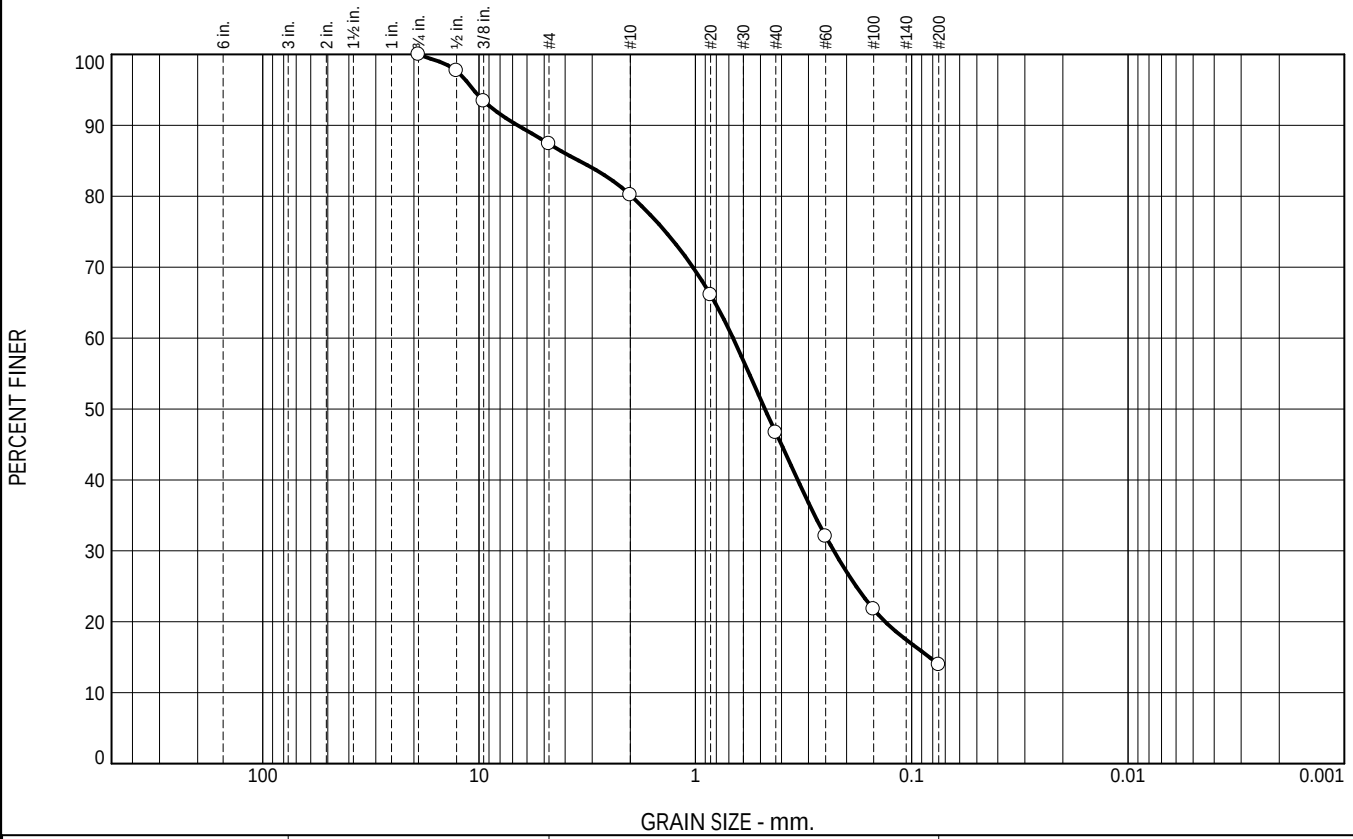
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.6	7.2	33.5	32.8	13.9	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	97.7		
3/8"	93.4		
#4	87.4		
#10	80.2		
#20	66.1		
#40	46.7		
#60	32.0		
#100	21.8		
#200	13.9		

* (no specification provided)

Soil Description

Brown silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 6.6266 D_{85}= 3.4456 D_{60}= 0.6698
D_{50}= 0.4772 D_{30}= 0.2291 D_{15}= 0.0828
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample received with standing water.

Source of Sample: Boring Depth: 10-12'
Sample Number: CEC-4-1 / S-6 Date: 12.1.23

Thielsch Engineering Inc.	Client: Civil & Environmental Consultants, Inc
Cranston, RI	Project: MassCEC Expansion New Bedford, MA
	Project No: 332-344 Fig. 23-S-4758

Tested By: RB Checked By: Rebecca Roth

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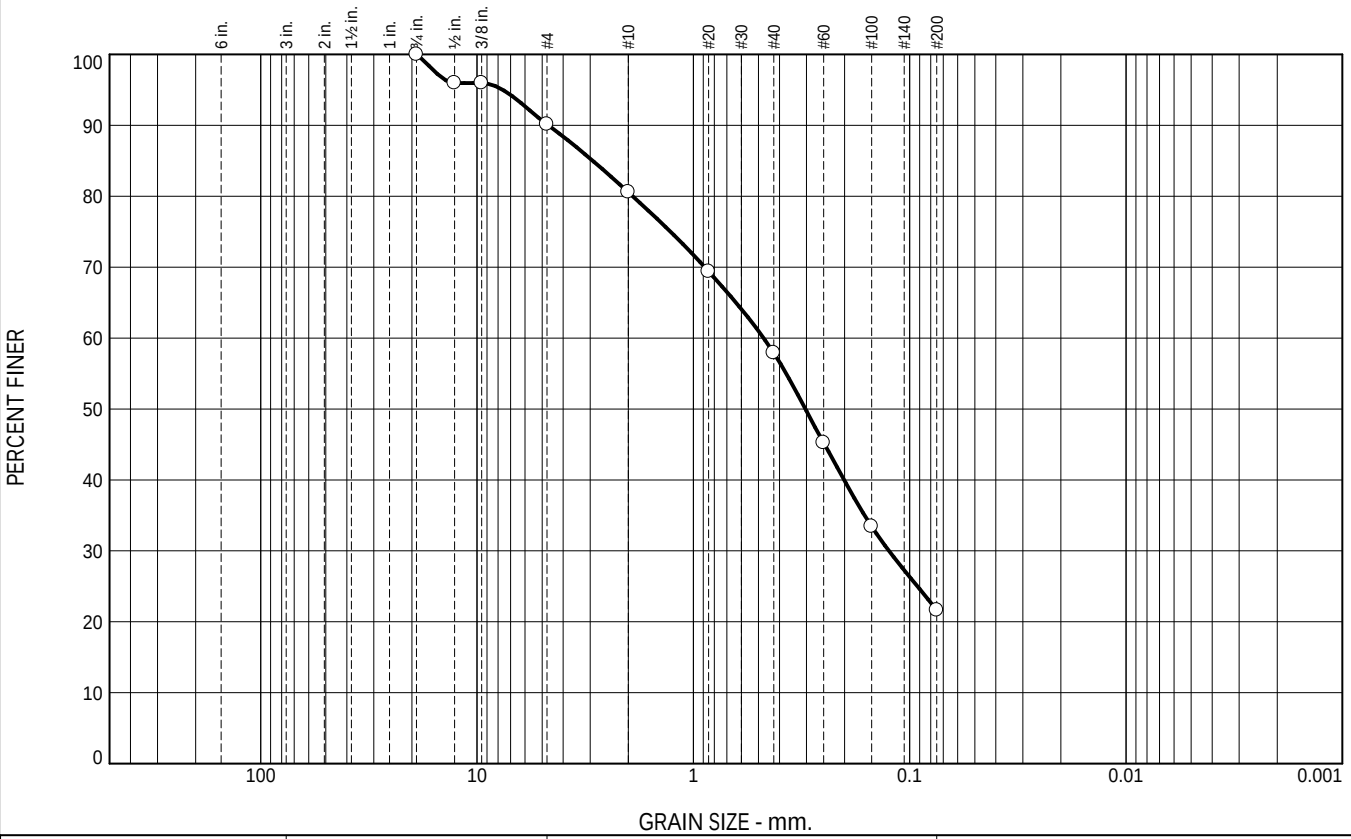
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.8	9.6	22.7	36.3	21.6	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	96.0		
3/8"	96.0		
#4	90.2		
#10	80.6		
#20	69.4		
#40	57.9		
#60	45.2		
#100	33.4		
#200	21.6		

* (no specification provided)

Soil Description

Dark Brown silty clayey sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 4.6759 D_{85}= 2.9169 D_{60}= 0.4736
D_{50}= 0.3036 D_{30}= 0.1248 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Sample visually classified as plastic. Sample rolled to 1/4"

Source of Sample: Boring Depth: 8-10'
Sample Number: CEC-5-1 / S-5 Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Fig. 23-S-4759

Tested By: RB Checked By: Kris Roland

Thielsch DIVISION OF THE RISE GROUP	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 cts.thielsch.com *Let's Build a Solid Foundation*	Client Information: Civil & Environmental Consultants Raynham, MA Project Manager: Tony Sousa Assigned By: Client Collected By: Client	Project Information: **MassCEC Expansion** **New Bedford, MA** Project Number: 332-344 Summary Page: 1 of 1 Report Date: 12.19.23

LABORATORY TESTING DATA SHEET, Report No.: 7423-M-B014

Boring	Sample ID	Depth (ft)	Laboratory No.	Identification Tests									Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Rcvd Moisture Content %	LL %	PL %	OD LL	Gravel %	Sand %	Fines %	Org. %	pH	g_d MAX (pcf) W_{opt} (%)	g_d MAX (pcf) W_{opt} (%) (Corr.)	Dry unit wt. (pcf)	Test Moisture Content %	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318			D6913			D2974	D4792	D1557								
CEC-1-2	S-3A	4.5-6	23-S-B1105	19.5				42.1	44.8	13.1	4.5										Dark Brown silty sand with gravel
CEC-1-2	S-6	10-12	23-S-B1106	20.9				27.0	64.2	8.8											Brown poorly graded sand with silt and gravel
CEC-2-2	S-3	4-6	23-S-B1107	9.0				44.4	46.5	9.1											Dark Grey poorly graded sand with silt and gravel
CEC-2-2	S-5	8-10	23-S-B1108	24.3				0.0	94.7	5.3											Grey poorly graded sand with silt
CEC-3-2	S-2	2.25-4.25	23-S-B1109	8.6				12.6	70.5	16.9											Brown silty sand
CEC-3-2	S-7	12-14	23-S-B1110	21.3				8.3	69.9	21.8	1.1										Grey silty sand
CEC-4-2	S-2	2-4	23-S-B1111	7.6				5.0	77.2	17.8											Brown silty sand
CEC-6-2	S-4	6-7.75	23-S-B1112	16.4				40.7	48.7	10.6											Dark Grey poorly graded sand with silt and gravel
CEC-7-2	S-4	6-8	23-S-B1113	11.8				28.5	59.6	11.9											Brown poorly graded sand with silt and gravel
CEC-8-2	S-3	4-6	23-S-B1114	9.0				31.7	55.1	13.2											Brown silty sand with gravel
Organic Content ran by AF from 12.14.23 to 12.18.23.																					

Date Received: **12.12.23** Reviewed By: Date Reviewed: **12.19.23**

This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.
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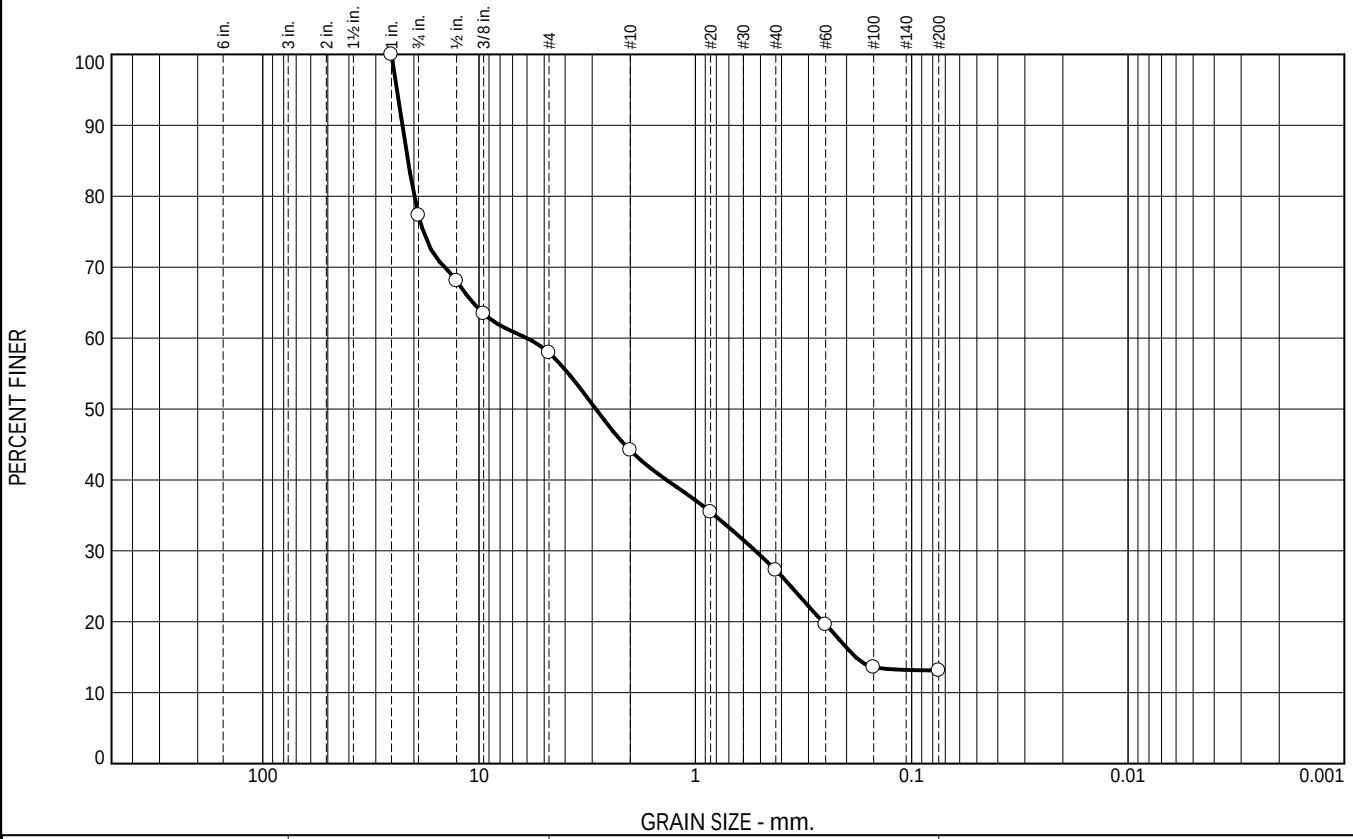
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.7	19.4	13.7	16.9	14.2	13.1	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	77.3		
1/2"	68.1		
3/8"	63.5		
#4	57.9		
#10	44.2		
#20	35.5		
#40	27.3		
#60	19.6		
#100	13.6		
#200	13.1		

* (no specification provided)

Soil Description

Dark Brown silty clayey sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 22.6004 D_{85}= 21.3146 D_{60}= 6.0152
D_{50}= 2.8846 D_{30}= 0.5279 D_{15}= 0.1812
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-a

Remarks

Sample visually classified as plastic. Sample rolled to 1/4"

Source of Sample: Boring 23-M-B014 Depth: 4.5-6'
Sample Number: CEC-1-2 / S-3A

Date: 12.18.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Figure 23-S-B1105

