Weston & Sampson

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Boston, MA 02108

CONTRACT DOCUMENTS

October 14, 2026

TOWN OF
Nantucket
MASSACHUSETTS

Tom Nevers Road
Multi-Use Path Project

W&S Project No. ENG22-1221
Nantucket Bid No. 2026-DPW-1007

ISSUED FOR BID



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ADVERTISEMENT FOR BIDS

Town of Nantucket, Massachusetts

Sealed bids for construction of the Tom Nevers Road Multi-Use Path Project for the Town of Nantucket, Massachusetts, will be received directly via the e-Procurement Portal at https://procurement.opengov.com/portal/nantucket until 2:00 PM prevailing time, on Tuesday, November 17, 2026, at which time the bidding period will be closed.

The Work under this Contract includes all labor, materials, equipment, supervision, coordination and incidental work required for the Tom Nevers Road Multi-Use Path Project, as shown on the Contract Drawings and specified herein. The Work generally includes selective demolition and salvage; construction of a multi-use path and raised boardwalk; roadway and driveway crossings; grading and drainage improvements; erosion and sediment controls; coordination of utility relocations and work by others; permanent signage and shared-use-path pavement markings; coordination with Owner/Town-provided roadway pavement markings; loam, seeding, planting and restoration; and related site improvements.

Bid security for all general bidders in the form of a bid bond, cash, certified check, treasurer's or cashier's check, payable to the Owner, is required in the amount of five (5) percent of the total bid, in accordance with the conditions in Section 00 21 13 INSTRUCTIONS TO BIDDERS.

The Contract Documents can be obtained free of charge from the Town of Nantucket's procurement website (https://procurement.opengov.com/portal/nantucket).

If any changes are made to this IFB, an addendum will be issued. All addenda so issued shall become part of the Contract Documents. Addenda notification will be emailed to all bidders who may follow the bid posting by clicking on "Follow" *on the bid postings page*. Each responder shall acknowledge receipt of any and all addendum issued via the Town's e-Procurement portal. **Failure to do so may cause rejection of the submittal as being unresponsive**.

The selected Contractor shall furnish performance and payment bonds, each in an amount equal to one hundred percent (100%) of the Contract Price, as stipulated in Section 00 72 00, GENERAL CONDITIONS of these specifications.

A non-mandatory, **in-person** pre-bid conference will be held at 10:00 AM on Wednesday, October 28, 2026 at 130 Tom Nevers Road, Nantucket, Massachusetts 02554 (Tom Nevers Fields & Playground).

All bids for this project are subject to applicable bidding laws of Massachusetts, including General Laws Chapter 30, Section 39M as amended.

All questions can be submitted directly to the Nantucket procurement portal (https://procurement.opengov.com/portal/nantucket) under the corresponding project and Q&A section. The deadline for submitting questions shall be Friday, October 30, 2026, at 2:00 PM. Bidders shall be aware of all addenda posted on this portal and acknowledge all addenda on their bid form. No addenda will be released after 4:00 PM on Friday, November 6, 2026.
Prevailing Wage Rates as determined by the Director of the Executive Office of Labor and Workforce Development under the provisions of the Massachusetts General Laws Chapter 149, Section 26 to 27H, as amended, apply to this project. It is the responsibility of the Bidder, before bid opening, to request if necessary, any additional information on Prevailing Wage Rates for those trades people who may be employed for the proposed work under this contract.

By submission of a bid, the Bidder agrees that this bid shall be good and may not be withdrawn for a period of sixty (60) days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

The Owner reserves the right to waive any informalities in bids and to reject any or all bids.

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

1. Receipt and Opening of Bids
2. Location and Work to be Done
3. Preparation of Bid
4. Modification of Bids
5. Obligation of Bidder
6. Information not Guaranteed
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12. Statutes Regulating Competitive Bidding
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18. Laws and Regulations
19. Liquidated Damages for Failure to Enter into Contract
20. Indeterminate Items and Estimated Quantities
21. CONTRACTOR Records
22. Bidder Certification – OSHA Training
23. Prevailing Wage Rates
24. Guarantee
25. Price Adjustments

1. Receipt and Opening of Bids

The Town of Nantucket, Massachusetts herein called the OWNER, acting by and through its Town Manager will receive sealed Bids for the construction of Tom Nevers Road Multi-Use Path Project.

Sealed bids for construction of the Tom Nevers Road Multi-Use Path Project for the Town of Nantucket , Massachusetts, will be received directly via the e-Procurement Portal at https://procurement.opengov.com/portal/nantucket until 2:00 PM prevailing time, on Tuesday, November 17, 2026, at which time the bidding period will be closed.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered. By submission of a bid, the bidder agrees that this bid shall be good and may not be withdrawn for the number of days, after the opening of bids, as stipulated in the FORM OF GENERAL BID.

2. Location and Work to be Done

The location, general characteristics, and principal details of the Work are indicated on the Contract Drawings consisting of a total of seventy-six (76) sheets (including the cover sheet) and entitled: 'Tom Nevers Road Multi-Use Path Project'.

Additional drawings showing details in accordance with which the Work is to be done may be furnished by addendum from time to time during the bidding period by the ENGINEER, and shall then become a part of the Contract Documents.

The CONTRACTOR shall furnish all superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to do all work required for the completion of each item of the Work and as herein specified.

The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of that item.

3. Preparation of Bid

Each bid must be submitted on the prescribed form in Section 00 41 13, FORM OF GENERAL BID. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures.

Each bid must be submitted via the e-Procurement Portal at https://procurement.opengov.com/portal/nantucket.

4. Modification of Bids

Bids may be modified, corrected or withdrawn by the bidder via the Towns e-Procurement Portal before Tuesday, November 17, 2026 at 2:00 PM.

5. Obligation of Bidder

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect of its bid.

6. Information not Guaranteed

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the OWNER. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the OWNER does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents.

It is further agreed and understood that no bidder or CONTRACTOR shall use or be entitled to use any of the information made available to it or obtained in any examination made by it in any manner as a basis of or grounds for any claim or demand against the OWNER or the ENGINEER, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

7. Bid Security

Each bid must be accompanied by a certified check, a bid bond, cash, a treasurer's or cashier's check, payable to the OWNER, in the amount stated in Section 00 11 13, ADVERTISEMENT FOR BIDS. Such deposits will be returned to all except the three lowest responsible and eligible bidders within five days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids, and the remaining deposits will be returned promptly after the OWNER and the accepted bidder have executed the Contract, or if no notice of intent to award has been presented to any bidder within 30 days, Saturdays, Sundays and legal holidays excluded, after the date of the opening of bids, upon demand of the bidder at any time thereafter.

8. Time for Completion

The successful general bidder must agree to commence work on or before a date to be specified in the written "Notice to Proceed" from the OWNER and to fully complete the project within the time limit stated in Section 00 41 13, FORM OF GENERAL BID.

9. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other prebid documents will be made to any bidder orally, and if provided orally, shall not be relied upon by bidders unless confirmed in a written addendum. All information given to bidders other than by means of the plans, specifications, or by addenda, as described below, is given informally and shall not be used as the basis of a claim against the OWNER or the ENGINEER.

Every request for such interpretation should be entered into the Q&A section within the e-procurement portal and to be given consideration must be received by Friday, October 30, 2026 at 2:00 PM.

If any changes are made to this IFB, an addendum will be issued. All addenda so issued shall become part of the Contract Documents. Addenda notification will be emailed to all bidders who may follow the bid posting by clicking on "Follow" on the *bid postings page*.

Each responder shall acknowledge receipt of any and all addendum issued via the Town's e-Procurement portal. **Failure to do so may cause rejection of the submittal as being unresponsive.**

10. Bid Opening Procedure

The following list of requirements shall be met by each filed bid.

Bids shall be filed at the place and before the time specified in Receipt and Opening of Bids, above.

The bid and all accompanying documents so required shall be signed by the Bidder or its authorized representative before submission.

All bidders shall include with their bids written acknowledgment of receipt of all addenda. Refer to acknowledgment form provided in Section 00 41 13, FORM OF GENERAL BID.

The total dollar amount of each bid will be read, and the three apparent lowest bids will be selected for further consideration. These three apparent low bids will be read aloud for the benefit of the other bidders and the bid opening procedure will be closed. All those present at the bid opening may examine all bids after the bid opening and after the reading of the three apparent low bids except for the DCAMM Update Statements if contained therein, which are not public records.

11. Comparison of Bids

Bids will be compared on the basis of the quantities and unit and lump sum prices stated in the bid forms.

In the event that there is a discrepancy in Section 00 41 13, FORM OF GENERAL BID between the lump sum or unit prices written in words and figures, the prices written in words will govern.

The OWNER agrees to examine and consider each FORM OF GENERAL BID submitted in accordance with the terms and conditions set forth herein and as set forth in Section 00 41 13, FORM OF GENERAL BID.

12. Statutes Regulating Competitive Bidding

Any bid, which does not comply with the provisions of Massachusetts General Laws Chapter 30, Section 39M as amended, need not be accepted and the OWNER may reject every such bid.

13. Right to Reject Bid

The OWNER may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids,

should the OWNER deem it to be in the public interest to do so.

The OWNER may also reject bids which in its sole judgment are either incomplete, conditional, obscure or not responsive or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities, and may reject bids for any other reason permitted by law, or the OWNER may waive such omissions, conditions or irregularities.

14. Ability and Experience of Bidder

No award will be made to any bidder who cannot satisfy the OWNER that it has sufficient ability and experience in this class of work and sufficient capital and plant to enable it to prosecute and complete the work successfully within the time named. The OWNER's decision or judgment on these matters will be final, conclusive, and binding to the fullest extent permitted by law.

The OWNER may make such investigations as it deems necessary, and the bidder shall furnish to the OWNER, under oath if so required, all such information and data for this purpose as the OWNER may request.

15. Conditions of Work

Each bidder must inform itself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of its obligation to furnish all material and labor necessary to carry out the provisions of its contract. Insofar as possible the CONTRACTOR, in carrying out its work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

16. Security for Faithful Performance

Simultaneously with its delivery of the executed Contract, the CONTRACTOR shall furnish performance and payment bonds, each in an amount equal to one hundred percent (100%) of the Contract Price, as required by Section 00 72 00, GENERAL CONDITIONS. The payment bond shall conform to Section 00 61 13.16, PAYMENT BOND. The surety on such bond shall be a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the OWNER. The bond shall remain in force for one year after final acceptance of the work by the OWNER, unless the OWNER, in writing, releases the CONTRACTOR from the obligation sooner.

17. Power of Attorney

Attorneys-in-fact who sign Contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

18. Laws and Regulations

Applicable provisions of Massachusetts General Laws and Regulations and/or the United

States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where a conflict between Federal and State Laws and Regulations exists, the more stringent requirement shall apply.

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances or bylaws, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

Attention is directed to Section 00 73 73.13 STATE REGULATIONS and to other applicable sections of this specification. In the event of any conflict between provisions of law or regulation quoted or paraphrased in the Contract Documents, the actual provisions of law or regulation shall control.

19. Liquidated Damages for Failure to Enter into Contract

The successful bidder, upon its failure or refusal to execute and deliver the Contract, Bonds and Certificates of Insurance required within 10 days after receipt of notice of the acceptance of the bid, shall, except as otherwise provided by applicable law, forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with its bid, provided that the amount forfeited shall not exceed the difference between its bid price and the bid price of the next lowest responsible and eligible bidder. In case of death, disability, bonafide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder, its bid deposit will be returned.

20. Indeterminate Items and Estimated Quantities

The work to be done under this Contract has been divided into parts or items, if applicable, to enable each bidder to bid on different portions of the work in accordance with its estimate of their cost and so that the actual quantity of work executed under each item may be paid for at the price bid for that particular item, even though each bidder may have judged that such quantity may be greater or less than the estimated quantity stated in Section 00 41 13, FORM OF GENERAL BID.

21. CONTRACTOR Records

The CONTRACTOR shall comply with the provisions of Massachusetts General Laws, Chapter 30, Section 39R, concerning CONTRACTOR records. This section has been reprinted in Section 00 73 73.13, STATE REGULATIONS.

22. Bidder Certification – OSHA Training

All employees who work on Massachusetts public works construction sites, on projects estimated to cost more than $10,000, must have no less than ten (10) hours of OSHA-approved safety and health training.

The Massachusetts Attorney General is authorized to restrain award of construction contracts to any contractor who is in violation of this requirement and to restrain the performance of these contracts by non-complying contractors.

Noncompliance with this law will disqualify contractors from bidding on public contracts.

23. Prevailing Wage Rates

Prevailing Wage Rates as determined by the Director of the Executive Office of Labor and Workforce Development under the provisions of the Massachusetts General Laws Chapter 149, Section 26 to 27H, as amended, apply to this project. It is the responsibility of the Bidder, before bid opening, to request, if necessary, any additional information on Prevailing Wage Rates for those trades people who may be employed for the proposed work under this contract.

24. Guarantee

The Contractor shall guarantee that the Work and Services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in the construction of the same shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other contract documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the Work as stated in the final estimate. If part of the Work is accepted in accordance with that subsection of this AGREEMENT titled "Partial Acceptance", the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

25. Price Adjustments

This Contract is subject to the provisions for material price adjustments in accordance with Chapter 30, Section 38A of the Massachusetts General Laws.

END OF SECTION

SECTION 00 31 32

SUBSURFACE DATA

PART I - GENERAL

1.01 SCOPE:

A. A subsurface exploration program consisting of soil borings, test pits, and geotechnical laboratory testing has been performed, with reasonable care. The following geotechnical report is appended hereto and is for informational purposes as described below:

"Geotechnical Engineering Report, Proposed Tom Nevers Road Multi-Use Path – Elevated Boardwalk, Nantucket, Massachusetts" dated April 20, 2026.

B. The attached subsurface data is provided for informational purposes only. The Contractor shall not rely on the interpretations, opinions, conclusions, or recommendations included in the report, only the factual data relative to the specific times, locations, and depths/elevations. Specific project requirements are referenced only in the drawings and specifications.

C. If Contractors deem the subsurface information insufficient, they may, after obtaining Owner's permission, carry out additional subsurface explorations, at no expense to the Owner.

D. Subsurface information provided in the Contract Documents is limited by the methods used for obtaining and expressing such data and is subject to various interpretations. The terms used to describe soils, rock, groundwater, and such other conditions are subject to local usage and individual interpretation.

E. Borings and test pits have been completed substantially at the locations indicated on the figures in the attached report and advanced to the depths shown on the logs. Soil information presented in the boring logs, as to classification, gradation, properties, density and consistency, is based on visual observation of recovered samples. Reported groundwater levels are those measured in the field at the particular location and at the time measurements were made, and do not necessarily represent permanent or seasonal groundwater elevations. Groundwater elevations may be affected by temperature, rainfall, tidal fluctuation, and other factors that may not have been present at the time the measurements were made. The Contractors should be aware that groundwater level fluctuations may affect methods of construction.

F. Subsurface exploration, soil and rock data are for the general information of the Contractors. The Contractors are obligated to examine the site, review boring and test pit logs, all available information and records of explorations, investigations and other pertinent data for the site, and then based upon their own interpretations and investigations decide the character of material to be encountered and excavated, the suitability of the materials to be used for backfilling and such other purposes, the groundwater conditions, difficulties or obstacles likely to be encountered, and other

conditions affecting the work. The subsurface data is accurate only at the particular locations and times the subsurface explorations were made. No other warranty either expressed or implied by the Owner, Engineer or their agents is made as to the accuracy of the subsurface information and data shown on the drawings or presented in the Contract Documents.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 00 31 43

PERMITS

PART 1 – GENERAL

1.01 DESCRIPTION:

This Section identifies permit and approval requirements applicable to the Work and establishes the respective responsibilities of the Owner and Contractor for obtaining, paying for, maintaining, and complying with such permits and approvals.

1.02 RELATED WORK:

A. Section 01 11 00, CONTROL OF WORK AND MATERIALS
B. Section 01 14 19.16, DUST CONTROL
C. Section 01 57 19, ENVIRONMENTAL PROTECTION
D. Section 01 55 26.13, TEMPORARY SIGNAGE AND TRAFFIC CONTROL
E. Section 01 56 26, TEMPORARY FENCING AND BARRIER
F. Section 01 12 16, SCOPE AND SEQUENCE OF WORK
G. Section 01 56 00, CONSTRUCTION ZONE SAFETY PLAN
H. Section 31 25 00, EROSION AND SEDIMENT CONTROL
I. Appendix B – Stormwater Management Report: Refer to the report for stormwater design information. Construction stormwater permitting, pollution-prevention planning, inspections, and compliance responsibilities shall be as expressly assigned in the Contract Documents.

1.03 GENERAL REQUIREMENTS:

A. The Owner is responsible for obtaining the project permits, approvals, and environmental determinations identified as Owner-provided in Article 1.04. Issuance status and available attachments are identified individually in that Article. Issued approvals and their applicable conditions included with this Section form part of the Contract Documents. The Contractor shall comply with requirements applicable to its Work and provide required construction coordination, notifications, and documentation. These Owner-provided approvals do not relieve the Contractor of obtaining permits and authorizations assigned to it under this Section.

B. Contractor-Provided Permits and Approvals: Except for permits and approvals expressly identified as being provided by the Owner, the Contractor shall prepare applications for, obtain, maintain, and close out permits, licenses, approvals, work authorizations, and notifications required for the Contractor's means, methods, temporary work, equipment, operations, and performance of the Work.

C. Contractor-provided permits and approvals may include, but are not limited to:
   a. Confined-space entry permits, where applicable.

b. Town of Nantucket permits and approvals required for work within public ways or on Town property.
c. Road-opening, trench, excavation, or public-way work permits, where applicable.
d. Electrical permits required for electrical work expressly assigned to the Contractor under the Contract Documents.
e. Utility-owner work authorizations, outage approvals, protection requirements, and inspection requirements applicable to Contractor operations.
f. Dewatering, discharge, or temporary water-management approvals, where applicable.
g. Temporary traffic-control, road-closure, detour, or access approvals required by the Town or another authority having jurisdiction.
h. EPA Construction General Permit: The Contractor shall obtain coverage under the EPA Construction General Permit for stormwater discharges associated with construction activity. Include preparation and submission of the required Notice of Intent, preparation and implementation of the Stormwater Pollution Prevention Plan (SWPPP), required inspections and documentation, maintenance of permit coverage throughout applicable construction activities, and submission of the Notice of Termination upon satisfaction of the applicable termination requirements. Include associated costs in the Contract Price.
i. Other permits, licenses, approvals, and notifications required by the Contract Documents or authorities having jurisdiction.

D. Fees and Expenses: The Contractor shall bear the costs of preparing applications and obtaining Contractor-provided permits, licenses, approvals, and authorizations, except that the Owner will pay or waive Town permit application fees where specifically indicated by the Owner.

E. Permit fees, inspection fees, utility charges, police-detail costs, and similar costs shall be allocated as expressly stated elsewhere in the Contract Documents. Where the Contract Documents assign a cost directly to the Owner, the Contractor shall remain responsible for required scheduling, coordination, notifications, and documentation.

F. Permits and authorizations for work expressly assigned to the Owner, utility owners, Property Owners, or separate contractors shall be obtained by the party responsible for that work, unless otherwise indicated. Contractor coordination, notification, and access responsibilities do not transfer that work or its permit obligations to the Contractor.

1.04 OWNER-PROVIDED PERMITS, APPROVALS, AND ENVIRONMENTAL DETERMINATIONS:

A. The following documents are attached to this Section:
a. Massachusetts Endangered Species Act (MESA) Determination:
i. Issuing Agency: Massachusetts Division of Fisheries and Wildlife.
ii. Document: Tom Nevers Road Multi-Use Path Project MESA
iii. Reference Number:
1. NHESP File No.: 25-19914
2. Heritage Hub Form ID: RC-96267
iv. Date Issued: September 15, 2026

v. Status: Issued. The Division determined that the Project will not result in a prohibited Take of state-listed rare species.
vi. Attachment: Attachment A — MESA Determination, included following this Section.
vii. Contractor shall comply with the requirements and limitations of the attached determination applicable to the Work.

b. Massachusetts Environmental Policy Act Environmental Notification Form (ENF) Determination:
i. Issuing Agency: The Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs
ii. Document: Certificate of the Secretary of Energy and Environmental Affairs on the Environmental Notification Form
iii. Reference Number:
1. EEA Number: 17012
iv. Date Issued: December 8, 2025
v. Status: Issued. The Secretary determined that an Environmental Impact Report (EIR) is not required.
vi. Attachment: Attachment B — ENF Determination, included following this Section.
vii. Contractor shall comply with the requirements and limitations of the attached determination applicable to the Work.

c. Massachusetts Historical Commission
i. Issuing Agency: Massachusetts Historical Commission, Office of the Secretary of the Commonwealth.
ii. Document: Project Notification Form bearing the Massachusetts Historical Commission's review determination.
iii. Reference Number: RC 7704
iv. Date Issued: October 16, 2025
v. Status: Review completed. The Massachusetts Historical Commission determined that the Project is unlikely to affect significant historic or archaeological resources.
vi. Attachment: Attachment C — MHC Determination, included following this Section.
vii. Contractor shall comply with the requirements and limitations of the attached determination applicable to the Work.

d. MassDOT Non-Vehicular Access Permit:
i. Issuing Agency: Massachusetts Department of Transportation.
ii. Application Number: 5-2025-0781
iii. Status: Draft preparation; permit issuance pending. MassDOT's notification dated October 13, 2026, indicates that the application has advanced to the "Draft" stage, with completion of that stage anticipated on or before October 28, 2026. This date is an agency processing target and does not constitute confirmation of permit issuance or authorization to begin work.
iv. The issued permit is not included in this bid package. The Owner's design

consultant is coordinating the permit application on behalf of the Owner. The issued permit and applicable conditions will be furnished when available. If received during the bidding period, these documents will be issued by addendum.

v. Contractor shall coordinate the affected Work with the Owner and comply with the issued permit conditions applicable to its operations. Do not begin work requiring this permit until the Owner has furnished the issued permit and applicable preconstruction conditions have been satisfied.

B. Permit Attachments A, B, and C to this Section contain the MESA Determination, ENF Determination and related correspondence, and Massachusetts Historical Commission Determination, respectively. Contractor shall comply with the requirements and limitations of the final determinations applicable to the Work. Agency and public correspondence included in Permit Attachment B documents the environmental review process; public comments and requested alternatives do not independently modify the Contractor's scope. For final MESA review status, refer to Permit Attachment A. Notify the Owner and Engineer of discrepancies between the final determinations and the Contract Documents before proceeding with affected Work.

PART 2 - PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS:

A. Perform the Work in accordance with the Contract Documents, permits and approvals included in or subsequently incorporated into the Contract Documents, Contractor-obtained permits and approvals, and applicable requirements of authorities having jurisdiction.

B. Before commencing an activity requiring a permit, approval, authorization, inspection, or notification, submit a copy of the applicable document to the Owner and Engineer and demonstrate that required preliminary conditions have been satisfied. Maintain compliance throughout the Work and provide access to authorized permitting and inspection personnel.

C. Provide required notifications to permitting authorities, utility owners, inspection agencies, and other authorities before commencing the applicable Work. Maintain current copies of permits, approvals, authorizations, inspection records, required postings, and related correspondence at the Site for the duration of the applicable Work.

D. Schedule required inspections sufficiently in advance to avoid covering or concealing Work before inspection. Work concealed before a required inspection shall be uncovered and restored at no additional cost to the Owner.

E. Immediately notify the Owner and Engineer of a permit violation, notice of noncompliance, stop-work directive, enforcement communication, or other permit-related issue. Promptly correct noncompliance resulting from Contractor operations at no additional cost to the Owner.
F. Review or acceptance of a permit application, traffic-control plan, environmental-control plan, or other Contractor submission does not transfer responsibility for means, methods, sequences, safety, permit compliance, or performance of the Work from the Contractor.

END OF SECTION

PERMIT ATTACHMENT A

MESA DETERMINATION

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

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MASS.GOV/MASSWILDLIFE

September 15, 2026

Drew Patnode
Town of Nantucket
16 Broad St
Nantucket, Massachusetts, 02554

RE: Project Location: Tom Nevers Road, Nantucket
Project Description: Tom Nevers Road Multi-Use Path Project
NHESP File No.: 25-19914
Heritage Hub Form ID: RC-96267

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist and supporting documentation for review pursuant to the Massachusetts Endangered Species Act (MGL. c. 131A) and its implementing regulations (321 CMR 10.00) (MESA).

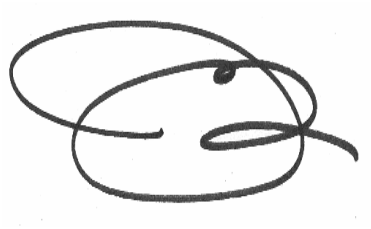
PROJECT DESCRIPTION (the "Project")
The project, as currently proposed, includes the construction of a multi-use path along Tom Nevers Road in Nantucket as shown on the Project Plan.

MASSACHUSETTS ENDANGERED SPECIES ACT (MESA)
The MESA is administered by the Division and prohibits the Take of state-listed species, which includes actions that "in reference to animals, means to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of habitat of state-listed wildlife species" (321 CMR 10.02). The purpose of the Division's review under the MESA regulations is to determine whether a Take of state-listed species will result from the proposed project.

Based on a review of the information that was provided and the information that is currently contained in our database, the Division has determined that this Project **will not result in a prohibited Take of state-listed rare species**. This determination is a final decision of the Division of Fisheries & Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project. The authorization for work is valid for 5 years from the date of issuance.

If you have any questions regarding this letter please contact Tim McGuire, Endangered Species Review Biologist, at timothy.mcguire2@mass.gov, (508) 389-6366.

Sincerely,



Jesse Leddick
Assistant Director

cc: Shelly McComb
Drew Patnode, Town of Nantucket

PERMIT ATTACHMENT B

MEPA ENF DETERMINATION

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
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Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

December 8, 2025

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE ENVIRONMENTAL NOTIFICATION FORM

Project Name	: Tom Nevers Road Multiuse Trail
Project Municipality	: Nantucket
Project Watershed	: Islands
EEA Number	: 17012
Project Proponent	: Town of Nantucket
Date Noticed in Monitor	: November 7, 2025

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.06 of the MEPA Regulations (301 CMR 11.00), I hereby determine that this project **does not require** the preparation of an Environmental Impact Report (EIR).

Project Description

As described in the Environmental Notification Form (ENF), the project consists of the construction of a new, paved, 2.1- mile, multi-use path that will connect Milestone Road to Tom Nevers Field and Playground by following within/along the east side of the right-of-way (ROW) of Tom Nevers Road. The path will be located a minimum of five feet from the edge of the existing roadway and the path will be 10-12 feet wide. This separation ensures safe travel for pedestrians and cyclists, while localizing adjustments in alignment to accommodate existing features such as utility poles and drainage structures. The project will also incorporate a stormwater management system, erosion control measures, and tree replanting to replace public shade trees removed during construction.

The project will create a direct connection between downtown Nantucket and Tom Nevers Field, which offers athletic fields, parking, a pavilion, picnic areas, a playground, and beachfront access.

Project Site

The 7.82-acre project corridor begins at the intersection of Milestone Road and Tom Nevers Road, and includes a portion of the ROW on the east side of Tom Nevers Road, ending at

Tom Nevers Field. Land use along either side of the existing road is dominated by residential properties and wooded areas. The path will encroach on approximately 37 privately owned properties. The Town of Nantucket is in the process of acquiring Town held easements for these properties.

Wetland resource areas in the vicinity of the project limits include Coastal Bank, Coastal Beach, Coastal Dune and Land Subject to Coastal Storm Flowage.[1] A portion of the site is mapped as Priority Habitat by the Natural Heritage and Endangered Species Program (NHESP). Approximately 343 feet of the project site is designated as Article 97 land.[2] According to the ENF, the project site is not within an Area of Critical Environmental Concern (ACEC) and the site does not contain any structures listed in the State Register of Historic Places or the Massachusetts Historical Commission's (MHC's) Inventory of Historic and Archaeological Assets of the Commonwealth. The site is not mapped within a Federal Emergency Management Agency (FEMA) Flood Zone.

As shown in the EEA EJ Mapper, the project site is not located within one mile of any Environmental Justice (EJ) Populations.[3] Additionally, no languages were identified as being spoken by 5% or more of Limited English Proficiency ("LEP") residents within one mile of the project site.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include the alteration of approximately 2.69 acres of land and the addition of 2.53 acres of impervious area. The project will also remove 10 public shade trees and alter Priority Habitat.

Measures to avoid, minimize, and mitigate environmental impacts include the installation of a stormwater management system, installation of sedimentation and erosion controls prior to the start of construction and use of construction period best management practices (BMPs). The project will also replant 10 public shade trees within the ROW to mitigate for project related tree removal. The project has been designed to avoid impacts to wetland resources including the Buffer Zone.

Jurisdiction and Permitting

This project is subject to MEPA review because it requires Agency Action and meets/exceeds MEPA review thresholds pursuant to 301 CMR 11.03(6)(b)(2)(a)-Construction, widening, or maintenance of a roadway or its right-of-way that will: alter the bank or terrain located ten more feet from the existing roadway for one-half or more miles, unless necessary to install a structure or equipment; and 301 CMR 11.03(6)(b)(2)(b)-Construction, widening, or

[1] All proposed work is designed to avoid impacts to wetland resource areas and is outside the applicable buffer zones.
[2] This parcel is owned by the Nantucket Islands Land Bank ("Land Bank"). The proposed project includes the construction of a boardwalk on the Land Bank property to allow users an opportunity to get off the road and immersed into the natural setting.
[3] The EEA EJ Mapper is available at: https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts.

maintenance of a roadway or its right-of-way that will: cut five or more living public shade trees of 14 or more inches in diameter at breast height. The project will require an Agency Action in the form of a Non-Vehicular Access Permit from the Massachusetts Department of Transportation (MassDOT).

The project requires a National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) from the United States Environmental Protection Agency (EPA).

The project is not receiving Financial Assistance from the Commonwealth. Therefore, MEPA jurisdiction for any future reviews would be limited to those aspects of the project that are within the subject matter of any required or potentially required Agency Actions and that may cause Damage to the Environment, as defined in MEPA regulations.

Review of the ENF

The ENF included a project description, alternatives analysis, existing and proposed conditions plans, estimates of project-related impacts, and an identification of measures to avoid, minimize and mitigate environmental impacts. Consistent with the MEPA Interim Protocol on Climate Change Adaptation and Resiliency, the ENF contained an output report from the Climate Resilience Design Standards Tool prepared by the Resilient Massachusetts Action Team (RMAT) (the "MA Resilience Design Tool"),[4] together with information on climate resilience strategies to be undertaken by the project.

Alternatives Analysis

The ENF analyzed a series of alternatives for the multi-use path including a No-Build Alternative, a Retaining Wall Alternative and the Preferred Alternative. The No-Build Alternative would not result in an increase in impervious area. However, this alternative would not meet the project's goal of providing a safe and direct connection between downtown Nantucket and the Tom Nevers Field.

The Town considered adding 4-5 foot retaining walls in areas where the grade differential between the proposed path and adjacent ground is significant. This Alternative would reduce the overall grading footprint and confine earthwork to a smaller corridor along the road. Potential retaining wall locations included:

- 1 Sandpiper Way
- 3 Sandpiper Way
- 7 Sandpiper Way
- 9 Sandpiper Way
- 6 Flintlock Road
- 4 Flintlock Road

[4] Available at: https://resilientma.mass.gov/rmat_home/designstandards/

Although this Alternative limits slope disturbance and minimizes the need for cut and fill operations, it was dismissed because it would create barriers to wildlife movement, compromise the rural and natural visual character of the area, and introduce new safety and maintenance issues.

The Preferred Alternative consists of a paved shared-use path that begins at the intersection of Milestone Road and Tom Never Road and runs parallel along the east side of Tom Nevers Road. In addition, although it was not presented in the ENF as a formal Alternative, after evaluating both sides of Tom Nevers Road, the east side of the road affected fewer private parcels and created the most direct and safest connection between Milestone Road and Tom Nevers Field Park.

Land Alteration, Impervious Surfaces, Stormwater and Wetlands

As noted above, the project will result in the direct alteration of 2.69 acres of land and the creation of 2.53 acres of impervious surface. Specific impacts will include the removal of 10 public shade trees. To mitigate for this tree loss, the project will plant approximately 24 trees, including 10 public shade trees ranging between 7'-8' in height. In addition, disturbed areas will be stabilized with native seed mixes, erosion control matting, and plantings.

The project proposes to construct a 12-foot boardwalk across 343 of Article 97 protected land. This parcel is owned by the Nantucket Islands Land Bank ("Land Bank"). According to the ENF, the Land Bank has been involved in the project and at their July 22, 2025, meeting it was unanimously voted that the proposed project, including the development of a boardwalk on Land Bank property, would be supported. This will be conducted through a license agreement between the Land Bank and the Town of Nantucket. The filing notes that the project does not constitute a disposition of Article 97 Land as the Land Bank will retain ownership and control of the parcel and the project will not represent a change in use because the current use of the parcel includes recreational activity.

Runoff generated from impervious surfaces will be managed in accordance with the MassDEP Stormwater Management Standards (SMS) to the maximum extent practicable. Stormwater management will include vegetated swales and naturalized roadside landscapes that help absorb stormwater and reduce runoff to adjacent properties and low-lying areas.

As noted above, all proposed work is designed to avoid impacts to wetland resource areas and is outside the applicable buffer zones. However, comments from the Massachusetts Department of Environmental Protection note that should the project scale change to include activities within areas subject to protection under M.G.L. c. 131, §40, the filing of a Notice of Intent with the Nantucket Conservation Commission is required in accordance with 310 CMR 10.02(2).

Rare Species

Based on the Massachusetts Natural Heritage Atlas, 15th Edition, portions of the project site have been delineated as Priority Habitat for Threatened Species and Species of Special

Concern, which include Northern Harrier (*Circus hudsonius*), Melsheimer's Sack Bearer (*Cicinnus melsheimeri*), Barrens Dagger Moth (*Acronicta albarufa*), Herodias Underwing Moth (*Catocala Herodias*), Buck Moth (*Hemileuca maia*), Chain Dot Geometer (*Cingilia catenaria*), Heath Metarranthis (*Metarranthis pilosaria*), Pink Sallow Moth (*Psectraglaea carnosa*), and Sandplain Heterocampa (*Heterocampa varia*). These species and their habitat are protected pursuant to the Massachusetts Endangered Species Act (MESA) and its implementing regulations (312 CMR 10.00). Comments from NHESP state that, the Proponent submitted a MESA Review Checklist with accompanying site plans (dated September 23, 2025) and supporting documentation for review pursuant to the MA Endangered Species Act Regulations (321 CMR 10.18). Comments note that the Proponent will need to supplement their application in order for NHESP to complete its review. Comments state that following information must be submitted:

- Ownership Interest or Landowner Assent: The project proposes work including grading across multiple properties. The Applicant must provide sufficient information to demonstrate that the Applicant is either the Record Owner, as defined in 321 CMR 10.02, for each property upon which the project is proposed or is a person authorized in writing from the Record Owner to submit the MESA filing. Sufficient information must include a written instrument or recorded deed demonstrating that the Applicant holds legal or equitable interest, right or title to said property, or written authorization from the Record Owner.
- Site Plans: Project plans that include existing and proposed conditions, as required pursuant to 321 CMR 10.20(h), as well as a clearly demarcated area of physical disturbance for the proposed project, as required pursuant to 321 CMR 10.20(f). Site plans should identify locations of all work including stormwater management features. Project plans should confirm the surface type of the proposed trail and clarify proposed maintenance and construction methodology

Comments from NHESP anticipate that the work associated with the project can be conducted in a matter that minimizes impact to state-listed species.[5] Comments state that as the MESA review process has not been completed, no alteration to the soil, surface, or vegetation associated with the proposed project shall occur on the property until NHESP has made a final decision pursuant to 321 CMR 10.18.

Climate Change

Effective October 1, 2021, all MEPA projects are required to submit an output report from the MA Resilience Design Tool to assess the climate risks of the project. Based on the output report attached to the ENF, the project has a "High" exposure rating based on the project's location for the following climate parameters: extreme precipitation (stormwater flooding), and extreme heat. The project also has a "Moderate" exposure rating based on the project's location for extreme precipitation (riverine flooding). Based on the 20-year useful life and the self-assessed criticality identified for the path, the MA Resilience Design Tool recommends a planning horizon of 2050 and a return period associated with a 50-year (2% annual chance)

[5] Email from NHESP to MEPA on November 26, 2025.

storm event for extreme precipitation. It also recommends planning for the 90th percentile for applicable extreme heat parameters.

The MA Resilience Design Tool output indicates that the project site has a maximum annual daily rainfall that exceeds 10 inches within the overall project's useful life, the project proposes to create new impervious surface and part of the project is within 200 feet of a waterbody and less than 30 feet above the waterbody. These series of factors are indicated in the Tool as contributing to the "High" exposures for the extreme precipitation (stormwater flooding) parameter and a "Moderate" exposure for the extreme precipitation (riverine flooding) parameter. According to the MA Resilience Design Tool output report, the projected 24-hour precipitation depth associated with a 2050 50-year storm event is 7.5 inches. The filing states that stormwater will be managed in accordance with the MassDEP SMS to the maximum extent practicable and will include vegetated swales and naturalized roadside landscapes. However, the filing does not state whether the proposed stormwater management system has been sized to accommodate future storm events. I encourage the Proponent to consider future climate scenarios and maximize opportunities for adding resiliency to the stormwater management system. Although the project received a "Moderate" exposure for the extreme precipitation (riverine flooding) parameter, the filing notes that the project is not situated within a FEMA Flood Zone. In addition, the lowest point of the path will be approximately 23 feet higher than the closest mapped FEMA 100-year base flood elevation (BFE).

To mitigate the effects of higher maximum and mean temperatures and more frequent and longer extreme heat, the project design will include measures to adapt to these conditions including planting 24 trees, including 10 public shade trees, and incorporating native plant species along the trail.

Construction Period

All construction and demolition (C&D) activities should be managed in accordance with applicable MassDEP regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017). The project should include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management, etc.) and emissions of air pollutants from equipment, including anti-idling measures in accordance with the Air Quality regulations (310 CMR 7.11). I encourage the Proponent to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards, or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD). If oil and/or hazardous materials are found during construction, the Proponent should notify MassDEP in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). All construction activities should be undertaken in compliance with the conditions of all State and local permits. I encourage the Proponent to reuse or recycle C&D debris to the maximum extent.

Conclusion

The ENF has adequately described and analyzed the project and its alternatives and assessed its potential environmental impacts and mitigation measures. Based on review of the ENF and comments received on it, I have determined that an EIR is not required.

December 8, 2025
Date

Rebecca L. Tepper

Comments received:

11/12/2025 Liz Phelps
11/26/2025 Natural Heritage & Endangered Species Program (NHESP)
11/28/2025 Massachusetts Department of Environmental Protection (MassDEP) – Southeast Regional Office (SERO)
12/03/2025 Malgorzata Mrózek
12/04/2025 Doug & Carolyn Everson
12/06/2025 Janet and Rick Sherlund

RLT/NSP/nsp

Good afternoon,

I want to express my support and excitement for the Tom Nevers multi-use path project. I've been a permanent resident of a Tom Nevers property for the last 8 years with my husband and 9-year old son. We enjoy the paths, residential side streets, playground and beaches of Tom Nevers, but continue to have major safety concerns regarding Tom Nevers Road. It is a narrow road with no shoulder, with a speed limit of 40 mph, and many people drive much faster than that. Children wait in the morning for the school bus, and many people exercise on it, walk their dogs, or use the road to access the bike path along Milestone and the beach/playground at the end of the road. It feels like an extremely dangerous road to walk/ride your bike along, and there was recently a serious accident involving a pedestrian. Thank you so much for undertaking this much needed project. It will make our neighborhood safer and much more pedestrian-friendly.

Sincerely, Liz Phelps

MASSWILDLIFE

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FISHERIES & WILDLIFE

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November 12, 2025

Drew Patnode
Town of Nantucket
16 Broad Street
Nantucket, MA 02554

Applicant:	Town of Nantucket
Project Location:	Tom Nevers Road, Nantucket
Project Description:	Construction of a Multi-use Path
NHESP Tracking No.:	25-19914
Heritage Hub No.:	RC-96267

RE: Notice that your MESA application for review under 321 CMR 10.18 is incomplete and requires submission of additional information.