Tested By: AF / SF Checked By: Andrew Flanagan

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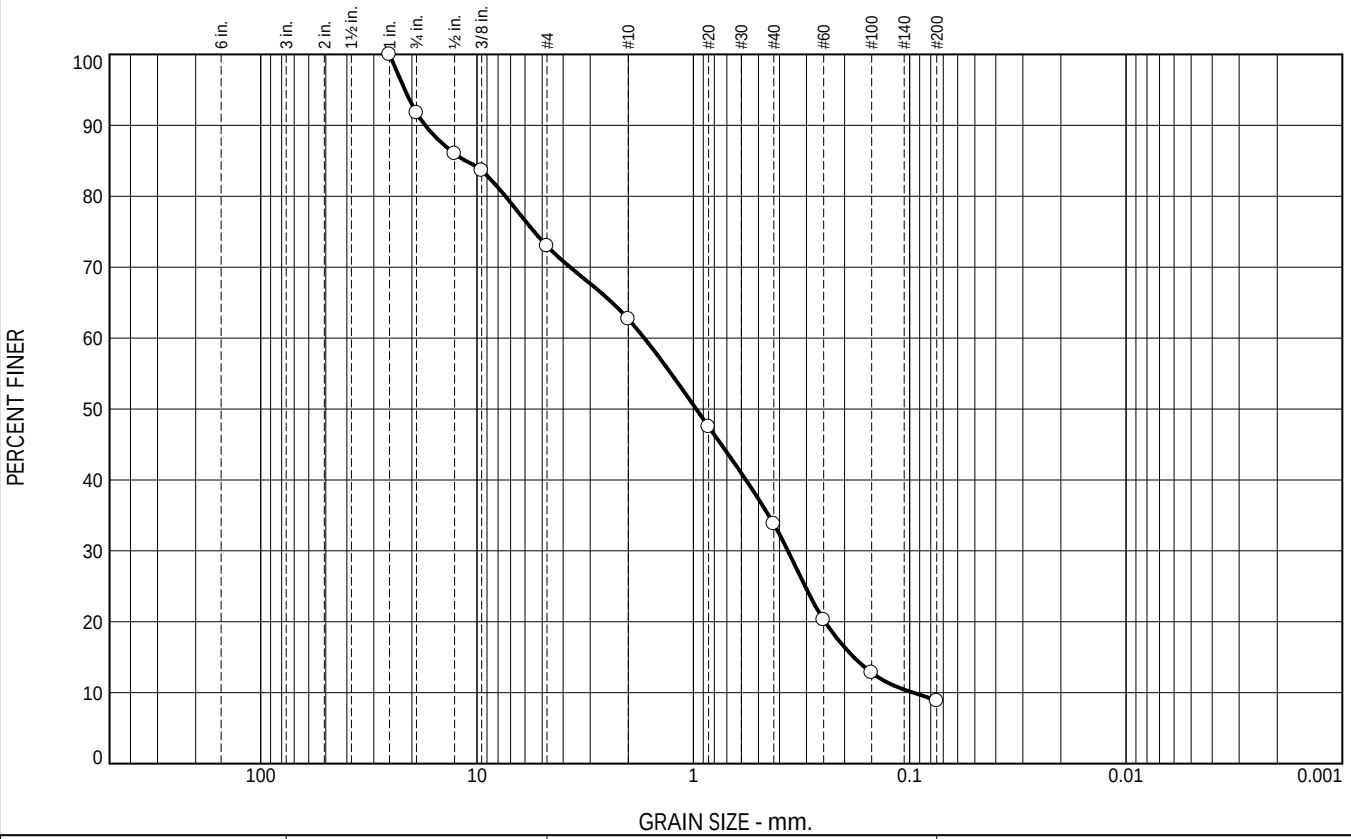
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.3	18.7	10.3	28.9	25.0	8.8	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	91.7		
1/2"	86.0		
3/8"	83.6		
#4	73.0		
#10	62.7		
#20	47.5		
#40	33.8		
#60	20.3		
#100	12.8		
#200	8.8		

* (no specification provided)

Soil Description

Brown poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 17.3838 D_{85}= 11.2743 D_{60}= 1.6854
D_{50}= 0.9703 D_{30}= 0.3655 D_{15}= 0.1812
D_{10}= 0.0961 C_u= 17.54 C_c= 0.82

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample contains brick.

Source of Sample: Boring 23-M-B014 Depth: 10-12'
Sample Number: CEC-1-2 / S-6 Date: 12.18.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Figure 23-S-B1106

Tested By: AF / SF Checked By: Andrew Flanagan

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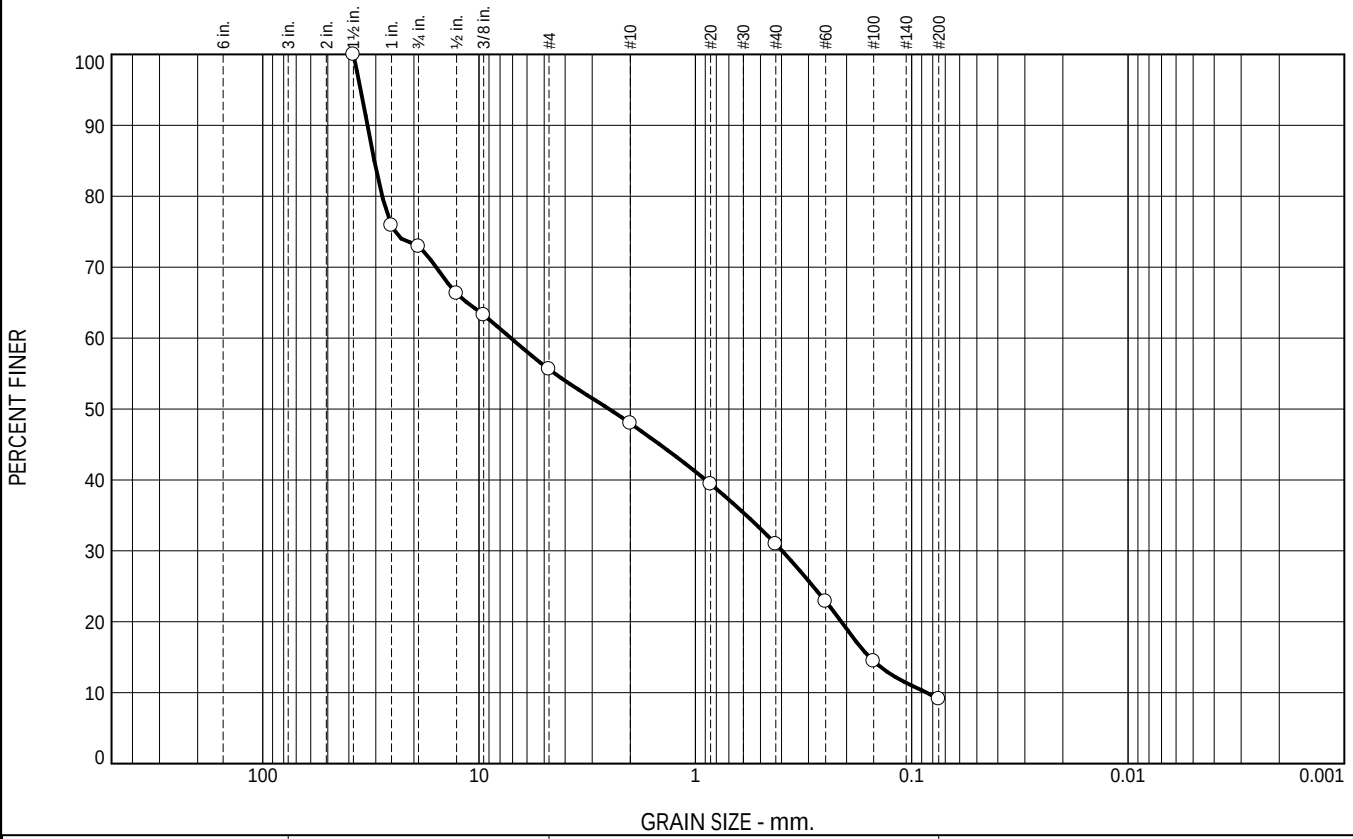
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	27.1	17.3	7.6	17.0	21.9	9.1	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	75.9		
3/4"	72.9		
1/2"	66.3		
3/8"	63.3		
#4	55.6		
#10	48.0		
#20	39.4		
#40	31.0		
#60	22.9		
#100	14.5		
#200	9.1		

* (no specification provided)

Soil Description

Dark Grey poorly graded sand with silty clay and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 32.7918 D_{85}= 30.4665 D_{60}= 7.1208
D_{50}= 2.5074 D_{30}= 0.3971 D_{15}= 0.1565
D_{10}= 0.0853 C_u= 83.46 C_c= 0.26

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample visually classified as plastic. Sample rolled to 1/4"

Source of Sample: Boring 23-M-B014 Depth: 4-6'
Sample Number: CEC-2-2 / S-3

Date: 12.18.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Figure 23-S-B1107

Tested By: AF / SF Checked By: Andrew Flanagan

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Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	5.4	19.8	69.5	5.3	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	94.6		
#20	90.1		
#40	74.8		
#60	47.1		
#100	21.8		
#200	5.3		

* (no specification provided)

Soil Description

Grey poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.8430 D_{85}= 0.6159 D_{60}= 0.3153
D_{50}= 0.2641 D_{30}= 0.1806 D_{15}= 0.1191
D_{10}= 0.0938 C_u= 3.36 C_c= 1.10

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Sample received with standing water.

Source of Sample: Boring 23-M-B014 Depth: 8-10'
Sample Number: CEC-2-2 / S-5 Date: 12.18.23

Thielsch Engineering Inc.	Client: Civil & Environmental Consultants, Inc
Cranston, RI	Project: MassCEC Expansion New Bedford, MA
	Project No: 332-344 Figure 23-S-B1108

Tested By: AF / SF Checked By: Andrew Flanagan

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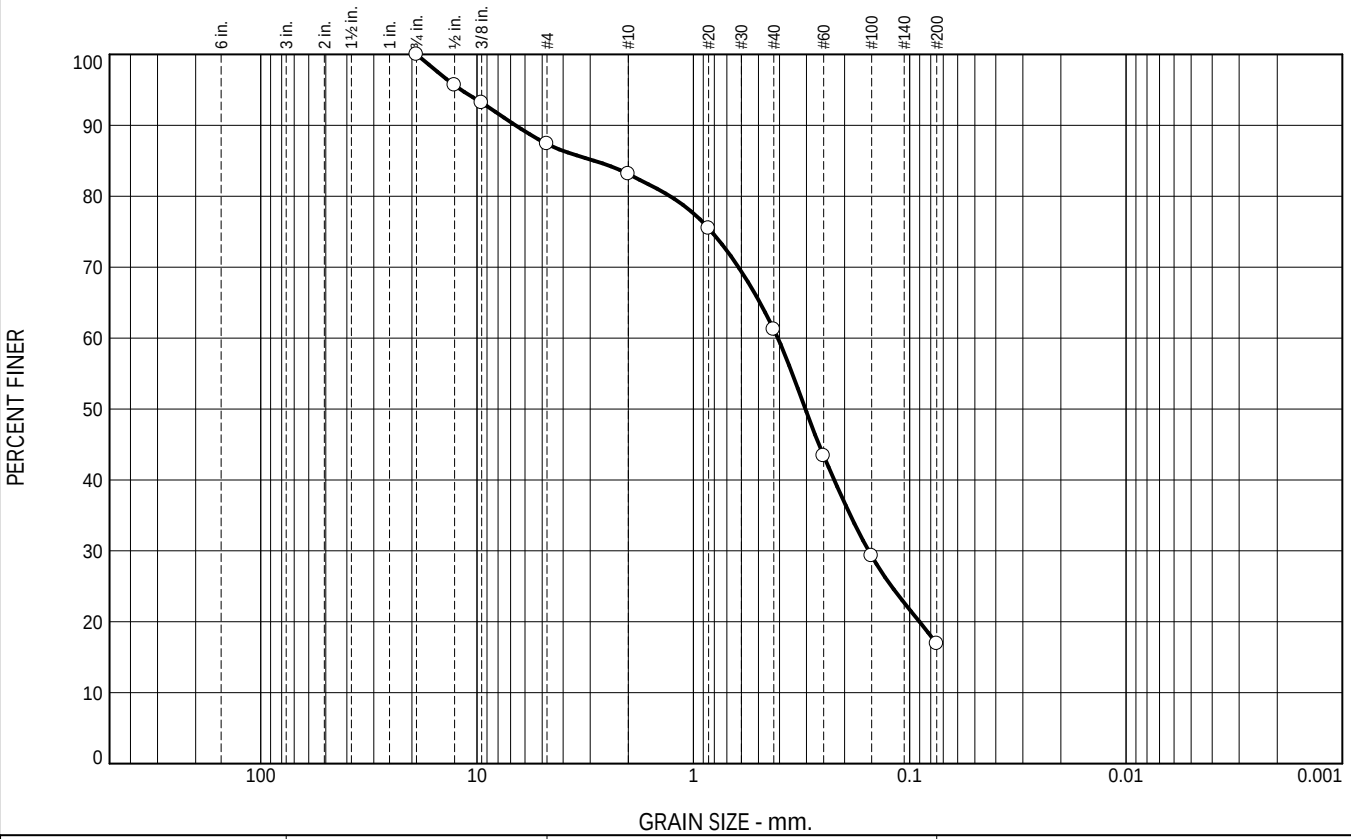
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.6	4.3	21.9	44.3	16.9	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	95.7		
3/8"	93.2		
#4	87.4		
#10	83.1		
#20	75.5		
#40	61.2		
#60	43.4		
#100	29.3		
#200	16.9		

* (no specification provided)

Soil Description

Brown silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 6.6305 D_{85}= 2.8636 D_{60}= 0.4069
D_{50}= 0.3037 D_{30}= 0.1547 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: Boring 23-M-B014 Depth: 2.25-4.25'
Sample Number: CEC-3-2 / S-2 Date: 12.18.23

Thielsch Engineering Inc.	Client: Civil & Environmental Consultants, Inc
Cranston, RI	Project: MassCEC Expansion New Bedford, MA
	Project No: 332-344 Figure 23-S-B1109

Tested By: AF / SF Checked By: Andrew Flanagan

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Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.3	1.2	12.5	56.2	21.8	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	95.1		
3/8"	94.2		
#4	91.7		
#10	90.5		
#20	88.1		
#40	78.0		
#60	65.5		
#100	45.7		
#200	21.8		

* (no specification provided)

Soil Description

Grey silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 1.3281 D_{85}= 0.6440 D_{60}= 0.2144
D_{50}= 0.1678 D_{30}= 0.0956 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: Boring 23-M-B014 Depth: 12-14'
Sample Number: CEC-3-2 / S-7 Date: 12.18.23

Thielsch Engineering Inc.	Client: Civil & Environmental Consultants, Inc
Cranston, RI	Project: MassCEC Expansion New Bedford, MA
	Project No: 332-344 Figure 23-S-B1110

Tested By: AF / SF Checked By: Andrew Flanagan

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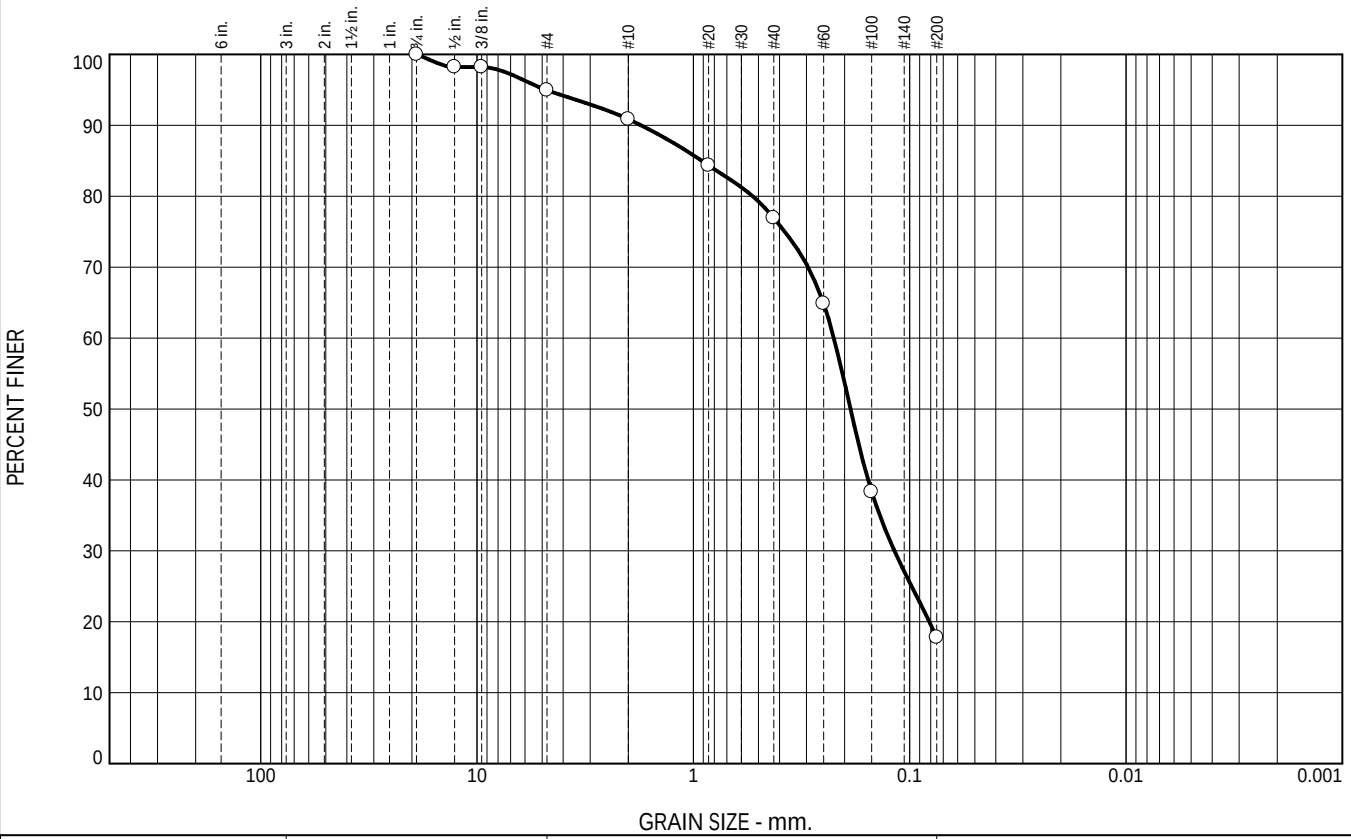
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.0	4.1	14.0	59.1	17.8	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	98.2		
3/8"	98.2		
#4	95.0		
#10	90.9		
#20	84.3		
#40	76.9		
#60	64.9		
#100	38.3		
#200	17.8		

* (no specification provided)

Soil Description

Brown silty sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.7459 D_{85}= 0.9136 D_{60}= 0.2242
D_{50}= 0.1877 D_{30}= 0.1177 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: Boring 23-M-B014 Depth: 2-4'
Sample Number: CEC-4-2 / S-2

Date: 12.18.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Figure 23-S-B1111

Tested By: AF / SF Checked By: Andrew Flanagan

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Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.5	31.2	7.1	19.9	21.7	10.6	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	90.5		
1/2"	71.5		
3/8"	65.9		
#4	59.3		
#10	52.2		
#20	41.8		
#40	32.3		
#60	23.3		
#100	16.4		
#200	10.6		

* (no specification provided)

Soil Description

Dark Grey poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 18.8373 D_{85}= 16.9252 D_{60}= 5.1552
D_{50}= 1.6315 D_{30}= 0.3700 D_{15}= 0.1305
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample contains twigs.

Source of Sample: Boring 23-M-B014 Depth: 6-7.75'
Sample Number: CEC-6-2 / S-4 Date: 12.18.23

Thielsch Engineering Inc.	Client: Civil & Environmental Consultants, Inc
Cranston, RI	Project: MassCEC Expansion New Bedford, MA
	Project No: 332-344 Figure 23-S-B1112

Tested By: AF / SF Checked By: Andrew Flanagan

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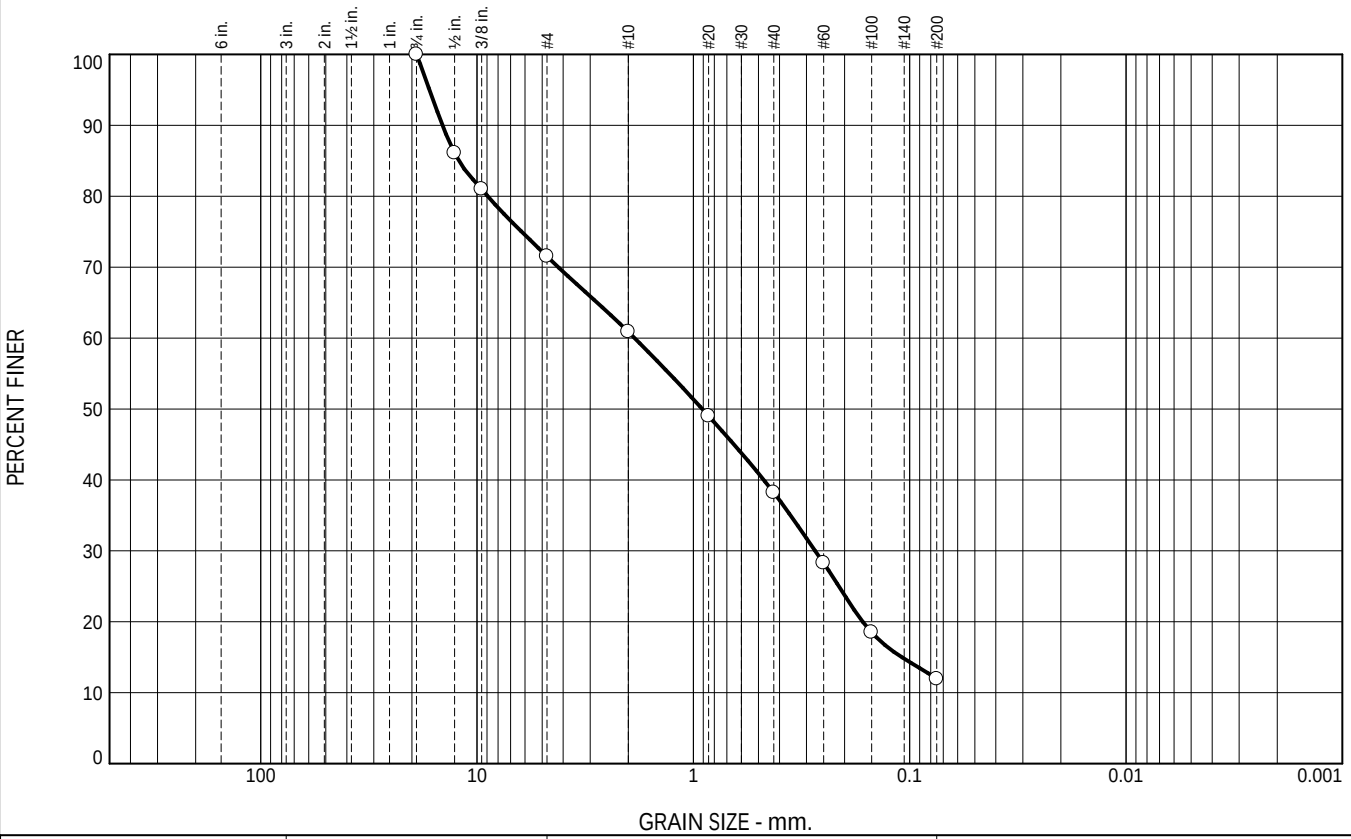
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	28.5	10.6	22.7	26.3	11.9	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	86.1		
3/8"	81.0		
#4	71.5		
#10	60.9		
#20	49.0		
#40	38.2		
#60	28.3		
#100	18.5		
#200	11.9		

* (no specification provided)

Soil Description

Brown poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 14.4385 D_{85}= 12.1294 D_{60}= 1.8701
D_{50}= 0.9094 D_{30}= 0.2738 D_{15}= 0.1088
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Source of Sample: Boring 23-M-B014 Depth: 6-8'
Sample Number: CEC-7-2 / S-4

Date: 12.19.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Figure 23-S-B1113

Tested By: AF / SF Checked By: Andrew Flanagan

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Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.9	20.8	8.3	19.6	27.2	13.2	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	89.1		
1/2"	78.5		
3/8"	76.1		
#4	68.3		
#10	60.0		
#20	50.5		
#40	40.4		
#60	29.6		
#100	21.0		
#200	13.2		

* (no specification provided)

Soil Description

Brown silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 19.5747 D_{85}= 16.6788 D_{60}= 1.9972
D_{50}= 0.8188 D_{30}= 0.2555 D_{15}= 0.0884
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: Boring 23-M-B014 Depth: 4-6'
Sample Number: CEC-8-2 / S-3

Date: 12.19.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Figure 23-S-B1114

Tested By: AF / SF Checked By: Andrew Flanagan

ATTACHMENT 6

MULTI-LAYER BEARING CAPACITY CALCULATIONS

CEC Project Number	**332-344**	
Performed by:	**GSS**	**9/19/2024**
Checked by:	**TES**	**10/18/2024**

Bearing Capacity Calculation			
Variable		**Value**	**Units**
Foundation Size			
Foundation Length	L	50	ft
Foundation Width	B	3	ft
Foundation Depth	D_f	0	ft
Top Layer - Soil Properties			
Layer Thickness	H	3	ft
Unit Weight	γ_1	140	pcf
Cohesion	c_1	0	psf
Friction Angle	ϕ_1	40	deg.
Bearing Capacity Factor (cohesion)	N_{c1}	75.31	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 1}$	109.41	--
Bearing Capacity Factor (friction angle)	N_{q1}	64.20	--
Bearing Capacity Factor Ratio	N_{q1}/N_{c1}	0.85	--
Shape Factor (cohesion)	F_{cs1}	1.051	--
Shape Factor (unit weight)	$F_{\gamma s1}$	0.976	--
Shape Factor (friction Angle)	F_{qs1}	1.050	--
Bottom Layer - Soil Properties			
Unit Weight	γ_2	130	pcf
Undrained Shear Strength	c_2	0	psf
Friction Angle	ϕ_2	30	deg.
Bearing Capacity Factor (cohesion)	N_{c2}	30.14	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 2}$	22.40	--
Bearing Capacity Factor (friction angle)	N_{q2}	18.40	--
Bearing Capacity Factor Ratio	N_{q2}/N_{c2}	0.61	--
Shape Factor (cohesion)	F_{cs2}	1.037	--
Shape Factor (unit weight)	$F_{\gamma s2}$	0.976	--
Shape Factor (friction Angle)	F_{qs2}	1.035	--
Intermediate Calculations			
Bearing Capacity of homogeneous top layer	q_1	22,976.2	psf
Bearing Capacity of homogeneous bottom layer	q_2	4,368.5	psf
Ratio	q_2/q_1	0.19	--
Adhesion Ratio (Fig. 3.22)	c_a/c_1	0.8	--
Punching Shear Coefficient (Fig. 3.21)	K_s	3.1	--
Adhesion Coefficient	c_a	0	psf
Ultimate Bearing Capacity - Bottom Layer	q_b	12,259.8	psf
Ultimate Bearing Capacity - Top Layer	q_t	22,424.8	psf
Results			
Ultimate Bearing Capacity	q_u	**12,997.9**	**psf**
Is $q_u < q_t$?	**--**	**YES**	**--**
Required Bearing Pressure	**P**	**4,100**	**psf**
Factor of Safety	**FS**	**3.17**	**--**

CEC Project Number	**332-344**	
Performed by:	**GSS**	**9/19/2024**
Checked by:	**TES**	**10/18/2024**

Bearing Capacity Calculation			
Variable		**Value**	**Units**
Foundation Size			
Foundation Length	L	50	ft
Foundation Width	B	5	ft
Foundation Depth	D_f	0	ft
Top Layer - Soil Properties			
Layer Thickness	H	3	ft
Unit Weight	γ_1	140	pcf
Cohesion	c_1	0	psf
Friction Angle	ϕ_1	40	deg.
Bearing Capacity Factor (cohesion)	N_{c1}	75.31	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 1}$	109.41	--
Bearing Capacity Factor (friction angle)	N_{q1}	64.20	--
Bearing Capacity Factor Ratio	N_{q1}/N_{c1}	0.85	--
Shape Factor (cohesion)	F_{cs1}	1.085	--
Shape Factor (unit weight)	$F_{\gamma s1}$	0.960	--
Shape Factor (friction Angle)	F_{qs1}	1.084	--
Bottom Layer - Soil Properties			
Unit Weight	γ_2	130	pcf
Undrained Shear Strength	c_2	0	psf
Friction Angle	ϕ_2	30	deg.
Bearing Capacity Factor (cohesion)	N_{c2}	30.14	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 2}$	22.40	--
Bearing Capacity Factor (friction angle)	N_{q2}	18.40	--
Bearing Capacity Factor Ratio	N_{q2}/N_{c2}	0.61	--
Shape Factor (cohesion)	F_{cs2}	1.061	--
Shape Factor (unit weight)	$F_{\gamma s2}$	0.960	--
Shape Factor (friction Angle)	F_{qs2}	1.058	--
Intermediate Calculations			
Bearing Capacity of homogeneous top layer	q_1	38,293.7	psf
Bearing Capacity of homogeneous bottom layer	q_2	7,280.8	psf
Ratio	q_2/q_1	0.19	--
Adhesion Ratio (Fig. 3.22)	c_a/c_1	0.8	--
Punching Shear Coefficient (Fig. 3.21)	K_s	4.2	--
Adhesion Coefficient	c_a	0	psf
Ultimate Bearing Capacity - Bottom Layer	q_b	15,164.3	psf
Ultimate Bearing Capacity - Top Layer	q_t	36,761.9	psf
Results			
Ultimate Bearing Capacity	q_u	**15,721.2**	**psf**
Is $q_u < q_t$?	**--**	**YES**	**--**
Required Bearing Pressure	**P**	**4,100**	**psf**
Factor of Safety	**FS**	**3.83**	**--**

CEC Project Number	**332-344**	
Performed by:	**GSS**	**9/19/2024**
Checked by:	**TES**	**10/18/2024**

Bearing Capacity Calculation			
Variable		**Value**	**Units**
Foundation Size			
Foundation Length	L	50	ft
Foundation Width	B	10	ft
Foundation Depth	D_f	0	ft
Top Layer - Soil Properties			
Layer Thickness	H	3	ft
Unit Weight	γ_1	140	pcf
Cohesion	c_1	0	psf
Friction Angle	ϕ_1	40	deg.
Bearing Capacity Factor (cohesion)	N_{c1}	75.31	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 1}$	109.41	--
Bearing Capacity Factor (friction angle)	N_{q1}	64.20	--
Bearing Capacity Factor Ratio	N_{q1}/N_{c1}	0.85	--
Shape Factor (cohesion)	F_{cs1}	1.170	--
Shape Factor (unit weight)	$F_{\gamma s1}$	0.920	--
Shape Factor (friction Angle)	F_{qs1}	1.168	--
Bottom Layer - Soil Properties			
Unit Weight	γ_2	130	pcf
Undrained Shear Strength	c_2	0	psf
Friction Angle	ϕ_2	30	deg.
Bearing Capacity Factor (cohesion)	N_{c2}	30.14	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 2}$	22.40	--
Bearing Capacity Factor (friction angle)	N_{q2}	18.40	--
Bearing Capacity Factor Ratio	N_{q2}/N_{c2}	0.61	--
Shape Factor (cohesion)	F_{cs2}	1.122	--
Shape Factor (unit weight)	$F_{\gamma s2}$	0.920	--
Shape Factor (friction Angle)	F_{qs2}	1.115	--
Intermediate Calculations			
Bearing Capacity of homogeneous top layer	q_1	76,587.4	psf
Bearing Capacity of homogeneous bottom layer	q_2	14,561.6	psf
Ratio	q_2/q_1	0.19	--
Adhesion Ratio (Fig. 3.22)	c_a/c_1	0.8	--
Punching Shear Coefficient (Fig. 3.21)	K_s	4.2	--
Adhesion Coefficient	c_a	0	psf
Ultimate Bearing Capacity - Bottom Layer	q_b	22,017.6	psf
Ultimate Bearing Capacity - Top Layer	q_t	70,460.4	psf
Results			
Ultimate Bearing Capacity	q_u	**22,130.4**	**psf**
Is $q_u < q_t$?	**--**	**YES**	**--**
Required Bearing Pressure	**P**	**4,100**	**psf**
Factor of Safety	**FS**	**5.40**	**--**

CEC Project Number	**332-344**	
Performed by:	**GSS**	**9/19/2024**
Checked by:	**TES**	**10/18/2024**

Bearing Capacity Calculation			
Variable		**Value**	**Units**
Foundation Size			
Foundation Length	L	5	ft
Foundation Width	B	5	ft
Foundation Depth	D_f	0	ft
Top Layer - Soil Properties			
Layer Thickness	H	3	ft
Unit Weight	γ_1	140	pcf
Cohesion	c_1	0	psf
Friction Angle	ϕ_1	40	deg.
Bearing Capacity Factor (cohesion)	N_{c1}	75.31	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 1}$	109.41	--
Bearing Capacity Factor (friction angle)	N_{q1}	64.20	--
Bearing Capacity Factor Ratio	N_{q1}/N_{c1}	0.85	--
Shape Factor (cohesion)	F_{cs1}	1.852	--
Shape Factor (unit weight)	$F_{\gamma s1}$	0.600	--
Shape Factor (friction Angle)	F_{qs1}	1.839	--
Bottom Layer - Soil Properties			
Unit Weight	γ_2	130	pcf
Undrained Shear Strength	c_2	0	psf
Friction Angle	ϕ_2	30	deg.
Bearing Capacity Factor (cohesion)	N_{c2}	30.14	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 2}$	22.40	--
Bearing Capacity Factor (friction angle)	N_{q2}	18.40	--
Bearing Capacity Factor Ratio	N_{q2}/N_{c2}	0.61	--
Shape Factor (cohesion)	F_{cs2}	1.611	--
Shape Factor (unit weight)	$F_{\gamma s2}$	0.600	--
Shape Factor (friction Angle)	F_{qs2}	1.577	--
Intermediate Calculations			
Bearing Capacity of homogeneous top layer	q_1	38,293.7	psf
Bearing Capacity of homogeneous bottom layer	q_2	7,280.8	psf
Ratio	q_2/q_1	0.19	--
Adhesion Ratio (Fig. 3.22)	c_a/c_1	0.8	--
Punching Shear Coefficient (Fig. 3.21)	K_s	4.2	--
Adhesion Coefficient	c_a	0	psf
Ultimate Bearing Capacity - Bottom Layer	q_b	16,559.0	psf
Ultimate Bearing Capacity - Top Layer	q_t	22,976.2	psf
Results			
Ultimate Bearing Capacity	q_u	**17,915.2**	**psf**
Is $q_u < q_t$?	**--**	**YES**	**--**
Required Bearing Pressure	**P**	**4,100**	**psf**
Factor of Safety	**FS**	**4.37**	**--**

CEC Project Number	**332-344**	
Performed by:	**GSS**	**9/19/2024**
Checked by:	**TES**	**10/18/2024**