Dear Applicant,

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Review Checklist with accompanying site plans: "*Town of Nantucket Tom Nevers Multi-use Path"* (dated September 23, 2025) and supporting documentation for review pursuant to the MA Endangered Species Act Regulations (321 CMR 10.18).

The Division has determined that this Project, as currently proposed, will occur within mapped habitat for the following state-listed species:

Scientific Name	Common Name	Taxonomic Group	MESA Status
Circus hudsonius	Northern Harrier	Bird	Threatened
Cicinnus melsheimeri	Melsheimer's Sack Bearer	Butterfly/Moth	Threatened
Acronicta albarufa	Barrens Dagger Moth	Butterfly/Moth	Threatened
Catocala herodias	Herodias Underwing Moth	Butterfly/Moth	Special Concern
Hemileuca maia	Buck Moth	Butterfly/Moth	Special Concern
Cingilia catenaria	Chain Dot Geometer	Butterfly/Moth	Special Concern
Metarranthis pilosaria	Heath Metarranthis	Butterfly/Moth	Special Concern
Psectraglaea carnosa	Pink Sallow Moth	Butterfly/Moth	Special Concern
Heterocampa varia	Sandplain Heterocampa	Butterfly/Moth	Threatened

State-listed species and their habitats are protected in accordance with the MESA.

The purpose of the Division's review under the MESA regulations is to determine whether a Take of state-listed species will result from the proposed project. Under 321 CMR 10.18(1), the Division is required to notify the Record Owner of the property where the project is proposed within 30 days whether the submitted application

contains the information required to be submitted to the Division pursuant to 321 CMR 10.20, including the applicable review fee. The Division also has the authority under 321 CMR 10.20 to require an applicant to provide additional information beyond the minimum information specified therein.

This letter is to inform you that the Division has determined your application for review under 321 CMR 10.18 is **incomplete** because it does not contain all the minimum information specified in 321 CMR 10.20. Further, **additional information** is required in order for the Division to complete its review. Therefore, the following information must be submitted to the Division to take further action on your application:

1. **Ownership Interest or Landowner Assent**: The project proposes work including grading across multiple properties. The Applicant must provide sufficient information to demonstrate that the Applicant is either the Record Owner, as defined in 321 CMR 10.02, for each property upon which the project is proposed or is a person authorized in writing from the Record Owner to submit the MESA filing. Sufficient information must include a written instrument or recorded deed demonstrating that the Applicant holds legal or equitable interest, right or title to said property, or written authorization from the Record Owner.
2. **Site Plans:** Project plans that include existing and proposed conditions, as required pursuant to 321 CMR 10.20(h), as well as a clearly demarcated area of physical disturbance for the proposed project, as required pursuant to 321 CMR 10.20(f). Site plans should identify locations of all work including stormwater management features as well as the locations of any and all wetland resource areas on-site and quantify proposed impacts to these areas. Project Plans should confirm the surface type of the proposed trail and clarify proposed maintenance and construction methodology.

The Division recommends that the Applicant contact our office in order to discuss the project and the above-mentioned information. After receipt of the requested information, the Division will continue its review of the proposed project for compliance with the MESA. The Division reserves the right to request additional information to understand the potential impacts of the proposed project on state-listed species and their habitats.

No work or other activities related to your filing may be conducted anywhere on the project site until requirements under 321 CMR 10.18(1) are satisfied, and the Division completes its review.

If you have any questions concerning this notice, please contact Tim McGuire, Endangered Species Review Biologist, at timothy.mcguire2@mass.gov or (508) 389-6366**.**

Sincerely,



Jesse Leddick
Assistant Director

cc: Devin Herrick, Weston & Sampson, Inc.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Maura T. Healey
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Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

November 28, 2025

Rebecca L. Tepper
Secretary of Energy and Environment
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
ATTN: MEPA Office
Boston, MA 02114

RE: ENF Review 17012 NANTUCKET
Tom Nevers Road Multiuse Trail Project
at Tom Nevers Road

Dear Secretary Tepper,

The Southeast Regional Office of the Department of Environmental Protection (MassDEP or the Department) has reviewed the Environmental Notification Form (ENF) for the Tom Nevers Road Multiuse Trail Project at Tom Nevers Road, Nantucket, Massachusetts (EOEEA #17012). The Project Proponent provides the following information for the Project:

The proposed project includes the installation of a 2.1-mile multi-use pathway along Tom Nevers Road in Nantucket MA. Upon project completion, the community and visitors to the island will be able to safely access Tom Nevers Field and the adjacent public beach directly from Milestone Road via bike path. This ENF is being submitted because the project will include construction, widening or maintenance of a roadway or its right-of-way that will:

a) *alter the bank or terrain located ten more feet from the existing roadway for one-half or more miles and*
b) *cut five or more living public shade trees of 14 or more inches in diameter at breast height.*

Bureau of Water Resources (BWR) Comments:

Wetlands: According to the ENF, jurisdictional wetland resource areas identified near Tom Nevers Road and Tom Nevers Field include Coastal Bank (310 CMR 10.30), Coastal Beach

(310 CMR 10.27), Coastal Dune (310 CMR 10.28), and Land Subject to Coastal Storm Flowage (310 CMR 10.04). The Proponent indicates that all proposed work is designed to avoid impacts to resource areas and is outside the applicable buffer zones. An intermittent stream runs south of Tom Nevers Road but appears to be further than 100 feet from the limit of work. Based on the information provided in the ENF and on a review of the MassGIS data layers, the wetlands program concludes that the work as proposed does not appear to require the filing of a Notice of Intent with the Department and the Nantucket Conservation Commission. However, MassDEP recommends that the Proponent works with the Nantucket Conservation Commission to determine and confirm jurisdiction under the Wetlands Protection Act and the applicable wetland bylaw, prior to commencement of work. Should the Project scale change to include activities within areas subject to protection under M.G.L. c. 131, §40, the filing of a Notice of Intent is required in accordance with 310 CMR 10.02(2).

Waterways. Pursuant to the Department's internal review, no work appears within a geographic area subject to jurisdiction pursuant to Chapter 91 and its regulations at 310 CMR 9.00.

Stormwater:

Underground Injection Control:
The Proponent should be aware that the conveyances of stormwater through underground stormwater infiltration structures are subject to the jurisdiction of the MassDEP *Underground Injection Control (UIC)* program. These structures must be registered with MassDEP UIC program through the submittal of a BRP WS-06 UIC Registration application through MassDEP's electronic filing system, eDEP. All information regarding on-line (eDEP) UIC registration applications may be obtained at the following web page under the category "Applications & Forms": https://www.mass.gov/underground-injection-control-uic. For further information please contact Joe Cerutti, the statewide UIC program contact, who can be reached at joseph.cerutti@mass.gov.

NPDES Construction General Stormwater Permit:
The Project Proponent acknowledges that its activities exceed an acre and thus requires an NPDES Stormwater Permit for its construction Activities. The Proponent can access information regarding the NPDES Stormwater requirements and an application for the Construction General Permit by completing and submitting a Notice of Intent (NOI) to EPA via the https://www.epa.gov/npdes/stormwater-discharges-construction-activities.

The Proponent is advised to consult with Meridith Finegan at finegan.meridith@epa.gov, 617- 918-1533) for questions regarding EPA's NPDES Construction General Permit requirements.

In addition, the Proponent is reminded that local Planning Boards (and/or other local authorities) may require stormwater controls beyond that of the Wetlands

Protection Act. These controls are usually created to keep stormwater onsite so as not to create nuisance conditions offsite.

Bureau of Waste Site Cleanup (BWSC) Comments:

Based upon the information provided, the Bureau of Waste Site Cleanup (BWSC) searched its databases for disposal sites and release notifications that have occurred at or might impact the proposed Project area. A disposal site is a location where there has been a release to the environment of oil and/or hazardous material that is regulated under M.G.L. c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000].

RTN 4-0000113 is associated with the former Tom Nevers Naval Facility. It appears that the Proposed Project does not include any work within the former U.S. Military Reservation Formerly Used Defense (FUD) site footprint at Tom Nevers Field. No building demolition is proposed; therefore, no munitions would be anticipated. Munitions findings would be subject to applicable MCP reporting requirements. There are no other listed MCP disposal sites located at or in the vicinity of the site that would appear to impact the proposed Project area.

Interested parties may view a map showing the location of BWSC disposal sites using the MassGIS data viewer at MassMapper. Under the Available Data Layers listed on the right sidebar, select "Regulated Areas", and then "DEP Tier Classified 21E Sites". MCP reports and the compliance status of specific disposal sites may be viewed using the BWSC Waste Sites/Reportable Release Lookup at: https://eeaonline.eea.state.ma.us/portal/dep/wastesite/

The Project Proponent is advised that if contaminated media is encountered a Licensed Site Professional (LSP) must be employed or engaged to manage, supervise or actually perform the necessary response actions at the site for excavating, removing and/or disposing of contaminated soil or contaminated media (which includes contaminated sediment) must be conducted under the provisions of Massachusetts General Law Chapter 21E (and, potentially, c.21C) and all other applicable federal (including the Environmental Protection Agencies Toxic Substance Control Act - TSCA), state, and local laws, regulations, and bylaws. Contaminated media cannot be managed without prior submittal of appropriate plan to MassDEP (such as a Release Abatement Measure (RAM) Plan), which describes the proposed handling and disposal approach for any contaminated media encountered and health and safety precautions for those conducting the work. If contamination at the site is known or suspected, the appropriate tests should be conducted well in advance of the start of construction and professional environmental consulting services should be readily available to provide technical guidance to facilitate any necessary permits. The BWSC may be contacted for guidance if questions arise regarding cleanup.

Spills Prevention and Control: The Project Proponent is advised that a spills contingency plan addressing prevention and management of potential releases of oil and/or hazardous

materials from pre- and post-construction activities should be presented to workers at the site and enforced. The plan should include but not be limited to, refueling of machinery, storage of fuels, and potential on-site activity releases.

Bureau of Air and Waste (BAW) Comments:

Air Quality: The Proponent should implement measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the construction activities. Such measures must comply with MassDEP Bureau of Air and Waste Prevention (former BWP) Regulations 310 CMR 7.01, 7.09, and 7.10. To determine the appropriate requirements please refer to:

- 310 CMR 7.09 Dust, Odor, Construction, and Demolition
- 310 CMR 7.10 Noise

Construction-Related Measures:

The Project Proponent reports: "Any emissions on site will be consistent with local, state, and federal standards. Construction vehicles will minimize idling during construction."

MassDEP requests that all non-road diesel equipment rated 50 horsepower or greater meet EPA's Tier 4 emission limits, which are the most stringent emission standards currently available for off-road engines. If a piece of equipment is not available in the Tier 4 configuration, then the Proponent should use construction equipment that has been retrofitted with appropriate emissions reduction equipment. Emission reduction equipment includes EPA-verified, CARB-verified, or MassDEP-approved diesel oxidation catalysts (DOCs) or Diesel Particulate Filters (DPFs). The Proponent should maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for Departmental review.

MassDEP reminds the Proponent that unnecessary idling (i.e., in excess of five minutes), with limited exception, is not permitted during the construction and operations phase of the Project (Section 7.11 of 310 CMR 7.00). Regarding construction period activity, typical methods of reducing idling include driver training, periodic inspections by site supervisors, and posting signage. In addition, to ensure compliance with this regulation once the Project is occupied, MassDEP requests that the Proponent install permanent signs limiting idling to five minutes or less on-site.

Solid Waste Management: The Project Proponent reports: "Waste generated during construction, including asphalt, granite blocks, concrete slabs, bricks, woody debris, guardrail, and fencing will be managed in accordance with local, state, and federal regulations. Where feasible, materials such as asphalt, concrete, and bricks will be recycled or repurposed. Non-recyclable materials, including trash and deteriorated fencing, will be disposed of at an approved landfill. Woody debris will be chipped and removed from the site or disposed of appropriately."

The Project Proponent is reminded of its requirements for the management of its solid waste:

1. *Beneficial Reuse of any Material:*
   Beneficial Reuse of any Material associated with the Project requires submittal of MassDEP's BWP SW41. Beneficial Use Determination – Restricted Applications. The permit is intended to protect public health, safety, and the environment by comprehensively regulating the reuse of waste materials as effective substitutes for a commercial product or commodity. Information pertaining to this requirement is available at *https://www.mass.gov/doc/instructions-sw-39-40-41-42-beneficial-use-determinations/download*.

2. *Compliance with Waste Ban Regulations*:
   Waste materials discovered during construction that are determined to be solid waste (e.g., construction and demolition waste) and/or recyclable material (e.g., metal, asphalt, brick, and concrete) shall be disposed, recycled, and/or otherwise handled in accordance with the Solid Waste Regulations including *310 CMR 19.017: Waste Bans*. Waste Ban regulations prohibit the disposal, transfer for disposal, or contracting for disposal of certain hazardous, recyclable, or compostable items at solid waste facilities in Massachusetts, including, but not limited to, metal, wood, asphalt pavement, brick, concrete, and clean gypsum wallboard. The goals of the waste bans are to: promote reuse, waste reduction, or recycling; reduce the adverse impacts of solid waste management on the environment; conserve capacity at existing solid waste disposal facilities; minimize the need for construction of new solid waste disposal facilities; and support the recycling industry by ensuring that large volumes of material are available on a consistent basis. Further guidance can be found at: https://www.mass.gov/guides/massdep-waste-disposal-bans.

   MassDEP recommends the Proponent consider source separation or separating different recyclable materials at the job site. Source separation may lead to higher recycling rates and lower recycling costs. Further guidance can be found at: https://recyclingworksma.com/construction-demolition-materials-guidance/.

   For more information on how to prevent banned materials from entering the waste stream the Proponent should contact the RecyclingWorks in Massachusetts program at (888) 254-5525 or via email at info@recyclingworksma.com. RecyclingWorks in Massachusetts also provides a website that includes a searchable database of recycling service providers, available at http://www.recyclingworksma.com.

3. *Tree removal/land clearing/clean wood:*
   As defined in 310 CMR 16.02, clean wood means "discarded material consisting of trees, stumps and brush, including but limited to sawdust, chips, shavings, bark, and new or used lumber" …etc. Clean wood does not include wood from commingled construction

and demolition waste, engineered wood products, and wood containing or likely to contain asbestos, chemical preservatives, paints, stains or other coatings, or adhesives. The Proponent should be aware that wood is not allowed to be buried or disposed of at the Site pursuant to 310 CMR 16.00 & 310 CMR 19.000 unless otherwise approved by MassDEP. Clean wood may be handled in accordance with 310 CMR 16.03(2)(c)7 which allows for the on-site processing (i.e., chipping) of wood for use at the Site (i.e., use as landscaping material) and/or the wood to be transported to a permitted facility (i.e., wood waste reclamation facility) or other facility that is permitted to accept and process wood.

4. *Asphalt, brick and concrete (ABC) rubble*:
   Rubble generated through the demolition of buildings or other structures must be handled in accordance with the Solid Waste regulations. These regulations allow, and MassDEP encourages, the recycling/reuse of ABC rubble. The Proponent should refer to MassDEP's Information Sheet, entitled "Using or Processing Asphalt Pavement, Brick and Concrete Rubble, Updated February 27, 2017 ", that answers commonly asked questions about ABC rubble and identifies the provisions of the solid waste regulations that pertain to recycling/reusing ABC rubble. This policy can be found on-line at the MassDEP website: https://www.mass.gov/files/documents/2018/03/19/abc-rubble.pdf.

5. *Reuse of any demolition material:*
   Reuse of any demolition material requires submittal of MassDEP's BWP SW41 – Beneficial Use Determination – Restricted Applications. The permit is intended to protect public health, safety and the environment by comprehensively regulating the reuse of waste materials as effective substitutes for a commercial product or commodity. Information pertaining to this requirement is available at https://www.mass.gov/doc/instructions-sw-39-40-41-42-beneficial-use-determinations/download.

If you have any questions regarding the Solid Waste Program comments, please contact Mathew Ferris at Mathew.Ferris@mass.gov or Jennifer Wharff at Jennifer.Wharff@mass.gov.

Proposed s.61 Findings:

The "Certificate of the Secretary of Energy and Environmental Affairs on the Environmental Notification Form" may indicate that this Project requires further MEPA review and the preparation of an Environmental Impact Report. Pursuant to MEPA Regulations 301 CMR 11.12(5)(d), the Proponent will prepare Proposed Section 61 Findings to be included in the EIR in a separate chapter updating and summarizing proposed mitigation measures. In accordance with 301 CMR 11.07(6)(k), this chapter should also include separate updated draft Section 61 Findings for each State agency that will issue permits for the Project. The draft Section 61 Findings should contain clear commitments to implement mitigation

measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

Other Comments/Guidance:

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this ENF. If you have any questions regarding these comments, please contact George Zoto at George.Zoto@mass.gov or Jonathan Hobill at Jonathan.Hobill@mass.gov.

Very truly yours,



Jonathan E. Hobill,
Regional Engineer,
Bureau of Water Resources

JH/GZ

Cc: DEP/SERO

ATTN: Gerard Martin, Regional Director
Brian Harrington, Deputy Regional Director, BWR
John Handrahan, Deputy Regional Director, BWSC
Mark Dakers, Acting Deputy Regional Director, BAW
Jennifer Viveiros, Deputy Regional Director, ADMIN
Maissoun Reda, Chief, Wetlands, BWR
Brendan Mullaney, Chief, Waterways. BWR
Jennifer Wharff, Acting Chief, Solid Waste Management, BAW
Michelle McCloud, Solid Waste Management, BAW
Angela Gallagher, Chief, Site Management, BWSC
Amanda Boustany, Site Management, BWSC

FITCH

MALGORZATA A. MRÓZEK
mam@fitchlp.com

FITCH LAW PARTNERS LLP
84 STATE STREET
BOSTON, MA 02109

December 2, 2025

VIA E-MAIL

Nick Perry, Environmental Analyst
Massachusetts Environmental Policy Act (MEPA) Office
100 Cambridge Street, 10th Floor
Boston, MA 02114
Nicholas.perry@mass.gov

RE: Tom Nevers Road Multiuse Trail – NANTUCKET (EEA#: 17012)

Dear Mr. Perry:

Our firm represents Alice, Janet Lea, and Wayne Berman ("the Bermans") owners of 98 Tom Nevers Road, Nantucket, MA ("the Property") with respect to the proposed multi-use trail ("Multiuse Trail") planned by the Town of Nantucket ("Town") along Tom Nevers Road, Nantucket, Massachusetts.

I am writing on behalf of the Bermans to request that, in your review of the Multiuse Trail, you encourage the Town to modify their plans for the Multiuse Trail from the Option B – Off-Road Path, to the Option A – Bike Lanes option, which can be seen in the NP&EDC Path Alignment Options PDF, attached hereto as **Exhibit A**. The Bike Lanes would have a significantly less damaging environmental impact than the Off-Road Path. Specifically, there are only a few trees along this stretch of road, all of which would need to be destroyed to construct the Bike Path. These are mature cherry and pear trees that contribute greatly the beauty of the area, and provide the only shade and root support to the soil there.

Losing nine trees from a stretch of road with very few trees already is deeply upsetting; birds nest in them, they create an ecological barrier against the wind, and two different tree experts have told the Bermans that if they try to transplant the trees, they will die, due to the size of the rootball.

There is a real concern from a safety standpoint about creating a bike path to a dangerous "park" at the end of the road, which has "unexploded ordinance" signs posted. In the past year

PHONE 617-542-5542
FAX 617-542-1542
FITCHLP.COM

alone, that stretch of clifface has lost forty feet, causing an unstable place for anyone to walk, not to mention the deserted metal pieces and unexploded ordinances. This park is no meeting place: it is incredibly hazardous. The cliff is eroding at a concerning pace, and between the threat of someone falling and the concrete ruins, it's shocking that this area hasn't been closed off to pedestrians.

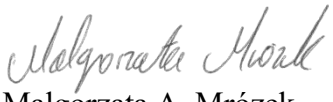
This area sees very little pedestrian or bike traffic, and, ideally, it would remain that way, for purposes of safety.

For months now, the Bermans have been requesting that the Town reconsider its selection of the Bike Path, for the southern stretch of Tom Nevers Road, in order to protect these trees. See letters to various Town entities attached hereto as **Exhibits B, C, D and E.**

The Bermans respectfully request that MEPA review these letters and recommend that the Town adopt the Bike Lanes option in order to protect the trees and vegetation in the neighborhood.

Thank you for your attention to this matter.

Sincerely yours,



Malgorzata A. Mrózek

MAM:cab

Attachments

cc: Ms. Alice Berman
Ms. Janet Lea Berman
Mr. Wayne Berman
Kurt S. Kusiak, Esq.
T. Michael Burns, AICP
Herrick Devin

The comment letter references “Exhibits”, which are too large to include as part of this Certificate. However, the full comment letter, including all “Exhibits”, was sent to the Proponent (the Town of Nantucket) for their records.

Good morning Mr. Perry,

My name is Doug Everson. My wife, Carolyn, and I reside at **94 Tom Nevers Road** on Nantucket. I am writing to you regarding the proposed bike path under consideration for Tom Nevers Road, and to express **serious concerns about the significant and lasting impact the currently proposed route would have on native vegetation and the surrounding natural landscape.**

To be clear at the outset, there is **strong, near-unanimous support** for expanding safe pedestrian and bicycle access along Tom Nevers Road. Carolyn and I are **enthusiastic supporters** of a bike path and fully recognize the safety benefits it would provide for both walkers and cyclists.

However, the **reality** is that the terminal portion of Tom Nevers Road currently experiences **minimal pedestrian and bicycle use**. This low utilization is largely attributable to the deteriorated state of the recreational fields at the end of the road—facilities that have been in chronic disrepair for decades—as well as the **ongoing bluff erosion** driven by increasingly severe climate impacts. The few individuals who use the fields typically arrive by car, as there is ample parking but **no practical or sanctioned beach access**.

Given these conditions, I would assume that a **formal traffic and utilization study** has been conducted as part of the planning process to verify present-day pedestrian, bicycle, and vehicular usage along all sections of Tom Nevers Road. If such a study has not yet been performed, I would strongly recommend that it be completed to ensure that decisions regarding the bike path are **data-driven and aligned with actual community need**.

With this context in mind, the homeowners along the terminal section of Tom Nevers Road—beginning at the intersection with Old Tom Nevers Road—would experience **substantial negative impacts** under the current proposal. These include the removal of large areas of **native, environmentally valuable vegetation** and the loss of carefully maintained landscaping that homeowners have invested in and preserved over many years. While planted landscaping can technically be recreated—albeit at significant expense to both the Town and the affected homeowners—the **irreversible destruction of native vegetation** is a far more serious loss, particularly in an area exposed to harsh year-round weather conditions.

Additionally, the **scale and design** of the proposed bike path along this quiet stretch of road appear **disproportionate to both current usage and realistic future demand**. The design resembles paths constructed alongside high-traffic corridors such as Milestone Road—an intensity and width that is neither necessary nor appropriate for this sparsely utilized and lightly populated section of the island. In effect, this risks becoming an **overbuilt, costly, and largely underused "bridge to nowhere,"** while simultaneously causing extensive and unnecessary environmental disruption.

We respectfully urge consideration of a **more practical, less invasive alternative**: a bike path integrated along the existing alignment of Tom Nevers Road. Such an approach would significantly **reduce environmental damage**, better reflect current and future levels of foot and bicycle activity, and **limit intrusion onto private property**. It would also represent a **material cost savings** for the Town of Nantucket. Pairing this alternative with a **reduced speed limit of 25 mph** would further enhance safety without sacrificing the natural character of the area.

We would be grateful for your **thoughtful consideration and support** of this more balanced and environmentally responsible solution. Carolyn and I would welcome the opportunity to discuss this matter with you or members of your team at your convenience.

Thank you very much for your time, and we wish you and your family a wonderful upcoming holiday season.

Sincerely,
Doug & Carolyn Everson

Dear Mr. Perry,

My name is Janet Sherlund, and my husband, Rick and I live full time at 120 Tom Nevers Road on Nantucket. We want to let you know of our serious concerns about the impact of the proposed bike path on our section of Tom Nevers Road. While we support the proposed bike path from Milestone Road to Old Tom Nevers Road, we have serious concerns about such an invasive path from Old Tom Nevers Road to the field.

The section of Tom Nevers Road from Old Tom Nevers Road to the field has minimal bike and pedestrian use. Our home is 3 houses from the field, and we observe activity year-round. The field is not a viable destination. It has lost over 40' of beach and bluff erosion in the past few years, which further exposed massive concrete structures and rebar across the beach and in the water. There is no safe beach access. Additionally, the town recently posted multiple signs warning of unexploded ordinances throughout the area. Buildings are rusting and dilapidated. Outside of an adult softball game on Sunday afternoons to which participants drive and then use their trucks to play loud music and party, there is no regular use of the field.

Those of us who call this neighborhood home chose this area for its quiet, undeveloped sanctuary and rugged beauty. We fall asleep to the sound of the waves, our skies are not obscured, and we see a dome of stars nightly, including the Milky Way. The wind is always blowing out here, and we love how the mounds of native grasses we planted dance in the wind.

We note seasons differently out here. Our microclimate is 2 weeks later than towns, and after a harsh, wind driven winter we greatly appreciate whatever signs of spring our neighborhood provides. The beautiful flowering cherry trees that miraculously thrive out here bring color and hope for the coming season. Daffodils and thoughtful landscaping create the feeling of a neighborhood and remind us of returning friends who also sought out this quiet area for their home.

The scale and design of the proposed bike path is disproportionate to both current usage and realistic future demand. The design is more suitable for high traffic roads such as Milestone Road. Its width and intrusion on our neighborhood's environment are not necessary or appropriate. It is a poor use of funds and smacks of the infamous "bridge to nowhere".

Building the proposed bike path would necessitate the removal of large areas of native vegetation and the loss of carefully maintained landscaping homeowners have invested in and preserved over many years. While such landscaping can technically be recreated (at significant expense to affected homeowners and the Town), the destruction of native vegetation in an area of harsh year-round weather is a serious loss.

The less invasive, more appropriate solution for this sparsely utilized and lightly populated section of the island is the bike lane. A bike lane would reduce environmental damage, appropriately reflect current and future levels of bike and pedestrian traffic and limit intrusion onto private property.

We would appreciate your thoughtful consideration and support of the more balanced, environmentally responsible solution.

Thank you.

Janet and Rick Sherlund

PERMIT ATTACHMENT C

MHC DETERMINATION

RECEIVED
SEP 30 2025
MASS. HIST. COMM
RC.77404

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Tom Nevers Road Multi-Use Path Project

Location / Address: Tom Nevers Rd, Nantucket, MA, 02554

City / Town: Nantucket

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

Caitriona Parker RC.77404 — Date 10/16/25
Preservation Planner
Massachusetts Historical Commission

Project Proponent

Name: Town of Nantucket

Address: 16 Broad St

City/Town/Zip/Telephone: Nantucket, MA, 02554/ 508-228-7200 Ext. 7522

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Massachusetts Endangered Species Act	Project Review
Massachusetts Environmental Policy Act Office (MEPA)	Environmental Notification Form (ENF)
Massachusetts Department of Transportation (MassDOT)	Non-Vehicular Access Permit

Project Description (narrative):

This proposed project includes the construction of a new, 2.1-mile, multi-use path that will connect Milestone Road to Tom Nevers Field and Playground by following within/along the right-of-way of Tom Nevers Road. See attached project description.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

No demolition is proposed.

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

Utilizing the Massachusetts Cultural Resource Information System Maps (MACRIS), the entire island of Nantucket is classified as the "Nantucket Historic District". No other known historical or archaeological properties exist within the limit of work.

What is the total acreage of the project area?

Woodland 0	acres	Productive Resources:	
Wetland 0	acres	Agriculture 0	acres
Floodplain 0	acres	Forestry 0	acres
Open space 7.4 (road right of way)	acres	Mining/Extraction 0	acres
Developed 0.4 (existing road and driveway crossings)			acres
Total Project Acreage 7.8			acres

What is the acreage of the proposed new construction? **7.8** acres

What is the present land use of the project area?

Present land use within the limit of work includes existing roadway, undeveloped right of way, residential properties and open space.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

See attached.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: Devin Herrick Date: 9/25/2025

Name: Weston & Sampson Engineers – Devin Herrick

Address: 55 Walkers Brook Drive, Suite 100

City/Town/Zip: Reading/MA/01867

Telephone: 978-573-5802

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

SECTION 00 41 13
FORM OF GENERAL BID

Proposal of _____ (hereinafter called "Bidder")*

(__) a corporation, organized and existing under the laws of the State of _____

(__) a joint venture

(__) a limited liability company

(__) a partnership

(__) an individual doing business as _____

*Insert corporation, partnership, joint venture, limited liability company, or individual as applicable.

To the Town of Nantucket, Massachusetts (hereinafter called the Owner).

The undersigned Bidder, in compliance with your invitation for bids for the construction of Tom Nevers Road Multi-Use Path Project having examined the plans and specifications with related documents and the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to construct the project in accordance with the contract documents, as prepared by Weston & Sampson Engineers, Inc., within the time set forth therein and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this bid is a part.

The Bidder hereby agrees that if selected as the Contractor it will commence work under this contract on or before a date to be fixed in the written "Notice to Proceed" given by the Owner to the Contractor and to fully complete the project no later than May 28, 2027. The Bidder further agrees to pay as liquidated damages the sum of $1,000 for each consecutive calendar day thereafter during which the work has not been fully completed, as provided in the "Liquidated Damages" provisions of Section 00 73 00 SUPPLEMENTARY CONDITIONS.

Bidder acknowledges receipt of the following addenda:

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

Item 1. BASE PROPOSAL: Bidder agrees to perform all of the work described in the Specifications and shown on the plans for the sum of: _____

_____Dollars and _____Cents ($_____)

Item 2. ROADWAY TRAFFIC FLAGGERS: Bidder agrees to provide authorized Roadway Traffic Flaggers in accordance with Section 01 55 26.22.

Estimated Quantity: 200 Flagger-Hours

Unit Price per Flagger-Hour: _____ Dollars and _____ Cents ($_____)

Extended Price (200 Flagger-Hours × Unit Price): _____ Dollars and _____ Cents ($_____)

TOTAL BID (ITEM 1 BASE PROPOSAL + ITEM 2 EXTENDED PRICE): _____ Dollars and _____ Cents ($_____)

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

The BASE PROPOSAL and the above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, bond premiums, engineering costs, etc., to cover the finished work of the several kinds called for.

The Bidder understands that all bids for this project are subject to the applicable bidding laws of the Commonwealth of Massachusetts, including General Laws Chapter 30, Section 39M, as amended.

The contract will be awarded to the lowest responsible and eligible bidder.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 60 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

Within 10 days of receipt of the written notice of acceptance of this bid, the Bidder will execute the formal agreement attached in Section 00 52 00 AGREEMENT.

Bid security is attached in the sum of five percent (5%) of the total bid in accordance with the conditions of Section 00 21 13 INSTRUCTIONS TO BIDDERS. The bid security may become the property of the Owner in the event the contract and bond are not executed within the time set forth above.

The selected Contractor shall furnish performance and payment bonds, each in an amount equal to one hundred percent (100%) of the Contract Price, as required by Section 00 72 00, GENERAL CONDITIONS. The payment bond shall conform to Section 00 61 13.16, PAYMENT BOND.

The undersigned offers the following information as evidence of its qualifications to perform the work as bid upon according to all the requirements of the plans and specifications.

1. Have been in business under present name for _____ years.

2. The names and addresses of all persons interested in the bid (if made by a partnership or corporation) as Principals, are as follows:

_____

_____

_____

_____

(Attach supplementary list if necessary)

3. The Bidder shall state below what work of a similar character to that included in the proposed contract it has done, and give references that will enable the Owner to judge its experience, skill and business standing (add supplementary page if necessary).

Completion Date	Project Name	Contract Amount	Design Engineer	Reference Name	Telephone No.
a.					
b.					
c.					
d.					
e.					
f.					

Pursuant to M.G.L. CH. 62C, Sec 49A, the undersigned Bidder certifies under the penalties of perjury that it is in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

The undersigned Bidder hereby certifies it will comply with the specific affirmative action steps contained in the EEO/AA provisions of this Contract, including compliance with the Disadvantaged Business Enterprise provisions as required under these contract provisions. The contractor receiving the award of the contract shall incorporate the EEO/AA provisions of this contract into all subcontracts and purchase orders so that such provisions will be binding upon each subcontractor or vendor.

The undersigned Bidder hereby certifies that (1) it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and 3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned Bidder hereby certifies, under pains and penalties of perjury, that the foregoing bid is based upon the payment to laborers to be employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned bidder agrees to indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work arising out of or as a result of (1) the failure of the said bid to be based upon the payment of

the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the Contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section Twenty-Nine F of Chapter Twenty-Nine, Section 25C (10) of Chapter 152 (workers' compensation) or any other applicable debarment provisions of any other Chapter of the General Laws or any rule or regulations promulgated thereunder.

Respectfully submitted:

Date _____ By _____

(Signature)

_____

(Name - Typed or Printed)

_____

(Title)

(SEAL - if bid is by a corporation)

_____

(Business Name)

_____

(Federal ID Number)

_____

(Business Address)

_____

(City and State)

_____

(Telephone Number)

_____

(Fax Number)

SECTION 00 52 00

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, _____, by and between the_____, hereinafter called "OWNER," acting herein through its Town Manager, _____, and _____, doing business as (a corporation) (a limited liability company) (a partnership) (a joint venture) (an individual)* located in the (City) (Town)* of _____, County of_____, and State of _____, hereinafter called "CONTRACTOR."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the project described as follows:

TOM NEVERS ROAD MULTI-USE PATH PROJECT

hereinafter called the project, for the sum of _____ Dollars and _____ Cents ($_____) and all extra work in connection therewith, under the terms as stated in the Contract Documents; and at its own proper cost and expense to furnish superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to complete the said project in accordance with the conditions and prices stated in Section 00 41 13, FORM OF GENERAL BID, Section 00 72 00, GENERAL CONDITIONS, Section 00 73 00, SUPPLEMENTARY CONDITIONS, Section 00 73 73.13, STATE REGULATIONS, the plans, which include all maps, plates, drawings, blue prints, and the specifications and all other contract documents therefor as prepared by Weston & Sampson Engineers, Inc., including all bid documents and issued addenda.

The CONTRACTOR hereby agrees to commence work under this contract on or before a date to be fixed in the written Notice to Proceed given by the OWNER to the CONTRACTOR and to fully complete the project no later than May 28, 2027. The CONTRACTOR further agrees to pay as liquidated damages the sum of $ 1,000 for each consecutive calendar day thereafter during which the work has not been fully completed, as provided in the Liquidated Damages provisions of Section 00 73 00 SUPPLEMENTARY CONDITIONS.

The CONTRACTOR shall not discriminate against or exclude any person from participation herein on grounds of race, color, religious creed, national origin, sex, sexual orientation, ancestry, or age; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, sexual orientation, ancestry, age, or handicapped status.

The CONTRACTOR shall not participate in or cooperate with an international boycott, as defined in Section 999 (b)(3) and (4) of the Internal Revenue Code of 1986, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Agreement and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Federal and State Laws and Regulations exists, the more stringent requirement shall apply.

Subject to G.L. c.30, sec. 39K and/or sec. 39G and G.L. c.30, sec. 39F, as applicable, the OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Agreement, subject to additions and deductions, as provided in Section 00 72 00, GENERAL CONDITIONS, and to make payments on account thereof as provided in Section 00 72 00, GENERAL CONDITIONS and Section 00 73 00, SUPPLEMENTARY CONDITIONS

In accordance with the requirements of G.L. c.149, §27B, the Contractor shall submit, and shall require all of its subcontractors required to keep a record of hours and wages paid to laborers employed on the project to submit, to the awarding authority on a weekly basis, copies of such records. All such weekly submissions shall be accompanied by the following certification:

> The undersigned contractor hereby certifies, under the pains and penalties of perjury, that the foregoing payroll records are true and accurate records of the wages paid to laborers employed on the project for the period stated and said wages are in an amount no less than the prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned contractor agrees, in addition to any other remedies available to the awarding authority, to indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or as a result of (1) the contractor's failure to pay laborers employed on the project the said applicable prevailing wage rates; (2) the failure of the foregoing payroll records to accurately state the said applicable prevailing wage
> rates; or (3) the failure of the foregoing payroll records to accurately represent the wages actually paid to laborers employed on the project.

The Agreed upon DIRECT LABOR MARKUP (percentage) for Change Orders on this project shall be 20 percent.

IN WITNESS WHEREOF, the parties to these presents have executed this Agreement in three (3) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

AGREED:

Town of Nantucket, Massachusetts
(Owner)

By _____

_____
(Name)

_____
(Town Manager)

_____
(Contractor)

By _____

_____
(Name)

_____
(Title)

_____
(Address)

_____
(City and State)

Approved as to Form:

By _____
(Owner's Counsel)

_____
(Name)

In accordance with M.G.L. c. 44, § 31C, this is to certify that an appropriation in the amount of this Contract is available therefor and that the Town Manager, _____, has been authorized to execute the Contract and approve all requisitions and change orders.

By _____

_____
(Name)

_____
(Title)

CERTIFICATE OF VOTE
(to be filed if Contractor is a Corporation)

I, _____, hereby certify that I am the duly qualified and acting Secretary of
(Secretary of Corporation)
_____ and I further certify that a meeting of the Directors of said company,
(Name of Corporation)
duly called and held on _____, at which all members were present and voting, the
(Date of Meeting)
following vote was unanimously passed:

VOTED: To authorize and empower

_____

_____

_____

_____

_____

Anyone acting singly, to execute Forms of General Bid, Contracts or Bonds on behalf of the Corporation.

I further certify that the above vote is still in effect and has not been changed or modified in any respect.

By:_____
(Secretary of Corporation)

A True Copy:

Attest: _____
(Notary Public)

My Commission Expires:_____
(Date)

Contractor's Certification

A Contractor will not be eligible for award of a contract unless such Contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTOR'S CERTIFICATION

_____

Name of the General Contractor

certifies that it:

1. Will not discriminate in their employment practices;

2. Intends to use the following listed construction trades in the work under the contract:

   _____

   _____

   and

3. Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and

4. Is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and

5. Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.

6. Agrees to comply with all provisions contained herein.

_____

Signature of authorized representative of Contractor Date

_____

Printed name of authorized representative of Contractor

Contractor's Certification (Continued)

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal 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 natural person, business, partnership, corporation, committee, union, club or other organization, entity, or group of individuals.

Signature_____ Date_____

_____ _____
Print Name & Title Company Name

CERTIFICATE OF TAX COMPLIANCE

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A (b), I

_____, authorized signatory for _____
Name of individual *Name of contractor*
do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

_____ _____
Signature Date

LABOR HARMONY AND OSHA TRAINING REQUIREMENTS

The undersigned certifies under penalties of perjury that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed at the work ***and*** that all employees to be employed at the worksite and in the work will have completed an OSHA-approved construction safety and health course lasting at least ten (10) hours.

Signature_____ Date_____

_____ _____
Print Name & Title Company Name

Subcontractor's Certification

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit to the General Contractor the following certification, which will be deemed a part of the resulting subcontract:

SUBCONTRACTOR'S CERTIFICATION

_____
Name of the Subcontractor

certifies that it:

1.Will not discriminate in their employment practices;

2.Intends to use the following listed construction trades in the work under the contract:

_____

_____

and

3.Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and

4.Is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and

5.Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.

6.Agrees to comply with all provisions contained herein.

_____
Signature of authorized representative of Subcontractor Date

_____
Printed name of authorized representative of Subcontractor

END OF SECTION

SECTION 00 61 13.16

PAYMENT BOND

KNOW EVERYONE BY THESE PRESENTS: That we _____
(Name of Contractor)
a _____hereinafter called "Principal" and
(Corporation, Partnership, Joint Venture, Limited Liability Company, or Individual)
_____of _____, State of _____
(Surety) (City) (State)
hereinafter called "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts are held and firmly bound to the Town of Nantucket, Massachusetts, hereinafter called "Owner," in the penal sum of_____
_____ Dollars and _____
_____ Cents ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal has entered into a certain contract with the Owner (the "Contract"), dated the _____ day of _____ _____, 20____, which Contract is by reference made a part hereof, for the construction described as follows:

TOM NEVERS ROAD MULTI-USE PATH PROJECT

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this Contract or to the work or to the specifications. The Surety Company providing the bond shall have a rating of A or better within the Best Key Rating Guide.