Bearing Capacity Calculation			
Variable		**Value**	**Units**
Foundation Size			
Foundation Length	L	10	ft
Foundation Width	B	10	ft
Foundation Depth	D_f	0	ft
Top Layer - Soil Properties			
Layer Thickness	H	3	ft
Unit Weight	γ_1	140	pcf
Cohesion	c_1	0	psf
Friction Angle	ϕ_1	40	deg.
Bearing Capacity Factor (cohesion)	N_{c1}	75.31	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 1}$	109.41	--
Bearing Capacity Factor (friction angle)	N_{q1}	64.20	--
Bearing Capacity Factor Ratio	N_{q1}/N_{c1}	0.85	--
Shape Factor (cohesion)	F_{cs1}	1.852	--
Shape Factor (unit weight)	$F_{\gamma s1}$	0.600	--
Shape Factor (friction Angle)	F_{qs1}	1.839	--
Bottom Layer - Soil Properties			
Unit Weight	γ_2	130	pcf
Undrained Shear Strength	c_2	0	psf
Friction Angle	ϕ_2	30	deg.
Bearing Capacity Factor (cohesion)	N_{c2}	30.14	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 2}$	22.40	--
Bearing Capacity Factor (friction angle)	N_{q2}	18.40	--
Bearing Capacity Factor Ratio	N_{q2}/N_{c2}	0.61	--
Shape Factor (cohesion)	F_{cs2}	1.611	--
Shape Factor (unit weight)	$F_{\gamma s2}$	0.600	--
Shape Factor (friction Angle)	F_{qs2}	1.577	--
Intermediate Calculations			
Bearing Capacity of homogeneous top layer	q_1	76,587.4	psf
Bearing Capacity of homogeneous bottom layer	q_2	14,561.6	psf
Ratio	q_2/q_1	0.19	--
Adhesion Ratio (Fig. 3.22)	c_a/c_1	0.8	--
Punching Shear Coefficient (Fig. 3.21)	K_s	4.2	--
Adhesion Coefficient	c_a	0	psf
Ultimate Bearing Capacity - Bottom Layer	q_b	20,927.5	psf
Ultimate Bearing Capacity - Top Layer	q_t	45,952.4	psf
Results			
Ultimate Bearing Capacity	q_u	**21,395.6**	**psf**
Is $q_u < q_t$?	**--**	**YES**	**--**
Required Bearing Pressure	**P**	**4,100**	**psf**
Factor of Safety	**FS**	**5.22**	**--**

CEC Project Number	**332-344**	
Performed by:	**GSS**	**9/19/2024**
Checked by:	**TES**	**10/18/2024**

Bearing Capacity Calculation			
Variable		**Value**	**Units**
Foundation Size			
Foundation Length	L	50	ft
Foundation Width	B	50	ft
Foundation Depth	D_f	0	ft
Top Layer - Soil Properties			
Layer Thickness	H	3	ft
Unit Weight	γ_1	140	pcf
Cohesion	c_1	0	psf
Friction Angle	ϕ_1	40	deg.
Bearing Capacity Factor (cohesion)	N_{c1}	75.31	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 1}$	109.41	--
Bearing Capacity Factor (friction angle)	N_{q1}	64.20	--
Bearing Capacity Factor Ratio	N_{q1}/N_{c1}	0.85	--
Shape Factor (cohesion)	F_{cs1}	1.852	--
Shape Factor (unit weight)	$F_{\gamma s1}$	0.600	--
Shape Factor (friction Angle)	F_{qs1}	1.839	--
Bottom Layer - Soil Properties			
Unit Weight	γ_2	130	pcf
Undrained Shear Strength	c_2	0	psf
Friction Angle	ϕ_2	30	deg.
Bearing Capacity Factor (cohesion)	N_{c2}	30.14	--
Bearing Capacity Factor (unit weight)	$N_{\gamma 2}$	22.40	--
Bearing Capacity Factor (friction angle)	N_{q2}	18.40	--
Bearing Capacity Factor Ratio	N_{q2}/N_{c2}	0.61	--
Shape Factor (cohesion)	F_{cs2}	1.611	--
Shape Factor (unit weight)	$F_{\gamma s2}$	0.600	--
Shape Factor (friction Angle)	F_{qs2}	1.577	--
Intermediate Calculations			
Bearing Capacity of homogeneous top layer	q_1	382,936.9	psf
Bearing Capacity of homogeneous bottom layer	q_2	72,808.1	psf
Ratio	q_2/q_1	0.19	--
Adhesion Ratio (Fig. 3.22)	c_a/c_1	0.8	--
Punching Shear Coefficient (Fig. 3.21)	K_s	4.2	--
Adhesion Coefficient	c_a	0	psf
Ultimate Bearing Capacity - Bottom Layer	q_b	55,875.4	psf
Ultimate Bearing Capacity - Top Layer	q_t	229,762.1	psf
Results			
Ultimate Bearing Capacity	q_u	**55,633.0**	**psf**
Is $q_u < q_t$?	**--**	**YES**	**--**
Required Bearing Pressure	**P**	**4,100**	**psf**
Factor of Safety	**FS**	**13.57**	**--**

ATTACHMENT 7

TENSAR PLUS SOFTWARE CALCULATIONS

Detailed Calculations Outline

Input data / Variables:

Loading:

Pressure distribution	Rectangular	
Loaded width, W_1 =	3	ft
Loaded length, L_1 =	50	ft
Max. pressure, P_1 =	4100	psf
Min. pressure, P_2 =	4100	psf
Factor of safety, FS_1 =	3	(Min)
Total track load, P_T =	205000	lb/ft
Eccentric load centroid, Lc =	25	ft
Effective loaded length, L_{eq1} =	50	ft
Applied pressure on platform, Q_1 =	4100	psf

Subgrade:

Friction angle, ϕ'_s =	30	deg
Unit weight, γ_s =	130	pcf
Bearing capacity factor, N_γ =	12.73	
Shape factor S_γ =	1.05	@ B/L = 1
	1	@ B/L = 0

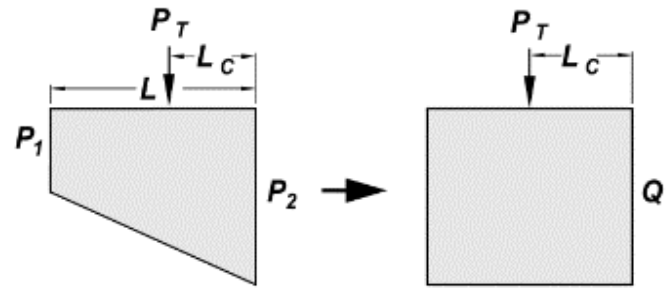
Platform:

Unit weight, $\gamma_{platform}$ =	140	pcf
Stabilized friction angle, $\phi'_{platform,s}$ =	45	deg
Stabilized $N_{\gamma,platform,s}$ =	271.75	
Stabilized $S_{\gamma,s}$ =	1.17	
Stabilized height, H_s =	18	inches
Mobilization factor, M_{max} =	0.91	@ B/L = 1
	1	@ B/L = 0

Groundwater:

Groundwater below existing subgrade, D_w =	6	ft

The pressure may be rectangular, triangular or trapezoidal distribution. The triangular and trapezoidal load distribution are converted to an equivalent uniform pressure distribution for analysis using the method described by Meyerhof (1953) as shown below.



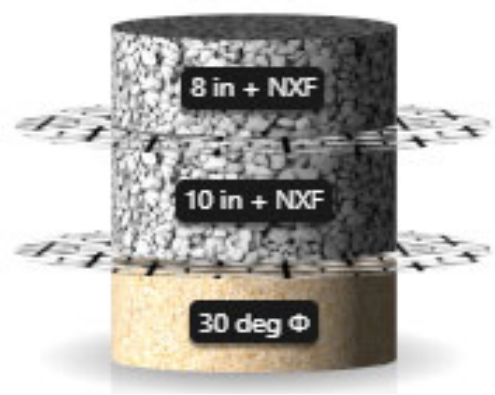
Total track load, $P_T = (P_1 + P_2) * L / 2$

Eccentricity of load centroid, $L_C = L * (P_1 + 2 * P_2) / (3 * (P_1 + P_2))$

Equivalent uniform bearing pressure for use in design, $Q = P_T / (2 * L_C)$

Equivalent track bearing length for use in design, $L_{eq} = 2 * L_C$

Reference: Guide to working platforms: EFFC/DFI Working Platforms Task Group, 1st Edition, December 2019



Calculations / Equations:

Effective subgrade unit weight, γ'_s =	130	pcf
Tvalue, T =	4.48	@ B/L = 1
	7.70	@ B/L = 0
Stabilized platform effective unit weight depth of influence $D_{\gamma,s}$ =	6.00	
Stabilized platform effective unit weight, $\gamma'_{platform}$ =	140	pcf

Stabilized

Calculating ultimate subgrade bearing capacity (q_s)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$
$q_{s1} = 0.5W_1\gamma'_sN_\gamma S_\gamma$	$q_{s0} = 0.5W_1\gamma'_sN_\gamma S_\gamma$
2606.5 psf	2482.4 psf

Calculating ultimate platform bearing capacity (q_u)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$	For W/L_{eq} = 0.06
$q_u/q_{s1} = (1 + TH_s/W_1)^2$	$q_u/q_{s0} = (1 + TH_s/W_1)$	
q_u = 27361.65 psf	q_u = 12034.43	
$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$
= 24899.1 psf	= 12034.4 psf	= 12806.3 psf

Checking bearing capacity of stabilized platform

$q_{u\text{-}MSL} = 0.5 * W * \gamma'_{platform} * N_{\gamma platform,s} * s_{\gamma,s}$

= 66,996.67 psf

Minimum ultimate bearing capacity, $q_{u\text{-}min}$ = 12806.3 psf Minimum of $q_{u\text{-}MSL}$ or q_{u_str}

Factor of safety, $FS_1 = q_{u\text{-}min} / Q$

= 3.12

Detailed Calculations Outline

Input data / Variables:

Loading:

Pressure distribution	Rectangular	
Loaded width, W_1 =	5	ft
Loaded length, L_1 =	50	ft
Max. pressure, P_1 =	4100	psf
Min. pressure, P_2 =	4100	psf
Factor of safety, FS_1 =	3	(Min)
Total track load, P_T =	205000	lb/ft
Eccentric load centroid, Lc =	25	ft
Effective loaded length, L_{eq1} =	50	ft
Applied pressure on platform, Q_1 =	4100	psf

Subgrade:

Friction angle, ϕ'_s =	30	deg
Unit weight, γ_s =	130	pcf
Bearing capacity factor, N_γ =	12.73	
Shape factor S_γ =	1.05	@ B/L = 1
	1	@ B/L = 0

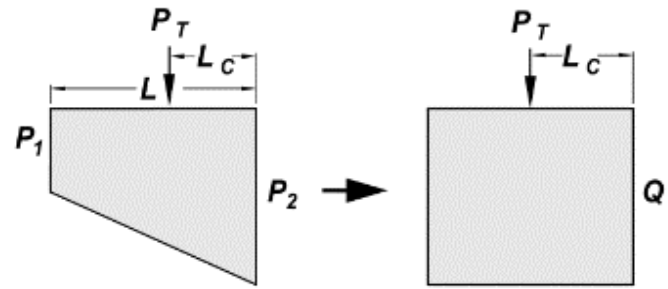
Platform:

Unit weight, $\gamma_{platform}$ =	140	pcf
Stabilized friction angle, $\phi'_{platform,s}$ =	45	deg
Stabilized $N_{\gamma,platform,s}$ =	271.75	
Stabilized $S_{\gamma,s}$ =	1.29	
Stabilized height, H_s =	16	inches
Mobilization factor, M_{max} =	0.91	@ B/L = 1
	1	@ B/L = 0

Groundwater:

Groundwater below existing subgrade, D_w =	6	ft

The pressure may be rectangular, triangular or trapezoidal distribution. The triangular and trapezoidal load distribution are converted to an equivalent uniform pressure distribution for analysis using the method described by Meyerhof (1953) as shown below.



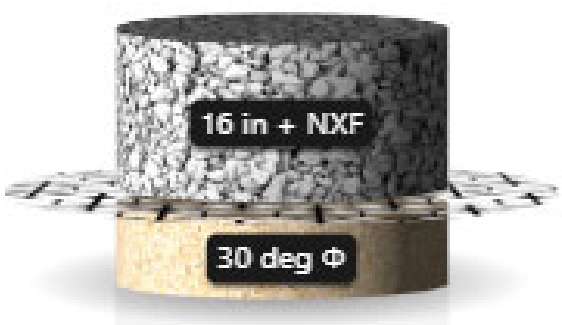
Total track load, $P_T = (P_1 + P_2) * L / 2$

Eccentricity of load centroid, $L_C = L * (P_1 + 2 * P_2) / (3 * (P_1 + P_2))$

Equivalent uniform bearing pressure for use in design, $Q = P_T / (2 * L_C)$

Equivalent track bearing length for use in design, $L_{eq} = 2 * L_C$

Reference: Guide to working platforms: EFFC/DFI Working Platforms Task Group, 1st Edition, December 2019



Calculations / Equations:

Effective subgrade unit weight, γ'_s =	116	pcf
Tvalue, T =	4.77	@ B/L = 1
	8.54	@ B/L = 0
Stabilized platform effective unit weight depth of influence $D_{\gamma,s}$ =	7.67	
Stabilized platform effective unit weight, $\gamma'_{platform}$ =	140	pcf

Stabilized

Calculating ultimate subgrade bearing capacity (q_s)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$
$q_{s1} = 0.5W_1\gamma'_sN_\gamma S_\gamma$	$q_{s0} = 0.5W_1\gamma'_sN_\gamma S_\gamma$
3890.8 psf	3705.5 psf

Calculating ultimate platform bearing capacity (q_u)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$	For W/L_{eq} = 0.10
$q_u/q_{s1} = (1 + TH_s/W_1)^2$	$q_u/q_{s0} = (1 + TH_s/W_1)$	
q_u = 20084.32 psf	q_u = 12144.28	
$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$
= 18276.7 psf	= 12144.3 psf	= 12757.5 psf

Checking bearing capacity of stabilized platform

$q_{u\text{-}MSL} = 0.5 * W * \gamma'_{platform} * N_{\gamma platform,s} * s_{\gamma,s}$
= 122,694.08 psf

Minimum ultimate bearing capacity, $q_{u\text{-}min}$ = 12757.5 psf Minimum of $q_{u\text{-}MSL}$ or q_{u_str}

Factor of safety, $FS_1 = q_{u\text{-}min} / Q$
= 3.11

Detailed Calculations Outline

Input data / Variables:

Loading:

Pressure distribution	Rectangular	
Loaded width, W_1 =	10	ft
Loaded length, L_1 =	50	ft
Max. pressure, P_1 =	4100	psf
Min. pressure, P_2 =	4100	psf
Factor of safety, FS_1 =	3	(Min)
Total track load, P_T =	205000	lb/ft
Eccentric load centroid, Lc =	25	ft
Effective loaded length, L_{eq1} =	50	ft
Applied pressure on platform, Q_1 =	4100	psf

Subgrade:

Friction angle, ϕ'_s =	30	deg
Unit weight, γ_s =	130	pcf
Bearing capacity factor, N_γ =	12.73	
Shape factor S_γ =	1.05	@ B/L = 1
	1	@ B/L = 0

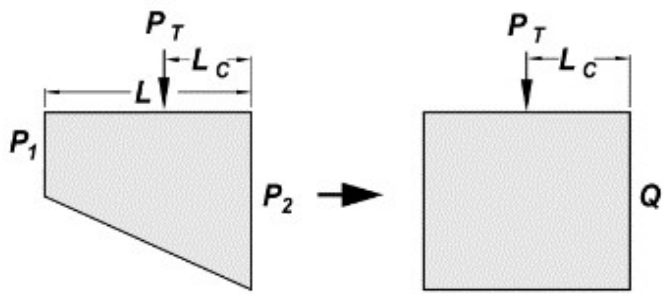
Platform:

Unit weight, $\gamma_{platform}$ =	140	pcf
Stabilized friction angle, $\phi'_{platform,s}$ =	45	deg
Stabilized $N_{\gamma,platform,s}$ =	271.75	
Stabilized $S_{\gamma,s}$ =	1.58	
Stabilized height, H_s =	12	inches
Mobilization factor, M_{max} =	0.91	@ B/L = 1
	1	@ B/L = 0

Groundwater:

Groundwater below existing subgrade, D_w =	6	ft

The pressure may be rectangular, triangular or trapezoidal distribution. The triangular and trapezoidal load distribution are converted to an equivalent uniform pressure distribution for analysis using the method described by Meyerhof (1953) as shown below.



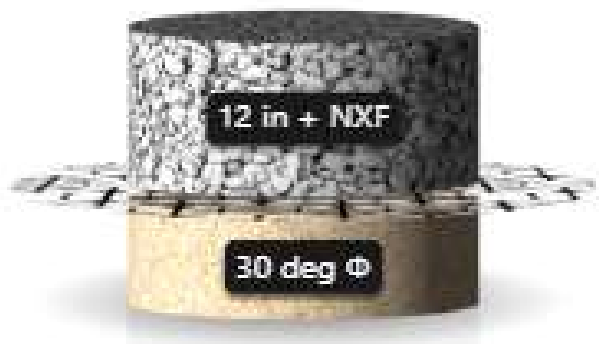
Total track load, $P_T = (P_1 + P_2) * L / 2$

Eccentricity of load centroid, $L_C = L * (P_1 + 2 * P_2) / (3 * (P_1 + P_2))$

Equivalent uniform bearing pressure for use in design, $Q = P_T / (2 * L_C)$

Equivalent track bearing length for use in design, $L_{eq} = 2 * L_C$

Reference: Guide to working platforms: EFFC/DFI Working Platforms Task Group, 1st Edition, December 2019



Calculations / Equations:

Effective subgrade unit weight, γ'_s =	99	pcf
Tvalue, T =	5.30	@ B/L = 1
	10.19	@ B/L = 0
Stabilized platform effective unit weight depth of influence $D_{\gamma,s}$ =	12.00	
Stabilized platform effective unit weight, $\gamma'_{platform}$ =	140	pcf

Stabilized

Calculating ultimate subgrade bearing capacity (q_s)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$
$q_{s1} = 0.5W_1\gamma'_sN_\gamma S_\gamma$	$q_{s0} = 0.5W_1\gamma'_sN_\gamma S_\gamma$
6603.1 psf	6288.6 psf

Calculating ultimate platform bearing capacity (q_u)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$	For W/L_{eq} = 0.20
$q_u/q_{s1} = (1 + TH_s/W_1)^2$	$q_u/q_{s0} = (1 + TH_s/W_1)$	
q_u = 15457.08 psf	q_u = 12696.72	
$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$
= 14065.9 psf	= 12696.7 psf	= 12970.6 psf

Checking bearing capacity of stabilized platform

$q_{u\text{-}MSL} = 0.5 * W * \gamma'_{platform} * N_{\gamma platform,s} * s_{\gamma,s}$

= 300,552.94 psf

Minimum ultimate bearing capacity, $q_{u\text{-}min}$ = 12970.6 psf Minimum of $q_{u\text{-}MSL}$ or q_{u_str}

Factor of safety, FS_1 = $q_{u\text{-}min}$ / Q

= 3.16

Detailed Calculations Outline

Input data / Variables:

Loading:

Pressure distribution	Square	
Loaded width, W_1 =	5	ft
Loaded length, L_1 =	5	ft
Max. pressure, P_1 =	4100	psf
Min. pressure, P_2 =	4100	psf
Factor of safety, FS_1 =	3	(Min)
Total track load, P_T =	20500	lb/ft
Eccentric load centroid, Lc =	2.5	ft
Effective loaded length, L_{eq1} =	5	ft
Applied pressure on platform, Q_1 =	4100	psf

Subgrade:

Friction angle, ϕ'_s =	30	deg
Unit weight, γ_s =	130	pcf
Bearing capacity factor, N_γ =	12.73	
Shape factor S_γ =	1.05	@ B/L = 1
	1	@ B/L = 0

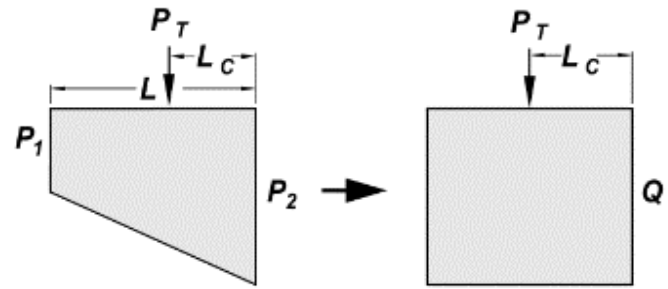
Platform:

Unit weight, $\gamma_{platform}$ =	140	pcf
Stabilized friction angle, $\phi'_{platform,s}$ =	45	deg
Stabilized $N_{\gamma,platform,s}$ =	271.75	
Stabilized $S_{\gamma,s}$ =	3.90	
Stabilized height, H_s =	12	inches
Mobilization factor, M_{max} =	0.91	@ B/L = 1
	1	@ B/L = 0

Groundwater:

Groundwater below existing subgrade, D_w =	6	ft

The pressure may be rectangular, triangular or trapezoidal distribution. The triangular and trapezoidal load distribution are converted to an equivalent uniform pressure distribution for analysis using the method described by Meyerhof (1953) as shown below.



Total track load, $P_T = (P_1 + P_2) * L / 2$

Eccentricity of load centroid, $L_C = L * (P_1 + 2 * P_2) / (3 * (P_1 + P_2))$

Equivalent uniform bearing pressure for use in design, $Q = P_T / (2 * L_C)$

Equivalent track bearing length for use in design, $L_{eq} = 2 * L_C$

Reference: Guide to working platforms: EFFC/DFI Working Platforms Task Group, 1st Edition, December 2019

Calculations / Equations:

Effective subgrade unit weight, γ'_s =	121	pcf
Tvalue, T =	4.67	@ B/L = 1
	8.25	@ B/L = 0
Stabilized platform effective unit weight depth of influence $D_{\gamma,s}$ =	7.00	
Stabilized platform effective unit weight, $\gamma'_{platform}$ =	140	pcf

Stabilized

Calculating ultimate subgrade bearing capacity (q_s)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$
$q_{s1} = 0.5W_1\gamma'_sN_\gamma S_\gamma$	$q_{s0} = 0.5W_1\gamma'_sN_\gamma S_\gamma$
4046.2 psf	3853.6 psf

Calculating ultimate platform bearing capacity (q_u)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$	For W/L_{eq} = 1.00
$q_u/q_{s1} = (1 + TH_s/W_1)^2$	$q_u/q_{s0} = (1 + TH_s/W_1)$	
q_u = 15134.34 psf	q_u = 10211.92	
$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$
= 13772.3 psf	= 10211.9 psf	= 13772.3 psf

Checking bearing capacity of stabilized platform

$q_{u\text{-}MSL} = 0.5 * W * \gamma'_{platform} * N_{\gamma platform,s} * s_{\gamma,s}$
= 370,935.58 psf

Minimum ultimate bearing capacity, $q_{u\text{-}min}$ = 13772.3 psf Minimum of $q_{u\text{-}MSL}$ or q_{u_str}

Factor of safety, $FS_1 = q_{u\text{-}min} / Q$
= 3.36

Detailed Calculations Outline

Input data / Variables:

Loading:

Pressure distribution	Rectangular	
Loaded width, W_1 =	10	ft
Loaded length, L_1 =	10	ft
Max. pressure, P_1 =	4100	psf
Min. pressure, P_2 =	4100	psf
Factor of safety, FS_1 =	3	(Min)
Total track load, P_T =	41000	lb/ft
Eccentric load centroid, Lc =	5	ft
Effective loaded length, L_{eq1} =	10	ft
Applied pressure on platform, Q_1 =	4100	psf

Subgrade:

Friction angle, ϕ'_s =	30	deg
Unit weight, γ_s =	130	pcf
Bearing capacity factor, N_γ =	12.73	
Shape factor S_γ =	1.05	@ B/L = 1
	1	@ B/L = 0

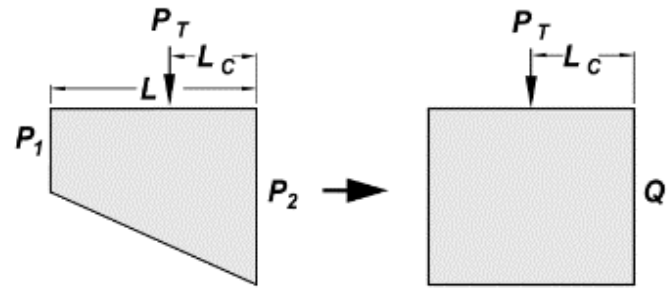
Platform:

Unit weight, $\gamma_{platform}$ =	140	pcf
Stabilized friction angle, $\phi'_{platform,s}$ =	45	deg
Stabilized $N_{\gamma,platform,s}$ =	271.75	
Stabilized $S_{\gamma,s}$ =	3.90	
Stabilized height, H_s =	12	inches
Mobilization factor, M_{max} =	0.91	@ B/L = 1
	1	@ B/L = 0

Groundwater:

Groundwater below existing subgrade, D_w =	6	ft

The pressure may be rectangular, triangular or trapezoidal distribution. The triangular and trapezoidal load distribution are converted to an equivalent uniform pressure distribution for analysis using the method described by Meyerhof (1953) as shown below.



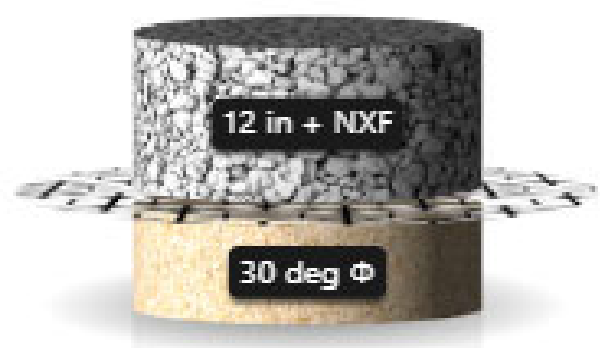
Total track load, $P_T = (P_1 + P_2) * L / 2$

Eccentricity of load centroid, $L_C = L * (P_1 + 2 * P_2) / (3 * (P_1 + P_2))$

Equivalent uniform bearing pressure for use in design, $Q = P_T / (2 * L_C)$

Equivalent track bearing length for use in design, $L_{eq} = 2 * L_C$

Reference: Guide to working platforms: EFFC/DFI Working Platforms Task Group, 1st Edition, December 2019



Calculations / Equations:

Effective subgrade unit weight, γ'_s =	99	pcf
Tvalue, T =	5.30	@ B/L = 1
	10.19	@ B/L = 0
Stabilized platform effective unit weight depth of influence $D_{\gamma,s}$ =	12.00	
Stabilized platform effective unit weight, $\gamma'_{platform}$ =	140	pcf

Stabilized

Calculating ultimate subgrade bearing capacity (q_s)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$
$q_{s1} = 0.5W_1\gamma'_sN_\gamma S_\gamma$	$q_{s0} = 0.5W_1\gamma'_sN_\gamma S_\gamma$
6603.1 psf	6288.6 psf

Calculating ultimate platform bearing capacity (q_u)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$	For W/L_{eq} = 1.00
$q_u/q_{s1} = (1 + TH_s/W_1)^2$	$q_u/q_{s0} = (1 + TH_s/W_1)$	
q_u = 15457.08 psf	q_u = 12696.72	
$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$
= 14065.9 psf	= 12696.7 psf	= 14065.9 psf

Checking bearing capacity of stabilized platform

$q_{u\text{-}MSL} = 0.5 * W * \gamma'_{platform} * N_{\gamma platform,s} * s_{\gamma,s}$

= 741,871.17 psf

Minimum ultimate bearing capacity, $q_{u\text{-}min}$ = 14065.9 psf Minimum of $q_{u\text{-}MSL}$ or q_{u_str}

Factor of safety, $FS_1 = q_{u\text{-}min} / Q$

= 3.43

Detailed Calculations Outline

Input data / Variables:

Loading:

Pressure distribution	Rectangular	
Loaded width, W_1 =	50	ft
Loaded length, L_1 =	50	ft
Max. pressure, P_1 =	4100	psf
Min. pressure, P_2 =	4100	psf
Factor of safety, FS_1 =	3	(Min)
Total track load, P_T =	205000	lb/ft
Eccentric load centroid, Lc =	25	ft
Effective loaded length, L_{eq1} =	50	ft
Applied pressure on platform, Q_1 =	4100	psf

Subgrade:

Friction angle, ϕ'_s =	30	deg
Unit weight, γ_s =	130	pcf
Bearing capacity factor, N_γ =	12.73	
Shape factor S_γ =	1.05	@ B/L = 1
	1	@ B/L = 0

Platform:

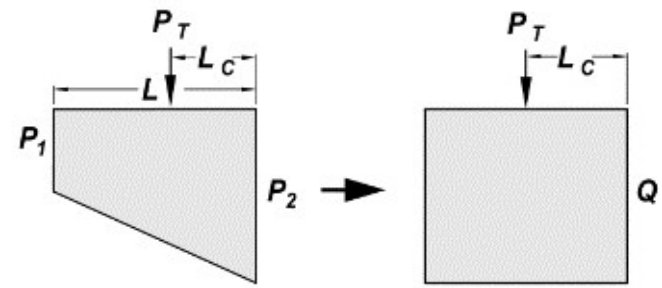
Unit weight, $\gamma_{platform}$ =	140	pcf
Stabilized friction angle, $\phi'_{platform,s}$ =	45	deg
Stabilized $N_{\gamma,platform,s}$ =	271.75	
Stabilized $S_{\gamma,s}$ =	3.90	
Stabilized height, H_s =	12	inches
Mobilization factor, M_{max} =	0.91	@ B/L = 1
	1	@ B/L = 0

Groundwater:

Groundwater below existing subgrade, D_w =	6	ft

Calculations / Equations:

The pressure may be rectangular, triangular or trapezoidal distribution. The triangular and trapezoidal load distribution are converted to an equivalent uniform pressure distribution for analysis using the method described by Meyerhof (1953) as shown below.



Total track load, $P_T = (P_1 + P_2) * L / 2$

Eccentricity of load centroid, $L_C = L * (P_1 + 2 * P_2) / (3 * (P_1 + P_2))$

Equivalent uniform bearing pressure for use in design, $Q = P_T / (2 * L_C)$

Equivalent track bearing length for use in design, $L_{eq} = 2 * L_C$

Reference: Guide to working platforms: EFFC/DFI Working Platforms Task Group, 1st Edition, December 2019

Effective subgrade unit weight, γ'_s =	75	pcf
Tvalue, T =	5.30	@ B/L = 1
	10.19	@ B/L = 0
Stabilized platform effective unit weight depth of influence $D_{\gamma,s}$ =	52.00	
Stabilized platform effective unit weight, $\gamma'_{platform}$ =	140	pcf

Stabilized

Calculating ultimate subgrade bearing capacity (q_s)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$
$q_{s1} = 0.5W_1\gamma'_sN_yS_y$	$q_{s0} = 0.5W_1\gamma'_sN_yS_y$
24995.4 psf	23805.1 psf

Calculating ultimate platform bearing capacity (q_u)

For $W/L_{eq} = 1$	For $W/L_{eq} = 0$	For W/L_{eq} = 1.00
$q_u/q_{s1} = (1 + TH_s/W_1)^2$	$q_u/q_{s0} = (1 + TH_s/W_1)$	
q_u = 30575.22 psf	q_u = 28656.58	
$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$	$q_{u_str} = M_{max} * q_u$
= 27823.4 psf	= 28656.6 psf	= 27823.4 psf

Checking bearing capacity of stabilized platform

$q_{u\text{-}MSL} = 0.5 * W * \gamma'_{platform} * N_{\gamma platform,s} * s_{\gamma,s}$

= 3,709,355.85 psf

Minimum ultimate bearing capacity, $q_{u\text{-}min}$ = 27823.4 psf

Minimum of $q_{u\text{-}MSL}$ or q_{u_str}

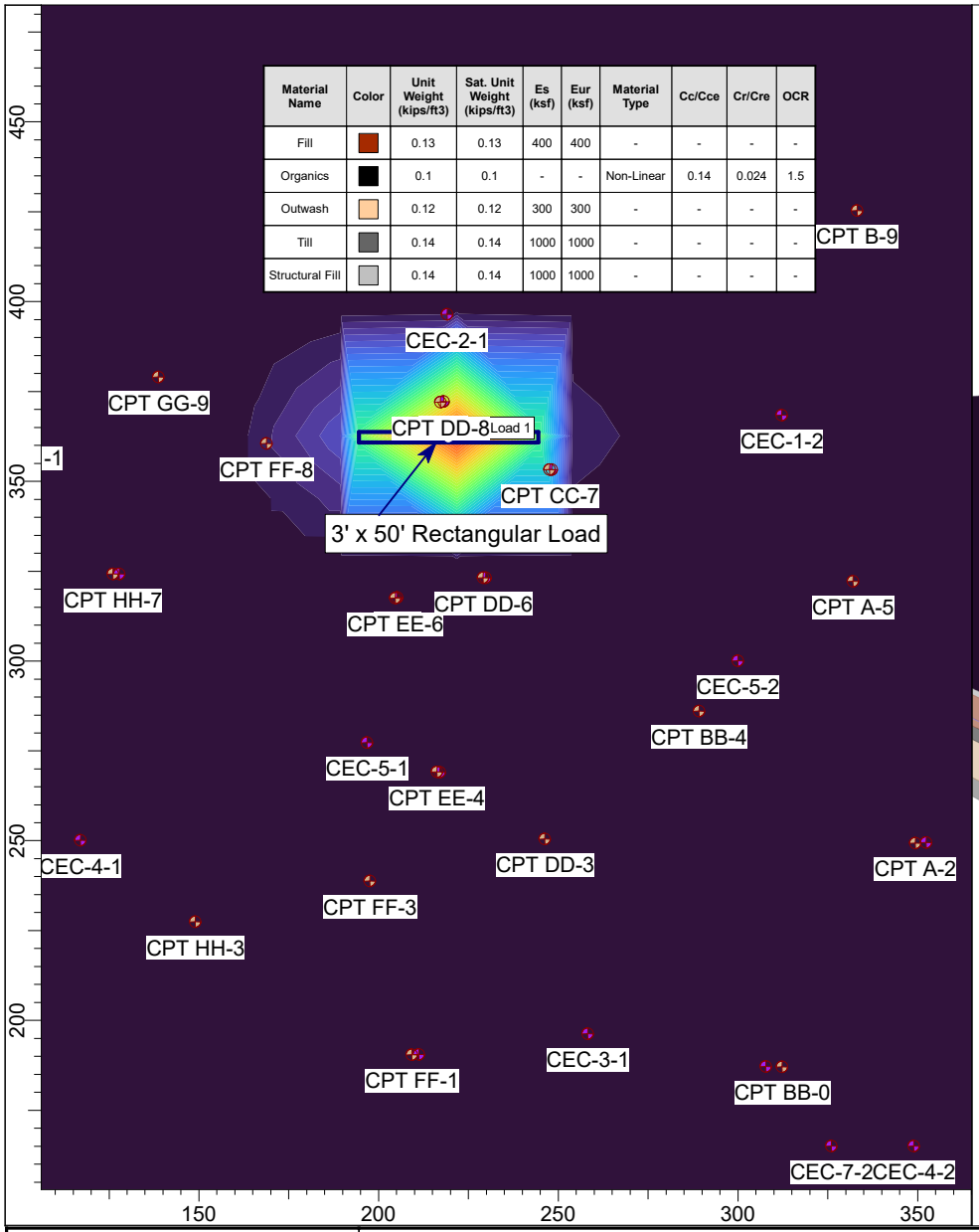
Factor of safety, $FS_1 = q_{u\text{-}min} / Q$