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

IN WITNESS WHEREOF, this instrument is executed in _____ ( ) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20___.

ATTEST:

_____ Principal	_____ Witness as to Principal Signature
By_____ Signature	_____ Name and Title
_____ Name and Title	_____ Address
_____ Address	_____ City and State
_____ City and State	(SEAL)

ATTEST:

_____ Surety	_____ Witness as to Surety Signature
By_____ Attorney-in-Fact Signature	_____ Name and Title
_____ Name and Title	_____ Address
_____ Address	_____ City and State
_____ City and State	(SEAL)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

END OF SECTION

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

SECTION 00 72 00
STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

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NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by

CONSTRUCTION SPECIFICATIONS INSTITUTE

REVISIONS HIGHLIGHTED WITHIN THE TEXT OF THIS SECTION HAVE BEEN APPROVED BY OWNER'S LEGAL COUNSEL KOPELMAN & PAIGE, P.C.

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SECTION 00 72 00
STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed. May also be referred to as "Proposal" which may be used interchangeably and shall have the same meaning.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

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12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor and complement the Specifications. Shop Drawings and other Contractor submittals are not Drawings as so defined. May also referred to as "Plans", which may be used interchangeably and shall have the same meaning. Notes on Drawings are directed to Contractor unless specifically noted otherwise.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 01 of the Specifications which govern the Work in all sections of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

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25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*—Polychlorinated biphenyls.

31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times. May also be referred to as "Construction Schedule", which may be used interchangeably and shall have the same meaning.

33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

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38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. The Specifications are based on the guidelines of the Construction Specifications Institute (CSI) Project Resource Manual, and are directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases in the Specifications.

43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

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48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

B. Additional Terms

1. *Final Completion*—The time at which all Work is completed and ready for final payment in accordance with Paragraph 14.07 of these General Conditions.

2. *Industry Practice*—The written practices, methods, materials, supplies and equipment, as changed from time to time, that are commonly used in the industry applicable to the Project to design, construct and operate facilities and plants, or any practices, methods and acts, which in the exercise of reasonable judgment in light of the facts known at the time, could have been expected to accomplish the desired results consistent with good business practices, reliability, safety and expedition.

3. *Punch List*—A list of open items representing portions of the Work which Contractor, Engineer, Owner reasonably agree is not complete on the date of Substantial Completion or Final Completion, but which items will not significantly interfere with the safe, reliable operation and integrity of the Project or its intended use.

4. *Purchase Order*—A written agreement between Contractor and a Supplier for provision of material and equipment.

5. *Warranty Period*—The correction period after the date of Substantial Completion per Paragraph 13.07 of these General Conditions.

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1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. Intent of Certain Terms or Adjectives:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight. See also Paragraph 17.02 of these General Conditions.

D. Defective:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

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2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. ~~When Contractor delivers the executed counterparts~~Prior to execution of the Agreement ~~to Owner~~, Contractor shall ~~also~~ deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Prior to execution of the Agreement and b~~B~~efore any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ~~ten~~ 5 printed or hard copies of the Contract Documents or Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the ~~sixtieth~~ 90th day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, unless mutually agreed otherwise.~~, whichever date is earlier.~~

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents and the lead times for equipment and materials per the listing in subparagraph 2.05.A.4;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work which will be confirmed in writing by Contractor at the time of submission. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and.

4. a complete listing of equipment and materials with lead times between placing orders and delivery, including normal allowances of time for processing and correcting Shop Drawings. All orders for long lead items shall be placed within 30 days after Effective Date of the Agreement if delivery is critical to scheduling. Failure to place orders promptly may result in full liability for liquidated damages if Contract Times are not met.

B. *Evidence of Insurance*: In accordance with Paragraph 2.01.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

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2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

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2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies:

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall ~~not~~ be liable to Owner or Engineer for failure to report any such conflict, error, ambiguity, or discrepancy in the Contract Documents ~~unless~~ if Contractor ~~had actual knowledge~~knew or reasonably should have known thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

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3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. ~~Unless otherwise stated in the Supplementary Conditions, t~~The data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies), files transmitted in in portable document format (PDF), and other electronic media formats of text, data, graphics or other file types supported by any digital document exchange system implemented for the Project, all of which are understood by all parties to constitute official Project correspondence and submittals . ~~Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.~~ If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

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C. Possible Price and Times Adjustments:

1. The Contract Price or the Contract Times, or both, ~~will~~ may be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

   b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

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2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. reviewing and checking all such information and data;

   b. locating all Underground Facilities shown or indicated in the Contract Documents;

   c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

   d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated:

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated ~~or not shown or indicated with reasonable accuracy~~ in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

3. Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, shall not be liable to Contractor for any Claims, losses, or damages incurred by Contractor (including but not limited to all fees and changes of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) related to Underground Facilities not shown or indicated.

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4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work unless Contractor caused or contributed to such Hazardous Environmental Condition. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly

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after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within ~~20~~ 5 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

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B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed, complies with the requirements of Article 5, and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; ~~and~~

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.~~;~~

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7. claims arising out of violation of Laws or Regulations; and

8. claims for damages because of negligent acts, errors and omissions arising out of performing or providing professional services.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided herein and in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

a. Such insurance shall remain in effect for two years after final payment.

b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

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C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation and related coverage:

Minimum limit of liability	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Employer's Liability	$1,000,000

2. Contractor's General Liability:

$1,000,000 per occurrence; $2,000,000 general aggregate; $2,000,000 per project aggregate, including:

- Broad Form Property Damage Liability including coverage for acts of terrorism
- Completed Operations and Product Liability
- Contractual Liability
- Independent Contractors
- Explosion, Collapse & Underground Hazards
- Personal Injury Coverage, Exclusion "C" Deleted
- Fire Legal Liability - $1,000,000
- Medical payments - $1,000,000

Pollution Liability (covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from the Contractor's operations and completed operations maintained for no less than three years after final completion): $1,000,000

Excess or Umbrella Liability: $5,000,000 per occurrence; $5,000,000 general aggregate

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

Combined Single Limit of $1,000,000 for bodily injury & property damage covering Contractor and any vehicles owned, hired and non-owned by the Contractor

4. Professional Liability (E&O for engineers, architects or surveyors): $1,000,000 for each claim with an annual aggregate of at least $2,000,000 if professional services are required under the Specifications

5. Owners Protective Liability: as may be specified in the Supplementary Conditions

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Any self-insured retention (not allowed for Worker's Compensation) and/or deductibles must be identified and cannot exceed $100,000 per occurrence without the prior approval of the Owner. Contractor must provide either an audited financial statement to confirm solvency or a letter of credit guaranteeing the $100,000 in case of loss for the duration of the Project and for the Correction Period.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations (ongoing and completed) under the Contract Documents.

5.06 *Property Insurance*

A. ~~Unless otherwise provided in the Supplementary Conditions,~~ Owner may, in its discretion, purchase and maintain property insurance upon the Work at the Site. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof. Contractor shall be responsible for any ~~(subject to such~~ deductible amounts or self-insured retention as may be provided in the Supplementary Conditions or required by Laws and Regulations~~)~~. This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a ~~Builder's Risk "all-risk"~~Special Forms policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against ~~at least~~ the ~~following~~ special form perils or causes of loss, including but not limited to: fire, lightning, flood, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued; and

8. comply with the requirements of Paragraph 5.06.C of the General Conditions.

B. (Not used)~~Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.~~

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary

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Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds(Not used)*

A. Not used~~Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order~~.

~~B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.~~

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

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6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

D. Provision of any instructions:

1. will not be effective to assign to Owner, or any of Owner's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 8.09; and

2. will not be effective to assign to Engineer, or any of Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09.

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6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item, make or catalogue number, or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

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b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items:

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

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a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Bidding Requirements or Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and ~~if~~

the Contractor has submitted a list thereof in accordance with the Bidding Requirements or Supplementary Conditions (which shall be included as an attachment to the Agreement), Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

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1. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

D. At the Owner's option, Contractor shall defend claims in connection with any alleged infringement of such rights.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses that are not listed in Section 00 31 43 PERMITS. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, Contractor shall give Engineer prompt written notice thereof, and any necessary changes will be authorized by one of the methods set forth in Paragraph 3.04. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

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6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work, Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

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6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings and other closeout submittals specified will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs (if any) and other safety requirements that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

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E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

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6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings:

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. Samples:

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures:

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

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2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1. or for errors or omissions in a Shop Drawing or Sample.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

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6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and in accordance with Subcontractor warranties, manufacturers and Suppliers warranties on equipment and material, and extended or special warranties and will not be defective for the correction period specified in 13.07. Owner and Engineer and ~~its~~ their officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

1. Contractor shall obtain and preserve for the benefit of the Owner:

   a. manufacturers' and Suppliers' written warranties and guarantees on equipment and material incorporated into the Work;

   b. written warranties and guarantees from each Subcontractor engaged in the performance of the Work; and

2. extended or special warranties.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; ~~or~~

7. any correction of defective Work by Owner; or~~.~~

8. any acceptance by Owner or any failure to do so.

D. Contractor shall prepare and execute a written general warranty and guarantee applicable to the Work reflecting the provisions of this Paragraph 6.19, Article 13 and other applicable provisions of the Contract Documents pertaining to warranties and guarantees, Subcontractor, manufacturers and Supplier warranties and guarantees, and extended or special warranties and guarantees. Contractor shall submit this written general warranty and guarantee in accordance with Article 14 and the General Requirements.

E. Provision of any warranties or guarantees:

1. will not be effective to assign to Owner, or any of Owner's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 8.09; and

2. will not be effective to assign to Engineer, or any of Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09.

F. The warranty and guarantee provisions of this Paragraph 6.19 shall be in addition to and not in limitation of any other warranties, guarantees or remedies allowed by Law or the Contract Documents.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify, defend, and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property ~~(other than the Work itself)~~, including the loss of use resulting therefrom but only to the extent caused by any negligent or wrongful act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of ~~, or the failure to prepare or approve~~ maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage~~.~~; or

3. caused by the negligent acts, errors or omissions of any of them.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

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ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. ~~The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.~~

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

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B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer ~~to whom Contractor makes no reasonable objection,~~ whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

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8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Owner shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

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ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

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9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

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E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and

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Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than ~~30~~ 14 days) after the start of the event giving rise thereto. Failure to comply with this notice requirement shall constitute a waiver of the Claim. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within ~~60~~ 30 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

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E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

G. Contractor shall not have the right to stop performance of the Work pending resolution of a Claim.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the

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Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

   c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

   e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

   f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

   g. The cost of utilities, fuel, and sanitary facilities at the Site.

   h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

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i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances:

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance:

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

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~~D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:~~

~~1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and~~

~~2. there is no corresponding adjustment with respect to any other item of Work; and~~

~~3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.~~

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be ~~15~~ 10 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

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c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of ~~15~~ 10 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor, provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 27 percent of the costs incurred by the Subcontractor who actually performs the Work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, acts of war or terrorism, or acts of God (force majeure).

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B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of war or terrorism, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

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B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Except as provided in 13.03.B above and where responsibility for a specific inspection or test is expressly allocated to Owner in the Specifications or by Laws and Regulations, Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense. ~~unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.~~

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

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C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

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13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor and may be deducted from amounts otherwise due the Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed and the terms of this Paragraph 13.07 will continue to apply.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

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13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, or immediately in the case of an emergency, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

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D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

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2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

   d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

   e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

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5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

   a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

   b. the Contract Price has been reduced by Change Orders;

   c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

   d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

   1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

   1. Owner may refuse to make payment of the full amount recommended by Engineer because:

      a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

      b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens and provides an indemnity satisfactory to Owner for all claims, costs, losses and damages arising out of such Liens;

      c. there are other items entitling Owner to a set-off against the amount recommended including liability for liquidated damages and correction of defective work by Owner or others; or

      d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

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2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use and final testing has been completed in accordance with the General Requirements, Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor in the Punchlist as incomplete) using the Notice of Substantial Completion form included in the Contract Documents, submit the Contractor's written general warranty and guarantee per Paragraph 6.19.D., and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion using the Certificate of Substantial Completion included in the Contract Documents. There shall be attached to the certificate a Punch List (tentative list of items to be completed or corrected before final payment). Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised Punch List (tentative list of items to be completed or corrected)) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

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D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

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14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, warranties, updated Contractor's written general warranty and guarantee per Paragraph 6.19.D if modified, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, and Engineer has indicated that the Work is acceptable (subject to the provisions of Paragraph 14.09), Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

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B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable using the Certificate of Completion form included in the Contract Documents, subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted as detailed on the Certificate of Completion. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

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ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's ~~persistent~~ failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents; or~~.~~

5. Contractor commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if Contractor takes any equivalent or similar action by filing a petition or otherwise under any Laws and Regulations in effect at such time relating to the bankruptcy or insolvency; or

6. a petition is filed against Contractor under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against Contractor under any Laws and Regulations in effect at the time relating to bankruptcy or insolvency; or

7. Contractor makes a general assignment for the benefit of creditors; or

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8. a trustee, receiver, custodian or agent of Contractor is appointed under applicable law or under contract, whose appointment or authority to take charge of property of Contractor is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of Contractor's creditors; or

9. Contractor admits in writing its inability to pay its debts generally as they become due.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

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15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

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ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process.~~; or~~

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

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17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

END OF SECTION

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SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

GENERAL

The address system used herein is the same as the address system used in the General Conditions, with the prefix "SC" added thereto. Additional terms used in this Section have the meanings stated below, which are applicable to both the singular and plural thereof.

This Section may include certain provisions required by Laws and Regulations, but does not represent or reflect all applicable provisions and policies or Laws and Regulations, and may only include excerpts and portions thereof. Other required provisions and policies, and Laws and Regulations, shall be deemed to be so included and incorporated herein. Contractor is solely responsible to determine, obtain, review and interpret the full text of applicable provisions and policies, Regulations, and Laws.

SC-1.01 *Defined Terms*

Add the following to A.15 *Contractor*:

> Also referred to as “General Contractor” or “general Contractor” in applicable statutory provisions which may be used interchangeably and shall have the same meaning.

Add the following to A.29. *Owner*:

> Also referred to as “Awarding Authority”, “awarding authority”, “Contracting Authority” or “contracting authority” in applicable statutory provisions which may be used interchangeably and shall have the same meaning.

Add the following new definitions to Paragraph 1.01.B.

6. *material or Material* -- shall include “any article, assembly, system, included in the Work, or any component part thereof” regarding items equal to those specified in accordance with statutory requirements.

SC- 2.01 *Delivery of Bonds and Evidence of Insurance*

Replace Paragraph 2.01.B. with the following:

B. Before any Work at the Site is started, Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which Owner or any additional insured may reasonably request) which Contractor is required to purchase and maintain in accordance with Article 5.

SC-2.03 *Commencement of Contract Times; Notice to Proceed*

In Paragraph 2.03.A., delete the last sentence in its entirety.

SC-3.02 ***Reference Standards***

In subparagraph 3.02.A.1., replace the phrase "in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids)," with:

"in effect and applicable at the time in question,"

SC 4.01 ***Availability of Lands***

In Paragraph 4.01.A., delete the last sentence in its entirety.
Delete Paragraph 4.01.B. in its entirety.

SC-4.03 ***Differing Subsurface or Physical Conditions***

Delete subparagraph 4.03.C.3. in its entirety.

SC-4.04 ***Underground Facilities***

In subparagraph 4.04.B.2., delete the last sentence in its entirety.

SC 4.05 ***Reference Points***

Pursuant to Paragraph 4.05.A., surveys exist for the Project and are reflected on the Drawings.

SC-4.06 ***Hazardous Environmental Conditions at Site***

Pursuant to Paragraph 4.06.A.,

1. The following reports regarding Hazardous Environmental Conditions at the Site are known to Owner:

   a. NONE

2. The following drawings regarding Hazardous Environmental Conditions at the Site are known to Owner:

   a. NONE

In Paragraph 4.06.D., delete the last sentence in its entirety.
In Paragraph 4.06.E., delete the last sentence in its entirety.
In Paragraph 4.06.F., delete the second sentence in its entirety.
In Paragraph 4.06.G., replace the language in its entirety with "(Not used)".
In Paragraph 4.06.H., delete the last sentence in its entirety.

SC-5.03 ***Certificates of Insurance***

In Paragraph 5.03.B., replace the language in its entirety with "(Not used)".

SC-5.04 ***Contractor's Insurance***

In subparagraph 5.04.B.1., line 1, replace "5.04.A.6 inclusive" with "5.04.A.7 inclusive".

In subparagraph 5.04.B.4. line 2, delete the words "materially changed" per Massachusetts insurance Laws.

Replace Paragraph 5.04.B.6., in its entirety with the following:

6. include products and completed operations coverage:

   a. Such insurance shall remain in effect for **six years** after final payment.

   b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and annually for **five years** thereafter.

In Paragraph 5.04.B., add the following new subparagraph.

7. All coverage shall be written on an occurrence basis.

In Paragraph 5.04.C.1, replace "Employer's Liability $1,000,000" with the following.

Employer's Liability:
$1,000,000 Bodily Injury by Accident
$1,000,000 Bodily Injury by Disease – policy limit
$1,000,000 Bodily Injury by Disease – each employee

In Paragraph 5.04.C.2,

Insert the following as the third bullet item.

- Premises-Operations

Insert the following at the end of Excess or Umbrella Liability.

and $5,000,000 products and completed operations aggregate. Coverage shall be excess to the Contractor's General Liability, Auto Liability, and Employers Liability coverages.

In Paragraph 5.04.C.3. after "property damage, insert "each accident".

SC-5.06 ***Property Insurance***

In Paragraph C, line 3, delete the words "or materially changed" per Massachusetts Insurance Laws.

Replace Paragraph 5.06.D in its entirety, with the following:

D. The risk of loss within any identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

SC-5.07 ***Waiver of Rights***

In Paragraph 5.07.A., delete the second, third, and fourth sentences in their entirety.
Delete Paragraphs 5.07.B. and 5.07.C. in their entirety.

SC-5.09 ***Acceptance of Bonds and Insurance; Option to Replace***

At the end of the Article heading, insert "(Not Used)" and delete Paragraph 5.09.A. in its entirety.

SC-5.10 ***Partial Utilization, Acknowledgment of Property Insurer***

In the Article heading, delete the words "Acknowledgment of Property Insurer", and replace Paragraph 5.10.A. in its entirety with the following.

A. Owner may occupy or use a portion of the Work prior to Substantial Completion.

SC-6.02 ***Labor; Working Hours***

Pursuant to Paragraph 6.02.B., regular working hours for this Project are 7:30 a.m. to 5:00 p.m., Monday through Friday as regulated by the Town's noise bylaw. The Contractor may apply to the Select Board for a variance if necessary.

SC-6.05 ***Substitutes and "Or-Equals"***

In Paragraph 6.05.A., add the following language at the end of the Paragraph.

", and in accordance with MGL Chapter 30, Section 39M (b)"

SC-6.06 ***Concerning Subcontractors, Suppliers, and Others***

In Paragraph 6.06.F., add the following language at the beginning of the Paragraph.

"Except as required by and indicated in the Specifications and Contract Documents pursuant to MGL Chapter 149, Section 44F (if applicable to the Project),"

SC-6.07 ***Patent Fees and Royalties***

In Paragraph 6.07.A., delete the second sentence in its entirety.
In Paragraph 6.07.B., replace the language in its entirety with "(Not used)".

SC-6.09 ***Laws and Regulations***

In Paragraph 6.09.C., delete the last sentence in its entirety.

SC-6.10 ***Taxes***

Add the following new Paragraph after Paragraph 6.10.A.

B. Owner is exempt from payment of Commonwealth of Massachusetts sales taxes on building materials and supplies to be used in the Work.

1. The words "building materials and supplies" shall include all materials and supplies consumed, employed or expended in the construction, reconstruction, alteration, remodeling or repair of any building, structure, public highway, bridge, or other such public work, as well as such materials and supplies physically incorporated therein. Said words shall also include rental charges for construction vehicles, equipment and machinery rented specifically for use on the Project Site, or while being used exclusively for the transportation of materials for the Project.

2. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchases of building materials and supplies.

SC-6.13 ***Safety and Protection***

Add the following immediately after Paragraph 6.13.B.

1. Contractor shall comply with the following minimum requirements and is solely responsible to determine, obtain, review and interpret the full text of applicable Laws and Regulations.

- Code of Federal Regulations, Chapter XVII-Occupational Safety and Health Administration (OSHA), Department of Labor, Title 29, Part 1926, Safety and Health Regulations for Construction
- Hazard Communication Standard 1910.1200 regulated by OSHA, including providing and maintaining Safety Data Sheets, labeling of hazardous substances, and providing required protective equipment and training and instruction to personnel on the Site including Owner and Engineer's personnel
- OSHA General Industry 1910.146: Permit Required Confined Space Entry

- ANSI/ASSE A10 series of safety construction standards including the "Manual of Accident Prevention In Construction" published by The Associated General Contractors of America
- AASHTO Guide on Occupational Safety on Highway Construction Projects, Subpart N, 1926.550, relating to protection of personnel and equipment under electric lines and construction equipment clearances at overhead electric lines especially during operations using large vehicles

2. Pursuant to *MGL Chapter 30, Section 39S*, all employees to be employed at the Work Site will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins Work, and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee. Any employee found on a Work Site subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

3. This Project is also subject to the following.

- MGL Chapter 82, *The Laying Out, Alteration, Relocation and Discontinuance Of Public Ways, And Specific Repairs Thereon*, *Section 40*
  Section 40 Definitions
  Section 40A Excavations; notice
  Section 40B Designation of location of underground facilities
  Section 40C Excavator's responsibility to maintain designation markings; damage caused by excavator
  Section 40D Local laws requiring excavation permits; public ways
- MGL Chapter 82A, *Excavation and Trench Safety*
  Section 1 Unattended open trenches; safety hazards; rules and regulations; fines
  Section 2 Trench excavating permits; permits issued by board or officer; certificate of insurance; fees
  Section 3 Form of trench excavation permits; required statements
  Section 4 Definitions
  Section 5 Additional requirements
- MGL Chapter 149
  Section 6C Health and safety of general public and asbestos workers; rules and regulations
  Section 18A Sanitary and safety conditions; tools
  Section 18B Confined spaces; ventilation
  Section 18C Power transmission equipment
  Section 18D Ropes, hooks and cranes; use and operation

Section 18E Safety precautions in dangerous undertakings
Section 18F Explosives
Section 18G Industrial truck and internal combustion equipment
Section 129A Shoring Trenches for local governments

- Massachusetts Department of Labor and Industries, Division of Occupational Safety (Chapter 454 CMR 10.00 et seq.)
- Massachusetts Department of Public Safety "*Excavation and Trench Safety*" (Chapter 520 CMR 14.00 et seq.)

In Paragraph 6.13.E., fourth sentence, insert a period after the word "Contractor" and delete the remaining language in parenthesis in its entirety.

SC-7.01 ***Related Work at Site***

In subparagraph 7.01.A.1., delete the word "and" and insert a period. Delete subparagraph 7.01.A.2. in its entirety.

Pursuant to Paragraph 7.01, Owner has not and does not intend to separately contract for other work on the Project at the Site.

SC-7.02 ***Coordination***

At the end of the Article heading, insert "(Not Used)" and delete Paragraphs 7.02.A. and 7.02.B. in their entirety.

SC-8.07 ***Change Orders***

At the end of the Article heading, insert "(Not Used)" and delete Paragraph 8.07.A. in its entirety.

SC-9.03 ***Project Representative***

In Paragraph 9.03.A., delete the last sentence in its entirety.

Add the following new Paragraph.

B. The Resident Project Representative (RPR) if provided, or the Engineer's Construction Project Manager will be Engineer's employee or agent, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:

1. *Schedules:* Review the Progress Schedule, schedule of Shop Drawing and Samples submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other Project-related meetings, and prepare and circulate copies of minutes thereof.

3. *Liaison*:

   a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, to assist in providing information regarding the intent of the Contract Documents.

   b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

   c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

4. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

5. *Shop Drawings and Samples:*

   a. Record date of receipt of Samples and approved Shop Drawings.

   b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

6. *Modifications*:

   a. Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer.

   b. Transmit to Contractor in writing, decisions as issued by Engineer.

7. *Review of Work and Rejection of Defective Work:*

   a. Conduct on-Site observations of Contractor's Work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

   b. Report to Engineer whenever RPR believes that any part of Contractor's Work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of Work in progress that RPR believes should be corrected or

rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. *Inspections, Tests, and System Startups*:

   a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

   b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

9. *Records:*

   a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of Contractor, Subcontractors, and major Suppliers.

   b. Maintain records for use in preparing Project documentation.

10. *Reports:*

    a. Furnish periodic reports to Engineer as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.

    b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

    c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition or conditions that may impede the compliant operation of existing facilities on Site.

11. *Payment Requests:* Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. *Certificates, Operation and Maintenance Manuals:* During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

13. *Completion:*

    a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of the Punch List (lists of items to be completed or corrected).

    b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final Punch List (list of items to be completed and deficiencies to be remedied).

    c. Observe whether all items on the final Punch List have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

F. The RPR or Engineer's Construction Project Manager shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment, including "or-equal" items.

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's superintendent.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's Work unless such advice or directions are specifically required by the Contract Documents.

5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-Site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part or determine operational protocol that may affect the compliant operation of existing facilities.

SC-9.04 ***Authorized Variations in Work***

In Paragraph 9.04.A, delete the last sentence in its entirety.

SC-9.08 ***Decisions on Requirements of Contract Documents and Acceptability of Work***

In Paragraph 9.08.C., insert a period after the word "Contractor" and delete the remaining language in its entirety.

SC-10.03 ***Execution of Change Orders***

At the end of subparagraph 10.03.A.1., insert the word "and".
At the end of subparagraph 10.03.A.2., delete the word "and".
Delete subparagraph 10.03.A.3. in its entirety.

SC-11.01 ***Cost of the Work***

In subparagraph 11.01.A.5., item a., replace the language in its entirety with "(Not used)"and in item b., replace the language in its entirety with "(Not used)".
Delete items d, e, f, g, and h in their entirety.

SC-11.02 ***Allowances***

At the end of the Article heading, insert "(Not Used)" and delete Paragraphs 11.02.A., B., C., and D. in their entirety.

SC-12.01 ***Change of Contract Price***

In subparagraph 12.01.B.3., delete the words "(determined as provided in Paragraph 12.01.C.)" at the end of the sentence.

In subparagraph 12.01.C.1, delete the word "or". Delete subparagraph 12.01.C.2 in its entirety (including items a through f).

SC-12.03 ***Delays***

In Paragraph 12.03.B., replace the language in its entirety with "(Not used)". Add the following new Paragraphs 12.03.F and 12.03.G.

F. In the event of delays caused by or within the control of the Owner, the Contractor's sole remedy shall be an extension of Contract Times. Notwithstanding anything to the contrary in the Contract Documents, Contractor shall not be eligible for any increase in the Contract Price on account of any delay in the Work, no matter by whom such delay is caused, and Contractor shall make no Claim for such an increase, whether such Claim is styled as a Claim for delay damages, acceleration of Work, loss of production, or otherwise, except as provided by MGL Chapter 30, Section 39O in the case of certain written orders by the Owner.

G. If the Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner the amount specified in the Contract, not as a penalty

but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contract shall be in default after the time stipulated in the Contract for completing the work. Such damages may be retained from time to time by the Owner from progress payments or any amounts owing to the Contractor, or otherwise collected.

SC-13.01 ***Notice of Defects***

In Paragraph 13.01.A., replace "Prompt notice" with "Notice".

SC-13.04 ***Uncovering Work***

Delete Paragraph 13.04.D. in its entirety.

SC-13.08 ***Acceptance of Defective Work***

In Paragraph 13.08.A., delete the last sentence in its entirety.

SC-13.09 ***Owner May Correct Defective Work***

In Paragraph 13.09.C., delete the second sentence in its entirety.

SC-14.02 ***Progress Payments***

In subparagraph 14.02.A.1, replace the first phrase ("At least. . . once a month),") with the following.

"On a monthly basis and in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable,"

Replace subparagraph 14.02.A.3 in its entirety with the following.

3. Retainage shall be in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable.

Replace subparagraph 14.02.C.1 in its entirety with the following.

1. Payment shall be made in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable.

In subparagraph 14.02.D.2., delete the word "immediate" in line 2 and delete the word "promptly" in line 3.

Delete subparagraph 14.02.D.3. in its entirety.

SC-14.04 ***Substantial Completion***

In Paragraph 14.04.C.,

Third sentence, replace the words “shall have seven days after receipt of” with “shall review” and replace “during which to” with “and”.
Fourth sentence, delete the words “within 14 days after submission of the tentative certificate to Owner,” in their entirety.
Fifth sentence, delete the words “within said 14 days,” in their entirety.

SC-14.05 ***Partial Utilization***

At the end of Paragraph 14.05.A, delete the words “, subject to the following conditions:”.
In subparagraph 14.05.A.1., replace the language in its entirety with “(Not used)”.
In subparagraph 14.05.A.2., replace the language in its entirety with “(Not used)”.
In subparagraph 14.05.A.3., delete the words “Within a reasonable time after either such request,” in their entirety.

SC-14.07 ***Final Payment***

Pursuant to Paragraph 14.07.A.2.a., documentation shall include Certificate(s) of Occupancy required for building(s).

In subparagraph 14.07.B.1., line 5, delete the words “within ten days after receipt of the final Application for Payment,”.

Replace subparagraph 14.07.C.1. in its entirety with the following.

9. Final payment shall be made in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable.

SC-14.09 ***Waiver of Claims***

In subparagraph 14.09.A.1., replace the language in its entirety with “(Not used)”.

SC-15.01 ***Owner May Suspend Work***

Replace Paragraph 15.01.A in its entirety with the following.

A. Owner may suspend the Work or any portion thereof in accordance with MGL Chapter 30, Section 39O.

SC-15.03 ***Owner May Terminate For Convenience***

In subparagraph 15.03.A.1., replace “including fair and reasonable sums for overhead and profit on such Work” with the word “and”.

In subparagraph 15.03.A.2., insert a period after the word “Work”, and delete the words “plus fair and reasonable sums for overhead and profit on such expenses” in their entirety.

Delete subparagraphs 15.03.A.3. and 15.03.A.4. in their entirety.

SC-15.04 ***Contractor May Stop Work or Terminate***

In Paragraph 15.04.B., delete the last sentence in its entirety.

SC-16 ***Dispute Resolution***

After the Article heading, insert the words “(Not Used)”.

Delete Paragraph 16.01 in its entirety.

END OF SECTION

SECTION 00 73 73.13

STATE STATUTES AND REGULATIONS COMMONWEALTH OF MASSACHUSETTS

A. REVISIONS TO GENERAL CONDITIONS

1. Definitions
2. Subsurface Conditions Found Different
3. Proprietary Specifications
4. Substitutions and "Or Equals" – Contractor's Expense
5. Subcontracting
6. Permits
7. Massachusetts Sales and Use Tax
8. Contractor Records
9. Engineer's Decisions on Requirements of Contract Documents and Acceptability of Work
10. Change of Contract Price
11. Payments
12. Suspension of Work and Termination
13. Special Requirements for Hazardous Wastes Contracts
14. Labor Classification and Prevailing Wage Rates
15. Contractor's Surety

B. OTHER REGULATORY REQUIREMENTS

1. Working Hours
2. Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program
3. DEP Community Sound Level Criteria
4. OSHA 10 Hour Certification Requirements

ATTACHMENT A (See Section 00 73 73.23)

Prevailing Wage Rates, as required by Massachusetts General Law, Chapter 149, Section 26 to 27H, as amended.

ATTACHMENT B (See Section 00 73 73.33)

Excerpts from Chapter 149, Chapter 30 and Chapter 82 of the Massachusetts General Law

ATTACHMENT C (see Section 00 73 73.43)

The Commonwealth of Massachusetts Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.

ATTACHMENT D (See Section 00 73 73.53)

Change Orders

ATTACHMENT E (See Section 00 73 73.73)

Price Adjustments

A. REVISIONS TO GENERAL CONDITIONS:

1. Definitions

The term "Awarding Authority," as used herein, shall be considered to be synonymous with the term "Owner," described in definition 1.01 A.30.

Delete definition 1.01 A.42 entitled "Substantial Completion" in the General Conditions in its entirety and insert the following in its place:

"Substantial Completion shall be interpreted in accordance with Massachusetts General Law (MGL) c. 30, §39G or 39K as appropriate."

2. Subsurface Conditions Found Different

Add the following sentence to the end of paragraph 5.04A of the General Conditions:

"...to do so. Adjustments resulting from subsurface or latent physical conditions will be in accordance with MGL c. 30, §39N."

3. Proprietary Specifications

Revise the third sentence of Paragraph 7.05A of the General Conditions to read as follows:

"Unless the specification indicates that a proprietary item is called for, other items of material or equipment or material or equipment of other suppliers may be submitted to Engineer for review under the circumstances described below, and in accordance with MGL c. 30, §39M."

4. Substitutions and "Or Equals" – Contractor's Expense

Insert the following at the beginning of Paragraphs 7.05B and 7.06E of the General Conditions:

"Except as required by and indicated in the specifications and contract documents pursuant to MGL. c. 149, §44F,".

5. Subcontracting

Add the following language at the end of paragraph 7.06J of the General Conditions:

", except as required otherwise by MGL c. 149, §44F, for Work governed by MGL c. 149, §44A through 44H."

6. Permits

Delete paragraph 7.09A of the General Conditions in its entirety and insert the following in its place:

"A. Unless otherwise provided for in Section 00 31 43 PERMITS, the Awarding Authority shall be responsible for identifying and obtaining all federal, state, and local permits required by the nature and location of construction, including but not limited to railroad permits, building construction permits, and permits for street and highway cuts and openings. Contractor shall be responsible for obtaining all permits required of its equipment, work force, or particular operations (such as blasting) in the performance of the Work and not otherwise specified to be obtained by the Awarding Authority. These permit fees shall be paid by Contractor. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of bids, or, if there are no Bids, on the Effective Date of the Agreement."

7. Massachusetts Sales and Use Tax

Add the following paragraph after paragraph 7.10A of the General Conditions:

"B. The materials and supplies to be used by the Contractor in the Work of this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. The Awarding Authority tax exemption certificate number will be furnished to the Contractor."

8. Contractor Records

Add a new paragraph immediately after paragraph 7.11C of the General Conditions, which is to read as follows:

"D. The Contractor shall comply with all applicable provisions Chapter 30, Section 39R of the Massachusetts General Laws regarding, Contractor's records."

9. Engineer's Decisions on Requirements of Contract Documents and Acceptability of Work

Add the following language at the end of paragraph 10.06A of the General Conditions:

"The Engineer's interpretation will be made in accordance with the requirements of MGL c. 30, §39P."

10. Change of Contract Price

Delete paragraphs 11.07, 13.01, 13.02 and 13.03 of the General Conditions, having to do with Change of Contract Price. Changes in contract price will be governed by the section called "Change Orders," in Section 00 73 73.53 (Attachment D) and Article 13 in the Supplementary Conditions.

11. Payments

Add the following paragraph after Paragraph 15.01B.4 of the General Conditions:
"5. The Contractor shall submit Weekly Payroll Records Report and Statement of Compliance verifying compliance with the Minimum Prevailing Wage Law, MGL c. 149, §26-27H. These Statements of Compliance shall be submitted as a condition of payment for work performed during the period the reports apply."

Delete paragraph 15.01C.1 of the General Conditions in its entirety and insert the following in its place:

"1. Progress Payments will be made in accordance with MGL c. 30, §39G, or §39K, as applicable."

Delete paragraph 15.01D.1 of the General Conditions in its entirety and replace it with the following:

"1. Payment shall be made in accordance with MGL c. 30, §39G, or §39K, as applicable."

Add the following new paragraph following paragraph 15.01D.1 of the General Conditions:

"2. The Contractor shall make payments to Subcontractors in accordance with the requirements of MGL c. 30, §39F."

Delete paragraph 15.06B of the General Conditions in its entirety and insert the following in its place:

"*Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of the Engineer's observation of the Work during construction and final inspection and, upon the Engineer's review of the final Application for Payment and accompanying documentation, the Engineer is satisfied that the Work has been completed and that the Contractor's other obligations under the Contract Documents have been fulfilled, the Engineer will indicate in writing its recommendation of payment and present the Application to the Awarding Authority for payment. Thereupon the Engineer will give written notice to the Awarding Authority and the Contractor that the Work is acceptable subject to the provisions of paragraph 15.07. Otherwise, the Engineer will return the Application to Contractor, indicating in writing the reasons for refusing to recommend final payment. In such case the Contractor shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are appropriate as to form and substance, the Awarding Authority shall in accordance with the applicable provisions of the Massachusetts General Laws, make payment to the Contractor."

Delete paragraph 15.06E of the General Conditions in its entirety and replace it with the following:

"1. Payment shall be made in accordance with MGL c. 30, §39G, or §39K, as applicable."

12. Suspension of Work and Termination

Delete paragraph 16.01A of the General Conditions in its entirety and insert the following in its place:

"A. The Awarding Authority may order, at any time and without cause, the Contractor to suspend or delay the Work in accordance with MGL c. 30, §39O."

13. Special Requirements for Hazardous Wastes Contracts

Add the following at the end of the first sentence of Paragraph 18.14 of the General Conditions:

", and to the "Rules and Regulations for the Prevention of Accidents in Construction Operations Chapter 454 CMR (Code of Massachusetts Regulations) 10.00 et seq."

14. Labor Classifications and Prevailing Wage Rates

Add the following paragraphs under the heading "Prevailing Wage Rates" after paragraph 18.14 of the Supplementary Conditions:

"18.15 Prevailing Wage Rates

A. Prevailing Wage Rates as determined by the Director of the Executive Office of Labor and Workforce Development under the provisions of MGL c. 149, §26-27H apply to this project. A copy of the wage schedule is included in Section 00 73 33.23. If, after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the Director. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The Contractor shall notify the Awarding Authority of its intention to employ persons in trades or occupations not classified in the wage determinations as soon as possible in order to allow sufficient time for the Awarding Authority to obtain approved rates for such trades or occupations.

B. The schedule of wages referred to above are minimum rates only, and the Awarding Authority will not consider any claims for additional compensation made by Contractor because of payment by the Contractor of any wage rate in excess of the applicable rate contained in the Contract.

C. The said schedule of wages shall continue to be the minimum rates to be paid during the life of this Agreement, except in the case of the duration of this Agreement exceeding one year, when the Contractor will be responsible for requesting and obtaining updated prevailing wage rates from the Owner before the one-year anniversary of the project's start date, and a legible copy of said schedule shall be kept posted in a conspicuous place at the site of the Work.

D. Contractor and subcontractors shall submit a copy of weekly payroll records to the Awarding Authority and the Awarding Authority shall retain the records for a minimum of three years."

15. Contractor's Surety

Add the following sentences at the end of paragraph 6.01A:

"The Surety Company providing the bonds shall have a rating of A or better within the Best Key Rating Guide and be licensed by the Massachusetts Division of Insurance**.** The Contractor shall pay the premiums for such Bonds."

B. OTHER REGULATORY REQUIREMENTS:

1. Working Hours

No laborer, workman, mechanic, foreman, or inspector, working within the 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 this contract, shall be

required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency.

2. Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program.

The Contractor shall abide by the Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, which is attached in its entirety on pages 00 73 73.43.

3. DEP Community Sound Level Criteria

The Community Sound Level Criteria as established by the Commonwealth of Massachusetts' Department of Environmental Protection (DEP) must be conformed to prior to the Awarding Authority's acceptance of the Project. The following sound level criteria must be met at the construction site:

A. The increase in the broadband noise level shall not be in excess of ten (10) dB(A) above ambient at the station boundary. The ambient level is defined as the A-weighted noise level that is exceeded ninety (90) percent of the time measured during the period in question.

B. The primary noise source(s) shall not produce a puretone condition. Puretone is any given octave band center frequency that exceeds the two adjacent center frequencies by three (3) or more decibels.

4. OSHA 10 Hour Certification Requirements

All employees of the Contractor who work at the jobsite must have received OSHA 10 Hour safety training, and have proof, at the jobsite, of being certified by OSHA as having received the training. The Contractor must provide written proof (copy of OSHA card each employee is required to carry is preferred) of this certification for every employee with submission of the first certified payroll report for each employee.