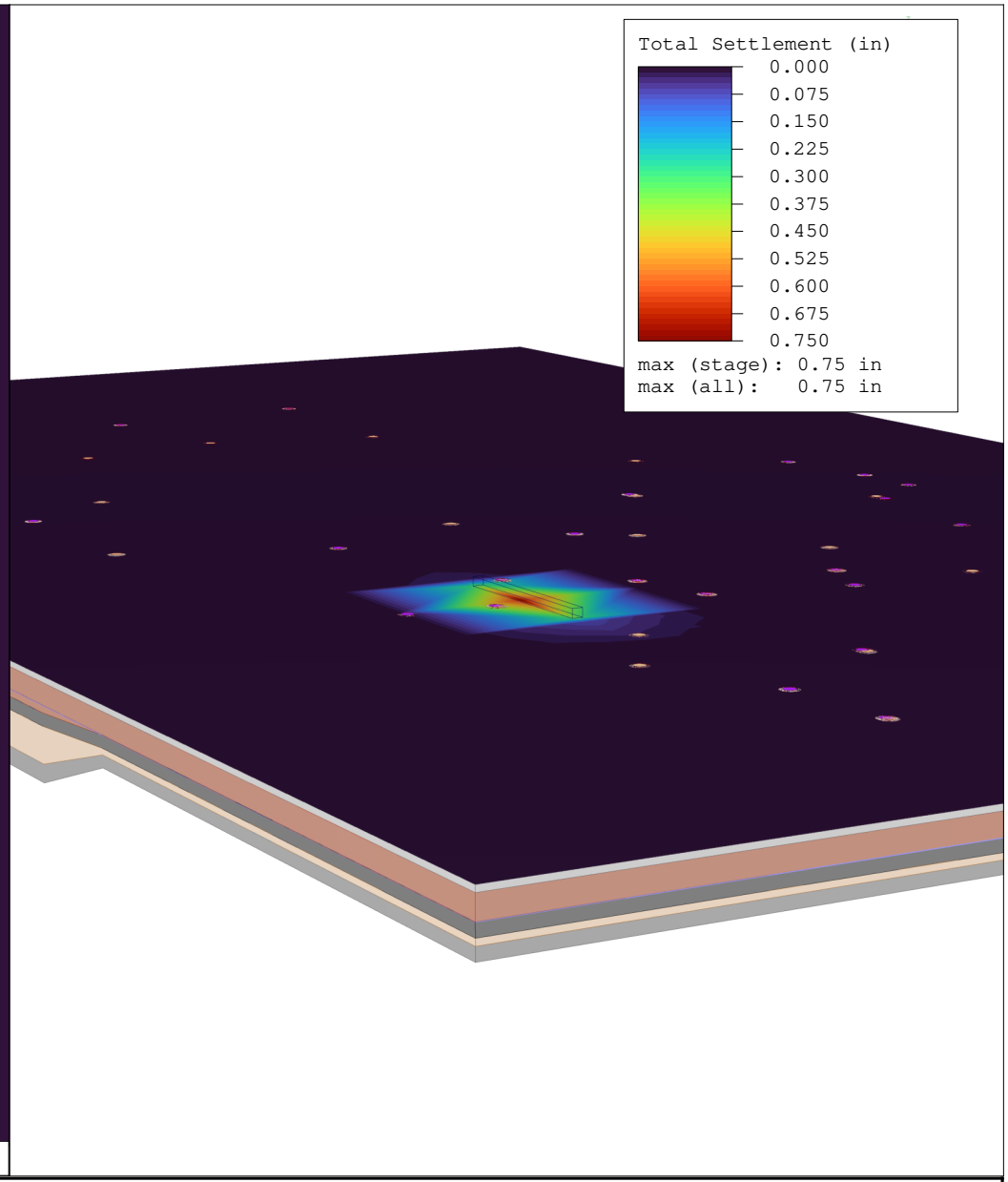
= 6.79

ATTACHMENT 8

SETTLE3 SETTLEMENT EVALUATION

Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)	Material Type	Cc/Cce	Cr/Cre	OCR
Fill		0.13	0.13	400	400	-	-	-	-
Organics		0.1	0.1	-	-	Non-Linear	0.14	0.024	1.5
Outwash		0.12	0.12	300	300	-	-	-	-
Till		0.14	0.14	1000	1000	-	-	-	-
Structural Fill		0.14	0.14	1000	1000	-	-	-	-



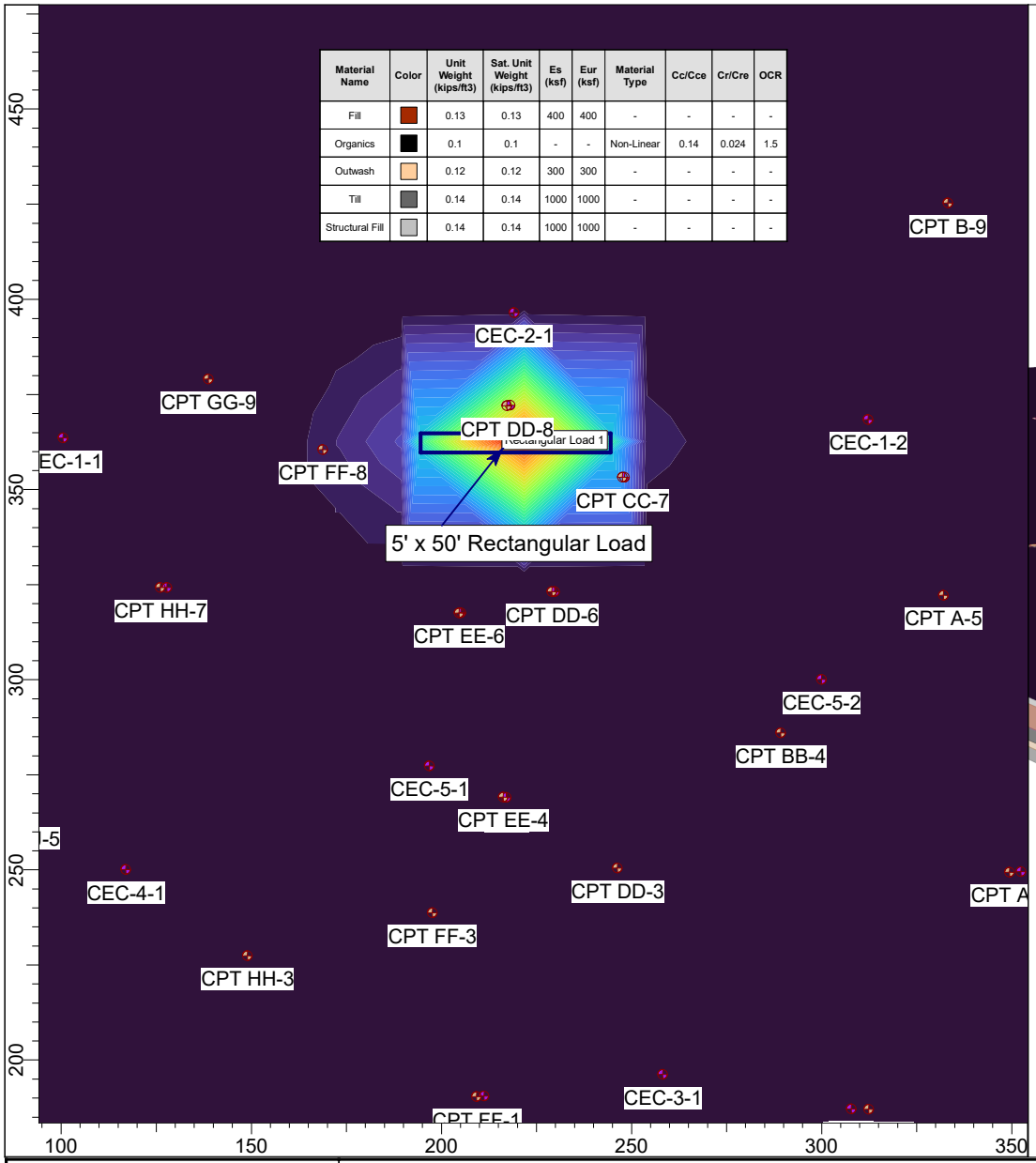


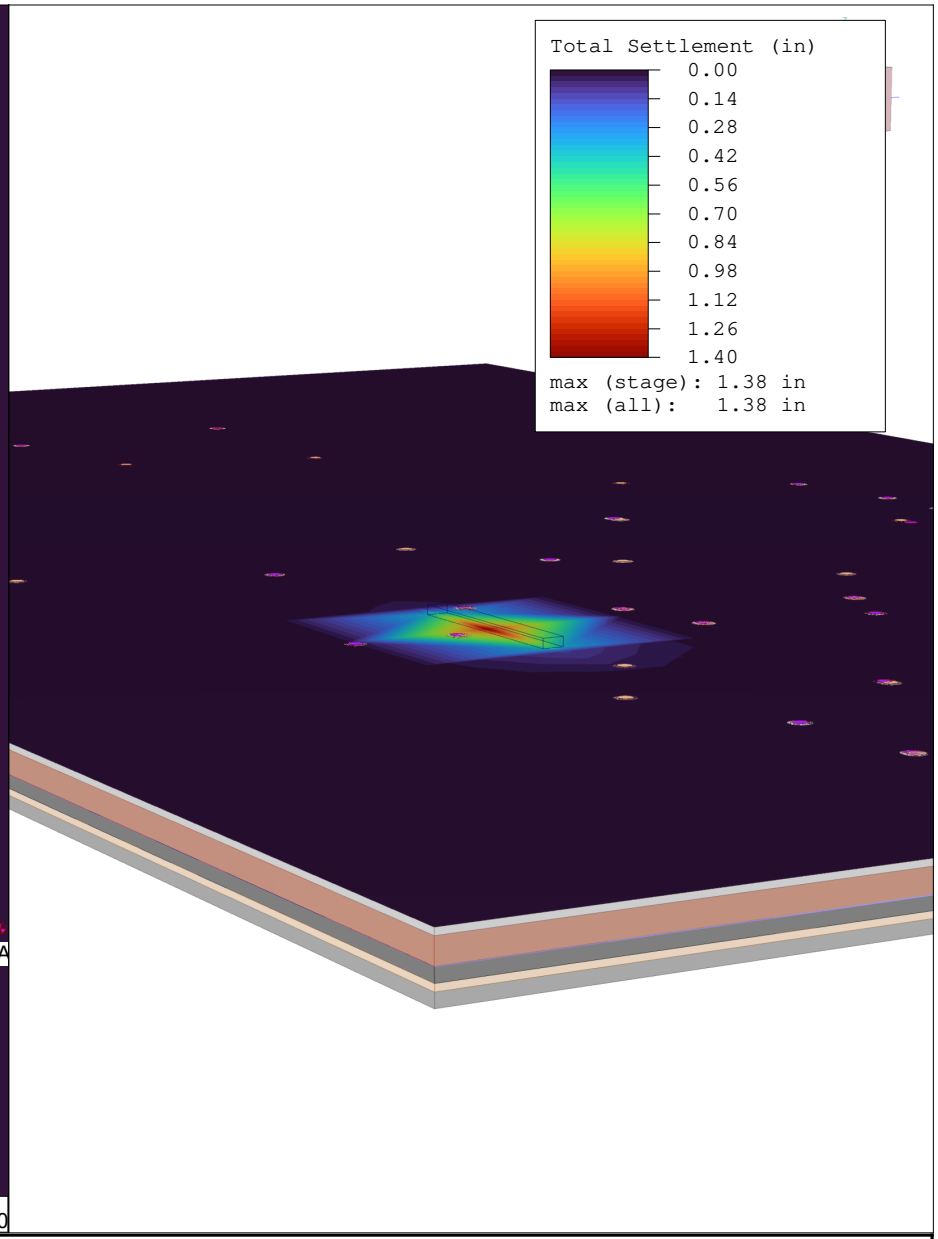
Civil & Environmental Consultants, Inc.

SETTLE3 5.024

Project	MassCEC Heavy Lift Expansion - 18 & 54 Wright St. New Bedford, MA		
Analysis Description	3' x 50' 4,100 psf Load	*Figure*	
Drawn By	TS	*Company*	CEC Inc.
Date	11/22/2024	*File Name*	Heavy Lift Settlement Evaluation 3 x 50.s3z

Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)	Material Type	Cc/Cce	Cr/Cre	OCR
Fill		0.13	0.13	400	400	-	-	-	-
Organics		0.1	0.1	-	-	Non-Linear	0.14	0.024	1.5
Outwash		0.12	0.12	300	300	-	-	-	-
Till		0.14	0.14	1000	1000	-	-	-	-
Structural Fill		0.14	0.14	1000	1000	-	-	-	-

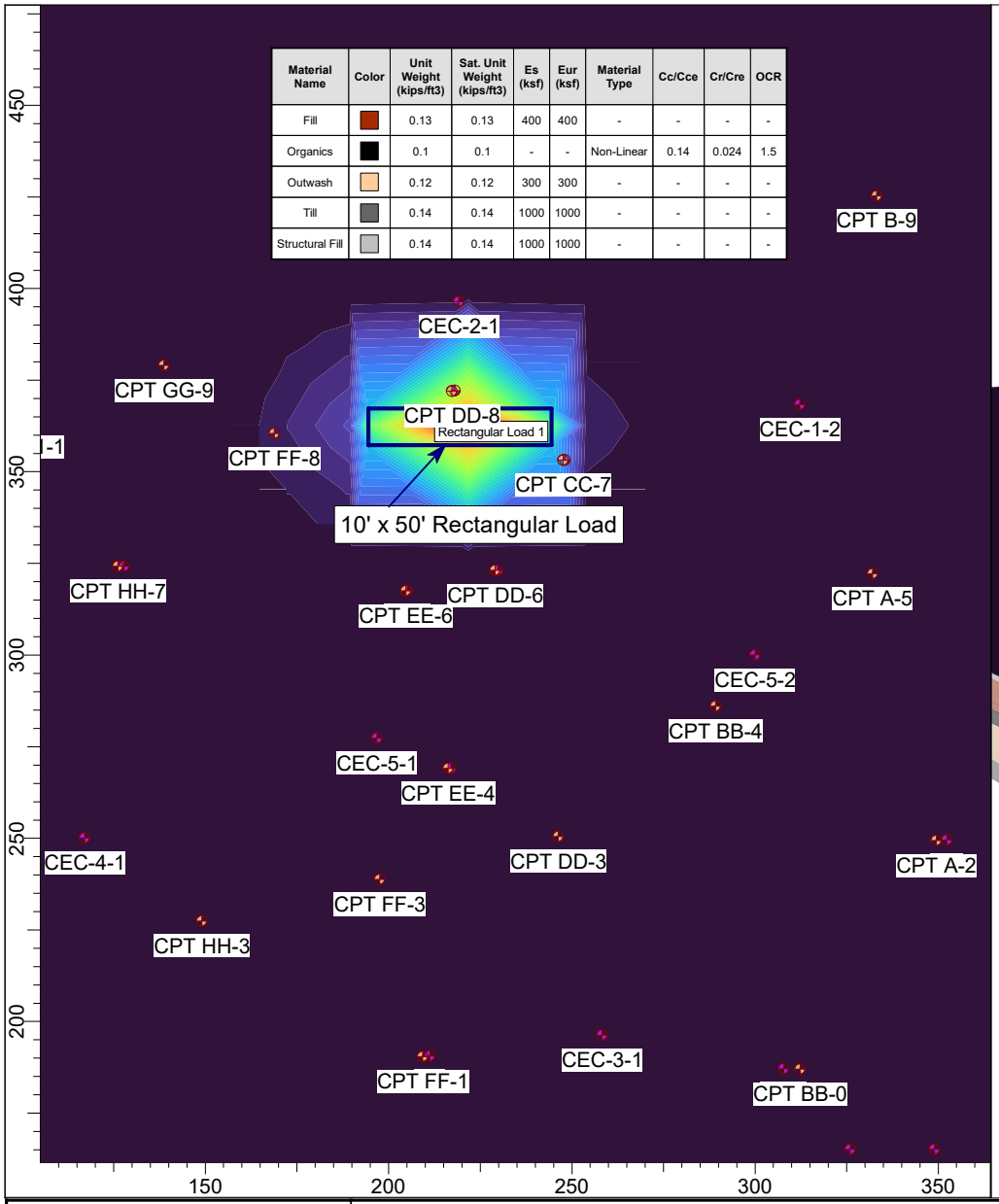




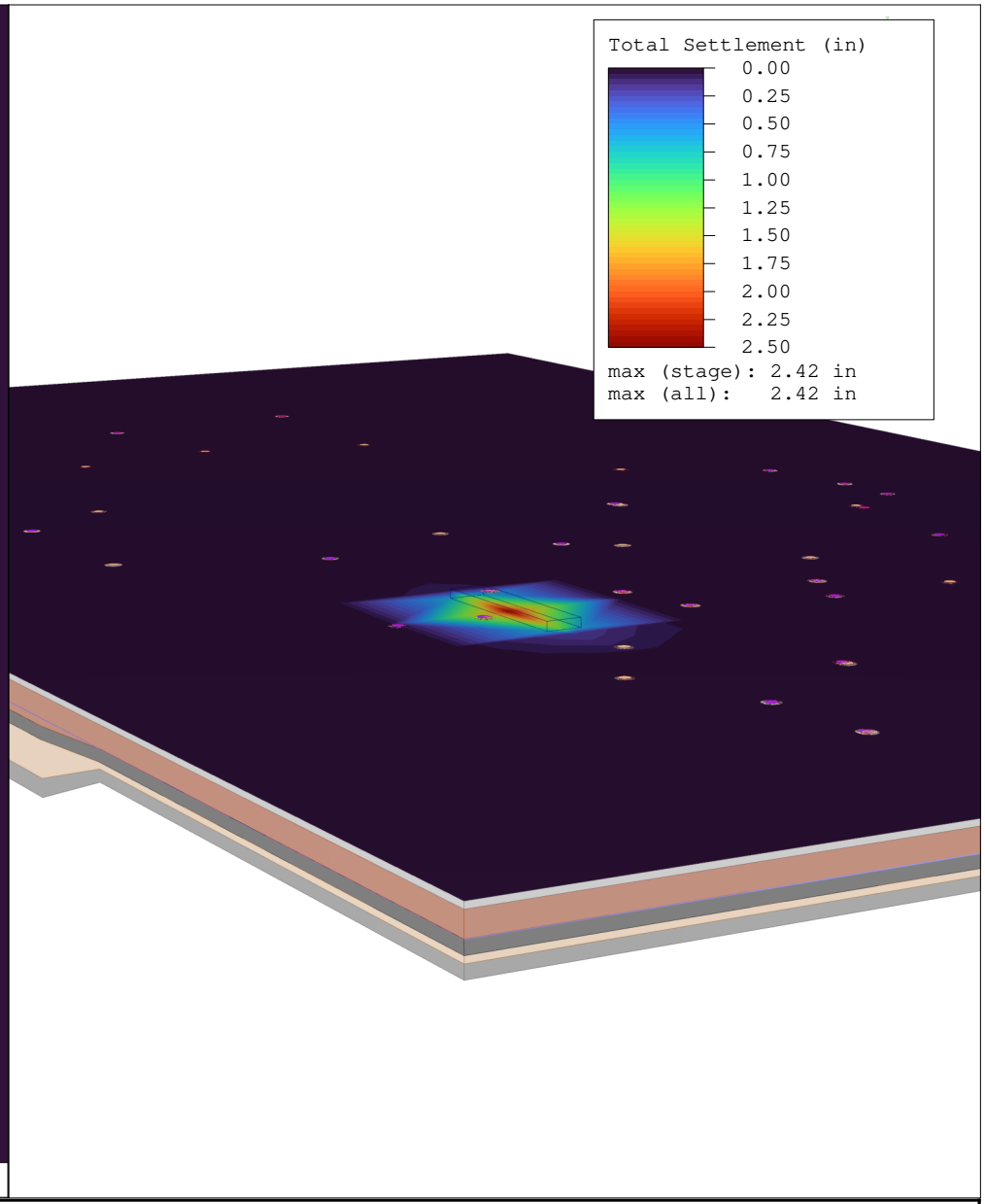
Civil & Environmental Consultants, Inc.

SETTLE3 5.024

Project	MassCEC Heavy Lift Expansion - 18 & 54 Wright St. New Bedford, MA		
Analysis Description	5' x 50' 4,100 psf Load	*Figure*	
Drawn By	TS	*Company*	CEC Inc.
Date	11/22/2024	*File Name*	Heavy Lift Settlement Evaluation 3 x 50.s3z



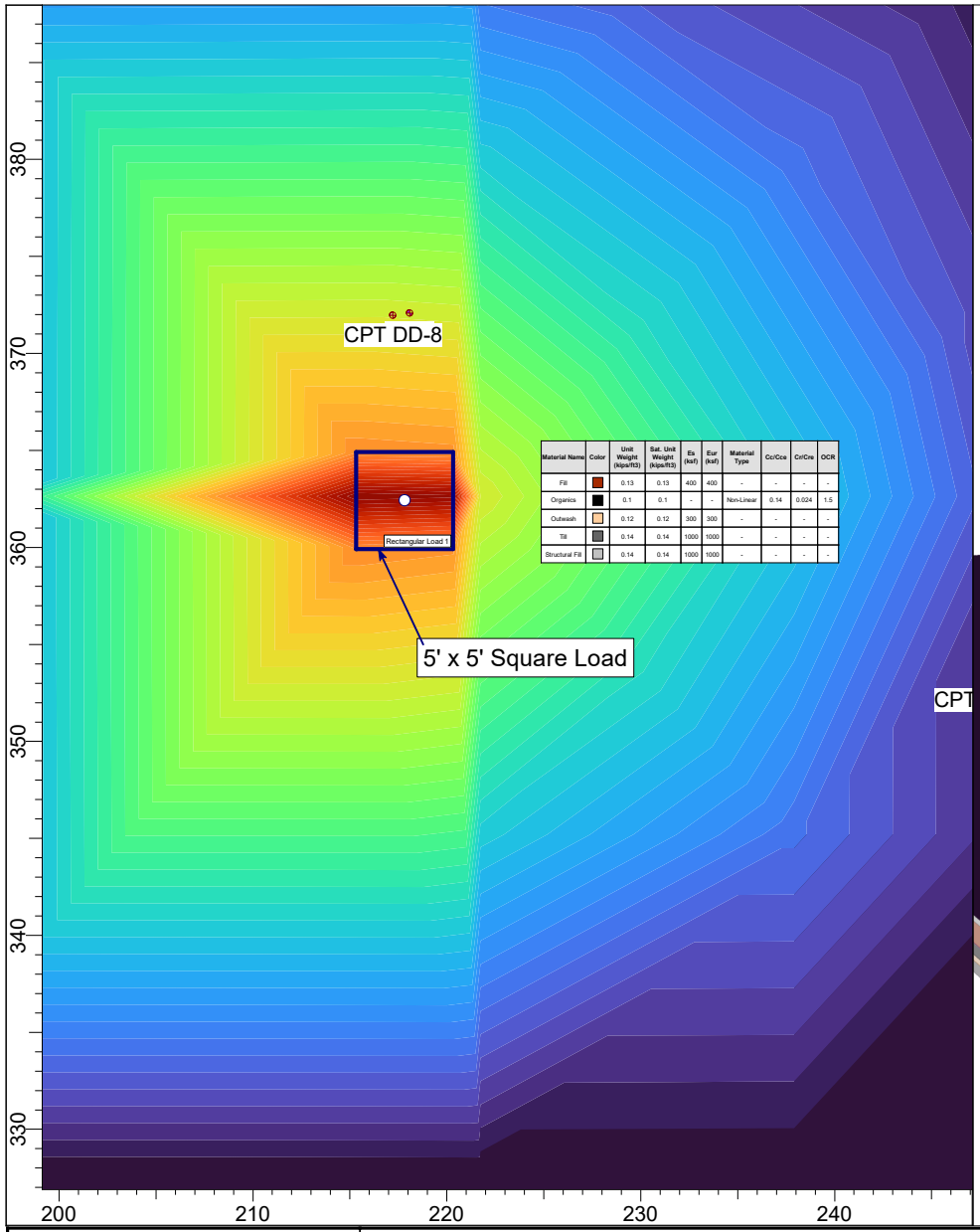
Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)	Material Type	Cc/Cce	Cr/Cre	OCR
Fill		0.13	0.13	400	400	-	-	-	-
Organics		0.1	0.1	-	-	Non-Linear	0.14	0.024	1.5
Outwash		0.12	0.12	300	300	-	-	-	-
Till		0.14	0.14	1000	1000	-	-	-	-
Structural Fill		0.14	0.14	1000	1000	-	-	-	-



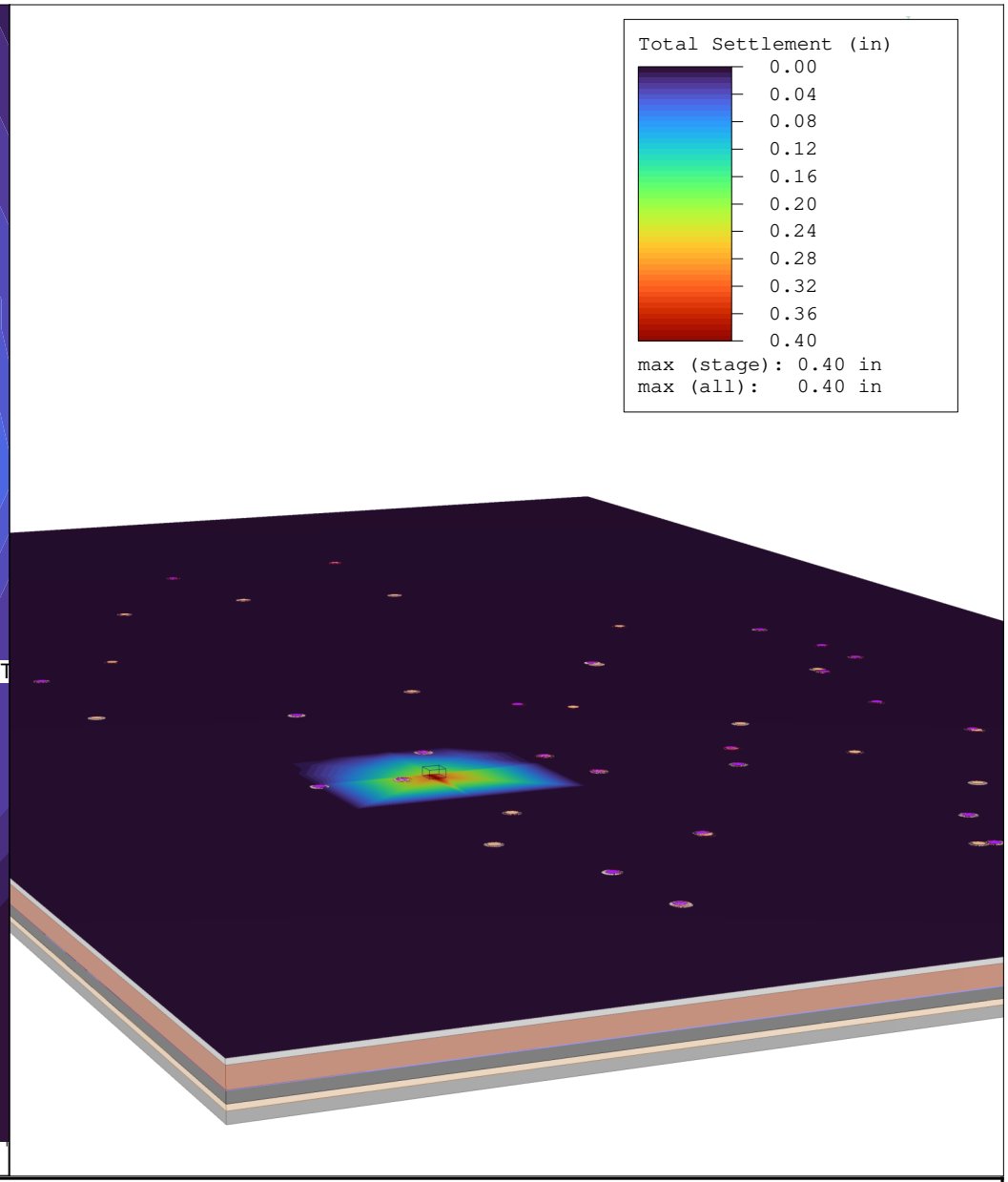
Civil & Environmental Consultants, Inc.

SETTLE3 5.024

Project	MassCEC Heavy Lift Expansion - 18 & 54 Wright St. New Bedford, MA		
Analysis Description	10' x 50' 4,100 psf Load	*Figure*	
Drawn By	TS	*Company*	CEC Inc.
Date	11/22/2024	*File Name*	Heavy Lift Settlement Evaluation 5 x 50.s3z



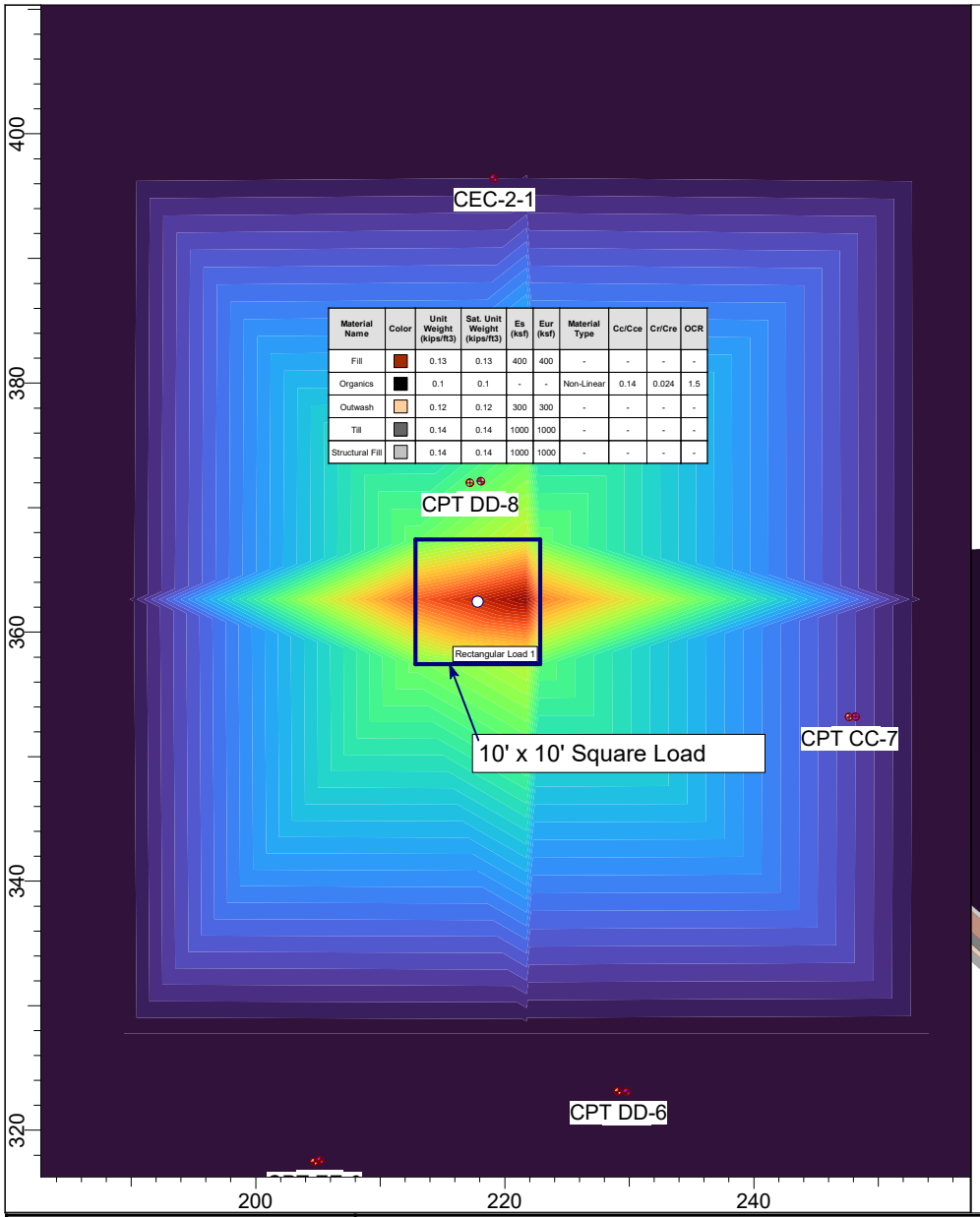
Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)	Material Type	Cc/Cce	Cr/Cre	OCR
Fill		0.13	0.13	400	400	-	-	-	-
Organics		0.1	0.1	-	-	Non-Linear	0.14	0.024	1.5
Outwash		0.12	0.12	300	300	-	-	-	-
Till		0.14	0.14	1000	1000	-	-	-	-
Structural Fill		0.14	0.14	1000	1000	-	-	-	-