END OF SECTION

ATTACHMENT A
SECTION 00 73 73.23

PREVAILING WAGE RATES

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS
Prevailing Wage Rates

MAURA HEALEY
Governor
KIM DRISCOLL
Lt. Governor

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:	Nantucket	**City/Town:**	NANTUCKET
Wage Request No:	20261013121229	**Job Location:**	130 Tom Nevers Road
Description of Work:	Construction of Tom Nevers bike path from Milestone Road to Tom Nevers Park.		
Contract Number:			

§§ 26-27D Construction Project

This Prevailing Wage Schedule establishes the minimum wage rates that employees on this public works construction project must be paid. The project's Wage Request Number is listed above and on all pages of this Schedule. This schedule applies **only** to this specific project.

Awarding Authority Responsibilities

- You must include this Prevailing Wage Schedule (PWS) or an appropriate reference to it in all advertisements and calls for bids.
- The PWS must be incorporated in its entirety into all contracts for this project (G.L. c. 149, § 27).
- The wage rates on this PWS will remain in effect for the duration of the project. **Exception:** You must request an updated schedule for any multi-year construction project no later than 2 weeks before the project's yearly anniversary date.
  - For CM AT RISK projects, the anniversary date is the earlier of the signing date of: (a) the GMP Amendment; or (b) the first amendment to permit procurement of construction services.
  - For all other construction projects, the anniversary date is the date the contract was signed by the Awarding Authority and the General Contractor.
- You must also request an updated PWS if you have not opened bids or selected a contractor within 90 days of the date of issuance on this PWS.
  - For CM AT RISK projects, the earlier of (a) the signing date of the GMP Amendment; or (b) the bid for the first construction scope of work must be within 90 days of the date of issuance on this Schedule.
- You must provide any updated PWS to all contractors working on the project, including general and sub-contractors.
- You must keep the contractors' weekly certified payroll records and Statements of Compliance on file for **3 years.**
- Awarding authorities have other prevailing wage responsibilities not listed above. Learn more at: **[Prevailing wage: for awarding authorities | Mass.gov]** and G.L. c. 149, §§ 26-27D.

Contractor Responsibilities

- You must pay all employees who perform construction work on this project at least the wage rate listed on this PWS. **Warning!** If you do not follow this requirement, you can face civil fines, criminal charges, or private lawsuits.
- You must post this PWS at the worksite where it can be easily seen. (G.L. c. 149, § 27)
- You must file weekly payroll reports and a Statement of Compliance with the awarding authority (**not** DLS). You can file payroll reports by mail or email and must keep them on file for 3 years. Each weekly payroll report must include each employees' name, address, occupational classification(s), hours worked, and wages paid. Find a sample report at: mass.gov/dols/pw.
- You cannot pay any employees at the apprentice rates listed on this PWS unless they are registered with the Massachusetts Division of Apprentice Standards (DAS). Qualifying apprentices must be paid at the applicable step rate and must carry their apprentice ID card during all work hours on the project. Apprentices **not** registered with DAS must be paid at the listed journeyworker's rate, even if they are registered with a different federal/state public agency or private entity. For every week in which apprentice rates are paid, a copy of each apprentice's apprentice ID card issued by DAS shall be attached to the certified payroll records.
- If you don't know what classification or rate applies to the work being performed, you must ask DLS; paying the wrong rate subjects you to enforcement.
- Please contact DLS if you have any questions about the Prevailing Wage Schedule: (617) 626-6953 or **DLS.Feedback@mass.gov**

Employees who are **not** paid the wage listed on the Prevailing Wage Schedule (PWS) may file a complaint with the Attorney General's Fair Labor Division: **www.mass.gov/ago/fld**; **(617) 727-3465.**

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$41.95	$16.17	$21.78	$0.00	$0.00	$79.90
	12/1/2026	$41.95	$16.17	$23.52	$0.00	$0.00	$81.64
	1/1/2027	$41.95	$16.77	$23.52	$0.00	$0.00	$82.24
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.02	$16.17	$21.78	$0.00	$0.00	$79.97
	12/1/2026	$42.02	$16.17	$23.52	$0.00	$0.00	$81.71
	1/1/2027	$42.02	$16.77	$23.52	$0.00	$0.00	$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.14	$16.17	$21.78	$0.00	$0.00	$80.09
	12/1/2026	$42.14	$16.17	$23.52	$0.00	$0.00	$81.83
	1/1/2027	$42.14	$16.77	$23.52	$0.00	$0.00	$82.43
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1) For apprentice rates see "Apprentice- PILE DRIVER"	1/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
AIR TRACK OPERATOR LABORERS LABORERS - ZONE 2	6/1/2026	$42.41	$10.90	$9.75	$9.11	$0.00	$72.17
	12/1/2026	$43.85	$10.90	$9.75	$9.11	$0.00	$73.61
	6/1/2027	$45.30	$10.90	$9.75	$9.11	$0.00	$75.06
	12/1/2027	$46.75	$10.90	$9.75	$9.11	$0.00	$76.51
	6/1/2028	$48.25	$10.90	$9.75	$9.11	$0.00	$78.01
	12/1/2028	$49.75	$10.90	$9.75	$9.11	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"							
AIR TRACK OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$42.41	$10.90	$9.75	$9.21	$0.00	$72.27
	12/1/2026	$43.85	$10.90	$9.75	$9.21	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASBESTOS WORKER (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)	12/1/2025	$44.80	$14.50	$4.30	$6.75	$0.00	$70.35
ASPHALT RAKER LABORERS LABORERS - ZONE 2	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
ASPHALT RAKER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$59.38	$17.05	$13.35	$3.25	$0.00	$93.03
	12/1/2026	$60.83	$17.05	$13.35	$3.25	$0.00	$94.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
BACKHOE/FRONT-END LOADER	6/1/2026	$59.38	$17.05	$13.35	$3.25	$0.00	$93.03
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.83	$17.05	$13.35	$3.25	$0.00	$94.48
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BARCO-TYPE JUMPING TAMPER	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
LABORERS - ZONE 2	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER	6/1/2026	$42.41	$10.90	$9.75	$9.11	$0.00	$72.17
LABORERS	12/1/2026	$43.85	$10.90	$9.75	$9.11	$0.00	$73.61
LABORERS - ZONE 2	6/1/2027	$45.30	$10.90	$9.75	$9.11	$0.00	$75.06
	12/1/2027	$46.75	$10.90	$9.75	$9.11	$0.00	$76.51
	6/1/2028	$48.25	$10.90	$9.75	$9.11	$0.00	$78.01
	12/1/2028	$49.75	$10.90	$9.75	$9.11	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY)	6/1/2026	$42.41	$10.90	$9.75	$9.21	$0.00	$72.27
LABORERS	12/1/2026	$43.85	$10.90	$9.75	$9.21	$0.00	$73.71
LABORERS - ZONE 2 (HEAVY & HIGHWAY)							
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
BOILER MAKER	1/1/2024	$48.12	$7.07	$14.60	$6.00	$0.00	$75.79
BOILERMAKERS LOCAL 29							
BOILERMAKERS LOCAL 29							

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
2	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
3	70.00	$33.68	$7.07	$10.03	$4.20	$0.00	$54.98
4	75.00	$36.09	$7.07	$10.74	$4.50	$0.00	$58.40
5	80.00	$38.50	$7.07	$11.45	$4.80	$0.00	$61.82
6	85.00	$40.90	$7.07	$12.18	$5.10	$0.00	$65.25
7	90.00	$43.31	$7.07	$12.88	$5.40	$0.00	$68.66
8	95.00	$45.71	$7.07	$13.62	$5.70	$0.00	$72.10

Apprentice to Journeyworker Ratio: 1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	8/1/2026	$70.15	$12.84	$15.57	$8.02	$0.00	$106.58
BRICKLAYERS LOCAL 3	2/1/2027	$71.55	$12.84	$15.57	$8.02	$0.00	$107.98
BRICKLAYERS LOCAL 3 (NEW BEDFORD)							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 8/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$35.08	$12.84	$15.57	$8.02	$0.00	$71.51
2	60.00	$42.09	$12.84	$15.57	$8.02	$0.00	$78.52
3	70.00	$49.11	$12.84	$15.57	$8.02	$0.00	$85.54
4	80.00	$56.12	$12.84	$15.57	$8.02	$0.00	$92.55
5	90.00	$63.14	$12.84	$15.57	$8.02	$0.00	$99.57

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 2/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$35.78	$12.84	$15.57	$8.02	$0.00	$72.21
2	60.00	$42.93	$12.84	$15.57	$8.02	$0.00	$79.36
3	70.00	$50.09	$12.84	$15.57	$8.02	$0.00	$86.52
4	80.00	$57.24	$12.84	$15.57	$8.02	$0.00	$93.67
5	90.00	$64.40	$12.84	$15.57	$8.02	$0.00	$100.83

Apprentice to Journeyworker Ratio: 1:5

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
BULLDOZER/GRADER/SCRAPER	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
CAISSON & UNDERPINNING BOTTOM MAN	6/1/2026	$50.40	$10.90	$9.75	$9.80	$0.00	$80.85
LABORERS	12/1/2026	$51.90	$10.90	$9.75	$9.80	$0.00	$82.35
LABORERS - FOUNDATION AND MARINE							
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING LABORER	6/1/2026	$49.25	$10.90	$9.75	$9.80	$0.00	$79.70
LABORERS	12/1/2026	$50.75	$10.90	$9.75	$9.80	$0.00	$81.20
LABORERS - FOUNDATION AND MARINE							
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING TOP MAN	6/1/2026	$49.58	$10.90	$9.75	$9.80	$0.00	$80.03
LABORERS	12/1/2026	$51.08	$10.90	$9.75	$9.80	$0.00	$81.53
LABORERS - FOUNDATION AND MARINE							
For apprentice rates see "Apprentice- LABORER"							
CARBIDE CORE DRILL OPERATOR	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
LABORERS - ZONE 2	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CARPENTER	9/1/2026	$63.69	$10.58	$11.47	$8.50	$0.00	$94.24
CARPENTERS	3/1/2027	$65.19	$10.58	$11.47	$8.50	$0.00	$95.74
CARPENTERS -ZONE 1 (Metro Boston)							

Apprentice: CARPENTER

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$28.66	$11.08	$0.00	$1.73	$0.00	$41.47
2	45.00	$28.66	$11.08	$0.00	$1.73	$0.00	$41.47
3	55.00	$35.03	$11.08	$0.00	$3.40	$0.00	$49.51
4	55.00	$35.03	$11.08	$0.00	$3.40	$0.00	$49.51
5	70.00	$44.58	$11.08	$11.41	$5.10	$0.00	$72.17
6	70.00	$44.58	$11.08	$11.41	$5.10	$0.00	$72.17
7	80.00	$50.95	$11.08	$11.44	$6.80	$0.00	$80.27
8	80.00	$50.95	$11.08	$11.44	$6.80	$0.00	$80.27

Apprentice: CARPENTER

Effective Date: 3/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$29.34	$10.58	$0.00	$1.73	$0.00	$41.65
2	45.00	$29.34	$10.58	$0.00	$1.73	$0.00	$41.65
3	55.00	$35.85	$10.58	$0.00	$3.40	$0.00	$49.83
4	55.00	$35.85	$10.58	$0.00	$3.40	$0.00	$49.83
5	70.00	$45.63	$10.58	$11.41	$5.10	$0.00	$72.72
6	70.00	$45.63	$10.58	$11.41	$5.10	$0.00	$72.72
7	80.00	$52.15	$10.58	$11.44	$6.80	$0.00	$80.97
8	80.00	$52.15	$10.58	$11.44	$6.80	$0.00	$80.97

Apprentice to Journeyworker Ratio: 1:5

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	10/1/2026	$28.47	$7.38	$4.47	$1.00	$0.00	$41.32
CARPENTERS							
CARPENTERS-ZONE 3 (Wood Frame)							

All Aspects of New Wood Frame Work

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$17.08	$7.38	$0.00	$0.00	$0.00	$24.46
2	60.00	$17.08	$7.38	$0.00	$0.00	$0.00	$24.46
3	65.00	$18.51	$7.38	$0.00	$1.00	$0.00	$26.89
4	70.00	$19.93	$7.38	$0.00	$1.00	$0.00	$28.31
5	75.00	$21.35	$7.38	$3.80	$1.00	$0.00	$33.53
6	80.00	$22.78	$7.38	$3.80	$1.00	$0.00	$34.96

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: CARPENTER WOOD FRAME							
Effective Date: 10/1/2026							
Step Percent		**Apprentice Base Wage**	**Health**	**Pension**	**Annuity**	**Supplemental Unemployment**	**Total Rate**
7 85.00		$24.20	$7.38	$3.80	$1.00	$0.00	$36.38
8 90.00		$25.62	$7.38	$3.80	$1.00	$0.00	$37.80
Apprentice to Journeyworker Ratio: 1:5							
CEMENT MASONRY/PLASTERING	7/1/2026	$54.49	$13.35	$16.43	$7.78	$1.80	$93.85
PLASTERERS AND CEMENT MASONS LOCAL 534	1/1/2027	$55.94	$13.35	$16.43	$7.78	$1.80	$95.30
Plasterers and Cement Masons - Zone 1	7/1/2027	$57.29	$13.35	$16.43	$7.78	$1.80	$96.65
	1/1/2028	$58.64	$13.35	$16.43	$7.78	$1.80	$98.00
Apprentice: CEMENT MASONRY/PLASTERING							
Effective Date: 7/1/2026							
Step Percent		**Apprentice Base Wage**	**Health**	**Pension**	**Annuity**	**Supplemental Unemployment**	**Total Rate**
1 50.00		$27.25	$13.35	$16.43	$0.00	$0.00	$57.03
2 60.00		$32.69	$13.35	$16.43	$7.78	$1.80	$72.05
3 65.00		$35.42	$13.35	$16.43	$7.78	$1.80	$74.78
4 70.00		$38.14	$13.35	$16.43	$7.78	$1.80	$77.50
5 75.00		$40.87	$13.35	$16.43	$7.78	$1.80	$80.23
6 80.00		$43.59	$13.35	$16.43	$7.78	$1.80	$82.95
7 90.00		$49.04	$13.35	$16.43	$7.78	$0.00	$86.60
Apprentice: CEMENT MASONRY/PLASTERING							
Effective Date: 1/1/2027							
Step Percent		**Apprentice Base Wage**	**Health**	**Pension**	**Annuity**	**Supplemental Unemployment**	**Total Rate**
1 50.00		$27.97	$13.35	$16.43	$0.00	$0.00	$57.75
2 60.00		$33.56	$13.35	$16.43	$7.78	$1.80	$72.92
3 65.00		$36.36	$13.35	$16.43	$7.78	$1.80	$75.72
4 70.00		$39.16	$13.35	$16.43	$7.78	$1.80	$78.52
5 75.00		$41.96	$13.35	$16.43	$7.78	$1.80	$81.32
6 80.00		$44.75	$13.35	$16.43	$7.78	$1.80	$84.11
7 90.00		$50.35	$13.35	$16.43	$0.00	$0.00	$80.13
Apprentice to Journeyworker Ratio: 1:5							
CHAIN SAW OPERATOR	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
LABORERS - ZONE 2	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES	6/1/2026	$60.61	$17.05	$13.35	$3.25	$0.00	$94.26
OPERATING ENGINEERS LOCAL 4	12/1/2026	$62.09	$17.05	$13.35	$3.25	$0.00	$95.74
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
COMPRESSOR OPERATOR	6/1/2026	$37.63	$17.05	$13.35	$3.25	$0.00	$71.28
OPERATING ENGINEERS LOCAL 4	12/1/2026	$38.58	$17.05	$13.35	$3.25	$0.00	$72.23
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DELEADER (BRIDGE)	1/1/2026	$59.56	$10.35	$12.00	$12.60	$0.00	$94.51
PAINTERS LOCAL 35							
PAINTERS LOCAL 35 - ZONE 2							

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

DEMO: ADZEMAN	6/1/2026	$49.30	$10.90	$9.75	$9.65	$0.00	$79.60
LABORERS	12/7/2026	$50.80	$10.90	$9.75	$9.65	$0.00	$81.10
LABORERS - ZONE 2	6/7/2027	$52.40	$10.90	$9.75	$9.65	$0.00	$82.70
	12/6/2027	$54.00	$10.90	$9.75	$9.65	$0.00	$84.30
	6/5/2028	$55.68	$10.90	$9.75	$9.65	$0.00	$85.98
	12/4/2028	$57.35	$10.90	$9.75	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	6/1/2026	$50.30	$10.90	$9.75	$9.65	$0.00	$80.60
LABORERS	12/7/2026	$51.80	$10.90	$9.75	$9.65	$0.00	$82.10
LABORERS - ZONE 2	6/7/2027	$53.40	$10.90	$9.75	$9.65	$0.00	$83.70
	12/6/2027	$55.00	$10.90	$9.75	$9.65	$0.00	$85.30
	6/5/2028	$56.68	$10.90	$9.75	$9.65	$0.00	$86.98
	12/4/2028	$58.35	$10.90	$9.75	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BURNERS	6/1/2026	$50.05	$10.90	$9.75	$9.65	$0.00	$80.35
LABORERS	12/7/2026	$51.55	$10.90	$9.75	$9.65	$0.00	$81.85
LABORERS - ZONE 2	6/7/2027	$53.15	$10.90	$9.75	$9.65	$0.00	$83.45
	12/6/2027	$54.75	$10.90	$9.75	$9.65	$0.00	$85.05
	6/5/2028	$56.43	$10.90	$9.75	$9.65	$0.00	$86.73
	12/4/2028	$58.10	$10.90	$9.75	$9.65	$0.00	$88.40

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"							
DEMO: CONCRETE CUTTER/SAWYER LABORERS LABORERS - ZONE 2	6/1/2026	$50.30	$10.90	$9.75	$9.65	$0.00	$80.60
	12/7/2026	$51.80	$10.90	$9.75	$9.65	$0.00	$82.10
	6/7/2027	$53.40	$10.90	$9.75	$9.65	$0.00	$83.70
	12/6/2027	$55.00	$10.90	$9.75	$9.65	$0.00	$85.30
	6/5/2028	$56.68	$10.90	$9.75	$9.65	$0.00	$86.98
	12/4/2028	$58.35	$10.90	$9.75	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: JACKHAMMER OPERATOR LABORERS LABORERS - ZONE 2	6/1/2026	$50.05	$10.90	$9.75	$9.65	$0.00	$80.35
	12/7/2026	$51.55	$10.90	$9.75	$9.65	$0.00	$81.85
	6/7/2027	$53.15	$10.90	$9.75	$9.65	$0.00	$83.45
	12/6/2027	$54.75	$10.90	$9.75	$9.65	$0.00	$85.05
	6/5/2028	$56.43	$10.90	$9.75	$9.65	$0.00	$86.73
	12/4/2028	$58.10	$10.90	$9.75	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: WRECKING LABORER LABORERS LABORERS - ZONE 2	6/1/2026	$49.30	$10.90	$9.75	$9.65	$0.00	$79.60
	12/7/2026	$50.80	$10.90	$9.75	$9.65	$0.00	$81.10
	6/7/2027	$52.40	$10.90	$9.75	$9.65	$0.00	$82.70
	12/6/2027	$54.00	$10.90	$9.75	$9.65	$0.00	$84.30
	6/5/2028	$55.68	$10.90	$9.75	$9.65	$0.00	$85.98
	12/4/2028	$57.35	$10.90	$9.75	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$78.11	$10.08	$11.62	$10.04	$0.00	$109.85
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 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
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 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$83.69	$10.08	$11.62	$12.67	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"							
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"							
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888	7/1/2020	$26.77	$6.67	$3.93	$0.00	$0.16	$37.53

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
DRAWBRIDGE - SEIU LOCAL 888							
ELECTRICIAN ELECTRICIANS LOCAL 223 ELECTRICIANS LOCAL 223	9/1/2026	$54.72	$12.50	$15.56	$4.00	$0.00	$86.78

Apprentice: ELECTRICIAN

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$21.89	$12.50	$0.66	$0.00	$0.00	$35.05
2	45.00	$24.62	$12.50	$0.74	$0.00	$0.00	$37.86
3	50.00	$27.36	$12.50	$0.82	$0.00	$0.00	$40.68
4	55.00	$30.10	$12.50	$6.92	$2.75	$0.00	$52.27
5	60.00	$32.83	$12.50	$7.54	$2.75	$0.00	$55.62
6	65.00	$35.57	$12.50	$8.18	$2.75	$0.00	$59.00
7	70.00	$38.30	$12.50	$8.81	$2.75	$0.00	$62.36
8	75.00	$41.04	$12.50	$9.43	$2.75	$0.00	$65.72

Apprentice to Journeyworker Ratio: 2:3

ELEVATOR CONSTRUCTOR ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2026	$77.26	$16.38	$11.06	$10.70	$0.00	$115.40
ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2027	$80.55	$16.48	$11.16	$11.00	$0.00	$119.19

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$38.63	$0.00	$0.00	$0.00	$0.00	$38.63
2	55.00	$42.49	$16.38	$11.06	$10.70	$0.00	$80.63
3	65.00	$50.22	$16.38	$11.06	$10.70	$0.00	$88.36
4	70.00	$54.08	$16.38	$11.06	$10.70	$0.00	$92.22
5	80.00	$61.81	$16.38	$11.06	$10.70	$0.00	$99.95

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$40.28	$0.00	$0.00	$0.00	$0.00	$40.28
2	55.00	$44.30	$16.48	$11.16	$11.00	$0.00	$82.94
3	65.00	$52.36	$16.48	$11.16	$11.00	$0.00	$91.00
4	70.00	$56.39	$16.48	$11.16	$11.00	$0.00	$95.03
5	80.00	$64.44	$16.48	$11.16	$11.00	$0.00	$103.08

Apprentice to Journeyworker Ratio: 1:1

ELEVATOR CONSTRUCTOR HELPER	1/1/2026	$54.08	$16.38	$11.06	$10.07	$0.00	$91.59

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ELEVATOR CONSTRUCTORS LOCAL 4 ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2027	$56.39	$16.48	$11.16	$11.00	$0.00	$95.03
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"							
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	5/1/2026	$54.40	$16.55	$13.35	$3.25	$0.00	$87.55
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	11/1/2026	$55.69	$16.55	$13.35	$3.25	$0.00	$88.84
	5/1/2027	$57.12	$16.55	$13.35	$3.25	$0.00	$90.27
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY	5/1/2026	$56.02	$16.55	$13.35	$3.25	$0.00	$89.17
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	11/1/2026	$57.32	$16.55	$13.35	$3.25	$0.00	$90.47
	5/1/2027	$58.77	$16.55	$13.35	$3.25	$0.00	$91.92
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY	5/1/2026	$26.28	$16.55	$13.35	$3.25	$0.00	$59.43
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	11/1/2026	$27.04	$16.55	$13.35	$3.25	$0.00	$60.19
	5/1/2027	$27.89	$16.55	$13.35	$3.25	$0.00	$61.04
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIRE ALARM INSTALLER ELECTRICIANS LOCAL 223 ELECTRICIANS LOCAL 223	9/1/2026	$54.72	$12.50	$15.56	$4.00	$0.00	$86.78
For apprentice rates see "Apprentice- ELECTRICIAN"							
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING ELECTRICIANS LOCAL 223 ELECTRICIANS LOCAL 223	9/1/2026	$54.72	$12.50	$15.56	$4.00	$0.00	$86.78
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"							
FIREMAN (ASST. ENGINEER)	6/1/2026	$47.55	$17.05	$13.35	$3.25	$0.00	$81.20
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2026	$48.73	$17.05	$13.35	$3.25	$0.00	$82.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FLAGGER & SIGNALER (HEAVY & HIGHWAY)	6/1/2026	$29.21	$10.90	$9.75	$9.21	$0.00	$59.07
LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/1/2026	$29.21	$10.90	$9.75	$9.21	$0.00	$59.07
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FLOORCOVERER	9/1/2026	$60.74	$10.33	$11.47	$8.80	$0.00	$91.34
FLOORCOVERERS LOCAL 2168 FLOORCOVERERS LOCAL 2168 ZONE I	3/1/2027	$62.24	$10.33	$11.47	$8.80	$0.00	$92.84

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: FLOORCOVERER

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$27.33	$10.33	$0.00	$1.76	$0.00	$39.42
2	45.00	$27.33	$10.33	$0.00	$1.76	$0.00	$39.42
3	55.00	$33.41	$10.33	$0.00	$3.52	$0.00	$47.26
4	55.00	$33.41	$10.33	$0.00	$3.52	$0.00	$47.26
5	70.00	$42.52	$10.33	$11.47	$5.28	$0.00	$69.60
6	70.00	$42.52	$10.33	$11.47	$5.28	$0.00	$69.60
7	80.00	$48.59	$10.33	$11.47	$7.04	$0.00	$77.43
8	80.00	$48.59	$10.33	$11.47	$7.04	$0.00	$77.43

Apprentice: FLOORCOVERER

Effective Date: 3/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$28.01	$10.33	$0.00	$1.76	$0.00	$40.10
2	45.00	$28.01	$10.33	$0.00	$1.76	$0.00	$40.10
3	55.00	$34.23	$10.33	$0.00	$3.52	$0.00	$48.08
4	55.00	$34.23	$10.33	$0.00	$3.52	$0.00	$48.08
5	70.00	$43.57	$10.33	$11.47	$5.28	$0.00	$70.65
6	70.00	$43.57	$10.33	$11.47	$5.28	$0.00	$70.65
7	80.00	$49.79	$10.33	$11.47	$7.04	$0.00	$78.63
8	80.00	$49.79	$10.33	$11.47	$7.04	$0.00	$78.63

Apprentice Notes

Steps are 750 hrs.

Apprentice to Journeyworker Ratio: 1:1

FORK LIFT/CHERRY PICKER	6/1/2026	$59.38	$17.05	$13.35	$3.25	$0.00	$93.03
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.83	$17.05	$13.35	$3.25	$0.00	$94.48
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GENERATOR/LIGHTING PLANT/HEATERS	6/1/2026	$37.63	$17.05	$13.35	$3.25	$0.00	$71.28
OPERATING ENGINEERS LOCAL 4	12/1/2026	$38.58	$17.05	$13.35	$3.25	$0.00	$72.23
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	6/1/2026	$44.73	$11.20	$8.40	$6.05	$0.00	$70.38
GLAZIERS LOCAL 1333	6/1/2027	$46.73	$11.60	$8.55	$6.60	$0.00	$73.48
GLAZIERS LOCAL 1333	6/1/2028	$48.73	$12.00	$8.70	$7.20	$0.00	$76.63

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
HOISTING ENGINEER/CRANES/GRADALLS	6/1/2026	$59.38	$17.05	$13.35	$3.25	$0.00	$93.03
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.83	$17.05	$13.35	$3.25	$0.00	$94.48
OPERATING ENGINEERS LOCAL 4							

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$22.37	$11.20	$8.40	$6.05	$0.00	$48.02
2	56.25	$25.16	$11.20	$8.40	$6.05	$0.00	$50.81
3	62.50	$27.96	$11.20	$8.40	$6.05	$0.00	$53.61
4	68.75	$30.75	$11.20	$8.40	$6.05	$0.00	$56.40
5	75.00	$33.55	$11.20	$8.40	$6.05	$0.00	$59.20
6	81.25	$36.34	$11.20	$8.40	$6.05	$0.00	$61.99
7	87.50	$39.14	$11.20	$8.40	$6.05	$0.00	$64.79
8	93.75	$41.93	$11.20	$8.40	$6.05	$0.00	$67.58

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 6/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$23.37	$11.60	$8.55	$6.60	$0.00	$50.12
2	56.25	$26.29	$11.60	$8.55	$6.60	$0.00	$53.04
3	62.50	$29.21	$11.60	$8.55	$6.60	$0.00	$55.96
4	68.75	$32.13	$11.60	$8.55	$6.60	$0.00	$58.88
5	75.00	$35.05	$11.60	$8.55	$6.60	$0.00	$61.80
6	81.25	$37.97	$11.60	$8.55	$6.60	$0.00	$64.72
7	87.50	$40.89	$11.60	$8.55	$6.60	$0.00	$67.64
8	93.75	$43.81	$11.60	$8.55	$6.60	$0.00	$70.56

Apprentice to Journeyworker Ratio: 3:1

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$32.66	$0.00	$0.00	$0.00	$0.00	$32.66
2	60.00	$35.63	$17.05	$13.35	$3.25	$0.00	$69.28
3	65.00	$38.60	$17.05	$13.35	$3.25	$0.00	$72.25
4	70.00	$41.57	$17.05	$13.35	$3.25	$0.00	$75.22
5	75.00	$44.54	$17.05	$13.35	$3.25	$0.00	$78.19
6	80.00	$47.50	$17.05	$13.35	$3.25	$0.00	$81.15
7	85.00	$50.47	$17.05	$13.35	$3.25	$0.00	$84.12
8	90.00	$53.44	$17.05	$13.35	$3.25	$0.00	$87.09

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 12/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$33.46	$0.00	$0.00	$0.00	$0.00	$33.46
2	60.00	$36.50	$17.05	$13.35	$3.25	$0.00	$70.15
3	65.00	$39.54	$17.05	$13.35	$3.25	$0.00	$73.19
4	70.00	$42.58	$17.05	$13.35	$3.25	$0.00	$76.23
5	75.00	$45.62	$17.05	$13.35	$3.25	$0.00	$79.27
6	80.00	$48.66	$17.05	$13.35	$3.25	$0.00	$82.31
7	85.00	$51.71	$17.05	$13.35	$3.25	$0.00	$85.36
8	90.00	$54.75	$17.05	$13.35	$3.25	$0.00	$88.40

Apprentice to Journeyworker Ratio: 1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - B	4/1/2026	$44.93	$15.25	$13.63	$6.15	$2.24	$82.20
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 223 ELECTRICIANS LOCAL 223	9/1/2026	$54.72	$12.50	$15.56	$4.00	$0.00	$86.78
For apprentice rates see "Apprentice- ELECTRICIAN"							
HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - B	4/1/2026	$44.93	$15.25	$13.63	$6.15	$2.24	$82.20
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (TESTING AND BALANCING -WATER) PLUMBERS & PIPEFITTERS LOCAL 51 PLUMBERS & PIPEFITTERS LOCAL 51	8/25/2025	$55.24	$10.80	$16.80	$4.60	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HVAC MECHANIC PLUMBERS & PIPEFITTERS LOCAL 51 PLUMBERS & PIPEFITTERS LOCAL 51	8/25/2025	$55.24	$10.80	$16.80	$4.60	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HYDRAULIC DRILLS LABORERS LABORERS - ZONE 2	6/1/2026	$42.41	$10.90	$9.75	$9.11	$0.00	$72.17
	12/1/2026	$43.85	$10.90	$9.75	$9.11	$0.00	$73.61
	6/1/2027	$45.30	$10.90	$9.75	$9.11	$0.00	$75.06
	12/1/2027	$46.75	$10.90	$9.75	$9.11	$0.00	$76.51
	6/1/2028	$48.25	$10.90	$9.75	$9.11	$0.00	$78.01
	12/1/2028	$49.75	$10.90	$9.75	$9.11	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"							
HYDRAULIC DRILLS (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$42.41	$10.90	$9.75	$9.21	$0.00	$72.27
	12/1/2026	$43.85	$10.90	$9.75	$9.21	$0.00	$73.71

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)	9/1/2026	$53.12	$16.15	$11.46	$11.49	$0.00	$92.22

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.56	$16.15	$11.21	$5.75	$0.00	$59.67
2	60.00	$31.87	$16.15	$11.26	$6.89	$0.00	$66.17
3	70.00	$37.18	$16.15	$11.31	$8.04	$0.00	$72.68
4	80.00	$42.50	$16.15	$11.36	$9.19	$0.00	$79.20

Apprentice to Journeyworker Ratio: 1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 37 IRONWORKERS LOCAL 37	3/16/2021	$42.46	$7.70	$12.10	$5.00	$0.00	$67.26

Apprentice: IRONWORKER/WELDER

Effective Date: 3/16/2021

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	70.00	$29.72	$7.70	$12.10	$5.00	$0.00	$54.52
2	75.00	$31.85	$7.70	$12.10	$5.00	$0.00	$56.65
3	80.00	$33.97	$7.70	$12.10	$5.00	$0.00	$58.77
4	85.00	$36.09	$7.70	$12.10	$5.00	$0.00	$60.89
5	90.00	$38.21	$7.70	$12.10	$5.00	$0.00	$63.01
6	95.00	$40.34	$7.70	$12.10	$5.00	$0.00	$65.14

Apprentice to Journeyworker Ratio: 1:4

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS LABORERS - ZONE 2	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
LABORER LABORERS LABORERS - ZONE 2	6/1/2026	$41.66	$10.90	$9.75	$9.11	$0.00	$71.42
	12/1/2026	$43.10	$10.90	$9.75	$9.11	$0.00	$72.86
	6/1/2027	$44.55	$10.90	$9.75	$9.11	$0.00	$74.31
	12/1/2027	$46.00	$10.90	$9.75	$9.11	$0.00	$75.76
	6/1/2028	$47.50	$10.90	$9.75	$9.11	$0.00	$77.26
	12/1/2028	$49.00	$10.90	$9.75	$9.11	$0.00	$78.76

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: LABORER

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$25.00	$10.90	$9.75	$9.11	$0.00	$54.76
2	70.00	$29.16	$10.90	$9.75	$9.11	$0.00	$58.92
3	80.00	$33.33	$10.90	$9.75	$9.11	$0.00	$63.09
4	90.00	$37.49	$10.90	$9.75	$9.11	$0.00	$67.25

Apprentice: LABORER

Effective Date: 12/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$25.86	$10.90	$9.75	$9.11	$0.00	$55.62
2	70.00	$30.17	$10.90	$9.75	$9.11	$0.00	$59.93
3	80.00	$34.48	$10.90	$9.75	$9.11	$0.00	$64.24
4	90.00	$38.79	$10.90	$9.75	$9.11	$0.00	$68.55

Apprentice to Journeyworker Ratio: 1:5

LABORER (HEAVY & HIGHWAY)	6/1/2026	$41.66	$10.90	$9.75	$9.21	$0.00	$71.52
LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/1/2026	$43.10	$10.90	$9.75	$9.21	$0.00	$72.96

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$25.00	$10.90	$9.75	$9.21	$0.00	$54.86
2	70.00	$29.16	$10.90	$9.75	$9.21	$0.00	$59.02
3	80.00	$33.33	$10.90	$9.75	$9.21	$0.00	$63.19
4	90.00	$37.49	$10.90	$9.75	$9.10	$0.00	$67.24

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 12/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$25.86	$10.90	$9.75	$9.21	$0.00	$55.72
2	70.00	$30.17	$10.90	$9.75	$9.21	$0.00	$60.03
3	80.00	$34.48	$10.90	$9.75	$9.21	$0.00	$64.34
4	90.00	$38.79	$10.90	$9.75	$9.21	$0.00	$68.65

Apprentice to Journeyworker Ratio: 1:5

LABORER: CARPENTER TENDER	6/1/2026	$41.66	$10.90	$9.75	$9.11	$0.00	$71.42

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS LABORERS - ZONE 2	12/1/2026	$43.10	$10.90	$9.75	$9.11	$0.00	$72.86
	6/1/2027	$44.55	$10.90	$9.75	$9.11	$0.00	$74.31
	12/1/2027	$46.00	$10.90	$9.75	$9.11	$0.00	$75.76
	6/1/2028	$47.50	$10.90	$9.75	$9.11	$0.00	$77.26
	12/1/2028	$49.00	$10.90	$9.75	$9.11	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"							
LABORER: CEMENT FINISHER TENDER LABORERS LABORERS - ZONE 2	6/1/2026	$41.66	$10.90	$9.75	$9.11	$0.00	$71.42
	12/1/2026	$43.10	$10.90	$9.75	$9.11	$0.00	$72.86
	6/1/2027	$44.55	$10.90	$9.75	$9.11	$0.00	$74.31
	12/1/2027	$46.00	$10.90	$9.75	$9.11	$0.00	$75.76
	6/1/2028	$47.50	$10.90	$9.75	$9.11	$0.00	$77.26
	12/1/2028	$49.00	$10.90	$9.75	$9.11	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"							
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS LABORERS - ZONE 2	6/1/2026	$41.75	$10.90	$9.75	$9.65	$0.00	$72.05
	12/7/2026	$43.19	$10.90	$9.75	$9.65	$0.00	$73.49
	6/7/2027	$44.64	$10.90	$9.75	$9.65	$0.00	$74.94
	12/6/2027	$46.09	$10.90	$9.75	$9.65	$0.00	$76.39
	6/5/2028	$47.59	$10.90	$9.75	$9.65	$0.00	$77.89
	12/4/2028	$49.09	$10.90	$9.75	$9.65	$0.00	$79.39
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER LABORERS LABORERS - ZONE 2	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
LABORER: MULTI-TRADE TENDER LABORERS LABORERS - ZONE 2	6/1/2026	$41.66	$10.90	$9.75	$9.11	$0.00	$71.42
	12/1/2026	$43.10	$10.90	$9.75	$9.11	$0.00	$72.86
	6/1/2027	$44.55	$10.90	$9.75	$9.11	$0.00	$74.31
	12/1/2027	$46.00	$10.90	$9.75	$9.11	$0.00	$75.76
	6/1/2028	$47.50	$10.90	$9.75	$9.11	$0.00	$77.26
	12/1/2028	$49.00	$10.90	$9.75	$9.11	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"							
LABORER: TREE REMOVER LABORERS LABORERS - ZONE 2	6/1/2026	$41.66	$10.90	$9.75	$9.11	$0.00	$71.42
	12/1/2026	$43.10	$10.90	$9.75	$9.11	$0.00	$72.86
	6/1/2027	$44.55	$10.90	$9.75	$9.11	$0.00	$74.31
	12/1/2027	$46.00	$10.90	$9.75	$9.11	$0.00	$75.76
	6/1/2028	$47.50	$10.90	$9.75	$9.11	$0.00	$77.26
	12/1/2028	$49.00	$10.90	$9.75	$9.11	$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							

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
incidental to construction . For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS LABORERS - ZONE 2	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
MARBLE & TILE FINISHERS	8/1/2026	$53.84	$12.84	$15.57	$5.78	$0.00	$88.03
BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	2/1/2027	$54.96	$12.84	$15.57	$5.78	$0.00	$89.15

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 8/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.92	$12.84	$15.57	$5.78	$0.00	$61.11
2	60.00	$32.30	$12.84	$15.57	$5.78	$0.00	$66.49
3	70.00	$37.69	$12.84	$15.57	$5.78	$0.00	$71.88
4	80.00	$43.07	$12.84	$15.57	$5.78	$0.00	$77.26
5	90.00	$48.46	$12.84	$15.57	$5.78	$0.00	$82.65

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 2/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.48	$12.84	$15.57	$5.78	$0.00	$61.67
2	60.00	$32.98	$12.84	$15.57	$5.78	$0.00	$67.17
3	70.00	$38.47	$12.84	$15.57	$5.78	$0.00	$72.66
4	80.00	$43.97	$12.84	$15.57	$5.78	$0.00	$78.16
5	90.00	$49.46	$12.84	$15.57	$5.78	$0.00	$83.65

Apprentice to Journeyworker Ratio: 1:5

MARBLE MASONS,TILELAYERS & TERRAZZO MECH	8/1/2026	$70.17	$12.84	$15.57	$7.99	$0.00	$106.57
BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	2/1/2027	$71.57	$12.84	$15.57	$7.99	$0.00	$107.97

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 8/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 8/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$35.09	$12.84	$15.57	$7.99	$0.00	$71.49
2	60.00	$42.10	$12.84	$15.57	$7.99	$0.00	$78.50
3	70.00	$49.12	$12.84	$15.57	$7.99	$0.00	$85.52
4	80.00	$56.14	$12.84	$15.57	$7.99	$0.00	$92.54
5	90.00	$63.15	$12.84	$15.57	$7.99	$0.00	$99.55

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 2/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$35.79	$12.84	$15.57	$7.99	$0.00	$72.19
2	60.00	$42.94	$12.84	$15.57	$7.99	$0.00	$79.34
3	70.00	$50.10	$12.84	$15.57	$7.99	$0.00	$86.50
4	80.00	$57.26	$12.84	$15.57	$7.99	$0.00	$93.66
5	90.00	$64.41	$12.84	$15.57	$7.99	$0.00	$100.81

Apprentice to Journeyworker Ratio: 1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026 12/1/2026	$58.70 $60.14	$17.05 $17.05	$13.35 $13.35	$3.25 $3.25	$0.00 $0.00	$92.35 $93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
MECHANICS MAINTENANCE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026 12/1/2026	$58.70 $60.14	$17.05 $17.05	$13.35 $13.35	$3.25 $3.25	$0.00 $0.00	$92.35 $93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
MILLWRIGHT (Zone 2) MILLWRIGHTS LOCAL 1121 MILLWRIGHTS LOCAL 1121 - Zone 2	1/5/2026	$46.86	$10.58	$11.47	$10.00	$0.00	$78.91

Apprentice: MILLWRIGHT (Zone 2)

Effective Date: 1/5/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$25.77	$10.58	$0.00	$5.50	$0.00	$41.85
2	65.00	$30.46	$10.58	$0.00	$6.50	$0.00	$47.54
3	75.00	$35.15	$10.58	$11.47	$7.50	$0.00	$64.70
4	85.00	$39.83	$10.58	$11.47	$8.50	$0.00	$70.38

Apprentice Notes

Step 1&2 Appr. indentured after 1/6/2020 receive no pension,

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice to Journeyworker Ratio: 1:4							
MORTAR MIXER LABORERS LABORERS - ZONE 2	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$25.07	$17.05	$13.35	$3.25	$0.00	$58.72
	12/1/2026	$25.74	$17.05	$13.35	$3.25	$0.00	$59.39
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$31.17	$17.05	$13.35	$3.25	$0.00	$64.82
	12/1/2026	$31.97	$17.05	$13.35	$3.25	$0.00	$65.62
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	1/1/2026	$59.56	$10.35	$12.00	$12.50	$0.00	$94.41

Apprentice: PAINTER (BRIDGES/TANKS)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

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 PAINTERS LOCAL 35 - ZONE 2	1/1/2026	$50.46	$10.35	$12.00	$12.60	$0.00	$85.41

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$25.23	$10.35	$0.00	$0.00	$0.00	$35.58
2	55.00	$27.75	$10.35	$0.00	$6.93	$0.00	$45.03
3	60.00	$30.28	$10.35	$0.00	$7.56	$0.00	$48.19
4	65.00	$32.80	$10.35	$0.00	$8.19	$0.00	$51.34
5	70.00	$35.32	$10.35	$12.00	$8.82	$0.00	$66.49
6	75.00	$37.85	$10.35	$12.00	$9.45	$0.00	$69.65
7	80.00	$40.37	$10.35	$12.00	$10.08	$0.00	$72.80
8	90.00	$45.41	$10.35	$12.00	$11.34	$0.00	$79.10

Apprentice to Journeyworker Ratio: 1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	1/1/2026	$48.52	$10.35	$12.00	$12.60	$0.00	$83.47

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.26	$10.35	$0.00	$0.00	$0.00	$34.61
2	55.00	$26.69	$10.35	$0.00	$6.93	$0.00	$43.97
3	60.00	$29.11	$10.35	$0.00	$7.56	$0.00	$47.02
4	65.00	$31.54	$10.35	$0.00	$8.19	$0.00	$50.08
5	70.00	$33.96	$10.35	$12.00	$8.82	$0.00	$65.13
6	75.00	$36.39	$10.35	$12.00	$9.45	$0.00	$68.19
7	80.00	$38.82	$10.35	$12.00	$10.08	$0.00	$71.25
8	90.00	$43.67	$10.35	$12.00	$11.34	$0.00	$77.36

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 PAINTERS LOCAL 35 - ZONE 2	1/1/2026	$49.06	$10.35	$12.00	$12.60	$0.00	$84.01

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.53	$10.35	$0.00	$0.00	$0.00	$34.88
2	55.00	$26.98	$10.35	$0.00	$6.93	$0.00	$44.26
3	60.00	$29.44	$10.35	$0.00	$7.56	$0.00	$47.35

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
4	65.00	$31.89	$10.35	$0.00	$8.19	$0.00	$50.43
5	70.00	$34.34	$10.35	$12.00	$8.82	$0.00	$65.51
6	75.00	$36.80	$10.35	$12.00	$9.45	$0.00	$68.60
7	80.00	$39.25	$10.35	$12.00	$10.08	$0.00	$71.68
8	90.00	$44.15	$10.35	$12.00	$11.34	$0.00	$77.84

Apprentice to Journeyworker Ratio: 1:1

PAINTER / TAPER (BRUSH, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	1/1/2026	$47.12	$10.35	$12.00	$12.60	$0.00	$82.07

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$23.56	$10.35	$0.00	$0.00	$0.00	$33.91
2	55.00	$25.92	$10.35	$0.00	$6.93	$0.00	$43.20
3	60.00	$28.27	$10.35	$0.00	$7.56	$0.00	$46.18
4	65.00	$30.63	$10.35	$0.00	$8.19	$0.00	$49.17
5	70.00	$32.98	$10.35	$12.00	$8.82	$0.00	$64.15
6	75.00	$35.34	$10.35	$12.00	$9.45	$0.00	$67.14
7	80.00	$37.70	$10.35	$12.00	$10.08	$0.00	$70.13
8	90.00	$42.41	$10.35	$12.00	$11.34	$0.00	$76.10

Apprentice to Journeyworker Ratio: 1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$41.66	$10.90	$9.75	$9.21	$0.00	$71.52
	12/1/2026	$43.10	$10.90	$9.75	$9.21	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
PANEL & PICKUP TRUCKS DRIVER TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$41.78	$16.17	$21.78	$0.00	$0.00	$79.73
	12/1/2026	$41.78	$16.17	$23.52	$0.00	$0.00	$81.47
	1/1/2027	$41.78	$16.77	$23.52	$0.00	$0.00	$82.07
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
For apprentice rates see "Apprentice- PILE DRIVER"							
PILE DRIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PILE DRIVER

Effective Date: 8/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.11	$10.08	$0.00	$2.53	$0.00	$37.72
2	55.00	$30.68	$10.08	$0.00	$5.07	$0.00	$45.83
3	70.00	$39.05	$10.08	$11.62	$7.60	$0.00	$68.35
4	80.00	$44.63	$10.08	$11.62	$10.14	$0.00	$76.47

Apprentice to Journeyworker Ratio: 1:5

PIPELAYER	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
LABORERS - ZONE 2	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
LABORERS - ZONE 2 (HEAVY & HIGHWAY)							

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PLUMBER & PIPEFITTER	8/25/2025	$55.24	$10.80	$16.80	$4.60	$0.00	$87.44
PLUMBERS & PIPEFITTERS LOCAL 51							
PLUMBERS & PIPEFITTERS LOCAL 51							

Apprentice: PLUMBER & PIPEFITTER

Effective Date: 8/25/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$22.10	$10.15	$2.50	$0.00	$0.00	$34.75
2	50.00	$27.62	$10.15	$2.50	$0.00	$0.00	$40.27
3	60.00	$33.14	$10.15	$8.40	$0.50	$0.00	$52.19
4	70.00	$38.67	$10.15	$13.44	$0.80	$0.00	$63.06
5	80.00	$44.19	$10.15	$16.80	$1.00	$0.00	$72.14

Apprentice to Journeyworker Ratio: 1:3

PNEUMATIC CONTROLS (TEMP.)	8/25/2025	$55.24	$10.80	$16.80	$4.60	$0.00	$87.44
PLUMBERS & PIPEFITTERS LOCAL 51							
PLUMBERS & PIPEFITTERS LOCAL 51							

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
LABORERS - ZONE 2	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWDERMAN & BLASTER LABORERS LABORERS - ZONE 2	6/1/2026	$42.66	$10.90	$9.75	$9.11	$0.00	$72.42
	12/1/2026	$44.10	$10.90	$9.75	$9.11	$0.00	$73.86
	6/1/2027	$45.55	$10.90	$9.75	$9.11	$0.00	$75.31
	12/1/2027	$47.00	$10.90	$9.75	$9.11	$0.00	$76.76
	6/1/2028	$48.50	$10.90	$9.75	$9.11	$0.00	$78.26
	12/1/2028	$50.00	$10.90	$9.75	$9.11	$0.00	$79.76
For apprentice rates see "Apprentice- LABORER"							
POWDERMAN & BLASTER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$42.66	$10.90	$9.75	$9.21	$0.00	$72.52
	12/1/2026	$44.10	$10.90	$9.75	$9.21	$0.00	$73.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWER SHOVEL/DERRICK/TRENCHING MACHINE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$59.38	$17.05	$13.35	$3.25	$0.00	$93.03
	12/1/2026	$60.83	$17.05	$13.35	$3.25	$0.00	$94.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (DEWATERING, OTHER) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$37.63	$17.05	$13.35	$3.25	$0.00	$71.28
	12/1/2026	$38.58	$17.05	$13.35	$3.25	$0.00	$72.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
READY-MIX CONCRETE DRIVER TEAMSTERS 653 TEAMSTERS 653 - Southeastern Concrete (Weymouth)	8/1/2023	$25.00	$13.91	$6.90	$0.00	$0.00	$45.81
RECLAIMERS OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
RIDE-ON MOTORIZED BUGGY OPERATOR LABORERS LABORERS - ZONE 2	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
OPERATING ENGINEERS LOCAL 4							

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	8/1/2026	$55.25	$14.53	$12.67	$9.03	$0.00	$91.48
ROOFERS LOCAL 33	2/1/2027	$57.00	$14.53	$12.67	$9.03	$0.00	$93.23
ROOFERS LOCAL 33	8/1/2027	$58.75	$14.53	$12.67	$9.03	$0.00	$94.98
	2/1/2028	$60.50	$14.53	$12.67	$9.03	$0.00	$96.73
	8/1/2028	$62.25	$14.53	$12.67	$9.03	$0.00	$98.48
	2/1/2029	$64.00	$14.53	$12.67	$9.03	$0.00	$100.23
	8/1/2029	$65.65	$14.53	$12.67	$9.03	$0.00	$101.88
	2/1/2030	$67.40	$14.53	$12.67	$9.03	$0.00	$103.63

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 8/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	0.00	$0.00	$14.53	$6.34	$0.00	$0.00	$20.87
2	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23
3	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23
4	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23
5	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 2/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	0.00	$0.00	$14.53	$6.34	$0.00	$0.00	$20.87
2	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23
3	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23
4	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23
5	0.00	$0.00	$14.53	$12.67	$9.03	$0.00	$36.23

Apprentice Notes

** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1

Apprentice to Journeyworker Ratio: 1:5

ROOFER SLATE / TILE / PRECAST CONCRETE	8/1/2026	$55.50	$14.53	$12.67	$9.03	$0.00	$91.73
ROOFERS LOCAL 33	2/1/2027	$57.25	$14.53	$12.67	$9.03	$0.00	$93.48
ROOFERS LOCAL 33	8/1/2027	$59.00	$14.53	$12.67	$9.03	$0.00	$95.23
	2/1/2028	$60.75	$14.53	$12.67	$9.03	$0.00	$96.98
	8/1/2028	$62.50	$14.53	$12.67	$9.03	$0.00	$98.73
	2/1/2029	$64.25	$14.53	$12.67	$9.03	$0.00	$100.48
	8/1/2029	$65.90	$14.53	$12.67	$9.03	$0.00	$102.13
	2/1/2030	$67.65	$14.53	$12.67	$9.03	$0.00	$103.88

For apprentice rates see "Apprentice- ROOFER"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - B	4/1/2026	$44.93	$15.25	$13.63	$6.15	$2.24	$82.20

Apprentice: SHEETMETAL WORKER

Effective Date: 4/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$17.97	$15.25	$4.27	$0.00	$1.09	$38.58
2	45.00	$20.22	$15.25	$4.80	$0.00	$1.17	$41.44
3	50.00	$22.47	$15.25	$12.56	$0.00	$1.45	$51.73
4	55.00	$24.71	$15.25	$12.56	$0.00	$1.52	$54.04
5	60.00	$26.96	$15.25	$12.56	$3.69	$1.64	$60.10
6	65.00	$29.20	$15.25	$12.56	$4.00	$1.71	$62.72
7	70.00	$31.45	$15.25	$12.56	$4.31	$1.78	$65.35
8	75.00	$33.70	$15.25	$12.56	$4.61	$1.86	$67.98
9	80.00	$35.94	$15.25	$12.56	$4.92	$1.93	$70.60
10	85.00	$38.19	$15.25	$12.56	$5.23	$2.00	$73.23

Apprentice to Journeyworker Ratio: 1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.24	$16.17	$21.78	$0.00	$0.00	$80.19
	12/1/2026	$42.24	$16.17	$23.52	$0.00	$0.00	$81.93
	1/1/2027	$42.24	$16.77	$23.52	$0.00	$0.00	$82.53
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.53	$16.17	$21.78	$0.00	$0.00	$80.48
	12/1/2026	$42.53	$16.17	$23.52	$0.00	$0.00	$82.22
	1/1/2027	$42.53	$16.77	$23.52	$0.00	$0.00	$82.82
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2	10/1/2026	$66.29	$13.55	$7.45	$20.30	$0.00	$107.59
	1/1/2027	$66.29	$14.80	$7.50	$19.00	$0.00	$107.59

Apprentice: SPRINKLER FITTER

Effective Date: 10/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	0.00	$23.20	$13.55	$12.06	$2.50	$0.00	$51.31
2	0.00	$26.52	$13.55	$13.07	$2.50	$0.00	$55.64
3	0.00	$29.83	$13.55	$14.09	$2.50	$0.00	$59.97
4	0.00	$33.15	$13.55	$15.11	$2.50	$0.00	$64.31
5	0.00	$36.46	$13.55	$16.11	$2.50	$0.00	$68.62
6	0.00	$39.77	$13.55	$15.63	$4.00	$0.00	$72.95
7	0.00	$43.09	$13.55	$16.64	$4.00	$0.00	$77.28
8	0.00	$46.40	$13.55	$17.66	$4.00	$0.00	$81.61
9	0.00	$49.72	$13.55	$18.67	$4.00	$0.00	$85.94
10	0.00	$53.03	$13.55	$19.69	$4.00	$0.00	$90.27

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: SPRINKLER FITTER							
Effective Date: 1/1/2027							
Step / Percent / Apprentice Base Wage							
1 / 0.00		$23.20	$14.80	$11.65	$2.50	$0.00	$52.15
2 / 0.00		$26.52	$14.80	$12.60	$2.50	$0.00	$56.42
3 / 0.00		$29.83	$14.80	$13.55	$2.50	$0.00	$60.68
4 / 0.00		$33.15	$14.80	$14.51	$2.50	$0.00	$64.96
5 / 0.00		$36.46	$14.80	$15.45	$2.50	$0.00	$69.21
6 / 0.00		$39.77	$14.80	$14.90	$4.00	$0.00	$73.47
7 / 0.00		$43.09	$14.80	$15.85	$4.00	$0.00	$77.74
8 / 0.00		$46.40	$14.80	$16.80	$4.00	$0.00	$82.00
9 / 0.00		$49.72	$14.80	$17.75	$4.00	$0.00	$86.27
10 / 0.00		$53.03	$14.80	$18.70	$4.00	$0.00	$90.53
Apprentice Notes							
Apprentice entered prior 9/30/10:							
Apprentice to Journeyworker Ratio: 1:3							
STEAM BOILER OPERATOR	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TELECOMMUNICATION TECHNICIAN	9/1/2026	$44.41	$12.25	$12.59	$3.50	$0.00	$72.75
TELECOMMUNICATION TECHNICIAN	9/1/2027	$46.51	$12.50	$13.18	$3.75	$0.00	$75.94
ELECTRICIANS LOCAL 223							
ELECTRICIANS LOCAL 223							
For apprentice rates and ratios see "Apprentice- ELECTRICIAN"							
TERRAZZO FINISHERS	8/1/2026	$69.09	$12.84	$15.57	$8.02	$0.00	$105.52
BRICKLAYERS LOCAL 3	2/1/2027	$70.49	$12.84	$15.57	$8.02	$0.00	$106.92
BRICKLAYERS LOCAL 3 - MARBLE & TILE							
Apprentice: TERRAZZO FINISHERS							
Effective Date: 8/1/2026							
Step / Percent / Apprentice Base Wage							
1 / 50.00		$34.55	$12.84	$15.57	$8.02	$0.00	$70.98
2 / 60.00		$41.45	$12.84	$15.57	$8.02	$0.00	$77.88
3 / 70.00		$48.36	$12.84	$15.57	$8.02	$0.00	$84.79
4 / 80.00		$55.27	$12.84	$15.57	$8.02	$0.00	$91.70

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: TERRAZZO FINISHERS

Effective Date: 8/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
5	90.00	$62.18	$12.84	$15.57	$8.02	$0.00	$98.61

Apprentice: TERRAZZO FINISHERS

Effective Date: 2/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$35.25	$12.84	$15.57	$8.02	$0.00	$71.68
2	60.00	$42.29	$12.84	$15.57	$8.02	$0.00	$78.72
3	70.00	$49.34	$12.84	$15.57	$8.02	$0.00	$85.77
4	80.00	$56.39	$12.84	$15.57	$8.02	$0.00	$92.82
5	90.00	$63.44	$12.84	$15.57	$8.02	$0.00	$99.87

Apprentice to Journeyworker Ratio: 1:5

TEST BORING DRILLER LABORERS LABORERS - FOUNDATION AND MARINE	6/1/2026	$53.25	$10.90	$9.75	$9.80	$0.00	$83.70
	12/1/2026	$54.75	$10.90	$9.75	$9.80	$0.00	$85.20
For apprentice rates see "Apprentice- LABORER"							
TEST BORING DRILLER HELPER LABORERS LABORERS - FOUNDATION AND MARINE	6/1/2026	$49.37	$10.90	$9.75	$9.80	$0.00	$79.82
	12/1/2026	$50.87	$10.90	$9.75	$9.80	$0.00	$81.32
For apprentice rates see "Apprentice- LABORER"							
TEST BORING LABORER LABORERS LABORERS - FOUNDATION AND MARINE	6/1/2026	$49.25	$10.90	$9.75	$9.80	$0.00	$79.70
	12/1/2026	$50.75	$10.90	$9.75	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
TRACTORS/PORTABLE STEAM GENERATORS OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2026	$58.70	$17.05	$13.35	$3.25	$0.00	$92.35
	12/1/2026	$60.14	$17.05	$13.35	$3.25	$0.00	$93.79
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	6/1/2026	$42.82	$16.17	$21.78	$0.00	$0.00	$80.77
	12/1/2026	$42.82	$16.17	$23.52	$0.00	$0.00	$82.51
	1/1/2027	$42.82	$16.77	$23.52	$0.00	$0.00	$83.11
TUNNEL WORK - COMPRESSED AIR LABORERS LABORERS (COMPRESSED AIR)	6/1/2026	$61.48	$10.90	$9.75	$10.25	$0.00	$92.38
	12/1/2026	$62.98	$10.90	$9.75	$10.25	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) LABORERS LABORERS (COMPRESSED AIR)	6/1/2026	$63.48	$10.90	$9.75	$10.25	$0.00	$94.38
	12/1/2026	$64.98	$10.90	$9.75	$10.25	$0.00	$95.88

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR	6/1/2026	$53.55	$10.90	$9.75	$10.25	$0.00	$84.45
LABORERS	12/1/2026	$55.05	$10.90	$9.75	$10.25	$0.00	$85.95
LABORERS (FREE AIR TUNNEL)							
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE)	6/1/2026	$55.55	$10.90	$9.75	$10.25	$0.00	$86.45
LABORERS	12/1/2026	$57.05	$10.90	$9.75	$10.25	$0.00	$87.95
LABORERS (FREE AIR TUNNEL)							
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL	6/1/2026	$42.24	$16.17	$21.78	$0.00	$0.00	$80.19
TEAMSTERS JOINT COUNCIL NO. 10	12/1/2026	$42.24	$16.17	$23.52	$0.00	$0.00	$81.93
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	1/1/2027	$42.24	$16.77	$23.52	$0.00	$0.00	$82.53
WAGON DRILL OPERATOR	6/1/2026	$41.91	$10.90	$9.75	$9.11	$0.00	$71.67
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.11	$0.00	$73.11
LABORERS - ZONE 2	6/1/2027	$44.80	$10.90	$9.75	$9.11	$0.00	$74.56
	12/1/2027	$46.25	$10.90	$9.75	$9.11	$0.00	$76.01
	6/1/2028	$47.75	$10.90	$9.75	$9.11	$0.00	$77.51
	12/1/2028	$49.25	$10.90	$9.75	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	6/1/2026	$41.91	$10.90	$9.75	$9.21	$0.00	$71.77
LABORERS	12/1/2026	$43.35	$10.90	$9.75	$9.21	$0.00	$73.21
LABORERS - ZONE 2 (HEAVY & HIGHWAY)							
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
WASTE WATER PUMP OPERATOR	6/1/2026	$59.38	$17.05	$13.35	$3.25	$0.00	$93.03
OPERATING ENGINEERS LOCAL 4	12/1/2026	$60.83	$17.05	$13.35	$3.25	$0.00	$94.48
OPERATING ENGINEERS LOCAL 4							
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
WATER METER INSTALLER	8/25/2025	$55.24	$10.80	$16.80	$4.60	$0.00	$87.44
PLUMBERS & PIPEFITTERS LOCAL 51							
PLUMBERS & PIPEFITTERS LOCAL 51							
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"							

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.

SECTION 00 73 73.33
ATTACHMENT B

Excerpts from Chapters 30, 82 and 149 of the Massachusetts General Laws

NOTICE *- These are* ***NOT*** *the official versions of the Massachusetts General Laws (MGL). While reasonable efforts have been made to assure the accuracy of the excerpts provided, do not rely on this information without first checking an official edition of the MGL. If you are in need of legal advice or counsel, consult a lawyer. These excerpts include amendments to the General Laws passed before January 4, 2023. For laws enacted since that time, see the 2023 Session Laws.*

CERTAIN EXCERPTS FROM THE MASSACHUSETTS GENERAL LAWS ARE APPLICABLE TO CONSTRUCTION CONTRACTS. ATTENTION IS DIRECTED TO THE FOLLOWING SECTIONS OF CHAPTER 149 AS AMENDED.

Section 25. LODGING, BOARD AND TRADE OF PUBLIC EMPLOYEES; STATUTE PART OF EMPLOYMENT CONTRACT.

"Every employee in public work shall lodge, board, and trade where and with whom he elects; and no person or his agents or employees under contract with the commonwealth, a county, city or town, or with a department, board, commission or officer acting therefor, for the doing of public work shall directly or indirectly require, as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the contract for such employment."

Section 26. PUBLIC WORKS; PREFERENCE TO VETERANS AND CITIZENS; WAGES.

"In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the commonwealth, or by a county, town, authority or district, or by persons contracting or subcontracting for such works, preference shall first be given to citizens of the commonwealth who have been residents of the commonwealth for at least six months at the commencement of their employment who are veterans as defined in clause Forty-third of section 7 of chapter 4 and who are qualified to perform the work to which the employment relates and, within such preference, preference shall be given to service-disabled veterans; and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provision to this effect..."

Section 34. PUBLIC CONTRACTS; STIPULATION AS TO HOURS AND DAYS OF WORK; VOID CONTRACTS.

"Every contract, except for the purchase of material or supplies, involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the 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 eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency, or, in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one day, except as aforesaid..."

Section 34A. CONTRACTS FOR PUBLIC WORKS; WORKERS' COMPENSATION INSURANCE; BREACH OF CONTRACT; ENFORCEMENT AND VIOLATION OF STATUTE.

"Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or other public works for the commonwealth or any political subdivision thereof shall contain stipulations

requiring that the contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty-two to all persons to be employed under the contract, and that the contractor shall continue such insurance in full force and effect during the term of the contract. No officer or agent contracting in behalf of the commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be a sufficient notice..."

Section 34B. CONTRACTS FOR PUBLIC WORKS; WAGES FOR RESERVE POLICE OFFICER.

"Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers in such city or town."

Whenever general bids are invited for a contract subject to Section 44A, the following provision applies:

Section 44E. FILING OF BIDS; FORMS; MODULAR BUILDINGS. Second paragraph of subdivision (2), clause E.

"The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A."

For projects estimated to cost more than $25,000, the following provision applies to sub-bidders:

Section 44F. PLANS AND SPECIFICATIONS; SUB-BIDS; FORM; CONTENTS. First paragraph of clause I of subdivision (2) of section 44F.

"The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F."

Section 44G. ALLOWANCES; ALTERNATES; WEATHER PROTECTION DEVICES.

"(A) "Allowance" as used herein means a sum of money covering one or more items of labor or labor and materials which is designated in bid documents and which general bidders are required to use in computing their bids. The use of such allowances shall be prohibited in the award of any contract subject to the provisions of section forty-four A. Whenever the designer is unable to supply specifications for any item prior to the solicitation of bids, such item shall not be included in any contract subject to the provisions of section forty-four A. The awarding authority shall solicit bids for every such item separately pursuant to the provisions of section forty-four A after specifications for that item are prepared.

(B) Every alternate contained in the form for general bids shall be listed in a numerical sequence in order of priority.

When the awarding authority decides to consider alternates in determining the lowest eligible and responsible bidder, the awarding authority shall consider the alternates in descending numerical sequence, such that no single alternate shall be considered unless every alternate preceding it on the list has been added to or subtracted from the base bid price.

(C) The use of options other than alternates in bid documents or bid forms subject to section forty-four A shall be prohibited under all circumstances.

(D) Every contract subject to section forty-four A shall include specifications for the installation of weather protection and shall require that the contractor shall install the same and that he shall furnish adequate heat in the area so protected during the months of November through March. Standards for such specifications shall be established by the commissioner or his designee."

Section 44J. INVITATIONS TO BID; NOTICE; CONTENTS; VIOLATIONS; PENALTY.

"(1) No public agency or authority of the commonwealth or any political subdivision thereof shall award any contract for which competitive bids are required pursuant to section forty-four A of this chapter or section thirty-nine M of chapter thirty, or for which competitive proposals are required pursuant to subsection (4) of section forty-four E of this chapter or section eleven C of chapter twenty-five A, unless a notice inviting bids or proposals therefor shall have been posted no less than one week prior to the time specified in such notice for the receipt of said bids or proposals in a conspicuous place in or near the offices of the awarding authority, and shall have remained posted until the time so specified, and unless such notice shall also have been published at least once not less than two weeks prior to the time so specified in the central register published by the secretary of state pursuant to section twenty A of chapter nine and in a newspaper of general circulation in the locality of the proposed project, and on the COMMBUYS system administered by the operational services division. Said notice shall also be published at such other times and in such other newspapers or trade periodicals as the commissioner of capital asset management and maintenance may require, having regard to the locality of the work involved.

(2) Said notice shall specify the time and place where plans and specifications of the proposed work may be had; the time and place of submission of general bids; and the time and place for opening of the general bids. For contracts subject to the provisions of section forty-four A to H, inclusive, of this chapter, said notice shall also specify the time and place for submission of filed sub-bids, where required pursuant to section forty-four F; and the time and place for opening of said filed sub-bids.

Said notice shall also provide sufficient facts concerning the nature and scope of such project, the type and elements of construction, and such other information as will assist applicants in deciding to bid on such contract.

(3) No contract or preliminary plans and specifications shall be split or divided for the purpose of evading the provisions of this section.

(4) General bids and filed sub-bids for any contract subject to this section shall be in writing and shall be opened in public at the time and place specified in the posted or published notice, and after being so opened shall be open to public inspection.

(5) The provisions of this section shall not apply to any transaction between the commonwealth and any public service corporation.

(6) The provisions of this section may be waived in cases of extreme emergency involving the health and safety of the people and their property, upon the written approval of said commissioner. The written approval shall contain a description of the circumstances and the reasons for the commissioner's determination.

(7) Whoever violates any provision of this section shall be punished by a fine of not more than ten thousand dollars or by imprisonment in the state prison for not more than three years or in a jail or house of correction for not more than two and one-half years, or by both said fine and imprisonment; and in the event of final conviction, said person shall be incapable of holding any office of honor, trust or profit under the commonwealth or under any county, district

of municipal agency.

Each and every person who shall cause or conspire to cause any contract or preliminary plans and specifications to be split or divided for the purpose of evading the provisions of this section shall forfeit and pay to the commonwealth, a political subdivision thereof or other awarding authority subject to this section, the sum of not more than five thousand dollars and, in addition, such person or persons shall pay, apportioned among them, double the amount of damages which the commonwealth or political subdivision thereof or other awarding authority may have sustained by reason of the doing of such act, together with the costs of the action.

(8) If an awarding authority rejects all general bids or does not receive any general bids, and advertises for a second opening of general bids with the original filed sub-bids as set forth in subsection (1) of section forty-four E the notice for receipt of such general bids may be published in the central register and elsewhere as required not less than one week prior to the time specified for such second opening of general bids.

(9) No request for proposals or invitation for bids issued under sections 38A ½ to 38O, inclusive, of chapter 7, section 11C of chapter 25A, section 39M of chapter 30, this section and sections 44A to 44H, inclusive, shall be advertised if the awarding authority's cost estimate is greater than 1 year old."

Attention is directed to the following sections of Chapter 30 of the General Laws of Massachusetts as amended to date.

Section 38A. PRICE ADJUSTMENT CLAUSE IN CONTRACTS FOR ROAD, BRIDGE, WATER AND SEWER PROJECTS AWARDED UNDER SEC. 39M

"Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent."

Section 39F. CONSTRUCTION CONTRACTS; ASSIGNMENT AND SUBROGATION; SUBCONTRACTOR DEFINED; ENFORCEMENT OF CLAIM FOR DIRECT PAYMENT; DEPOSIT; REDUCTION OF DISPUTED AMOUNTS.

"(1) Every contract awarded pursuant to sections forty-four A to L inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general 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 general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the

general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g), and (h).

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction."

Section 39G. COMPLETION OF PUBLIC WORKS; SEMI-FINAL AND FINAL ESTIMATES; PAYMENTS; EXTRA WORK; DISPUTED ITEMS.

"Upon substantial completion of the work required by a contract with the commonwealth, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges and other highway structures, sewers and water mains, airports and other public works, the contractor shall present in writing to the awarding authority its certification that the work has been substantially completed. Within twenty-one days thereafter, the awarding authority shall present to the contractor either a written declaration that the work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the contract sufficient to demonstrate that the work has not been substantially completed. The awarding authority 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. In the event that the awarding authority fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the contractor's certification within the twenty-one-day period, the contractor's certification shall take effect as the awarding authority's declaration that the work has been substantially completed.

Within sixty-five days after the effective date of a declaration of substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one percent retainage, if held by the awarding authority, on that work, including the quantity, price and all but one percent retainage, if held by the awarding authority, for the undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payment filed by subcontractors and not yet paid to subcontractors or deposited in joint accounts pursuant to section thirty-nine F, but no contract subject to said section thirty-nine F shall contain any other provision authorizing the awarding authority to deduct any amount by virtue of claims asserted against the contract by subcontractors, material suppliers or others.

If the awarding authority fails to prepare and send to the contractor any substantial completion estimate required by this section on or before the date herein above set forth, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such substantial completion estimate at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the awarding authority sends that substantial completion estimate to the contractor for acceptance or to the date of payment therefor, whichever occurs first. The awarding authority shall include the amount of such interest in the substantial completion estimate.

Within fifteen days after the effective date of the declaration of substantial completion, the awarding authority shall send to the contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the contractor shall complete all such work items within forty-five-days after the receipt of such list or before the then contract completion date, whichever is later. If the contractor fails to complete such work within such time, the awarding authority may, subsequent to seven days' written notice to the contractor by certified mail, return receipt requested, terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the contractor.

Within thirty days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage, if held by the awarding authority, on that work less all payments made to date, unless the awarding authority's inspection shows that work

items required by the contract remain incomplete or unsatisfactory, or that documentation required by the contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date of payment therefor, whichever occurs first, provided that the awarding authority's inspection shows that no work items required by the contract remain incomplete or unsatisfactory. Interest shall not be paid hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate.

The awarding authority shall pay the amount due pursuant to any substantial completion or final estimate within thirty-five days after receipt of written acceptance for such estimate from the contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth day to the date of payment. Within 15 days, 30 days in the case of the commonwealth, after receipt from the contractor, at the place designated by the awarding authority, if such place is so designated, of a periodic estimate requesting payment of the amount due for the preceding periodic estimate period, the awarding authority shall make a periodic payment to the contractor for the work performed during the preceding periodic estimate period and for the materials not incorporated in the work but delivered and suitably stored at the site, or at some location agreed upon in writing, to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances. The awarding authority shall include with each such payment interest on the amount due pursuant to such periodic estimate at the rate herein above provided from the due date. In the case of periodic payments, the contracting authority may deduct from its payment a retention based on its estimate of the fair value of its claims against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five per cent of the approved amount of any periodic payment, and the same right to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-nine F of chapter thirty; provided, that a five per cent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

No periodic, substantial completion or final estimate or acceptance or payment thereof shall bar a contractor from reserving all rights to dispute the quantity and amount of, or the failure of the awarding authority to approve a quantity and amount of, all or part of any work item or extra work item.

Substantial completion, for the purposes of this section, shall mean either that the work required by the contract has been completed except for work having a contract price of less than one percent of the then adjusted total contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract."

Section 39I. DEVIATIONS FROM PLANS AND SPECIFICATIONS.

"Every contractor having a contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or public works for the commonwealth, or of any political subdivision thereof, shall perform all the work required by such contract in conformity with the plans and specifications contained therein. No wilful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the awarding authority or by the engineer or architect in charge of the work who is duly authorized by the awarding authority to approve such deviations. In order to avoid delays in the prosecution of the work required by such contract such deviation from the plans or specifications may be authorized by a written order of the awarding authority or such engineer or architect so authorized to approve such deviation. Within thirty days thereafter, such written order shall be confirmed by a certificate of the awarding authority stating: (1) if such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the project as a whole; (3) that either the work substituted for the work specified is of the same cost and quality, or that

an equitable adjustment has been agreed upon between the contracting agency and the contractor and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the contracting authority.

Such certificate shall be signed under the penalties of perjury and shall be a permanent part of the file record of the work contracted for.

Whoever violates any provision of this section wilfully and with intent to defraud shall be punished by a fine of not more than five thousand dollars or by imprisonment for not more than six months, or both."

Section 39J. PUBLIC CONSTRUCTION CONTRACTS; EFFECT OF DECISIONS OF CONTRACTING BODY OR ADMINISTRATIVE BOARD.

"Notwithstanding any contrary provision of any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or public works by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount of the contract is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or other public body, a decision, by the contracting body or by any administrative board, official or agency, or by any architect or engineer, on a dispute, whether of fact or of law, arising under said contract shall not be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, or arbitrarily is unsupported by substantial evidence, or is based upon error of law."

Section 39K. PUBLIC BUILDING CONSTRUCTION CONTRACTS; PAYMENTS.

"Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or other public body, shall contain the following paragraph: Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five-days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one percent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each sub-subtrade listed in sub-bid form as required by specifications and a column listing the amount paid to each subcontractor and sub-subcontractor as of the date the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate.

A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than 1 per cent of the adjusted contract price, or the awarding authority has determined that the contractor has substantially completed the work and the awarding authority has taken possession for occupancy, the awarding authority may send to the general contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The general contractor shall then complete all such work items within 30 days of receipt of such list or before the contract completion date, whichever is later. If the general contractor fails to complete all incomplete and unsatisfactory work items within 45 days after receipt of such items furnished by the awarding authority or before the contract completion date, whichever is later, subsequent to an additional 14 days' written notice to the general contractor by certified mail, return receipt requested, the awarding authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the general contractor and such termination shall be without prejudice to any other rights or remedies the awarding authority may have under the contract. The awarding authority shall note any such termination in the evaluation form to be filed by the awarding authority pursuant to the provisions of section 44D of chapter 149."

Section 39L. PUBLIC CONSTRUCTION WORK BY FOREIGN CORPORATIONS; RESTRICTIONS AND REPORTS.

"The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for the work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with such awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth."

Section 39M. CONTRACTS FOR CONSTRUCTION AND MATERIALS; MANNER OF AWARDING.

"(b) Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if, in the opinion of the awarding authority: (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications. For each item of material the specifications shall provide for either a minimum of three named 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."

For projects estimated to cost more than $10,000, the following provision, section 39M subsection c, applies:

“(c) The term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder; and (5) who obtains within 10 days of the notification of contract award the security by bond required under section 29 of chapter 149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority; provided further, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.”

Section 39N. CONSTRUCTION CONTRACTS; EQUITABLE ADJUSTMENT IN CONTRACT PRICE FOR DIFFERING SUBSURFACE OR LATENT PHYSICAL CONDITIONS.

"Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

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 shown on the plans or indicated in the contract documents either the contractor or the contracting authority 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, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and 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, the contracting authority shall make an equitable adjustment in the contract price and

the contract shall be modified in writing accordingly."

Section 39O. CONTRACTS FOR CONSTRUCTION AND MATERIALS; SUSPENSION, DELAY OR INTERRUPTION DUE TO ORDER OF AWARDING AUTHORITY; ADJUSTMENT IN CONTRACT PRICE; WRITTEN CLAIM.

"Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

Section 39P. CONTRACTS FOR CONSTRUCTION AND MATERIALS; AWARDING AUTHORITY'S DECISIONS ON INTERPRETATION OF SPECIFICATIONS, ETC.; TIME LIMIT; NOTICE.

"Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made."

Section 39Q. CONTRACTS FOR CAPITAL FACILITY CONSTRUCTION; CONTENTS; ANNUAL CLAIMS REPORT.

"(1) Every contract awarded by any state agency as defined by section thirty-nine A of chapter seven for the construction, reconstruction, alteration, remodeling, repair or demolition of any capital facility as defined by the aforesaid section thirty-nine A shall contain the following subparagraphs (a) through (d) in their entirety:

(a) Disputes regarding changes in and interpretations of the terms or scope of the contract and denials of or failures to act upon claims for payment for extra work or materials shall be resolved according to the following procedures, which shall constitute the exclusive method for resolving such disputes. Written notice of the matter in dispute shall be submitted promptly by the claimant to the chief executive official of the state agency which awarded the contract or his designee. No person or business entity having a contract with a state agency shall delay, suspend, or curtail

performance under that contract as a result of any dispute subject to this section. Any disputed order, decision or action by the agency or its authorized representative shall be fully performed or complied with pending resolution of the dispute.

(b) Within thirty days of submission of the dispute to the chief executive official of the state agency or his designee, he shall issue a written decision stating the reasons therefor, and shall notify the parties of their right of appeal under this section. If the official or his designee is unable to issue a decision within thirty days, he shall notify the parties to the dispute in writing of the reasons why a decision cannot be issued within thirty days and of the date by which the decision shall issue. Failure to issue a decision within the thirty-day period or within the additional time period specified in such written notice shall be deemed to constitute a denial of the claim and shall authorize resort to the appeal procedure described below. The decision of the chief executive official or his designee shall be final and conclusive unless an appeal is taken as provided below.

(c) Within twenty-one calendar days of the receipt of a written decision or of the failure to issue a decision as stated in the preceding subparagraph, any aggrieved party may file a notice of claim for an adjudicatory hearing with the division of hearing officers or the aggrieved party may file an action directly in a court of competent jurisdiction and shall serve copies thereof upon all other parties in the form and manner prescribed by the rules governing the conduct of adjudicatory proceedings of the division of hearing officers. In the event an aggrieved party exercises his option to file an action directly in court as provided in the previous sentence, the twenty-one day period shall not apply to such filing and the period of filing such action shall be the same period otherwise applicable for filing a civil action in superior court. The appeal shall be referred to a hearing officer experienced in construction law and shall be prosecuted in accordance with the formal rules of procedure for the conduct of adjudicatory hearings of the division of hearing officers, except as provided below. The hearing officer shall issue a final decision as expeditiously as possible, but in no event more than one hundred and twenty calendar days after conclusion of the adjudicatory hearing, unless the decision is delayed by a request for extension of time for filing post-hearing briefs or other submissions assented to by all parties. Whenever, because an extension of time has been granted, the hearing officer is unable to issue a decision within one hundred and twenty days, he shall notify all parties of the reasons for the delay and the date when the decision will issue. Failure to issue a decision within the one hundred and twenty-day period or within the additional period specified in such written notice shall give the petitioner the right to pursue any legal remedies available to him without further delay.