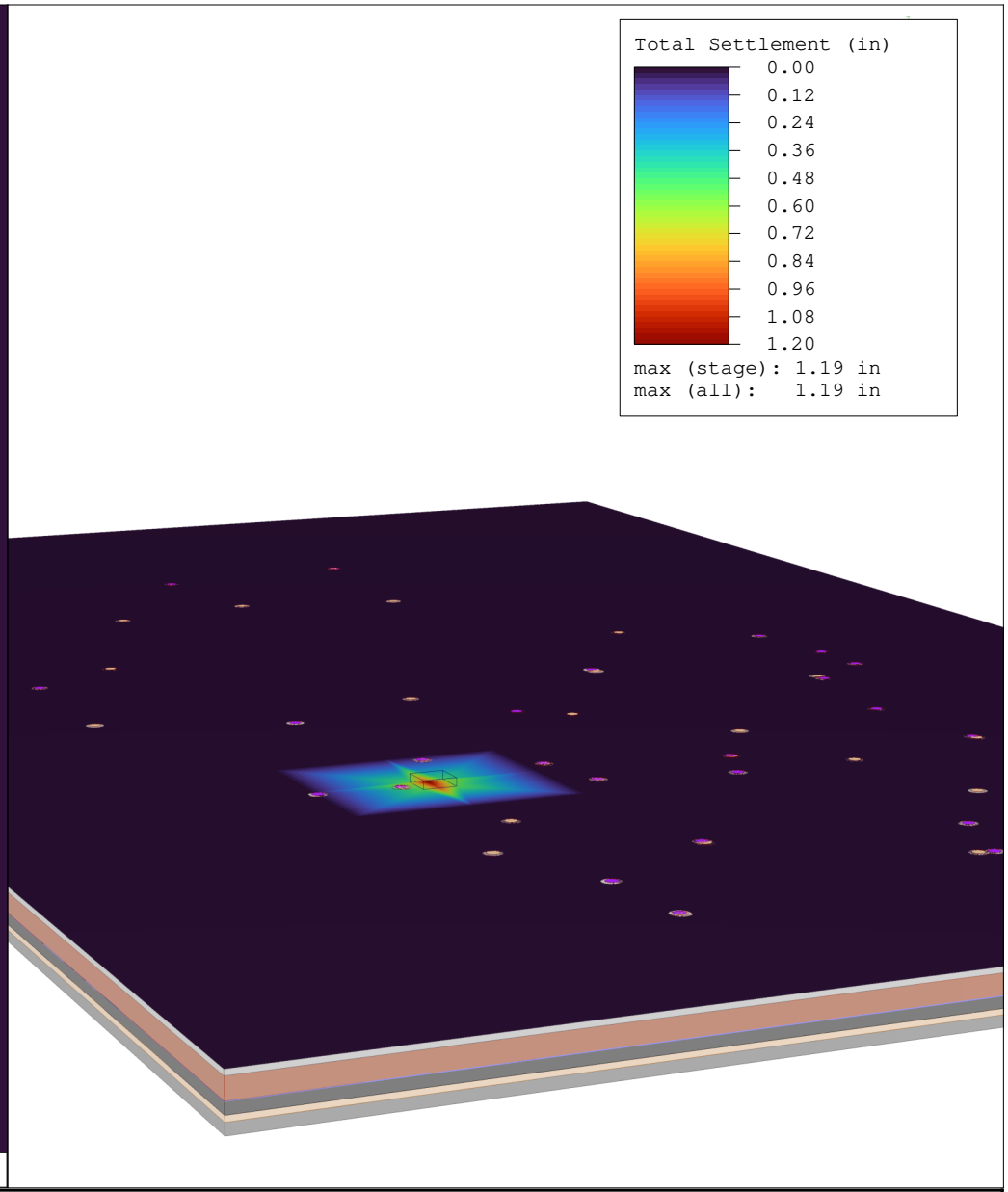
Civil & Environmental Consultants, Inc.

SETTLE3 5.024

Project	MassCEC Heavy Lift Expansion - 18 & 54 Wright St. New Bedford, MA		
Analysis Description	5' x 5' 4,100 psf Load	*Figure*	
Drawn By	TS	*Company*	CEC Inc.
Date	11/22/2024	*File Name*	Heavy Lift Settlement Evaluation 5 x 5.s3z



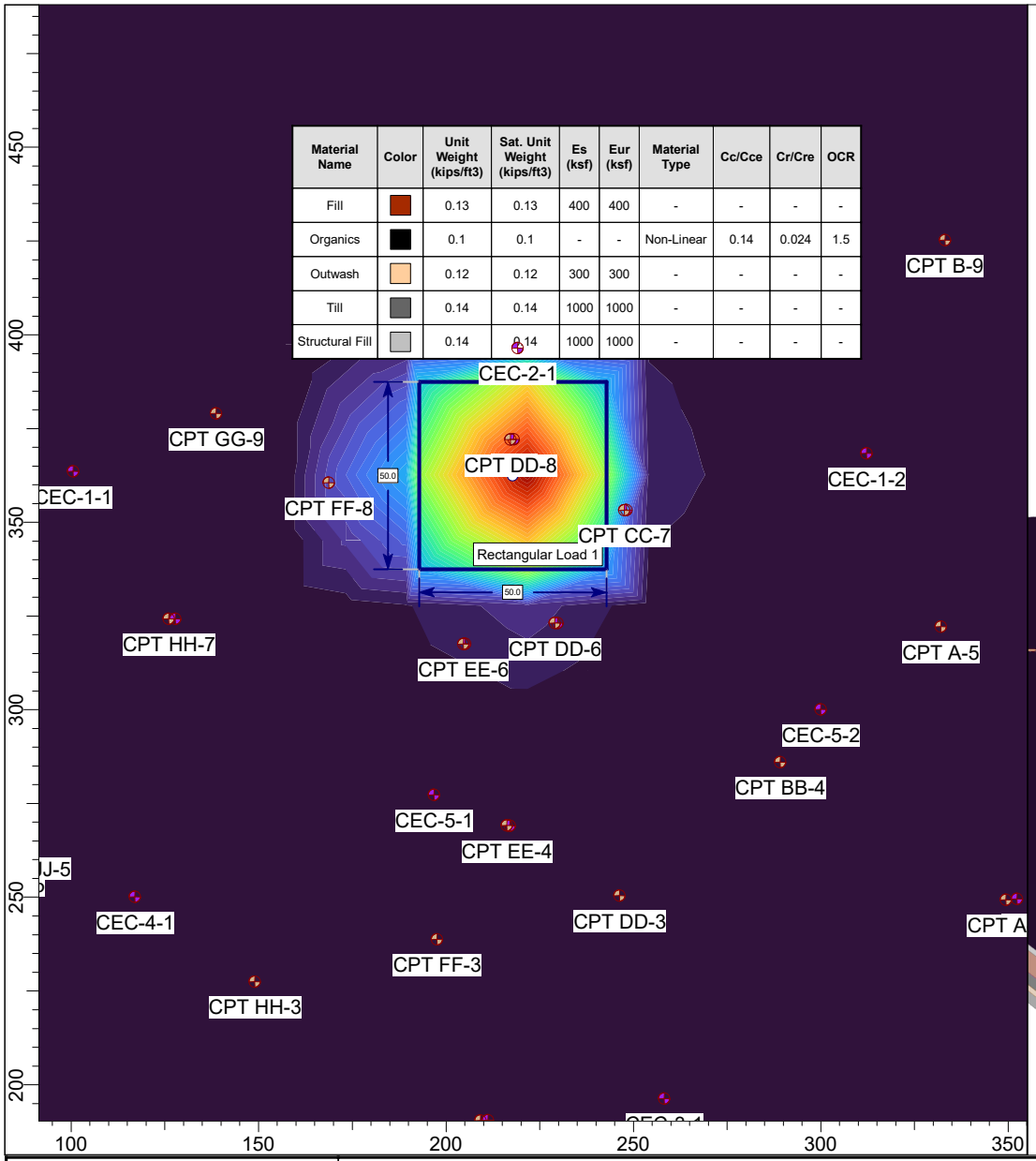
Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)	Material Type	Cc/Cce	Cr/Cre	OCR
Fill		0.13	0.13	400	400	-	-	-	-
Organics		0.1	0.1	-	-	Non-Linear	0.14	0.024	1.5
Outwash		0.12	0.12	300	300	-	-	-	-
Till		0.14	0.14	1000	1000	-	-	-	-
Structural Fill		0.14	0.14	1000	1000	-	-	-	-



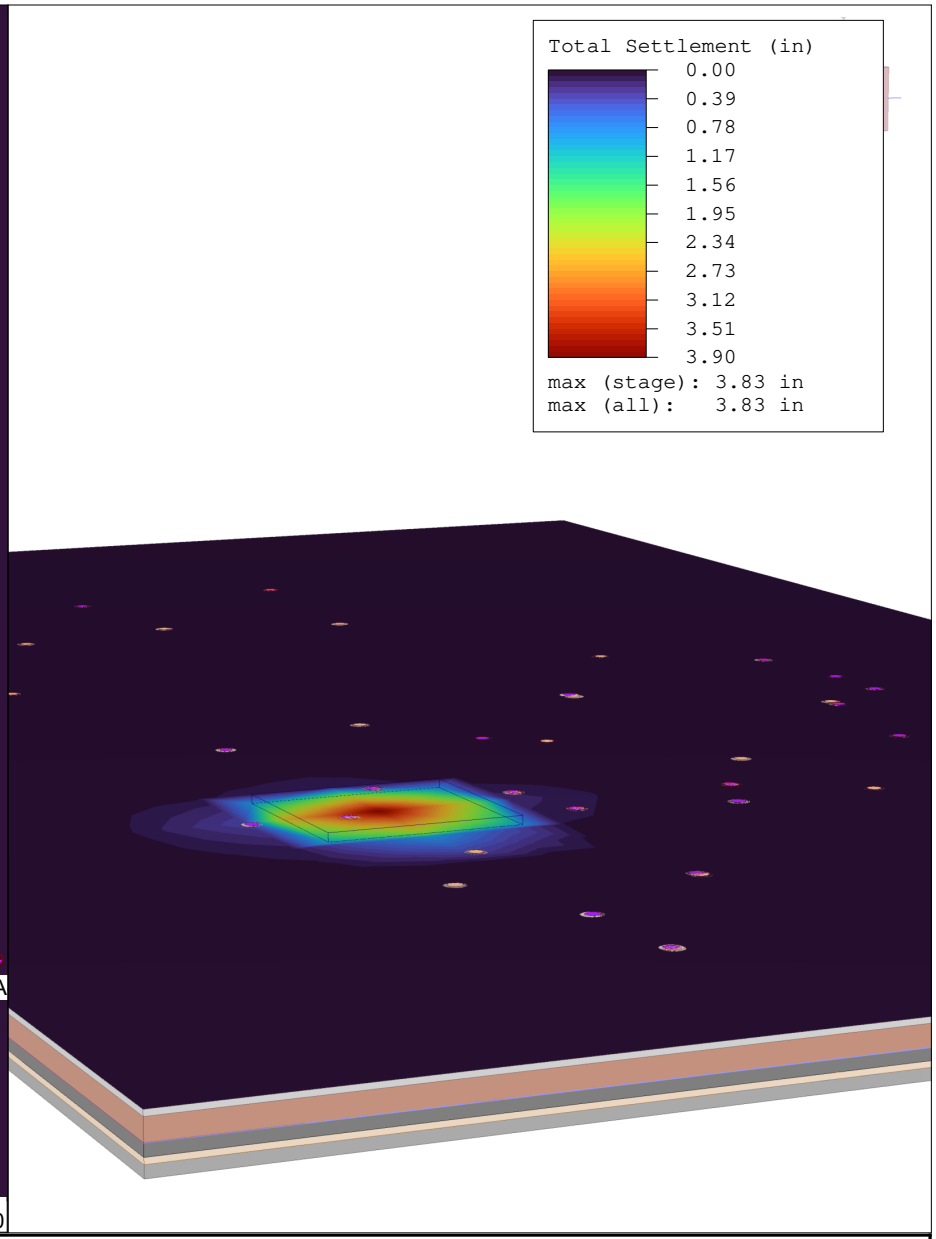
Civil & Environmental Consultants, Inc.

SETTLE3 5.024

Project	MassCEC Heavy Lift Expansion - 18 & 54 Wright St. New Bedford, MA		
Analysis Description	10' x 10' 4,100 psf Load	*Figure*	
Drawn By	TS	*Company*	CEC Inc.
Date	11/22/2024	*File Name*	Heavy Lift Settlement Evaluation 10 x 10.s3z



Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)	Material Type	Cc/Cce	Cr/Cre	OCR
Fill		0.13	0.13	400	400	-	-	-	-
Organics		0.1	0.1	-	-	Non-Linear	0.14	0.024	1.5
Outwash		0.12	0.12	300	300	-	-	-	-
Till		0.14	0.14	1000	1000	-	-	-	-
Structural Fill		0.14	0.14	1000	1000	-	-	-	-



Civil & Environmental Consultants, Inc.

SETTLE3 5.024

Project	MassCEC Heavy Lift Expansion - 18 & 54 Wright St. New Bedford, MA		
Analysis Description	50' x 50' 4,100 psf Load	*Figure*	
Drawn By	TS	*Company*	CEC Inc.
Date	11/22/2024	*File Name*	Heavy Lift Settlement Evaluation 50 x 50.s3z

ATTACHMENT 9

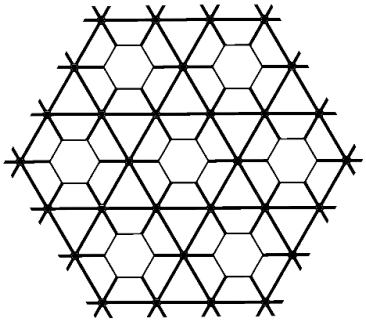
TENSAR INTERAX NXF SPECIFICATION SHEET

Product Data Sheet
InterAx™ Foundation NXF™ Geogrid

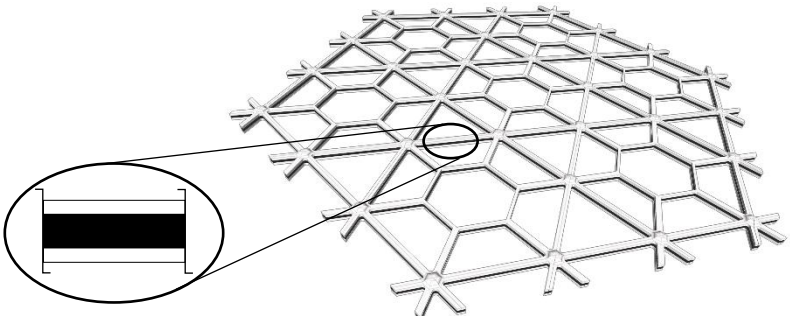
Tensar International Corporation reserves the right to change its product specifications at any time. It is the responsibility of the person specifying the use of this product and of the purchaser to ensure that product specifications relied upon for design or procurement purposes are current and that the product is suitable for its intended use in each instance.

General

1. The geogrid is manufactured from a coextruded, composite polymer sheet, which is then punched and oriented. The resulting structure consists of continuous and non-continuous ribs forming three aperture geometries (hexagon, trapezoid, and triangle) and an unimpeded suspended hexagon.



InterAx™ Foundation NXF Geogrid
Plan View



InterAx™ Foundation NXF Geogrid
Perspective View

2. The following properties are intended for product identification:

Identification Properties[1]	General
▪ Aperture shapes	Hexagonal, Trapezoidal, & Triangular
▪ Structure	Coextruded & Integrally Formed
▪ Rib shape	Rectangular
▪ Continuous parallel rib pitch[(2)], mm (in)	80 (3.2)
▪ Rib aspect ratio[(3)]	> 1.2
▪ Color identification	White / Black / White

Dimensions and Delivery

The geogrid shall be delivered to the jobsite in roll form with each roll individually identified. Rolls are shipped with nominal measurements: Equal to 3.8 meters (12.5 feet) in width by 60 meters (197 feet) in length.

Notes

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02
2. Nominal dimensions
3. Ratio of the mid-rib depth to the mid-rib width

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