(d) When the amount in dispute is less than ten thousand dollars, a contractor who is party to the dispute may elect to submit the appeal to a hearing officer experienced in construction law for expedited hearing in accordance with the informal rules of practice and procedure of the division of hearing officers. An expedited hearing under this subparagraph shall be available at the sole option of the contractor. The hearing officer shall issue a decision no later than sixty days following the conclusion of any hearing conducted pursuant to this subparagraph. The hearing officer's decision shall be final and conclusive, and shall not be set aside except in cases of fraud.

(2) The commissioner of administration shall require the division of hearings officers to prepare annually a report concerning the construction contract claims submitted to the division during the preceding twelve months, in such form as the commissioner shall prescribe. The report shall contain, at a minimum, the following information: the number of claims submitted; the names of all parties to each such claim; a brief description of the claim: the date of submission and of disposition of the claim; its disposition, whether by settlement, withdrawal, default or written decision; and the number of claims currently pending. The original of the report shall be submitted to the commissioner of administration by January fifteenth, and a copy shall be filed with the state librarian and shall be a public document."

Section 39R. KEEPING AND MAINTAINING OF BOOKS, RECORDS AND ACCOUNTS; STATEMENT OF MANAGEMENT ON INTERNAL ACCOUNTING CONTROL; FINANCIAL STATEMENTS; ENFORCEMENT.

"(a) The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded

a contract pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

(2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive, of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars.

(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 his 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 has made and sets forth his 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) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

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

(2) until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and

(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 description the date of the change and reasons therefor, and shall accompany said description with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(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 subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

(2) transactions are recorded as necessary:

i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. 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 has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) whether the representations 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

(2) 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) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance 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. Such statements shall be made available to the awarding authority upon request.

(e) The office of inspector general, the commissioner for capital asset management and maintenance and any other awarding authority shall enforce the provisions of this section. The commissioner of capital asset management and maintenance may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that

such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).”

Section 39S. CONTRACTS FOR CONSTRUCTION; REQUIREMENTS.

“(a) As used in this section the word "person" shall mean any natural person, joint venture, partnership corporation or other business or legal entity. Any person submitting a bid for, or signing a contract to work on, the construction, reconstruction, alteration, remodeling or repair of any public work by the commonwealth, or political subdivision thereof, or by any county, city, town, district, or housing authority, and estimated by the awarding authority to cost more than $10,000, and any person submitting a bid for, or signing a contract to work on, the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency, estimated to cost more than $10,000, shall certify on the bid, or contract, under penalties of perjury, as follows:

(1) That he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

(b) Any employee found on a worksite subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

(c) The attorney general, or his designee, shall have the power to enforce this section including the power to institute and prosecute proceedings in the superior court to restrain the award of contracts and the performance of contracts in all cases where, after investigation of the facts, he has made a finding that the award or performance has resulted in violation, directly or indirectly, of subsection (b), and he shall not be required to pay to the clerk of the court an entry fee in connection with the institution of the proceeding.”

Section 40. DISCHARGE OR RELEASE OF BONDS.

"Bonds given to the commonwealth, any county, city, town or political subdivision to secure the performance of contracts for the construction or repair of public buildings or other public works may be discharged or released by the awarding authority, upon such terms as it deems expedient, after the expiration of one year from the time of completion, subject to section thirty-nine K, of the work contracted to be done; provided that no claim filed under said bond is pending, and provided further, that no such bonds shall be discharged or released prior to the expiration of all special guarantees provided for in the contract unless new bonds in substitution therefor specifically relating to the unexpired guarantees shall be taken."

ATTENTION IS DIRECTED TO THE FOLLOWING SECTIONS OF CHAPTER 82 (THE LAYING OUT, ALTERATION, RELOCATION AND DISCONTINUANCE OF PUBLIC WAYS, AND SPECIFIC REPAIRS THEREON) OF THE GENERAL LAWS OF MASSACHUSETTS AS AMENDED TO DATE.

Section 40. DEFINITIONS APPLICABLE TO SECTIONS 40A TO 40E.

"The following words, as used in this section and sections 40A to 40E, inclusive, shall have the following meanings:

"**Company**", natural gas pipeline company, petroleum or petroleum products pipeline company, public utility company, cable television company, municipal traffic signal department, and municipal utility company or department that supply gas, electricity, telephone, communication or cable television services or private water companies within the city or town where such excavation is to be made.

"**Description of excavation location**", such description shall include the name of the city or town, street, way, or route number where appropriate, the name of the streets at the nearest intersection to the excavation, the number of the buildings closest to the excavation or any other description, including landmarks, utility pole numbers or other information which will accurately define the location of the excavation.

"**Emergency**", a condition in which the safety of the public is in imminent danger, such as a threat to life or health or where immediate correction is required to maintain or restore essential public utility service.

"**Excavation**", an operation for the purpose of movement or removal of earth, rock or the materials in the ground including, but not limited to, digging, blasting, augering, backfilling, test boring, drilling, pile driving, grading, plowing in, hammering, pulling in, jacking in, trenching, tunneling and demolition of structures.

"**Excavato**r", any entity including, but not limited to, a person, partnership, joint venture, trust, corporation, association, public utility, company or state or local government body which performs excavation operations.

"Marking standards", the methods by which a company designates its facilities in accordance with standards established by the Common Ground Alliance and the American Public Works Association.

"Non-mechanical means", excavation using any device or tool manipulated by human power, including air vacuum, air blowing or similar methods of excavation designed to minimize direct contact with utilities.

"**Premark**", to delineate the general scope of the excavation or boring on the paved surface of the ground using white paint, or stakes or other suitable white markings on nonpaved surfaces. No premarking shall be acceptable if such marks can reasonably interfere with traffic or pedestrian control or are misleading to the general public. Premarking shall not be required of any continuous excavation that is over 500 feet in length.

"Professional land surveyor", a professional land surveyor as defined in section 81D of chapter 112.

"**Safety zone**", a zone designated on the surface by the use of standard color-coded markings which contains the width of the facilities plus not more than 18 inches on each side.

"**Standard color-coded markings**", red - electric power lines, cables, conduit or light cables; yellow - gas, oil, street petroleum, or other gaseous materials; orange - communications cables or conduit, alarm or signal lines; blue - water, irrigation and slurry lines; green - sewer and drain lines; white - premark of proposed excavation.

"**System**", the underground plant damage prevention system as defined in section 76D of chapter 164."

Section 40A. EXCAVATIONS; NOTICE.

"No excavator installing a new facility or an addition to an existing facility or the relay or repair of an existing facility shall, except in an emergency, make an excavation, in any public or private way, any company right-of-way or easement or any public or privately owned land or way, unless at least 72 hours, exclusive of Saturdays, Sundays and legal holidays but not more than 30 days before the proposed excavation is to be made, such excavator has premarked not more than 500 feet of the proposed excavation and given an initial notice to the system. Such initial notice shall set forth a description of the excavation location in the manner as herein defined. In addition, such initial notice shall indicate whether any such excavation will involve blasting and, if so, the date and the location at which such blasting is to occur.

Any professional land surveyor working on a preliminary design for a new facility or renovation where excavation is necessary shall: (i) Premark the proposed excavation; and (ii) provide initial notice to the system.

The notice requirements shall be waived in an emergency as defined herein; provided, however, that before such excavation begins or during a life-threatening emergency, notification shall be given to the system and the initial point

of boring or excavation shall be premarked. The excavator shall ensure that the underground facilities of the utilities in the area of such excavation shall not be damaged or jeopardized.

In no event shall any excavation by blasting take place unless notice thereof, either in the initial notice or a subsequent notice accurately specifying the date and location of such blasting shall have been given and received at least 72 hours in advance, except in the case of an unanticipated obstruction requiring blasting when such notice shall be not less than four hours prior to such blasting. If any such notice cannot be given as aforesaid because of an emergency requiring blasting, it shall be given as soon as may be practicable but before any explosives are discharged."

Section 40B. DESIGNATION OF LOCATION OF UNDERGROUND FACILITIES.

"Within 72 hours, exclusive of Saturdays, Sundays and legal holidays, from the time the initial notice is received by the system or at such time as the company and the excavator or professional land surveyor agree, such company shall respond to the initial notice or subsequent notice by designating the location of the underground facilities within 15 feet in any direction of the premarking so that the existing facilities are to be found within a safety zone. Such safety zone shall be so designated by the use of standard color-coded markings. The providing of such designation by the company shall constitute prima facie evidence of an exercise of reasonable precaution by the company as required by this section; provided, however, that in the event that the excavator or professional land surveyor has given notice as aforesaid at a location at which because of the length of excavation the company cannot reasonably designate the entire location of its facilities within such 72 hour period, then such excavator or professional land surveyor shall identify for the company that portion of the excavation which is to be first made and the company shall designate the location of its facilities in such portion within 72 hours and shall designate the location of its facilities in the remaining portion of the location within a reasonable time thereafter. When an emergency notification has been given to the system, the company shall make every attempt to designate its facilities as promptly as possible. A company shall conduct periodic audits to ensure: (i) the accuracy of the designated location and marking of its facilities; and (ii) its adherence to marking standards."

Section 40C. EXCAVATOR'S RESPONSIBILITY TO MAINTAIN DESIGNATION MARKINGS; DAMAGE CAUSED BY EXCAVATOR.

"After a company has designated the location of its facilities at the location in accordance with section 40B, the excavator shall be responsible for maintaining the designation markings at such locations, unless such excavator requests remarking at the location due to the obliteration, destruction or other removal of such markings. The company shall then remark such location within 24 hours following receipt of such request.

When excavating in close proximity to the underground facilities of any company when such facilities are to be exposed, non-mechanical means shall be employed, as necessary, to avoid damage in locating such facility and any further excavation shall be performed employing reasonable precautions to avoid damage to any underground facilities including, but not limited to, any substantial weakening of structural or lateral support of such facilities, penetration or destruction of any pipe, main, wire or conduit or the protective coating thereof, or damage to any pipe, main, wire or conduit.

If any damage to such pipe, main, wire or conduit or its protective coating occurs, the company shall be notified immediately by the excavator responsible for causing such damage.

The making of an excavation without providing the notice required by section 40A with respect to any proposed excavation which results in any damage to a pipe, main, wire or conduit, or its protective coating, shall be prima facie evidence in any legal or administrative proceeding that such damage was caused by the negligence of such person."

Section 40D. LOCAL LAWS REQUIRING EXCAVATION PERMITS; PUBLIC WAYS.

"Nothing in this section shall affect or impair local ordinances or by-laws requiring a permit to be obtained before excavation in a public way or on private property; but notwithstanding any general or special law, ordinance or by-law to the contrary, to the extent that any permit issued under the provisions of the state building code or state fire

code requires excavation by an excavator on a public way or on private property, the permit shall not be valid unless the excavator notifies the system as required pursuant to sections 40 and 40A, before the commencement of the excavation, and has complied with the permitting requirements of chapter 82A."

Section 40E. VIOLATIONS OF SECS. 40A TO 40E; PUNISHMENT.

"Any person or company found by the department of public utilities, after a hearing, to have violated any provision of sections 40A to 40E, inclusive, shall be fined $1000 for the first offense and not less than $5,000 nor more than $10,000 for any subsequent offense within 12 consecutive months as set forth by the rules of said department; provided, however, that nothing herein shall be construed to require forfeiture of any penal sum by a state or local government body for violation of section 40A or 40C; and provided, further, that nothing herein shall be construed to require the forfeiture of any penal sum by a residential property owner for the failure to premark for an excavation on such person's residential property. The department of public utilities may require any person or company not in compliance with sections 40A to 40E, inclusive, to complete a "Dig Safe" training program in lieu of a fine for a first offense. "

ATTENTION IS DIRECTED TO THE FOLLOWING SECTIONS OF CHAPTER 30 (AN ACT MOBILIZING ECONOMIC RECOVERY IN THE COMMONWEALTH) OF THE ACTS OF 2009.

Section 33.

"(a) Notwithstanding any general or special law to the contrary, the following requirements shall apply to any public works project funded by the American Recovery and Reinvestment Act of 2009 where the amount of construction costs under any contract awarded is likely to exceed $1,000,000. For the purposes of this section, "public works" shall mean building or work the construction of which is carried on by authority of the commonwealth, or by a county, town, authority or district, or with funds of a federal agency or the commonwealth or a county, city, town, authority or district to serve the interest of the general public, regardless of whether title thereof is in the commonwealth or in a county, city, town, authority or district; provided, however, that for the purposes of this definition, "construction" shall have the meaning provided in section 27D of chapter 149 of the General Laws.

(b) For any public works project subject to subsection (a), the specifications set forth in any request for responses shall include a requirement that, on a per project basis, not less than 20 per cent of the total hours of employees receiving an hourly wage who are directly employed on the site of the project, employed by the contractor or a subcontractor and subject to the prevailing wage, shall be performed by apprentices in bona fide apprentice training programs as provided in sections 11H and 11I of chapter 23 of the General Laws which are approved by the division of apprentice training in the executive office of labor and workforce development.

(c) During the performance of a public works project subject to subsections (a) and (b), the contractor shall submit periodic reports to the awarding authority with records indicating the total hours worked by all journeymen and apprentices in positions subject to the apprentice requirement. In any instance in which the apprentice hours do not constitute 5 per cent of the total hours of employees subject to the apprentice requirement, the contractor shall submit a plan to the awarding authority describing how the contractor shall comply with the apprentice requirement.

(d) The attorney general shall have all the necessary powers to require compliance with the requirements of subsections (a), (b) and (c) therewith, including the power to institute and prosecute proceedings in the superior court to restrain the award of contracts and the performance of contracts. Prior to award of the contract, an awarding authority may petition the attorney general for approval to adjust the requirements set forth in said subsections (a), (b) and (c). The attorney general may adjust these requirements only if he determines that compliance with these requirements is not feasible or if application of the requirements would be preempted by federal law.

(e) An awarding authority serving a low-income population may require additional specifications that address the needs of its clients including, but not limited to, preferential hiring for residents of public housing authorities for available apprenticeship positions.

(f) Subject to appropriation, the division of apprentice training shall enhance its outreach efforts to underserved populations in order to increase and diversify the number of apprentices in the commonwealth."

Section 39.

"Any entity located in the commonwealth that receives federal funds through the American Recovery and Reinvestment Act of 2009 shall provide information as directed by the secretary of administration and finance regarding the use of the funds. The required information shall include, but not be limited to, the reporting information required by the federal government and any other information deemed necessary by the secretary to administer the American Recovery and Reinvestment Act of 2009 responsibly, efficiently and transparently. To the extent possible, the secretary shall work to streamline the reporting of this information, minimize duplication of data entry by recipients and ensure data consistency. The secretary may issue regulations to effectuate this reporting requirement."

Section 40.

"Employers and hiring agents on all projects funded in whole or in part by the American Recovery and Reinvestment Act of 2009 shall post notices of available employment opportunities to the commonwealth's job bank or the one-stop career centers closest to where the projects shall be located. The postings shall contain such information as directed by the secretary of labor and workforce development. The secretary may issue regulations to effectuate this job posting requirement."

END OF SECTION

SECTION 00 73 73.43

ATTACHMENT C

THE COMMONWEALTH OF MASSACHUSETTS

SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM

I. Definitions

For purposes of this contract,

"Minority" means a person who meets one or more of the following definitions:

(a) American Indian or Native American means: all persons having origins in any of the original peoples of North America and who are recognized as an Indian by a tribe or tribal organization.
(b) Asian means: All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian sub-continent, or the Pacific Islands, including, but not limited to China, Japan, Korea, Samoa, India, and the Philippine Islands.
(c) Black means: All persons having origins in any of the Black racial groups of Africa, including, but not limited to, African-Americans, and all persons having origins in any of the original peoples of the Cape Verdean Islands.
(d) Eskimo or Aleut means: All persons having origins in any of the peoples of Northern Canada, Greenland, Alaska, and Eastern Siberia.
(e) Hispanic means: All persons having their origins in any of the Spanish-speaking peoples of Mexico, Puerto Rico, Cuba, Central or South America, or the Caribbean Islands.

"State construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility, or a contract for the construction, reconstruction, alteration, remodeling or repair of a public work undertaken by a department, agency, board, or commission of the commonwealth.

"State assisted construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility undertaken by a political subdivision of the commonwealth, or two or more political subdivisions thereof, an authority, or other instrumentality and whose costs of the contract are paid for, reimbursed, grant funded, or otherwise supported, in whole or in part, by the commonwealth.

II. Equal Opportunity, Non-Discrimination and Affirmative Action

During the performance of this Contract, the Contractor and all subcontractors (hereinafter collectively referred to as "the Contractor") for a state construction contract or a state assisted construction contract, for him/herself, his/her assignees and successors in interest, agree to comply with all applicable equal employment opportunity, non-discrimination and affirmative action requirements, including but not limited to the following:

In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability, shall not discriminate in the selection or retention of subcontractors, and shall not discriminate in the procurement of materials and rentals of equipment.

The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion, or transfer; recruitment advertising, layoff or termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship or on-the-job training opportunity. The Contractor shall comply with the provisions of chapter 151B of the Massachusetts General Laws, as amended, and all other applicable anti-discrimination and equal opportunity laws, all of which are herein incorporated by reference and made a part of this Contract.

The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the Massachusetts Commission Against Discrimination setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter 151B).

In connection with the performance of work under this contract, the Contractor shall undertake, in good faith, affirmative action measures to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. Such affirmative action measures shall entail positive and aggressive measures to ensure non-discrimination and to promote equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, apprenticeship and on-the-job training programs. A list of positive and aggressive measures shall include, but not be limited to, advertising employment opportunities in minority and other community news media; notifying minority, women and other community-based organizations of employment opportunities; validating all job specifications, selection requirements, and tests; maintaining a file of names and addresses of each worker referred to the Contractor and what action was taken concerning such worker; and notifying the administering agency in writing when a union with whom the Contractor has a collective bargaining agreement has failed to refer a minority or woman worker. These and other affirmative action measures shall include all actions required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. One purpose of this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this and future Commonwealth public construction projects.

III. Minority and Women Workforce Participation

Pursuant to his/her obligations under the preceding section, the Contractor shall strive to achieve on this project the labor participation goals contained herein. Said participation goals shall apply in each job category on this project including but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers and those classes of work enumerated in Section 44F of Chapter 149 of the Massachusetts General Laws. The participation goals for this project shall be 15.3% for minorities and 6.9% for women. The participation goals, as set forth herein, shall not be construed as quotas or set-asides; rather, such participation goals will be used to measure the progress of the Commonwealth's equal opportunity, non-discrimination and affirmative action program. Additionally, the participation goals contained herein should not be seen or treated as a floor or as a ceiling for the employment of particular individuals or group of individuals.

IV. Liaison Committee

At the discretion of the agency that administers the contract for the construction project there may be established for the life of the contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the agency or agencies administering the contract for the construction project, hereinafter called the administering agency, a representative from the Office of Affirmative action, and such other representatives as may be designated by the administering agency.

The Contractor (or his/her agent, if any, designated by him/her as the on-site equal employment opportunity officer) shall recognize the Liaison Committee as an affirmative action body, and shall establish a continuing working relationship with the Liaison Committee, consulting with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

V. Reports and Records

The Contractor shall prepare projected workforce tables on a quarterly basis when required by the administering agency. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and also, when updated, to the administering agency and the Liaison Committee when required.

The Contractor shall prepare weekly reports in a form approved by the administering agency, unless information required is required to be reported electronically by the administering agency, the number of hours worked in each trade by each employee, identified as woman, minority, or non-minority. Copies of these shall be provided at the end of each such week to the administering agency and the Liaison Committee.

Records of employment referral orders, prepared by the Contractor, shall be made available to the administering agency on request.

The Contractor will provide all information and reports required by the administering agency on instructions issued by the administering agency and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the administering agency to effect the employment of personnel. This provision shall apply only to information pertinent to the Commonwealth's supplementary non-discrimination, equal opportunity and access and opportunity contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the administering agency and shall set forth what efforts he has made to obtain the information.

VI. Access to Work Site

A designee of the administering agency and a designee of the Liaison Committee shall each have a right to access the work site.

VII. Solicitations for Subcontracts, and for the Procurement of Materials and Equipment

In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under this contract relative to non-discrimination and equal opportunity.

VIII. Sanctions

Whenever the administering agency believes the General or Prime Contractor or any subcontractor may not be operating in compliance with the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter 151B), the administering agency may refer the matter to the Massachusetts Commission Against Discrimination (“Commission”) for investigation.

Following the referral of a matter by the administering agency to the Massachusetts Commission Against Discrimination, and while the matter is pending before the MCAD, the administering agency may withhold payments from contractors and subcontractors when it has documentation that the contractor or subcontractor has violated the Fair Employment Practices Law with respect to its activities on the Project, or if the administering agency determines that the contractor has materially failed to comply with its obligations and the requirements of this Section. The amount withheld shall not exceed a withhold of payment to the General or Prime Contractor of 1/100 or 1% of the contract award price or $5,000, whichever sum is greater, or, if a subcontractor is in non-compliance, a withhold by the administering agency from the General Contractor, to be assessed by the General Contractor as a charge against the subcontractor, of 1/100 or 1% of the subcontractor price, or $1,000 whichever sum is greater, for each violation of the applicable law or contract requirements. The total withheld from any one General or Prime Contractor or subcontractor on a Project shall not exceed $20,000 overall. No withhold of payments or investigation by the Commission or its agent shall be initiated without the administering agency providing prior notice to the Contractor.

If, after investigation, the Massachusetts Commission Against Discrimination finds that a General or Prime Contractor or subcontractor, in commission of a state construction contract or state-assisted construction contract, violated the provisions of the Fair Employment Practices Law, the administering agency may convert the amount withheld as set forth above into a permanent sanction, as a permanent deduct from payments to the General or Prime Contractor or subcontractor, which sanction will be in addition to any such sanctions, fines or penalties imposed by the Massachusetts Commission Against Discrimination:

No sanction enumerated under this Section shall be imposed by the administering agency except after notice to the General or Prime Contractor or subcontractor and an adjudicatory proceeding, as that term is used, under Massachusetts General Laws Chapter 30A, has been conducted.

IX. Severability

The provisions of this section are severable, and if any of these provisions shall be held unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

X. Contractor's Certification

A bidder for a state construction contract or state assisted construction contract will not be eligible for award of the contract unless such bidder has submitted to the administering agency the following certification, which will be incorporated into the resulting contract:

CONTRACTOR'S CERTIFICATION

_____certifies that they:
(Contractor Name)

1. Will not discriminate in their employment practices;

2. Intend to use the following listed construction trades in the work under the contract

   _____

   _____; and

3. Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and

4. Are in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and

5. Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.

6. Agree to comply with all provisions contained herein.

_____
(Signature of authorized representative of Contractor) Date

_____
(Printed name of authorized representative of Contractor)

XI. Subcontractor Requirements

Prior to the award of any subcontract for a state construction contract or a state assisted construction contract, regardless of tier, the Prime or General Contractor shall provide all prospective subcontractors with a complete copy of this Section entitled "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" and will incorporate the provisions of this Section by reference into any and all contracts or work orders for all subcontractors providing work on the Project. In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the prime contract, the Prime or General Contractor shall certify in writing to the administering agency that it has complied with the requirements as set forth in the proceeding paragraph.

ATTACHMENT D
SECTION 00 73 73.53

CHANGE ORDERS

Policy:

This section supplements Article 10, Changes in the Work, in the General Conditions and Supplementary Conditions.

All executed change orders submitted to the Engineer for review and processing must be prepared in accordance with the attached change order format (Appendix A) with the appropriate number of copies, calculation sheet(s) (Appendix B) and all other supporting documentation necessary for evaluation. Failure to comply with these instructions will result in delays in processing the change order.

In order to avoid possible delays with approval of change orders, at the beginning of the project and as circumstances warrant, the Contractor shall submit a list of construction equipment, identifying major pieces of equipment to be utilized on the project. The list shall include the Contractor's designation, if any, the manufacturer, model, year of manufacture, serial number, size and horsepower of equipment. The Contractor shall also provide for approval a proposed bluebook equipment rental rate development that separately lists for each piece of equipment the monthly rental rate, area adjustment factor, depreciation factor, estimated operating cost per hour and total hourly rate. In the event the Contractor fails or is unable to provide appropriate rate information the Engineer may develop equipment rental rates for use on change orders.

Payment of Change Orders:

Payment of all change orders shall be in accordance with the relevant provisions of Massachusetts General Laws, Chapter 30, Section 39G for non-building construction and Section 39K for building construction as amended from time to time.

Payment of change orders shall be made in accordance with one of the following three methods:

A. Existing unit prices as set forth in the contract; or

B. Agreed upon lump sum or unit prices; or

C. Time and materials

A. Payment for work for which there is a unit price in the contract:

Where the contract contains a unit price for work and the Engineer orders a change for work of the same kind as other work contained in the contract and is performed under similar physical conditions, the Contractor shall accept full and final payment at the contract unit price(s) for the acceptable quantities. Under certain circumstances, the unit prices may be subject to revaluation and adjustment. See Article 13 in the Supplementary

Conditions.

B. Payment for work or materials for which no price is contained in the contract:

If the Engineer directs, the Contractor shall submit promptly in writing to the Engineer an offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of:

1. The estimated cost of Labor, plus
2. Direct Labor Cost, plus
3. Material and Freight Costs, plus
4. Equipment Costs, plus
5. An amount not to exceed 15% of the sum of items 1 through 4 for overhead and profit, plus (if applicable),
6. In the case of work done by a subcontractor an amount not to exceed 5%, for the general contractor of the sum of the cost (not including subcontractor's overhead and profit) of items 1 through 4 for his overhead and profit (less, if applicable),
7. Credits for work deleted from the contract, including actual costs of the deleted work plus the percentage of overhead, profit, bonds and insurance attributable to such credit amount.

C. Payment for work on a time and materials basis:

Unless an agreed lump sum and/or unit price is obtained as noted above and is so stated in the change price, the Contractor shall accept as full payment for which no agreement is contained in contract, an amount equal to:

1. The estimated cost of Labor, plus
2. The Direct Labor Costs, plus
3. Equipment Costs, plus
4. Material and Freight Costs, plus
5. An amount not to exceed 15% of the sum of items 1 through 4 for overhead and profit, plus, if applicable,
6. In the case of work done by a subcontractor an amount not to exceed 5%, for the general contractor of the sum of the cost (not including subcontractor's overhead and profit) of items 1 through 4 for his overhead and profit (less, if applicable),
7. Credit for work deleted from the Contract, including actual costs of the deleted work plus the percentage of overhead, profit, bonds and insurance attributable to such credit amount.

Explanation of items 1 through 7 as outlined in "B" and "C" above:

1. Labor - Only those workers employed on the project who are doing the extra work, including the foreman in charge, are allowable. General foremen, superintendents, or other supervisory personnel are considered to be included in the overhead markup as provided in items 5 and/or 6. Hourly labor rates in excess of those as listed in the contract wage

rates require documentation. As a minimum, an explanation and the appropriate copy of the certified payroll are required.

2. Direct Labor Costs - These costs are limited to those which are required in the contract document. Coverage in excess of the contract provisions, secured by the contractor/subcontractor(s) at his option, are ineligible. The following list of typical direct labor charges is provided for your assistance and is in no way intended to be complete or all encompassing:

   Workman's Compensation

   Federal/State: Social Security Tax and Unemployment Tax;

   Health, Welfare and Pension Benefits; (this cost is included in the wage rates appearing in the Attachment A Massachusetts Wage Rates.

Liability insurance:	Bodily injury; excess umbrella; property damage; public liability
Blasters insurance:	If applied to any required direct labor costs
Builders risk insurance:	If applied to any required direct labor costs
Experience modification insurance:	If applied to any required direct labor costs
Surcharges:	If applied to any required direct labor costs

Following award and prior to execution of a construction contract, the Contractor and filed subbidders (where applicable) shall submit for review by the Owner, documentation to establish the markup percentage(s).

The documented direct labor markup for this contract may be adjusted on an annual basis as measured from the date the contract is executed. The contract agreement will provide for the establishment of the Direct Labor Cost percentage.

3. Material and Freight - Only those materials required as a result of the change order and reasonable freight charges for delivery of same are allowable.

4. Equipment - Only the equipment required as a result of the change order is allowable. Equipment rental rates shall be governed by the current EquipmentWatch, division of Intertec Publishing [Formerly Nielson/Dataquest] Rental Rate Bluebook for Construction Equipment (the "Bluebook"). In determining the rental rate, the following shall apply:

   a. For equipment already on the project - the monthly prorated rental rate by the hourly use shall be applicable;

   b. For equipment not on the project the daily rate, the weekly rate, or monthly

rate will prevail, whichever will prove to be most cost effective. Small tools and manual equipment are examples of costs not allowable under this item. These costs are considered to be included in the overhead markup as provided in items 5 and/or 6.

(1 Month (Normal Use) = 176 hours)

5.& 6. Overhead and Profit - All other costs not previously mentioned are considered to be included in this item, be it for the general contractor or subcontractor(s).

7. Credits - Work deleted, material and equipment removed from the contract, stored and/or returned shall be credited to the cost of the change order, less documented costs.

This change order will be prepared in such manner as to clearly separate Eligible and Ineligible Costs (as applicable to state-funded projects).

The Contractor shall furnish itemized statements of the cost of the work ordered and shall give the Engineer access to all accounts, bills and vouchers relating thereto; and unless the Contractor shall furnish such itemized statements, and access to all accounts, bills and vouchers, he shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

APPENDIX A

Change Order Sheet___of __
Tom Nevers Road Multi-Use Path Project
Nantucket, Massachusetts

Date_____

Project No. _____SRF No. (if applicable)_____

Contract No. _____

Change Order No. _____
Contract Amount (As Bid) $_____

Amount of Previous Change Orders $_____

Net Change in Contract Price (this Change Order) $_____

Total Adjusted Contract Price (including this Change Order $_____

This Change Order extends the time to complete the work by ____ calendar days.

The extended completion date is _____
_____.

This Change Order checked by: _____
Resident Representative Date

This Change Order is requested by: _____

This Change Order is recommended by:

_____
Consultant Engineer P.E. # Date

The undersigned agree to the terms of the Change Order.

_____
Contractor Date

_____
Owner Date

Certification of Appropriation under M.G.L. c.44, s.31C: Adequate funding in an amount sufficient to cover the total cost of this change order is available.

By: _____ _____
Certification Officer (Auditor, Accountant, Treasurer) Date

Do not write below this space: this space reserved for STATE AGENCY APPROVAL

_____

CHANGE ORDER (continued) Sheet___of___
Tom Nevers Road Multi-Use Path Project
Nantucket, Massachusetts

Date_____

Project No. _____SRF No. (if applicable)_____

Contract No. _____

Change Order No. _____

Owner's Name: _____

Owner's Address: _____

Contractor's Name: _____

Contractor's Address: _____

Item 1:

Description of Change:_____

Reason for Change:_____

Backup Information:_____

Cost: $_____

Item 2

Description of Change:_____

Reason for Change:_____

Backup Information:_____

Cost: $_____

Appendix B
Example Calculation Sheet

1. Labor

Foreman	10 hours @	$10.00/hour	$100.00
Engineer	10 hours @	8.80/hour	85.00
Operator	10 hours @	9.50/hour	95.00
Laborers	24 hours @	7.00/hour	168.00
			$448.00

2. Direct Labor Cost (use the agreed upon Direct Labor Cost)

*(30)% of $448.
*(used for example purposes only) $ 134.00

3. Materials & Freight

150 1.f. of 12" pipe @ $2.00/1.f.	$ 300.00
15 v.f. precast SMH	1,700.00
Freight (slip# enclosed)	25.00
	$2,025.00

EXAMPLE

4. Equipment

1 Backhoe	10 hours @	$ 80.00/hour	$ 800.00
1 Truck-crane	10 hours @	100.00/hour	1000.00
			$1800.00

TOTAL (items 1 through 4): $4,407.00

5. (20%) markup for Overhead, Profit

(20%) of $4,407 $ 881.00

6. (7½ %) markup on subcontractor's cost for general contractor (if subcontractor is involved)

(7½ %) of $4,407 $ 331.00

7. Credits (deductibles) -$323.00

TOTAL COST: $5,296.00

Reminder: Provide support documentation as necessary i.e. vouchers, correspondence, calculation, photographs, reports**.**

END OF SECTION

SECTION 00 73 73.73

ATTACHMENT E

PRICE ADJUSTMENTS

ATTACHMENT E

PRICE ADJUSTMENTS FOR CERTAIN MATERIALS IN CONSTRUCTION PROJECTS
MGL CHAPTER 30, SECTION 38A

On November 20, 2013, the Massachusetts Legislature passed a bill (Chapter 150 of the Acts of 2013) requiring that water and sewer projects bid under MGL Chapter 30 Section 39M include price adjustment clauses for **fuel** (both diesel and gasoline)**, liquid asphalt** and **portland cement** contained in cast in place concrete for all projects that are advertised for bid after January 1, 2014.

The inclusion of these clauses in the construction contract is the responsibility of the awarding authority, and as such, MassDEP does not dictate what language should be used in the contract. MassDEP will, however, review the contracts to verify that price adjustment clauses have been included.

Awarding Authorities may find value from researching the *price adjustment* information on the Massachusetts Department of Transportation (MassDOT) website at https://www.massdot.state.ma.us/highway/DoingBusinessWithUs/Construction/PriceAdjustments.aspx. MassDOT requires the use of price adjustment clauses in all of its contracts, and since 2008 has been requiring cities and towns utilizing Chapter 90 road construction funds to also include price adjustment clauses. Because of this, many cities and towns may already have drafted appropriate price adjustment language. This language would be suitable for use in SRF funded contracts. The MassDOT website has extensive information on price adjustments and required contract language for MassDOT contracts.

Attached below is the new Chapter 30, Section 38A language and the contract language that MassDOT uses in its construction contracts. The MassDOT contract language is presented as a possible starting point for borrowers that have not drafted price adjustment clauses. The LGU should consult with their legal and contract staff as appropriate in developing the price adjustment clauses.

Chapter 150 of the Acts of 2013
An Act Relative to Price Adjustment for Certain Materials in Construction Projects

Whereas, the deferred operation of this act would tend to defeat its purpose, which is to establish forthwith certain price adjustments, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

SECTION 1. Chapter 30 of the General Laws is hereby amended by inserting after section 38 the following section:-

Section 38A. Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and

portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.

SECTION 2. Section 1 shall apply to projects which are advertised for bid after January 1, 2014.

Approved, November 25, 2013.

MassDOT Price Adjustment Clauses

DOCUMENT 00811
SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
ENGLISH UNITS
Revised: 02/02/2009

This provision applies to all projects using greater than 100 tons of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

Base Price
The Base Price of liquid asphalt on a project as listed in the Notice to Contractors section of the bid documents is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price detailed below.

Period Price
Please note that, starting December 15, 2008, two sets of period prices will be posted each month on the MassHighway website at http://www.massdot.state.ma.us/. They will be labeled “New Asphalt Period Price Method” and “Old Asphalt Period Price Method”.

New Asphalt Period Price Method
The “New Asphalt Period Price Method” is for contracts bid after December 15, 2008 and will show the Period Price of liquid asphalt for each monthly period as determined by MassHighway using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. MassHighway will post this Period Price on this website within two (2) business days following their receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted MassHighway the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

Old Asphalt Period Price Method
The "Old Asphalt Period Price Method" Period Price will be for contracts bid on or before December 15, 2008 and will contain liquid asphalt prices as determined by the old or previous method. These prices will continue to be posted on MassHighway's website until all contracts using the "Old Asphalt Period Price Method" Period Price have been closed.

New and Old Asphalt Period Price Methods
The paragraphs below apply to both the New and the Old Asphalt Period Price Methods.
The Contract Price of the hot mix asphalt mixture will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of tons of hot mix asphalt mixtures placed during each monthly period times the liquid asphalt content percentage times the variance in price between Base Price and Period Price of liquid asphalt.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department approved extension of time.

******** END OF DOCUMENT ********

DOCUMENT 00812
SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE – ENGLISH UNITS
Revised: 01/26/2009

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site (http://www.massdot.state.ma.us/) for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made\ during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply only to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS	
	Diesel	**Gasoline**
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144., 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY	0.15 Gallons / CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply

******** END OF DOCUMENT ********

DOCUMENT 00814
SPECIAL PROVISIONS
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES
January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the
Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the **Construction Economics** section of *ENR Engineering News-Record* magazine or at the ENR website http://www.enr.com under **Construction Economics**. The Period Price will be posted on the MassHighway website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01.

No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

****
END OF DOCUMENT

SECTION 01 11 00

CONTROL OF WORK AND MATERIALS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section establishes general requirements for handling and storage of materials, use of easements, maintenance of access and traffic, protection of existing property and utilities, maintenance of drainage, and control of the Work.

1.02 RELATED SECTIONS

A. Section 01 55 26.13, TEMPORARY SIGNAGE AND TRAFFIC CONTROL.
B. Section 01 55 26.19, UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL.
C. Section 01 55 26.22, ROADWAY TRAFFIC FLAGGERS.
D. Section 01 56 39, TREE PROTECTION AND TRIMMING.
E. Section 02 41 13, SELECTIVE SITE DEMOLITION.
F. Section 31 13 13, TREE PRUNING AND STUMP REMOVALS.
G. Section 33 41 13.28, REINFORCED CONCRETE PIPE.
H. Section 33 42 16.13, PRECAST CONCRETE HEADWALLS.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 HAULING, HANDLING AND STORAGE OF MATERIALS:

A. At its own expense, handle, load, transport, unload, and store materials furnished by the Contractor. Remove surplus and waste materials from the Site upon completion of the applicable Work. Materials designated for salvage, reuse, resetting, or delivery to the Owner shall not be treated as surplus or waste and shall be handled in accordance with the Contract Documents.

B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by it that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.

C. Locate excavated materials, stored materials, and equipment so they do not damage the Work, existing facilities, vegetation, utilities, drainage systems, or property designated to remain. Maintain access at all times to active utilities, emergency facilities, driveways,

roadways, paths, and portions of the Work requiring inspection. Store materials only within approved staging and work areas and in a manner that minimizes inconvenience to the public and abutting owners and occupants.

D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

3.02 EASEMENTS:

A. Contractor shall schedule work so that it will cause minimum inconvenience and nuisance to abutting property owners, over the shortest possible time.

B. Do not store equipment, excavated material, excess soil, construction debris, or other materials within easements except where expressly shown or accepted in writing by the Owner. Keep easements clean and accessible throughout the Work.

C. Promptly restore surfaces and improvements disturbed by Contractor operations within easements, except for items expressly designated for removal without resetting or assigned to the Owner, utility owner, property owner, or others. Restoration shall comply with the Drawings and applicable technical Sections.

D. Do not use an easement to obtain access to another portion of the Project unless such use is shown on the Drawings or accepted in writing by the Owner. The Contractor shall be responsible for damage caused by unauthorized access or use.

3.03 OPEN EXCAVATIONS:

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights, and other means to prevent accidents to persons, and damage to property. The Contractor shall, at its own expense, provide suitable and safe means for completely covering all open excavations and for accommodating travel when work is not in progress.

B. Maintain safe access to occupied properties throughout construction unless a temporary interruption has been coordinated in advance with the Owner and affected property owner. Temporary plates, bridging, ramps, or other access provisions shall be designed, installed, maintained, and removed by the Contractor as required for the anticipated loading and applicable safety requirements.

C. The length of open trench will be controlled by the surrounding conditions but shall always be confined to the limits prescribed by the Engineer.

D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of trench and prohibiting stocking excavated material in the street.

E. All street excavations shall be completely closed at the end of each work day. Backfilling

or use of steel plates of adequate strength to carry traffic shall be used.

3.04 MAINTENANCE OF TRAFFIC:

A. Unless permission to close the street, path, sidewalk, driveway, or other public access route is received in writing from the proper authority, all excavated materials and equipment shall be placed so that vehicular, pedestrian, bicycle, driveway, and emergency access may be safely maintained at all times.

B. Should the Chief of Police, Traffic Control Officer, Owner/Town, or Engineer deem it necessary, uniformed officers will be assigned to direct traffic. The Contractor shall coordinate scheduling of required uniformed officers in accordance with Section 01 55 26.19, UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL. Uniformed officers required for temporary traffic control shall be paid directly by the Owner/Town, except for costs resulting from the Contractor's failure to properly schedule, coordinate, cancel, or otherwise comply with the requirements of Section 01 55 26.19. Roadway Traffic Flaggers shall be provided only when authorized and shall be coordinated, measured, and paid in accordance with Section 01 55 26.22, ROADWAY TRAFFIC FLAGGERS.

C. The Contractor shall, at its own expense, as directed by the Owner/Town's Traffic Control Officer or the Engineer, provide and erect acceptable barricades, barrier fences, traffic signs, and all other traffic control devices not specifically covered in a bid item, to protect the work from traffic, pedestrians, bicyclists, animals, and unauthorized access. The Contractor shall provide sufficient temporary lighting such as lanterns/flashers, electric battery-operated devices, or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public, at no additional cost to the Owner.

D. The Contractor shall furnish, install, maintain, relocate, and remove temporary construction signs, barricades, detour signs, warning signs, and other temporary traffic control devices in accordance with Section 01 55 26.13, TEMPORARY SIGNAGE AND TRAFFIC CONTROL, the MUTCD, Owner/Town requirements, and as directed by the Engineer.

E. The intent of policing is to ensure public safety by direction of traffic. Police officers are not to serve as guards to protect the Contractor's equipment and materials.

F. Nothing contained herein shall be construed as relieving the Contractor of any of its responsibilities for protection of persons and property under the terms of the Contract.

G. Traffic management associated with the Contractor's Work at and adjacent to Milestone Road is included in the Contractor's scope. The Contractor shall provide, implement, maintain, and remove all temporary traffic-control measures required for its operations, including traffic-control plans, signs, barricades, channelizing devices, temporary pedestrian and bicycle accommodations, and maintenance of traffic. Authorized Uniformed Officers will be paid directly by the Owner/Town in accordance with Section 01 55 26.19. Authorized Roadway Traffic Flaggers will be paid under the applicable unit-price item in accordance with Section 01 55 26.22.

3.05 CARE AND PROTECTION OF PROPERTY:

A. Protect public and private property designated to remain from damage caused by Contractor operations. Limit construction activities to the limits shown on the Drawings, established easements, and other areas authorized in writing by the Owner.

B. Promptly repair or replace property designated to remain that is damaged by the Contractor, its Subcontractors, suppliers, employees, equipment, or operations. Restoration shall be to a condition equal to or better than that existing immediately before the damage occurred and shall be completed at no additional cost to the Owner.

C. Authorized removal, salvage, relocation, resetting, or non-reinstallation of existing improvements shall be governed by the Drawings and applicable technical Sections. Nothing in this Section requires the Contractor to reinstall or replace private encroachments, landscaping, irrigation, lighting, granite pillars, fences, signs, guy wires, utilities, or other improvements expressly identified as being removed, relocated, reset, or replaced by the Owner, property owner, utility owner, or others.

D. Do not enter or use private property outside established easements without prior written authorization from the Owner and affected property owner.

E. Protect existing vegetation to remain and limit clearing, pruning, root disturbance, and removal to the minimum limits shown or authorized. Comply with Sections 01 56 39 and 31 13 13.

3.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

A. Protect and support existing buildings, utilities, pipes, drainage systems, poles, wires, fences, curbing, property markers, signs, landscaping, and other improvements designated to remain. Repair damage caused by Contractor operations at no additional cost to the Owner.

B. Before excavation, comply with applicable utility-marking requirements and verify the horizontal and vertical location of utilities that may be affected by the Work. Utility information shown on the Drawings is based on available records and field information and shall not relieve the Contractor of required verification and protection.

C. Maintain active utility services unless a temporary interruption has been authorized and coordinated in advance with the Owner, utility owner, and affected users.

D. Do not cut, disconnect, remove, relocate, adjust, or alter an existing utility, guy wire, pole, overhead service, privately owned improvement, or other facility except where specifically shown or authorized in writing. Work identified as being performed by a utility owner, property owner, the Owner, or others is not included in the Contractor’s Work.

E. When an unidentified facility or conflict is encountered, stop the affected Work, protect the facility, and notify the Owner and Engineer. Do not proceed until written direction has been received.

F. Remove and reset fences, signs, cobbles, and other existing improvements only where specifically identified in the Contract Documents. Existing private improvements or encroachments located within the public right-of-way or easements shall not be reinstalled by the Contractor unless expressly shown or specified.

3.07 MAINTENANCE OF FLOW:

A. Maintain the flow and function of existing drainage systems and other active piping affected by the Work. Submit proposed bypassing, diversion, plugging, pumping, or temporary-flow procedures to the Engineer sufficiently in advance of the interruption. Do not discharge sediment, contaminated water, sewage, or other prohibited material to drainage systems, wetlands, roadways, or private property.

B. All existing drainage facilities including, but not limited to; brooks, streams, canals, channels, ditches, culverts, catch basins and drainage piping shall be adequately safeguarded so as not to impede drainage or to cause siltation of downstream areas in any manner whatsoever. If the Contractor damages or impairs any of the previously mentioned drainage facilities, it shall repair the same within the same day.

C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by its operations as described in Section 01 74 13, CLEANING UP.

3.08 REJECTED MATERIALS AND DEFECTIVE WORK:

A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor and shall not be made use of elsewhere in the work.

B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.

C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or its employees, as determined by the Engineer, occurring before the final payment.

3.09 SANITARY REGULATIONS:

A. Provide, maintain, and service sanitary facilities in sufficient quantity for persons employed on the Work. Locate and screen facilities to minimize impacts on the public and adjoining properties and comply with applicable health and safety requirements.

B. Keep sanitary facilities clean and secure. Do not permit unsanitary conditions, improper disposal, or nuisances within or adjacent to the Site. Remove facilities upon completion and restore affected areas.

3.10 SAFETY AND HEALTH REGULATIONS:

A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.)." The Contractor shall be familiar with the requirements of these regulations.

3.11 SITE INVESTIGATION:

A. The Contractor acknowledges that it has satisfied itself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished as far as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the drawings and specifications made a part of this contract. Any failure of the Contractor to acquaint itself with available information will not relieve it from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor based on the information made available by the Owner.

3.12 ELECTRIC SERVICE:

A. The Contractor shall make all necessary applications and arrangements and pay for all fees and charges for electrical energy for power and light necessary for the proper completion of this contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.

B. There shall be sufficient electric lighting so that all work may be done in a skillful manner where there is not sufficient daylight.

3.13 HAZARDOUS WASTE:

A. Should the Contractor, while performing work under this contract, uncover hazardous materials (other than those identified in this specification to be addressed by the Contractor, if applicable), as defined in Massachusetts Hazardous Waste Regulations 310 CMR 30.00, it shall immediately notify the Engineer. The Contractor is not, and has no authority to act as, a handler, generator, operator or disposer of hazardous or toxic substances found or identified at the site, and the Owner shall undertake all such functions.

END OF SECTION

SECTION 01 12 16

SCOPE AND SEQUENCE OF WORK

PART 1 – GENERAL

1.01 WORK INCLUDED:

A. The Work includes furnishing all labor, materials, equipment, supervision, temporary facilities, protection, coordination, documentation, and incidental work necessary to complete the Tom Nevers Road Multi-Use Path Project in accordance with the Contract Documents. Work generally includes:

1. Selective site demolition, removal, salvage, storage, and resetting of specifically designated improvements.
2. Clearing, selective tree and shrub removal, trimming, and protection of vegetation designated to remain.
3. Construction of the multi-use asphalt path and resin-bound aggregate pavement at designated existing-tree locations.
4. Construction of the raised boardwalk, including delegated-design components, foundations, framing, decking, railings, and related work.
5. Roadway, driveway, and path crossings, including pavement removal, milling, full-depth pavement, overlays, detectable warnings, signs, and shared-use-path pavement markings. Permanent roadway pavement markings are by the Owner/Town as specified herein.
6. Earthwork, grading, aggregate base courses, drainage improvements, pipe and headwall work, erosion and sediment controls, and stabilization.
7. Temporary traffic control and maintenance of roadway, driveway, pedestrian, bicycle, and emergency access, including Contractor-provided traffic-control devices, coordination of Owner-paid Uniformed Officers, and authorized Roadway Traffic Flaggers.
8. Coordination with utility owners, abutting property owners, the Owner, separate contractors, and other parties performing related work.
9. Loam, seeding, planting, landscape restoration, pavement restoration, and final cleanup.
10. Testing, inspections, record documentation, warranties, closeout, and other Work shown or specified.

B. Work identified in the Contract Documents as being performed “by Owner,” “by utility owner,” “by property owner,” “by others,” or under a separate contract is not included in the Contractor’s Work unless otherwise expressly stated. The Contractor shall provide the coordination, notifications, access, protection, sequencing, and temporary provisions assigned to it, but shall not include the cost of performing, furnishing, reinstalling, replacing, or warranting such separate

work.

C. Uniformed Officers required for temporary traffic control shall be paid directly by the Owner/Town and shall not be included in the Contract Price. The Contractor remains responsible for scheduling, coordination, required notices, and related traffic-management responsibilities.

Permanent pavement markings located on public roadway pavement surfaces shall be furnished and installed by the Owner/Town. The Contractor shall coordinate scheduling and sequencing of this work. Shared-use-path pavement markings remain part of the Contractor's Work.

Charges assessed by National Grid or another utility owner for utility-owner-performed relocation, adjustment, protection, disconnection, reconnection, or other utility work required for the Project shall be paid directly by the Owner/Town and shall not be included in the Contract Price. The Contractor remains responsible for required notices, scheduling, access, protection, coordination, and sequencing.

1.02 RELATED WORK:

A. Section 01 11 00, CONTROL OF WORK AND MATERIALS.
B. Section 01 14 00, SPECIAL PROVISIONS.
C. Section 01 32 16, CONSTRUCTION SCHEDULING.
D. Section 01 55 26.13, TEMPORARY SIGNAGE AND TRAFFIC CONTROL.
E. Section 01 55 26.19, UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL.
F. Section 01 55 26.22, ROADWAY TRAFFIC FLAGGERS.
G. Section 01 56 39, TREE PROTECTION AND TRIMMING.
H. Section 01 57 19, ENVIRONMENTAL PROTECTION.
I. Section 02 41 13, SELECTIVE SITE DEMOLITION.
J. Section 31 13 13, TREE PRUNING AND STUMP REMOVALS.
K. Section 31 25 00, EROSION AND SEDIMENT CONTROL.
L. Section 33 41 13.28, REINFORCED CONCRETE PIPE.
M. Section 33 42 16.13, PRECAST CONCRETE HEADWALLS

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 GENERAL:

A. Prepare, submit, maintain, and update the construction Progress Schedule in accordance with Section 01 32 16. The Contractor is responsible for scheduling and coordinating its Work and the work of its Subcontractors to achieve the Contract milestones and completion date. Account for permit requirements, inspections,

seasonal restrictions, environmental controls, weather limitations, material lead times, delegated design, utility coordination, work by others, and required Owner reviews.

B. Before commencing Work at the Site, submit a detailed sequencing and logistics plan for review with the initial Progress Schedule. At a minimum, identify:
   a. Proposed phases and active work areas.
   b. Construction access routes and staging areas.
   c. Limits of disturbance and areas requiring temporary fencing or tree protection.
   d. Proposed sequence of demolition, clearing, utility coordination, drainage, earthwork, boardwalk construction, paving, signage, markings, and restoration.
   e. Roadway, driveway, pedestrian, and bicycle access provisions.
   f. Temporary traffic-control phases and anticipated requirements for uniformed officers or Roadway Traffic Flaggers.
   g. Work dependent on permits, inspections, utility owners, property owners, delegated-design approvals, or other parties.
   h. Temporary stabilization and protection of partially completed Work.
   i. Proposed sequence for final restoration and closeout.

3.02 CONSTRUCTION SEQUENCING REQUIREMENTS:

A. Sequence the Work to minimize disruption to abutting properties, roadway users, pedestrians, bicyclists, emergency services, public operations, existing utilities, vegetation, and drainage systems. Limit active work areas to those that can be safely managed, protected, temporarily stabilized, and restored within the durations shown on the accepted Progress Schedule.

B. Use only construction access routes, staging areas, easements, public rights-of-way, and limits of disturbance shown on the Drawings or accepted in writing by the Owner. Do not use private property outside authorized easements without written authorization from the Owner and affected property owner.

C. Maintain safe roadway, driveway, pedestrian, bicycle, property-owner, utility, and emergency access throughout construction unless a temporary closure or detour has been accepted by the Owner and approved by the authority having jurisdiction. Notify the Owner sufficiently in advance of proposed interruptions. Install, maintain, relocate, and remove temporary traffic controls, signage, fencing, barriers, plates, ramps, and detours in accordance with the Contract Documents.

D. Before removing trees or vegetation identified in the Contract Documents as being eligible for removal by an abutting property owner, notify the Owner and await written authorization to proceed. The Owner will provide the affected property owner an opportunity to coordinate removal within the period established by the Owner. If the property owner does not complete the removal within the established period, perform the removal as part of the Contract Work where shown. Do not permit property-owner operations to expand the Contractor’s limits of disturbance or

damage vegetation designated to remain.

E. Identify utility relocations, guy-wire adjustments, overhead service work, private-improvement relocations, and other work assigned to others as separate activities in the Progress Schedule. Provide timely notice of dates by which such work is required. Do not perform or direct work assigned to a utility owner, property owner, the Owner, or others without written authorization.

F. Perform drainage and culvert work in a sequence that maintains existing flow and protects downstream areas. Complete required pipe extensions, structures, headwalls, erosion protection, backfill, and testing before constructing permanent pavement over or immediately adjacent to the drainage installation. Do not leave an incomplete drainage installation in a condition that may cause flooding, erosion, sediment discharge, or unsafe roadway conditions.

G. Do not begin fabrication or installation of delegated-design boardwalk components until required Shop Drawings, calculations, product data, and delegated-design submittals have been reviewed. Verify field conditions, dimensions, elevations, utility conflicts, and foundation locations before fabrication. Protect foundations and partially completed boardwalk work from damage, displacement, unauthorized access, and adverse weather.

H. Sequence roadway and driveway crossing work to minimize the duration of open excavations and interrupted access. Provide the Owner/Town not less than 48 hours advance notice before beginning construction work affecting a private driveway so that the Owner/Town may provide the affected property owner or occupant with not less than 24 hours advance notice. Unless otherwise accepted, complete crossings one location or one manageable phase at a time, including temporary or permanent restoration necessary to reopen the crossing safely before beginning another crossing that would materially affect the same access route.

I. Perform restoration progressively as portions of the Work are completed. Do not defer all loaming, seeding, planting, pavement restoration, fence or sign resetting, and cleanup until the end of the Project. Stabilize disturbed areas within the time limits required by permits and the Contract Documents.

J. Removal of an existing improvement to facilitate construction does not, by itself, require its reinstallation. Reset or reinstall only those items specifically identified for resetting or reinstallation in the Contract Documents. Items identified for relocation or reinstallation by the Owner, utility owner, property owner, or others shall be protected or salvaged only to the extent expressly assigned to the Contractor.

END OF SECTION

SECTION 01 14 00

SPECIAL PROVISIONS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section establishes Project-specific requirements for construction water, utility coordination, use of private property, completion time, permits, environmental protection, documentation of existing conditions, construction hours, and winter operations.

1.02 RELATED SECTIONS:

A. Section 01 11 00, CONTROL OF WORK AND MATERIALS.
B. Section 01 12 16, SCOPE AND SEQUENCE OF WORK.
C. Section 01 32 16, CONSTRUCTION SCHEDULING.
D. Section 01 57 19, ENVIRONMENTAL PROTECTION.
E. Section 02 41 13, SELECTIVE SITE DEMOLITION.
F. Section 33 41 13.28, REINFORCED CONCRETE PIPE.
G. Section 33 42 16.13, PRECAST CONCRETE HEADWALLS.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

3.01 WATER FOR CONSTRUCTION PURPOSES:

A. The Town shall make water available without charge to the Contractor at a Town-designated source for watering seeded lawns and plantings required under Sections 32 92 19 and 32 93 00. The Contractor shall coordinate the filling location, access hours, connection requirements, and operating procedures with the Town before obtaining water. Use only the designated source and comply with the water supplier’s requirements.

B. The Contractor shall furnish and pay for all water trucks, tanks, hoses, pumps, connections, required backflow protection, labor, transportation, distribution, and application necessary to perform the specified watering. Include these costs in the Base Bid. The Town’s furnishing of water shall not relieve the Contractor of responsibility for watering, establishment, maintenance, or replacement of deficient lawn and planting work throughout the periods specified in Sections 32 92 19 and 32 93 00.

C. Prevent waste, leakage, runoff, erosion, flooding, and damage resulting from filling, transporting, or applying water. Notify the Owner promptly if the designated source

becomes unavailable and obtain direction regarding an alternate source. Any adjustment for an alternate source shall be addressed in accordance with the Contract Documents; routine trucking and application from the designated Town source are included in the Base Bid.

D. Except for water expressly furnished by the Town under Paragraph A, furnish and pay for water required for construction, dust control, compaction, cleaning, testing, and other Contractor operations.

3.02 DRAINAGE AND UTILITY LOCATIONS:

A. Install drainage, conduit, utilities, and other underground improvements at the locations and elevations shown on the Drawings unless otherwise authorized in writing.

B. When existing utilities, structures, tree roots, vegetation, resource areas, property constraints, or other field conditions conflict with the proposed Work, stop the affected Work and notify the Engineer. Do not relocate, realign, raise, lower, shorten, extend, or otherwise modify the proposed improvement without written direction.

C. Document authorized field adjustments on the Contractor's record documents.

3.03 OCCUPYING PRIVATE PROPERTY:

A. Do not enter, occupy, stage materials or equipment upon, or otherwise use private property outside established easements or authorized work limits without the affected property owner's prior written consent.

B. Submit a copy of the written authorization to the Owner and Engineer before entering the property. The authorization shall identify the permitted use, limits, duration, access route, and restoration responsibilities.

C. Private agreements do not modify the Contract Documents or obligate the Owner to compensate the Contractor or property owner. Restore property used by the Contractor in accordance with the written authorization and Contract Documents.

3.04 EXISTING UTILITY LOCATIONS – CONTRACTOR'S RESPONSIBILITY:

A. The location of existing underground services and utilities shown on the drawings is based on available records. It is not warranted that all existing utilities and services are shown, or that shown locations are correct. The Contractor shall be responsible for having the utility companies locate their respective utilities on the ground prior to excavating.

B. To satisfy the requirements of **Massachusetts law, Chapter 82, Section 40**, the Contractor shall, at least 72 hours, exclusive of Saturdays, Sundays and holidays, prior to excavation in the proximity of telephone, gas, cable television and electric utilities, notify the utilities concerned by calling "DIG SAFE" at telephone number: 1-888-344-7233.

C. The Contractor shall coordinate all work involving utilities and shall satisfy itself as to the existing conditions of the areas in which it is to perform its work. It shall conduct and arrange its work so as not to impede or interfere with the work of other contractors working in the same or adjacent areas.

D. Utility markings and information shown on the Drawings indicate approximate horizontal locations and do not establish exact depth, size, material, ownership, condition, or configuration. Use appropriate non-destructive methods to verify utilities where required for the Work.

E. When an unidentified utility or conflict is encountered, stop the affected Work, protect the facility, and notify the Engineer and utility owner. Do not cut, disconnect, relocate, adjust, support, or alter a utility, pole, guy wire, overhead service, or related facility unless specifically required by the Contract Documents or authorized in writing.

F. Work expressly assigned to a utility owner, property owner, the Owner, or others is not included in the Contractor's Work. The Contractor remains responsible for required notifications, scheduling, access, protection, and coordination.

G. Charges assessed by National Grid or another utility owner for utility-owner-performed relocation, adjustment, protection, support, disconnection, reconnection, or other utility work required for the Project shall be paid directly by the Owner/Town and shall not be included in the Contract Price. The Contractor remains responsible for coordination, scheduling, required notices, access, protection, and sequencing. This provision does not relieve the Contractor of responsibility for costs resulting from damage, unauthorized interference, or other actions attributable to the Contractor.

3.05 COORDINATION OF WORK:

A. Coordinate the Work of the Contractor, Subcontractors, suppliers, delegated-design professionals, and other parties under the Contractor's control.

B. Coordinate interfaces with utility owners, property owners, the Owner's forces, separate contractors, permitting authorities, and others identified in the Contract Documents. Coordination does not transfer responsibility for separately assigned work to the Contractor.

C. Notify the Engineer in advance of the planned start and completion of each major phase, roadway or driveway crossing, drainage installation, boardwalk operation, utility-dependent activity, and restoration phase.

D. Promptly provide written notice when the failure of another party to perform required work may affect the Progress Schedule. Do not direct the operations of utility owners, property owners, or separate contractors unless authorized by the Owner.

E. The Town will arrange work assigned to utility owners or separate electrical contractors. The Project Contractor shall provide timely notices, field information, access, protection, and construction sequencing necessary to coordinate that work. Except where

expressly identified as a contractual commitment, anticipated utility-work dates are planning information only and are not guaranteed by the Owner or Engineer.

F. Identify utility-dependent activities and required completion dates in the initial Progress Schedule. Promptly notify the Owner and Engineer in writing of actual or anticipated utility delays, identifying affected locations, schedule impacts, and proposed measures to continue unaffected Work.

G. Do not proceed with construction that depends upon incomplete utility relocation or adjustment. Protect and stabilize affected areas and continue unaffected Work where practicable. Do not alter utilities, reduce required clearances, or change the path alignment or grades without the required written authorization.

H. Where utility work prevents completion of an affected segment, the Owner may direct resequencing, temporary stabilization, or deferral of that segment under the Contract's change and suspension provisions. Written direction shall identify the affected limits, interim protection and maintenance responsibilities, and conditions for resuming Work. Do not open an incomplete or unsafe segment to public use.

I. Any adjustment of Contract Price or Contract Times, including effects of directed deferral or remobilization, shall be determined under the General Conditions, Supplementary Conditions, and applicable law. This Article neither guarantees an adjustment nor waives an entitlement established by those provisions.

3.06 TIME FOR COMPLETION OF CONTRACT:

A. The Contract Time and applicable completion requirements are stated in Section 00 41 13, FORM OF GENERAL BID, and Section 00 52 00, AGREEMENT. Prepare the Bid and Progress Schedule based on completing the Work within the stated Contract Time, including applicable seasonal restrictions, permit requirements, coordination with work by others, and weather limitations.

3.07 COMPLIANCE WITH PERMITS:

A. Perform the Work in accordance with permits and approvals included in or incorporated into the Contract Documents, Contractor-obtained permits and authorizations, and applicable requirements of authorities having jurisdiction.

B. Comply with the responsibility allocations, notification requirements, inspection requirements, and documentation requirements of Section 00 31 43, PERMITS.

C. Immediately notify the Owner and Engineer of a permit conflict, violation, enforcement communication, stop-work directive, or condition that may require modification of the Work.

3.08 CUTTING, FITTING AND PATCHING:

A. Perform cutting, fitting, and patching specifically required to complete the Contractor's

Work and properly integrate it with existing improvements and authorized work by others.

B. Do not cut, drill, alter, remove, or damage existing improvements or work by others without prior written authorization.

C. Match adjacent materials, profiles, finishes, patterns, colors, grades, and performance characteristics unless otherwise shown or specified.

D. Cutting, fitting, or patching does not require the Contractor to reinstall or modify an improvement expressly identified as being removed, relocated, reset, or replaced by the Owner, utility owner, property owner, or others.

3.09 PROTECTION OF GROUNDWATER AND ENVIRONMENTALLY SENSITIVE AREAS:

A. The Contractor shall take precautions to prevent fuels, oils, chemicals, sediment, concrete washout, or other pollutants from entering groundwater, drainage systems, wetlands, resource areas, or adjacent properties. Fuel storage, equipment maintenance, and hazardous material storage shall be performed only in approved locations and in accordance with permit requirements.

3.10 CONTRACTOR'S REPRESENTATIVE:

A. Designate in writing a primary representative and an alternate representative authorized to respond to emergencies and direct immediate protective action. Provide names and 24-hour telephone numbers before commencing Work at the Site.

B. Maintain current contact information throughout the Contract. The representative shall be available at all times, including nights, weekends, and holidays, when an emergency involving the Work, public safety, access, drainage, utilities, or property protection occurs.

3.11 VISUAL RECORDING:

A. Before beginning construction, the Contractor shall make a digital photo and/or video record along the entire project corridor, including roadways, driveways, abutter frontages, utility poles, signs, fences, drainage structures, vegetation, pavement, and other existing conditions that may be affected by the Work. One complete digital copy shall be furnished to the Engineer prior to the start of Work.

B. Organize photographs and video by date, approximate station, roadway, address, or identifiable location. Records shall clearly document existing condition and any preexisting damage.

C. Complete visual documentation before disturbing the applicable area and retain the original files through final payment. Furnish additional focused documentation before Work affecting sensitive vegetation, private improvements, utility facilities, drainage

structures, pavement, fences, signs, pillars, lighting, or other improvements designated to remain.

3.12 HOURS OF CONSTRUCTION ACTIVITY:

A. Conduct on-Site construction activities between 7:30 AM and 5:00 PM, Monday through Friday. Do not perform on-Site construction on Saturdays, Sundays, or legal holidays without prior written approval from the Owner and any required authorization from the authority having jurisdiction.

B. On-Site construction is prohibited from June 15 through September 15 unless specifically authorized in writing by the Owner and permitted by applicable Town requirements. Off-Site fabrication, procurement, submittal preparation, delegated design, and other activities not occurring at the Site may continue.

C. Submit proposed work outside permitted hours or during the seasonal restriction sufficiently in advance for review. Owner review does not constitute approval of a required municipal variance or permit.

D. Emergency protective work necessary to prevent immediate injury, property damage, utility interruption, flooding, erosion, or environmental harm may proceed when advance authorization cannot reasonably be obtained. Notify the Owner and Engineer immediately.

3.13 CONSTRUCTION CREWS:

A. The Contractor shall not increase the number of construction crews assigned to the work without providing one-week advance notice to the Engineer.

3.14 MASSACHUSETTS DATA SECURITY REGULATIONS:

A. The Contractor is required to comply with data security regulations contained in 201 CMR 17.00 that have been established to safeguard personal information of Massachusetts residents contained in paper or electronic records. The Contractor shall not submit to the Engineer or Owner documents in paper or electronic form that contain personal information (person's name combined with one or more of the following – Social Security Number, driver's license number or state-issued identification card number, financial institution account number, or credit or debit card number). Any document submitted to the Engineer that violates this provision shall be returned to the Contractor and the Contractor shall remove personal information from the document prior to resubmitting it to the Engineer. The Contractor shall require each Subcontractor to also comply with the MA data security regulations insofar as they involve submittal of personal information to the Engineer and Owner.

3.15 WINTER WORK:

A. Winter Work within public ways may proceed subject to the accepted Progress Schedule, permit requirements, weather conditions, required temporary stabilization,

and written restrictions issued by the Owner or authority having jurisdiction.

B. Securely backfill, plate, barricade, or otherwise protect excavations and incomplete Work at the end of each workday. Do not leave conditions that interfere with snow removal, drainage, emergency access, or safe public travel.

C. The Owner will perform its normal snow-and-ice operations on public ways that remain open to public travel. Such operations do not include the Contractor's staging areas, active work zones, closed portions of public ways, temporary access routes, stockpile areas, partially completed path or boardwalk areas, or areas outside the Owner's normal maintenance responsibility.

D. Provide snow and ice removal necessary for the Contractor's Work, access, temporary traffic-control facilities, emergency routes, closed work areas, temporary pedestrian or bicycle routes, and protection of completed or partially completed construction.

E. Coordinate work on private ways with the affected owner. The Owner is not responsible for snow or ice removal on private property or private ways.

F. Repair damage to temporary controls, permanent improvements, vegetation, pavement, drainage facilities, or other property caused by the Contractor's winter operations at no additional cost to the Owner.

END OF SECTION

SECTION 01 14 19.16

DUST CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Provide continuous control of dust generated by demolition, clearing, earthwork, grading, excavation, sawcutting, pavement milling, hauling, dumping, stockpiling, construction access, staging, and other Contractor operations.

B. Prevent visible dust from leaving the active work area or creating a nuisance, unsafe condition, reduced visibility, property damage, vegetation damage, or sediment accumulation on roadways, driveways, properties, drainage facilities, or completed Work.

C. Water shall be the primary dust-control method. Calcium chloride may be used only where specifically approved in writing by the Engineer and where its use will not affect vegetation, groundwater, drainage systems, resource areas, pavement, metals, or other improvements.

D. Dust-control measures are incidental to the Work and shall be provided at no additional cost to the Owner.

1.02 SUBMITTALS:

A. Before beginning dust-generating Work, submit a brief dust-control plan identifying:
1. Proposed water sources and application equipment.
2. Proposed methods for haul routes, stockpiles, pavement cutting, milling, excavation, and exposed soils.
3. Measures for preventing runoff, erosion, ponding, and discharge to drainage or resource areas.
4. Proposed calcium-chloride product, application locations, and rates, when its use is requested.
5. Contact information for the person responsible for responding to dust complaints or deficient conditions.

B. Submit product data and Safety Data Sheets for calcium chloride and other chemical dust suppressants proposed for use.

PART 2 - PRODUCTS

2.01 CALCIUM CHLORIDE:

A. Calcium chloride shall conform to the requirements of AASHTO-M 144, Type I or Type II and Specification for Calcium Chloride, ASTM D98. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.

B. Deliver calcium chloride in unopened, moisture-resistant containers bearing the manufacturer's name, product identification, net weight, and guaranteed calcium-chloride content. Reject material that is contaminated, caked, deteriorated, or otherwise unsuitable for uniform application.

C. Calcium chloride shall not contain additives detrimental to vegetation, pavement, groundwater, drainage systems, metals, resin-bound pavement, or adjacent improvements.

D. Other chemical dust suppressants are prohibited unless specifically approved in writing by the Engineer.

2.02 WATER:

A. Water shall be clean and free from salt, brackish content, oil, acid, alkali, sediment, organic matter, or other substances that may damage vegetation, soils, pavement, drainage systems, groundwater, resource areas, or completed Work.

B. Obtain water from a lawful and approved source. Furnish required hoses, tanks, pumps, meters, spray bars, nozzles, and other application equipment.

PART 3 - EXECUTION

3.01 APPLICATION:

A. Calcium chloride shall not be applied within wetland resource areas, buffer zones, drainage structures, paved surfaces draining directly to resource areas, planting areas, or other environmentally sensitive areas unless specifically approved by the Engineer.

B. Calcium chloride shall be uniformly applied at the rate of 1 1/2 pounds per square yard or at any other rate as required by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The Engineer shall determine the number and frequency of applications.

C. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.

D. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds

per square inch, gauge pressure.

E. Apply water in a controlled manner that does not cause erosion, sediment transport, ponding, muddy or unsafe travel surfaces, runoff to drainage systems or resource areas, damage to vegetation, or damage to completed work.

F. Cover or otherwise contain trucks transporting soil, aggregate, demolition debris, or other materials capable of generating dust or spilling onto public roadways.

G. Promptly remove soil, dust, aggregate, and debris tracked or deposited on roadways, driveways, paths, drainage structures, or adjoining property. Do not wash material into drainage systems, resource areas, or private property.

H. If dust cannot be adequately controlled, stop the affected operation until acceptable dust-control measures are in place.

END OF SECTION

SECTION 01 31 19.23

CONSTRUCTION MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This Section specifies requirements for project meetings including but not limited to Pre-Construction Conference and Progress Meetings.

B. It shall be the responsibility of the Contractor to coordinate work between all subcontractors, sections, and trades required for the proper completion of the Work.

1.02 PRE-CONSTRUCTION CONFERENCE:

A. After the bids have been opened but prior to the start of the construction there will be a pre-construction conference to discuss the phasing and scheduling of the Project. The specific time and place of the conference shall be arranged by the Engineer after the Contract has been awarded.

B. This pre-construction conference is intended to establish lines of communication between the parties involved, review responsibilities and personnel assignments, establish project schedules, discuss proposed performance methods, and coordinate Work to be performed by subcontractors.

C. Authorized representatives of the Owner, Engineer and their consultants, the Contractor, its Superintendent and Site Foreman, and all others invited by the Contractor, shall attend the pre-construction conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

D. Discuss items of significance at the pre-construction conference that could affect progress including at least the following:

1. Tentative construction schedule
2. Critical Work sequencing
3. Designation of responsible personnel
4. Procedures for processing field decisions and Change Orders
5. Procedures for processing Applications for Payment
6. Review of Davis Bacon and other federal requirements
7. Review of required permits, approvals, permit conditions, agency notifications, and coordination with the Owner/Town, MassDOT if applicable, and other authorities having jurisdiction.

8. Distribution of Contract Documents
9. Submittal of Shop Drawings, Product Data and Samples
10. Pedestrian, bicycle, shared-use path, and roadway access, including temporary detours, closures, signage, and maintenance of safe public access during construction.
11. Existing utilities, utility protection, utility coordination, and procedures for reporting conflicts or differing site conditions.
12. Coordination of long-lead materials, specialty items, boardwalk components, signage, and other fabricated items.
13. Preparation of record documents
14. Use of the premises
15. Office, work and storage, and laydown areas
16. Equipment deliveries
17. Construction safety procedures
18. Environmental health and safety procedures
19. First aid
20. Security
21. Housekeeping
22. Working hours
23. Traffic Control
24. Emergency Vehicle Access to and around work site
25. Environmental protection measures for construction site

1.03 PROGRESS MEETINGS:

A. During the course of the Project, the Contractor shall attend weekly progress meetings as scheduled by the Owner. The Owner, based on work progress and activities, may adjust the progress meetings to biweekly or other. The attendance of subcontractors may be required during the progress of the Work. The Contractor's delegate to the meeting shall be prepared and authorized to discuss the following items:

1. Progress of Work/Critical Work Sequencing in relation to Contract Schedule.
2. Proposed Work activities for forthcoming period.
3. Three-week look-ahead schedule, including anticipated work areas, access restrictions, deliveries, inspections, and impacts to public access.
4. Resources committed to Contract.
5. Coordination of Work with others.
6. Status of procurement of equipment and materials.
7. Status of Submittals.
8. Outstanding actions, decisions, or approvals that affect Work activities.
9. Site access and/or security issues.
10. Hazards and risks.
11. Housekeeping.
12. Quality issues.

13. Potential Claims.
14. Change Orders.
15. Costs, budget, and payment requests.
16. Status of RFIs, field issues, permit conditions, inspection requirements, and agency/Owner coordination items.

B. The Contractor shall revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized and the revised schedule shall be submitted to the Engineer and Owner.

PART 2 - PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01 32 16

CONSTRUCTION SCHEDULING

PART 1- GENERAL

1.01 PROGRAM DESCRIPTION:

A. A Critical Path Method (CPM) construction schedule shall be used to control the work of this Contract and to provide a definitive basis for determining job progress. The Contractor shall prepare the construction schedule. All work shall be done in accordance with the established CPM schedule and the Contractor and its subcontractors shall be responsible for cooperating fully with the Engineer and the Owner in effectively utilizing the CPM schedule.

B. The CPM schedule to be prepared and submitted by the Contractor shall consist of a CPM network (diagram of activities) and a computer-generated schedule (print-out) as specified herein. The format shall be the activity-on-node precedence network.

C. The Contractor shall develop its own outline of the work and prepare its proposed CPM schedule. The computer-based schedule shall be the product of a recognized commercial computer software producer and shall meet all of the requirements defined herein.

1.02 QUALIFICATIONS:

A. The Contractor shall have the capability of preparing and utilizing the specified CPM scheduling technique. A statement of CPM capability shall be submitted by the Contractor in writing to the Engineer within 10 days after the issuance of the Notice to Proceed to verify that either the Contractor's organization has in-house capability qualified to use the technique or that the Contractor employs a consultant who is so qualified. Capability shall be verified by description of the construction projects to which the Contractor or its consultant has successfully applied the CPM scheduling technique and which were controlled throughout the duration of the project by means of systematic use and updating of a computer-based CPM schedule. The submittal shall include the name of the individual on the Contractor's staff who will be responsible for the CPM schedule and for providing the required updating information.

1.03 SUBMITTALS:

A. Submit under provisions of Section 01 33 23.

B. Within 10 days following the issuance of the Notice to Proceed, the Contractor shall submit the CPM Schedule to the Engineer for review and acceptance. The Contractor shall submit to the Engineer a preliminary network defining the planned operations during the first 60 calendar days after the issuance of the Notice to Proceed. The Contractor's general approach for the balance of the project shall be indicated. Cost of

activities expected to be completed or partially completed before submission and approval of the complete network shall be included.

1.04 APPROVED CPM SCHEDULE:

A. Following review by the Engineer, the Contractor shall incorporate the Engineer's comments into the network and submit the revised network and computer-generated schedule. This final submittal shall be delivered to the Engineer within 60 days after the issuance of the Notice to Proceed.

B. CPM schedules, which contain activities showing negative, float or which extend beyond the contract completion date in the computer-generated schedule will not be approved.

C. The approved network shall then be the approved CPM schedule to be used by the Contractor for planning, organizing and directing the work, and reporting progress.

D. Approval of the CPM activity network by the Engineer is advisory only and shall not relieve the Contractor of responsibility for accomplishing the work within the contract completion date. Omissions and errors in the approved CPM schedule shall not excuse performance less than that required by the Contract. Approval by the Engineer in no way makes the Engineer an insurer of the CPM schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of approval by its agent, the Engineer, of the CPM schedule.

E. The CPM activity network shall be submitted electronically in PDF format and, when requested by the Engineer, on 24-inch by 36-inch sheets.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 NETWORK REQUIREMENTS:

A. The network shall show the order and inter-dependence of activities and the sequence in which the work is to be accomplished as planned by the Contractor. The basic concept of a network analysis diagram shall be followed to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of following activities.

B. Detailed network activities shall include: construction activities, the submittal and approval of shop drawings, the procurement of materials and equipment, fabrication of materials and equipment and their delivery, installation and testing, start-up and training. The Contractor shall break the work into activities with durations no longer than twenty working days each, except as to non-construction activities (such as procurement of

materials and delivery of equipment) and any other activities for which the Engineer may approve the showing of longer duration. To the extent feasible, activities related to a specific physical area of the work should be grouped on the network for ease of understanding and simplification. The schedule shall identify construction phasing by project segment or work area, including active work areas, boardwalk work, roadway crossings, driveway crossings, utility coordination, traffic control, pedestrian/bicycle detours, and restoration activities. Long-lead items, including boardwalk components, signage, traffic control devices, specialty materials, and other fabricated items, shall be identified as separate activities.

C. Separate activities shall be provided for each significant identifiable function in each trade area in each facility. Activities shall be so identified that there will be no reasonable doubt as to how much work remains on each. Specific activities which shall be included are: all subcontract work, all interface work between subcontractors and between the Contractor and subcontractors, leakage tests of pipelines, electrical connections to each item of equipment, supplier and manufacturer technical assistance, mechanical connections to each item of equipment, all tests, concrete finishing, each item of site work, (including restraints on other activities) and all utilities, fuels and chemicals. Temporary traffic control, pedestrian and bicycle detours, roadway crossings, driveway access maintenance, emergency access, and public access restrictions shall be shown as separate activities where they affect sequencing or access.

D. Each activity on the network shall have the following indicated on the NODE representing it.

1. A single duration (i.e., the single best estimate of elapsed time considering the scope of the work involved in the activity and the resources planned for accomplishing the activity) expressed in working days.

2. A five character (or less) code indicative of the party responsible for accomplishing the activity.

3. A cost estimate for each activity which, when accumulated with the cost of all activities, equals the total contract cost. Estimated overhead and profit shall be prorated throughout all activities. Materials costs shall be assigned to delivery activities.

4. A brief description of the activity.

E. The selection and number of activities shall be subject to the Engineer's approval. The detailed network need not be time scaled but shall be drafted to show a continuous flow from left to right with no flow from right to left. In addition to the brief description, the Contractor shall submit a separate list of all activities containing a detailed narrative of the scope of each activity, including the trades, subcontractors involved, and number of man-hours estimated.

F. To the extent that the network or any revision thereof shows anything not jointly agreed

upon or fails to show anything jointly agreed upon, it shall not be deemed to have been approved by the Engineer. Failure to include on a network any element of work required for the performance of this Contract shall not excuse the Contractor from completing all work required within any applicable completion date, notwithstanding the review of the network by the Engineer.

G. Except where earlier completions are specified, CPM schedules, which show completion of all work prior to the contract completion date, may be approved by the Engineer but in no event shall they be acceptable as a basis for claim for delay against the Owner by the Contractor.

3.02 COMPUTER-GENERATED SCHEDULE REQUIREMENTS:

A. Each computer-generated schedule submittal from the CPM activity network shall include the following tabulations: a list of activities in numerical order, a list of activity precedence's, a schedule sequenced by Early Start Date and a schedule sequenced by Total Float. Each schedule shall include the following minimum items:

1. Activity numbers

2. Estimated duration

3. Activity description

4. Early start date (calendar dated)

5. Early finish date (calendar dated)

6. Latest allowable start date (calendar dated)

7. Latest allowable finish date (calendar dated)

8. Status (whether critical)

9. Estimated cost of the activity

10. Total float and free float

B. In addition, each schedule shall be prefaced with the following summary data:

1. Contract name and number

2. Contractor's Name

3. Contract duration

4. Contract schedule

5. The effective or starting date of the schedule.

C. The workday to calendar date correlation shall be based on an 8-hour day and 40-hour week with adequate allowance for holidays, adverse weather and all other special requirements of the work.

3.03 PROGRESS REPORTING:

A. Progress under the approved CPM schedule shall be evaluated monthly by the Contractor. Not less than seven days prior to each monthly progress meeting, the Contractor shall evaluate the status of each activity on which work has started or is due to start, based on the preceding CPM schedule; to show actual progress, to identify those activities started and those completed during the previous period, to show the estimated time required to complete or the percent complete of each activity started but not yet completed and to reflect any changes indicated for the network. Activities shall not be considered complete until they are, in fact, 100 percent complete.

B. At each progress meeting the Contractor shall submit a narrative report based on the CPM schedule evaluation described above, in a format agreed upon by the Contractor and the Engineer. The report shall include a description of the progress during the previous period in terms of completed activities, an explanation of each activity which is showing a delay, a description of problem areas, current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates and an explanation of corrective action taken or proposed. This report, as well as the CPM Status Report, will be discussed at each progress meeting.

C. Contractor shall submit a three-week look-ahead schedule at each progress meeting identifying planned work areas, access restrictions, deliveries, inspections, traffic control changes, pedestrian/bicycle detours, and anticipated impacts to public access.

3.04 RESPONSIBILITY FOR SCHEDULE COMPLIANCE:

A. Whenever it becomes apparent from the current CPM schedule and narrative report that delays to the critical path have resulted and the contract completion date will not be met, the Contractor shall submit to the Engineer for approval a written statement of the steps it intends to take to remove or arrest the delay to the critical path in the approved schedule, at no additional cost to the Owner.

3.05 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME:

A. If the Contractor desires to make changes in its method of operating which affect the approved CPM schedule, it shall notify the Engineer in writing stating what changes are proposed and the reason for the change. If the Engineer approves these changes, the Contractor shall revise and submit for approval, without additional cost to the Owner, all of the affected portions of the CPM network. The Contractor shall adjust the CPM schedule only after prior approval of its proposed changes by the Engineer.

B. If the completion of any activity, whether or not critical, falls more than 100 percent behind its approved duration, the Contractor shall submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.

C. Shop drawings which are not approved on the first submittal or within the schedule time and equipment which do not pass the specified tests shall be immediately rescheduled.

D. The contract time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any contract completion date, it shall furnish such justification and supporting evidence as the Engineer may deem necessary to determine whether the Contractor is entitled to an extension of time under the provisions of this Contract. The Engineer will, after receipt of such justification and supporting evidence, make findings of fact and will advise the Contractor in writing thereof. If the Engineer finds that the Contractor is entitled to any extension of any contract completion date, the Engineer's determination as to the total number of day's extension shall be based upon the currently approved CPM schedule and on all data relevant to the extension. Such data shall be included in the next updating of the schedule. Actual delays in activities, which, according to the CPM schedule, do not affect any contract completion date shown by the critical path in the network, will not be the basis for a change therein.

E. For any requested extension of the Contract Times, the Contractor shall deliver initial written notice to the Engineer and Owner promptly, but no later than 14 days after the start of the event giving rise to the request, in accordance with General Conditions Paragraph 10.05.B. The Contractor shall deliver the requested extension, supporting justification, and CPM schedule analysis to the Engineer and Owner within 30 days after the start of that event, unless the Engineer allows additional time for supporting data as provided in Paragraph 10.05.B. Requests shall be submitted before final payment. The 30-day supporting-submittal period does not extend the initial notice deadline. All requests remain subject to General Conditions Paragraphs 10.05 and 12.02.

3.06 COORDINATING SCHEDULES WITH OTHER CONTRACT SCHEDULES:

A. Where work is to be performed under this Contract concurrently with or contingent upon work performed on the same facilities or area under other contracts, the Contractor's CPM Schedule shall be coordinated with the schedules of the other contracts. The Contractor shall obtain the schedules of the other appropriate contracts from the Owner for the preparation and updating of its CPM schedule and shall make the required changes in its schedule when indicated by changes in corresponding schedules.

B. In case of interference between the operations of different contractors, the Owner will determine the work priority of each Contractor and the sequence of work necessary to expedite the completion of the entire project. In all such cases, the decision of the Owner shall be accepted as final. The temporary delay of the Contractor's work due to such circumstances shall not be considered as justification for claims for additional compensation.

END OF SECTION

SECTION 01 33 23

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The Contractor shall provide the Engineer with submittals as required by the contract documents.

1.02 RELATED WORK:

A. Divisions 1 – 48 of these specifications that require submittals.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

A. As required by the General Conditions, Contractor shall submit a schedule of shop and working drawing submittals.

B. The Contractor shall submit the shop and working drawing submittals either electronically or hard copy.

3.02 ELECTRONIC SUBMITTALS:

A. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer, electronically by email, file transfer link, or other approved electronic method, one electronic copy in Portable Document Format (PDF) of shop or working drawings required as noted in the specifications.

B. Each submittal shall be provided as a single PDF containing a transmittal cover sheet followed by the shop drawings, product data, and other supporting documents. The cover sheet may be generated through Procore or prepared using the Contractor's own transmittal form. Identify the Project, Owner, Contractor, date, submittal number and revision, applicable specification section, description of the materials or Work, and a list of the documents submitted. A transmittal cover sheet is required regardless of the submission method.

C. Submittals may be transmitted through Procore or by email. The Engineer's review comments and disposition will be returned through Procore or by email, as applicable.

3.03 HARD COPY SUBMITTALS:

A. Hard copy submittals shall not be required unless specifically requested by the Engineer. Where hard copies are requested, Contractor shall submit the number of copies requested by the Engineer.

B. Each shipment of drawings shall be accompanied by the Engineer's standard shop drawing transmittal form, if applicable, on which is a list of the drawings, descriptions and numbers and the names of the Owner, Project, Contractor, and portion of the Work, equipment, material, or structure to which the submittal applies.

3.04 SHOP AND WORKING DRAWINGS:

A. Shop and working drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish of shop coat, grease fittings, etc., depending on the subject of the drawings. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.

B. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from its subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24-inch by 36-inch sheets, except those which are made by changing existing standard shop or working drawings. All drawings shall be clearly marked with the names of the Owner, Project, Contractor, and portion of the Work, equipment, material, or structure to which the drawing applies, and shall be suitably numbered. Each shipment of drawings shall be accompanied by the Engineer's standard shop drawing transmittal form, if applicable, on which is a list of the drawings, descriptions and numbers and the names mentioned above.

C. Only drawings that have been prepared, checked and corrected by the fabricator should be submitted to the Contractor by its subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Contract Documents in all respects. Shop drawings shall be reviewed and marked with the date, checker's name and indication of the Contractor's approval, and only then shall be submitted to the Engineer. Shop drawings unsatisfactory to the Contractor shall be returned directly to their source for correction, without submittal to the Engineer. Shop drawings submitted to the Engineer without the Contractor's approval stamp and signature will be rejected. Any deviation from the Contract Documents indicated on the shop drawings must be identified on the drawings and in a separate submittal to the Engineer, as required in this section of the specifications and General Conditions.

D. The Contractor shall be responsible for the prompt submittal and resubmittal, as

necessary, of all shop and working drawings so that there will be no delay in the work due to the absence of such drawings.

E. The Engineer will review the shop and working drawings as to their general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections of comments made on the drawings during the review do not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating its work with that of all other trades; and performing its work in a safe and satisfactory manner. The review of the shop drawings is general and shall not relieve the Contractor of the responsibility for details of design, dimensions, code compliance, etc., necessary for interfacing with other components, proper fitting and construction of the work required by the Contract and for achieving the specified performance. The Engineer will review submittals two times: once upon original submission and a second time if the Engineer requires a revision or corrections. The Contractor shall reimburse the Owner amounts charged to the Owner by the Engineer for performing any review of a submittal for the third time or greater.

F. For boardwalk submittals, comply with the coordinated Town and Engineer review period and written approval requirements of Section 32 34 13.

G. No material or equipment shall be purchased or fabricated especially for this Contract nor shall the Contractor proceed with any portion of the work, the design and details of which are dependent upon the design and details of equipment or other features for which review is required, until the required shop and working drawings have been submitted and reviewed by the Engineer as to their general conformance and compliance with the project and its Contract Documents. All materials and work involved in the construction shall then be as represented by said drawings.

H. Two copies of the shop and working drawings and/or catalog cuts will be returned to the Contractor. The Contractor shall furnish additional copies of such drawings or catalog cuts when it needs more than two copies or when so requested.

3.05 SAMPLES:

A. Samples specified in individual Sections include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

B. The number of samples submitted shall be as specified. Submittal and processing of samples shall follow the procedures outlined for shop and working drawings unless the

specifications call for a field submittal or mock-up.

C. Acceptance of samples will be acknowledged via a copy of the transmittal noting status. When samples are not acceptable, prompt resubmittal will be required.

3.06 OPERATING AND MAINTENANCE MANUALS AND SPARE PARTS LISTS:

A. Where reference is made in technical specification sections to operating and maintenance manuals and/or spare parts lists, the Contractor shall submit four copies to the Engineer for review in accordance with the instructions furnished under "Shop and Working Drawings." If the submittal is complete and does not require any changes, an acknowledgement (copy of transmittal) will be returned noting status. If the submittal is incomplete or does require changes, corrections, additions, etc., two copies of the submittal will be returned with a copy of transmittal noting status. Four copies of the final operating and maintenance manuals and/or spare parts list shall be delivered to the Engineer prior to or with the equipment when it is delivered to the job site. For systems or equipment requiring field testing, adjustment, startup, commissioning, or balancing, the Contractor shall submit separate test results and adjustment data upon completion of the work, to be incorporated into the system manual. The submittal schedule shall identify long-lead items, including boardwalk components, signage, traffic control devices, specialty materials, and other fabricated items that may affect the Project schedule.

B. The information included in the manual shall be as described in the specification sections, but as a minimum shall contain clear and concise instructions for operating, adjusting, lubricating and maintaining the equipment, an exploded assembly drawing identifying each part by number and a listing of all parts of the equipment, with part numbers and descriptions required for ordering spare parts. Spare parts lists shall include recommended quantity and price.

C. Operating and maintenance manuals shall be in durable loose-leaf binders, on 8½-inch by 11-inch paper, with diagrams and illustrations either on 8½-inch by 11 inch or multiple foldouts. The instructions shall be annotated to indicate only the specific equipment furnished. Reference to other sizes or models of similar requirement shall be deleted or neatly lined out.

D. Submit operation and maintenance manuals and spare parts lists in accordance with Section 01 92 13 SUBMITTAL OF OPERATION AND MAINTENANCE MANUALS.

END OF SECTION

SECTION 01 35 29

HEALTH AND SAFETY PLAN

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. Prior to the start of work on the site, Contractor shall prepare and submit a site-specific health and safety plan in accordance with paragraph 1.04 below.

1.02 REFERENCES:

A. OSHA 29 CFR 1926, Safety and Health Regulations for Construction.
B. OSHA 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, where applicable to hazardous or contaminated materials encountered during the Work.

1.03 RELATED WORK:

A. Section 01 11 00, CONTROL OF WORK AND MATERIALS
B. Section 01 55 26.13, TEMPORARY SIGNAGE AND TRAFFIC CONTROL
C. Section 01 56 26, TEMPORARY FENCING AND BARRIERS
D. Section 01 57 19, ENVIRONMENTAL PROTECTION

1.04 PREPARATION OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN:

A. Prior to the start of work on the Site, and no later than seven (7) calendar days after the date of the Notice to Proceed, Contractor shall prepare and submit an initial Site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the Site. Work may not proceed at the project Site until the Contractor's Health and Safety Plan has been received by Engineer.

B. The Health and Safety Plan shall be submitted to the Engineer for review, before any work can be initiated. The Contractor is responsible for its workers' and Subcontractors' health and safety. Therefore, the Engineer will only review the Contractor's Health and Safety Plan for relevant content. The Contractor shall implement, maintain, and enforce these procedures during all phases of the Work associated with the description of work described in this Section.

C. The Health and Safety Plan shall include Site access provisions that effectively limit access to active work areas to authorized personnel and protect the public from construction hazards. Access controls shall be coordinated with temporary fencing, barriers, signage, traffic control, pedestrian and bicycle detours, emergency access, and adjacent property access.

D. The Contractor shall be cognizant of the minimum health and safety plan standards set forth in 29 CFR 1910.120 and 29 CFR 1926. The Health and Safety Plan shall include, but not be limited to, the minimum requirements specified in Part 2 of this Section.

PART 2 – PRODUCTS

2.01 HEALTH AND SAFETY PLAN:

A. The Health and Safety Plan shall address the following items, as applicable to the Work and site conditions:

1. Identification of Contractor's Site Safety Officer.
2. Identification of Hazards and Risks Associated with Project.
3. Contractor's Standard Operating Procedures, Including Personnel Training and Field Orientation.
4. Respiratory Protection Training Requirements.
5. Levels of Protection and Selection of Equipment Procedures.
6. Type of Medical Surveillance Program.
7. Personal Hygiene Requirements and Guidelines.
8. Zone Delineation of the Project Site.
9. Site Security and Entry Control Procedures.
10. Field Monitoring of Site Contaminants.
11. Contingency and Emergency Procedures.
12. Listing of Emergency Contacts.
13. Traffic control, pedestrian and bicycle safety, and protection of the public.
14. Excavation, trenching, grading, and equipment operation safety.
15. Boardwalk construction, fall protection, working near wetlands/resource areas, and access over soft or unstable ground, where applicable.
16. Dust control, erosion and sediment control, and protection of adjacent properties and resource areas.

PART 3 - EXECUTION

3.01 PERSONAL PROTECTIVE EQUIPMENT:

A. The Contractor shall provide and enforce personal protective equipment appropriate for the Work and site conditions in accordance with OSHA 29 CFR 1926 and the Contractor's approved Health and Safety Plan. Where hazardous or contaminated materials are encountered or suspected, the Contractor shall provide additional monitoring, training, and personal protective equipment in accordance with applicable OSHA requirements, including 29 CFR 1910.120 where applicable.

END OF SECTION

SECTION 01 45 23

SPECIAL TESTING AND INSPECTIONS

PART 1 -GENERAL

1.01 WORK INCLUDED:

A. Provide labor, materials, equipment, coordination, and independent testing agency services necessary to complete the work of this Section, including but not limited to the following:

1. Retaining and paying for independent testing agency services for Contractor quality-control testing expressly assigned to the Contractor by the Contract Documents. Retention of agencies performing code-required special inspections shall be governed by Paragraph 1.03.A.
2. Obtaining, coordinating, and providing notifications to the Owner, Engineer, and Independent Testing Agency.
3. Providing safe access to the Work to accommodate the indicated tests and inspections.
4. Implementing corrective action and providing additional tests and/or inspections for Work identified as non-conforming by the Independent Testing Agency, at no additional cost to the Owner.

1.02 GENERAL REQUIREMENTS:

A. The Engineer of Record shall determine the applicable code-required special tests and inspections and prepare the project-specific Program of Special Tests and Inspections included as Attachment F. Coordinate the program with the foundation design, geotechnical recommendations, and delegated boardwalk design. Identify required inspections, testing, frequencies, responsible parties, reporting requirements, and applicable exemptions.

B. Attachment F, Program of Special Tests and Inspections, shall not relieve the Contractor or its subcontractors of their responsibilities and obligations for quality control of the Work; their other obligations for supervising the Work; for any design work which is included in their scope of services; for full compliance with the requirements of the Contract Documents; the detection of, or failure to detect, deficiencies or defects, whether detected or undetected, in all parts of the Work, and to otherwise comply with all requirements of the Contract Documents.

C. The Program of Special Tests and Inspection does not apply to the Contractor's equipment, temporary structures used by the Contractor to construct the project, the Contractor's means, methods, procedures, and job site safety.

1.03 CONTRACTOR RESPONSIBILITIES:

A. The Contractor shall include in the Base Bid the costs of boardwalk fabrication and installation inspections, foundation testing and inspections, required reports, and reinspection of corrected Work identified in the Contract Documents and Attachment F, except services required by applicable law to be paid directly by the Owner. The Owner shall retain and direct agencies performing code-required special inspections where required by applicable code. For such Owner-retained services whose costs are assigned to the Contractor, the Contractor shall reimburse the Owner for documented agency charges through the payment procedure established in the Contract Documents. Contractor payment shall not give the Contractor control over inspector selection, inspection scope, findings, or reporting.

B. The Contractor shall retain and pay for agencies performing quality-control testing expressly assigned to the Contractor. Contractor quality-control testing shall not substitute for required special inspections. Special-inspection reports shall be submitted directly to the Owner, Engineer of Record, and building official where required, with copies to the Contractor. Contractor quality-control reports shall be submitted to the Contractor, Owner, and Engineer. For special inspections unrelated to the boardwalk, the Owner shall retain and pay for the required agencies unless otherwise specified.

C. The Contractor shall notify the Owner, Engineer, and Independent Testing Agency at least forty-eight (48) hours, excluding Saturdays, Sundays, and legal holidays, before the Work will be ready for required testing or inspection. Coordinate the schedule with the Engineer and testing agency and promptly notify them of changes.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

ATTACHMENT F

PROGRAM OF SPECIAL TESTS AND INSPECTIONS

GENERAL REQUIREMENTS

A. This schedule establishes contractual testing and inspection requirements for structural fill, boardwalk foundations, and the prefabricated boardwalk system. Coordinate with Sections 03 30 00, 31 00 00, and 32 34 13, the Drawings, and approved delegated-design documents.

B. The Contractor shall retain and pay an independent testing agency acceptable to the Owner and Engineer for Contractor quality-control testing and inspections identified below. Retention, direction, payment, and reporting for code-required special inspections shall comply with Paragraphs 1.03.A and 1.03.B of Section 01 45 23. Contractor quality-control testing shall not replace required special inspections.

C. Before affected fabrication or construction begins, the Owner shall identify and retain the design professionals required to perform construction-phase engineering reviews and any applicable code-required special inspection services. Construction-phase services by the project design consultants are subject to separate authorization by the Owner and are not established by this testing and inspection schedule. The responsible design professionals shall confirm applicable inspection requirements within their respective scopes. Contractor-retained testing and inspection services shall not replace required engineering reviews or code-required special inspections.

D. Provide at least 48 hours' advance notice, excluding Saturdays, Sundays, and legal holidays, before required field inspections or testing. Coordinate inspections before covering or concealing Work. Engineer approval before concrete placement shall remain as required by Section 03 30 00.

E. Where this schedule requires review or approval by an Owner-retained engineer, the Contractor shall notify the Owner sufficiently in advance to coordinate that service. Do not cover affected Work or proceed beyond a required inspection or approval hold point until the required inspection, review, or approval is completed.

ABBREVIATIONS

Abbreviation	Agent
ER	Engineer retained and authorized by the Owner to perform the applicable construction-phase review.
ITA	Independent Testing Agency, retained as required by Section 01 45 23
MFR	Boardwalk manufacturer or qualified authorized representative

Item	Resp. Party	Tests, Inspections, and Reviews	Timing/Frequency
1. Structural Fill Materials	ITA	Verify proposed fill materials comply with Section 31 00 00. Perform applicable classification, gradation, and laboratory compaction testing.	Before use of each proposed material or source; repeat when materials change.
2. Footing Bearing Surfaces	Qualified geotechnical personnel through the ITA	Observe each footing excavation to verify bearing materials and subgrade preparation against the approved foundation design and project geotechnical requirements. Document unsuitable or unexpected conditions and refer them to the Owner for engineering review before proceeding.	At each footing, before placement of foundation fill, working-layer stone, or concrete.
3. Structural fill placement and compaction	ITA	Observe fill placement, lift thickness, moisture conditioning, and compaction. Perform field density testing in accordance with Section 31 00 00 and project geotechnical requirements.	During placement and before covering tested lifts, at the frequencies established by the specifications and project geotechnical requirements.
4. Foundation reinforcement and embedded items	ITA; Owner's Engineer for review and approval required by Section 03 30 00	Inspect foundation dimensions, reinforcing steel, concrete cover, anchor bolts, and embedded items for conformance with approved foundation and boardwalk drawings. Document deficiencies and verify corrections.	Before each concrete placement; reinspect corrected items before placement.

5. Concrete Testing	ITA	Verify delivery tickets and mix identification. Perform slump, air-content, temperature, and compressive-strength testing as required by Section 03 30 00.	At the frequencies specified in Section 03 30 00.
6. Boardwalk Fabrication	MFR for fabrication quality control; independent inspection agency where required under Section 01 45 23	Provide material certifications, fabrication inspection records, welding qualifications, required weld-testing reports, and galvanizing or coating records. Perform inspections required by the approved delegated design and applicable standards.	During fabrication at required frequencies; submit applicable documentation before shipment.
7. Boardwalk erection and connections	ITA; MFR assistance where required	Inspect installed support legs, bracing, base plates, anchors, bolts, and structural connections against approved shop drawings. Inspect authorized field welding and coating repairs where applicable.	During erection while connections remain accessible, and before concealment. Inspection methods and frequencies shall comply with the approved delegated design and applicable standards.
8. Completed boardwalk and transitions	Contractor and MFR; Owner's Engineer for separately authorized acceptance review	Verify deck fastening, guardrails, hardware, coating repairs, clear width, and transitions against approved documents. Submit installation certification and documentation of corrected deficiencies.	After installation and before opening to use; verify completion of corrective work.

1. The Contractor shall include the cost of Contractor-assigned testing, inspection, reporting, and coordination in the Contract Price. Retention, direction, payment, and reporting for code-required special inspections shall remain governed by Section 01 45 23. Contractor quality-control services shall not replace required special inspections.

2. Construction-phase reviews by the Owner's geotechnical, structural, or other design professionals require separate Owner authorization. This schedule does not establish or expand the project design consultants' construction administration scope. The Owner shall arrange required engineering services before the affected Work begins.
3. Before affected fabrication or construction begins, the responsible design professionals shall confirm applicable special inspection requirements, inspection frequencies, and any permitted exemptions. This schedule does not waive inspections required by applicable codes or the approved delegated design.
4. Provide at least 48 hours' advance notice, excluding Saturdays, Sundays, and legal holidays, before required field inspections or testing. Do not conceal affected Work or proceed beyond a required inspection or approval hold point until the required inspection or approval is completed.
5. Submit reports identifying the location of inspected Work, observations, test results, acceptance criteria, deficiencies, and corrective actions in accordance with Section 01 45 23. Promptly report unsuitable bearing conditions and other conditions requiring engineering evaluation to the Owner.
6. The Contractor shall pay for correction and repeat testing or inspection resulting from nonconforming Work attributable to the Contractor or its subcontractors. Submit complete testing and inspection records and documentation of corrected deficiencies before acceptance.

REPORTING AND CORRECTIVE WORK

A. Reports shall identify the date, inspector, location or footing/module identification, Work observed, tests performed, results, acceptance criteria, deficiencies, and corrective actions. Submit reports in accordance with Section 01 45 23.

B. Promptly report nonconforming Work to the Contractor, Owner, and Engineer. Correct deficiencies and obtain required reinspection before covering affected Work or proceeding with dependent construction.

C. The Contractor shall pay for correction and retesting or reinspection of nonconforming Work attributable to the Contractor or its subcontractors.

D. Before acceptance, submit a consolidated record of required tests and inspections, fabrication certifications, unresolved items, and documentation confirming correction of reported deficiencies.

END OF SECTION

SECTION 01 55 26.13

TEMPORARY SIGNAGE AND TRAFFIC CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing, installing, maintaining, relocating, and removing temporary traffic control signs, barricades, warning devices, pedestrian/bicycle detour devices, and other temporary traffic control measures required during construction. Permanent traffic, regulatory, warning, shared-use path, wayfinding, and site signage is specified under Section 10 14 53, TRAFFIC AND SITE SIGNAGE.

1.02 SYSTEM DESCRIPTION:

The Contractor shall furnish, install, maintain, relocate, and remove all temporary construction signs, barricades, channelizing devices, warning devices, pedestrian/bicycle detour signage, and other temporary traffic control measures necessary to protect vehicular traffic, pedestrians, bicyclists, workers, and the public during construction. Temporary traffic control shall comply with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD), including applicable requirements for temporary traffic control, pedestrian access, bicycle facilities, and work adjacent to or within public ways.

PART 2 - PRODUCTS

2.01 TRAFFIC WARNING AND REGULATING DEVICES:

Contractor shall provide temporary warning signs, regulatory signs, barricades, cones, drums, channelizing devices, pedestrian/bicycle detour signs, temporary fencing, and other traffic control devices in accordance with the MUTCD and applicable Owner/Town requirements. Size of signs, lettering, colors, retroreflectivity, method of support, mounting height, lateral offset, placement, and spacing shall comply with the MUTCD and shall be suitable for the site conditions and duration of use.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Contractor shall erect and maintain barricades, barrier fences, temporary traffic signs, pedestrian/bicycle detour signs, channelizing devices, and other temporary traffic control devices as required by the MUTCD, the Owner/Town, or the Engineer to protect the work area from vehicular traffic, pedestrians, bicyclists, animals, and unauthorized access.

B. Contractor shall inspect, maintain, adjust, and relocate barricades, signs, detour routes, channelizing devices, and other temporary traffic control measures as necessary as the work progresses and as site conditions change.

C. Unless extended protection is required for specific areas, upon completion of the work or as directed by the Engineer, Contractor shall remove all temporary warning signs, regulatory signs, barricades, fencing, detour signs, channelizing devices, and related temporary traffic control measures so that vehicular, pedestrian, and bicycle traffic can move safely and unimpeded through the area.

D. Contractor shall maintain safe pedestrian and bicycle access around or through the work area where required. Where existing pedestrian, bicycle, or shared-use path routes are closed, interrupted, or modified during construction, Contractor shall provide temporary detour signage, barricades, channelizing devices, and protection in accordance with the MUTCD and as approved by the Engineer.

E. Temporary traffic control devices shall not obstruct accessible routes, sight lines, driveways, road crossings, or emergency access unless approved by the Engineer and properly protected or detoured.

END OF SECTION

SECTION 01 55 26.19

UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers coordination requirements for Uniformed Officers for Traffic Control and Maintenance of Traffic as described in Section 01 11 00 CONTROL OF WORK AND MATERIALS. Uniformed Officers required for the Work shall be paid for directly by the Owner/Town and shall not be included in the Contractor's bid price, except where costs are incurred due to the Contractor's failure to provide required notice, cancellation, coordination, or other requirements of this Section.

1.02 DESCRIPTION:

A. The Contractor shall coordinate with the local jurisdiction's Traffic Control Officer and the Owner/Town to determine the number of Officers deemed necessary to provide for public safety and to maintain a smooth flow of traffic through the construction area(s) affected. The Owner/Town shall pay directly for Uniformed Officers required for temporary traffic control, subject to the Contractor's responsibilities for scheduling, coordination, cancellation notice, and costs resulting from failure to comply with this Section.

1.03 RELATED WORK:

A. SECTION 01 11 00, CONTROL OF WORK AND MATERIALS (MAINTENANCE OF TRAFFIC)

B. SECTION 01 55 26.13, SIGNAGE (TRAFFIC CONTROL)

C. SECTION 01 55 26.22, ROADWAY TRAFFIC FLAGGERS FOR TEMPORARY TRAFFIC CONTROL

D. SECTION 01 56 00, CONSTRUCTION ZONE SAFETY PLAN

PART 2 - PRODUCTS

2.01 UNIFORMED OFFICERS:

A. The Owner/Town shall pay directly for Uniformed Officers required for temporary traffic control. Contractor shall not include the cost of Uniformed Officers in the Contract Price, except for costs resulting from Contractor's failure to properly schedule, coordinate, cancel, or otherwise comply with the requirements of this Section.

B. Contractor shall provide the Traffic Control Officer with a minimum of 24 hours' notice indicating the time of day, street location, and confirmed number of officers required.

C. Contractor shall give the Traffic Control Officer a minimum of 2 hours' prior cancellation notice should Contractor determine that, due to weather or conditions beyond its control, the scheduled officers will not be needed.

D. The Owner/Town shall pay directly for authorized Uniformed Officers required for temporary traffic control. Uniformed Officer costs shall not be included in the Contract Price and shall not be measured for payment under this Contract.

E. If the Contractor fails to provide required notice, fails to provide required cancellation notice, schedules officers unnecessarily, delays officers, or otherwise causes Uniformed Officer costs to be incurred due to the Contractor's actions or inactions, the Owner/Town may deduct such costs from payments due to the Contractor or otherwise recover such costs from the Contractor.

PART 3 - EXECUTION

3.01 OPERATION:

A. Contractor shall provide barricades, barrier fences, traffic signs, and other traffic control devices as required by the Owner/Town's Traffic Control Officer, or as required by the Engineer, to protect the work area from traffic, pedestrians, and animals.

B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as required by the Owner/Town's Traffic Control Officer or the Engineer.

END OF SECTION

SECTION 01 55 26.22

ROADWAY TRAFFIC FLAGGERS FOR TEMPORARY TRAFFIC CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers the provisions for complying with MassDOT requirements for construction zone safety plans on public works projects where roadway traffic flaggers are specified.

1.02 DESCRIPTION:

The Contractor shall utilize certified Roadway Traffic Flaggers when authorized by the Owner/Town or authority having jurisdiction, including where Uniformed Officers are not required or are unavailable and Roadway Traffic Flaggers are authorized for the applicable operation. Roadway Traffic Flaggers may be required for temporary traffic control during roadway crossing, driveway crossing, crosswalk, stop bar, or other construction activities affecting public traffic.

1.03 RELATED WORK:

A. SECTION 01 56 00, CONSTRUCTION ZONE SAFETY PLAN
B. SECTION 01 55 26.13, TEMPORARY SIGNAGE AND TRAFFIC CONTROL
C. SECTION 01 55 26.19, UNIFORMED OFFICER
D. SECTION 32 17 23, SHARED-USE PATH PAVEMENT MARKINGS

1.04 REFERENCES:

700 CMR 6.00, Use of Road Flaggers and Police Details on Public Works Projects

Massachusetts Department of Transportation Standard specifications for Highways and Bridges – latest edition

1.05 FLAGGER TRAINING AND CERTIFICATION REQUIREMENTS:

A. Flaggers utilized during the performance of the work must possess a certificate of satisfactory completion from a MassDOT-approved flagger training program, such as, but not limited to, those offered by the Associated General Contractors, American Traffic Safety Services Association, American Flagging and Traffic Control, or the National Safety Council, within the previous three (3) years.

B. Prior to the start of work, the Contractor shall provide to the Engineer a written list of certified flaggers to be used, including the most recent date of certification or recertification for each person listed.

C. All flaggers shall carry their approved flagging training program certification card with them while performing flagging duties.

D. All flaggers shall have completed CPR and First Aid training according to the standards and guidelines of the American Heart Association or the American Red Cross. All flaggers shall carry their CPR/First Aid certification cards with them while performing flagging duties.

E. All certifications shall remain valid for the duration of the project or the flagger shall be removed from the project.

1.06 MEASUREMENT AND PAYMENT:

A. Roadway Traffic Flaggers shall be measured for payment by the actual number of authorized flagger-hours performed by certified roadway traffic flaggers and approved by the Owner/Town or Owner's Authorized Representative.

B. One flagger-hour is defined as one certified roadway traffic flagger performing authorized temporary traffic control services for one hour. When more than one flagger is authorized and used at the same time, each flagger's time shall be measured separately.

C. The Bid Form includes an estimated quantity of 200 flagger-hours. This quantity is provided for bidding purposes only and shall not be construed as a guarantee of the actual number of flagger-hours required. Payment shall be based on actual authorized flagger-hours used.

D. The unit price for Roadway Traffic Flaggers shall include all labor, supervision, scheduling, certification, personal protective equipment, stop/slow paddles, flags, radios, signage, transportation, incidentals, overhead, and profit necessary to provide certified roadway traffic flaggers in accordance with this Section, the approved Construction Zone Safety Plan, and requirements of the Owner/Town and authorities having jurisdiction.

E. Roadway Traffic Flaggers shall only be used where shown on the Drawings, required by the approved Construction Zone Safety Plan, directed by the Owner/Town or Owner's Authorized Representative, or approved by authorities having jurisdiction. Flaggers shall not be used as a substitute for Uniformed Officers where Uniformed Officers are required by the Owner/Town, Police Department, Construction Zone Safety Plan, or authorities having jurisdiction.

F. No payment will be made for flaggers provided for the Contractor's convenience, unauthorized work, rework, failure to properly schedule the Work, failure to maintain traffic control devices, or delays caused by the Contractor.

G. Uniformed Officers for temporary traffic control shall be paid for directly by the Owner/Town under Section 01 55 26.19 and shall not be included in the Roadway Traffic Flagger pay item.

PART 2 - PRODUCTS

2.01 FLAGGER EQUIPMENT:

A. Each flagger shall be equipped with the following high visibility clothing, signaling, and safety devices:

(1) A white protective hard hat with a minimum level of reflectivity per the requirements of ANSI, Type I, Class E&G.

(2) A clean, unfaded, untorn lime/yellow reflective safety vest and safety pants meeting the requirements of ANSI 107 Class 3 with the words "Traffic Control" on the front and rear panels in minimum two (2) inch (50 millimeter) high letters.

(3) A "STOP/SLOW" traffic paddle conforming to the requirements of Part 6E.03 of the Manual on Uniform Traffic Control Devices, a reflectorized red flag, flagger station advance warning signage, and two-way radios capable of providing clear communication within the work zone between flaggers, the Contractor, and the Engineer. The traffic paddle shall be mounted on a pole of sufficient length to be seven (7) feet above the ground as measured from the bottom of the paddle.

(4) A working flashlight with a minimum of 15,000 candlepower and a six (6) inch red attachable wand, a whistle with an attached lanyard, and a First Aid kit that complies with the requirements of ANSI Z308.1.

PART 3 - EXECUTION

3.01 OPERATION:

A. Flaggers shall be utilized in accordance with the appropriate traffic management plan, the approved Construction Zone Safety Plan, or as deemed necessary by the Owner's Authorized Representative for the direction and control of traffic. Flaggers shall also coordinate pedestrian, bicycle, driveway, abutter, and emergency access where affected by the Work.

B. Any flagger determined by the Authorized Representative or Engineer to be ineffective in controlling traffic may be removed at the discretion of the Engineer. If a flagger is directed to be removed, the Contractor shall immediately comply with the directive from the Engineer and shall suspend operations as necessary until a qualified replacement can be provided. Such a suspension of operations shall not be considered as a basis for a claim or an extension of time.

END OF SECTION

SECTION 01 56 00

CONSTRUCTION ZONE SAFETY PLAN

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers the provisions for complying with Commonwealth of Massachusetts requirements for construction zone safety plans on public works projects.

1.02 DESCRIPTION:

A. The Contractor shall implement traffic safety and control measures through the construction zone, including road closures, detours, temporary pedestrian and bicycle accommodations, driveway access, and measures to mitigate impacts on traffic, pedestrians, bicyclists, abutters, and emergency access outside of the construction zone in accordance with these Contract Documents.

1.03 RELATED WORK:

A. SECTION 01 11 00, CONTROL OF WORK AND MATERIALS

B. SECTION 01 55 26.13, SIGNAGE (TRAFFIC CONTROL)

C. SECTION 01 55 26.19, UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC

D. SECTION 01 56 26, TEMPORARY FENCING AND BARRIERS

E. SECTION 01 35 29, HEALTH AND SAFETY PLAN

1.04 REFERENCES:

A. Massachusetts Department of Transportation Standard Specifications for Highways and Bridges – latest edition

B. Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

PART 2 - PRODUCTS

2.01 Traffic control devices utilized by the Contractor shall meet the requirements of these contract documents and the latest Massachusetts Department of Transportation

(MassDOT) Standard Specifications and Manual on Uniform Traffic Control Devices (MUTCD).

PART 3 - EXECUTION

3.01 OPERATION:

A. Contractor shall be responsible for providing all temporary traffic control devices including barricades, barrier fences, signs, drums, cones, impact attenuators and other traffic control devices in accordance with typical traffic management plans and details shown on the drawings or as required by the Owner's Representative. Temporary traffic control shall account for roadway crossings, driveway crossings, pedestrian and bicycle detours, boardwalk approaches, abutter access, emergency access, and work adjacent to active public ways.

B. The Contractor shall prepare temporary traffic management plans and details that deviate significantly from the typical plans shown on the drawings and submit to the Owner's Representative for review and approval prior to start of the work.

C. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as required by the Owner's Traffic Control Officer or the Owner's Representative.

END OF SECTION

SECTION 01 56 26

TEMPORARY FENCING AND BARRIERS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The Contractor shall provide all labor, materials and appurtenances necessary for the installation, maintenance and dismantling of 8-foot temporary fencing.

B. Temporary fencing and barriers are not intended to continuously enclose the full length of the Project unless specifically shown on the Drawings or directed by the Engineer. Temporary fencing and barriers shall be installed at active work areas, staging and laydown areas, excavations, boardwalk construction areas, material storage areas, and other areas requiring temporary protection, and shall be relocated as the Work progresses.

1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

A. Manufacturer’s literature of the materials specified herein.

B. Shop drawings of the temporary chain link fence and gates.

1. Shop drawings shall indicate layout of temporary fencing, location and size of gates, existing pavement and roads, and other site-specific conditions. Prepare drawing after site observation and verification of existing conditions.

PART 2 - PRODUCTS

2.01 TEMPORARY CHAIN LINK FENCING

A. Unless otherwise indicated, type of 8-foot temporary chain link fencing shall be Contractor's option. Following types are acceptable:

1. New materials or previously used salvaged chain link fencing in good condition.

2. Posts: Galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings, driving into ground, anchoring with base plates, or inserting in precast concrete blocks.

3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.

B. Gates: Provide gates of the quantity and size indicated on the Contract Drawings or

required for functional access to Site.

1. Fabricate of same material as used for fencing.

2. Vehicle gates:

   a. Minimum width: 20 feet to allow access for emergency vehicles.
   b. Capable of manual operation by one person.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Temporary fencing and barriers shall be installed in phases and relocated as the Work progresses along the Project corridor. Contractor shall maintain fencing and barriers at active work areas and other areas requiring protection, while avoiding unnecessary obstruction of roadways, driveways, pedestrian routes, bicycle routes, emergency access, and approved detours.

B. Posts

   1. Maximum post spacing shall be 10-feet. Post spacing shall be uniform and posts shall be plumb.

   2. Drive posts, set in holes and backfill, or anchor in precast concrete blocks.

   3. For soft and unstable ground conditions, cast concrete plug around post.

   4. Posts over pavement: Use steel post plates or precast concrete blocks.

   5. Gate posts: Use bracing or concrete footings to provide rigidity for accommodating size of gate.

   6. Temporary terminal posts shall be securely braced or connected to adjacent fencing or supports as required to prevent unauthorized access to active work areas.

C. Securely attach wire fabric to posts. Maximum area of unbraced fence fabric shall not exceed 1,500 square feet.

D. Install with required hardware.

E. Fabric shall be stretched taut, with the bottom edge following the existing grade, and shall be a continuous mesh between terminal posts. Each span of fabric shall be attached independently at terminal posts. Where terminal posts do not have provisions for weaving fabric to posts, stretcher bars shall be placed through the end weave of the fabric and

secured to the post with bar bands spaced not more than 15-inches apart on the post. Temporary terminal posts shall be secured to adjacent fencing or supports as required to prevent unauthorized access to active work areas.

F. Fabric shall be attached with ties to line posts at intervals of not more than 14-inches (and to the top railing and braces at intervals not exceeding 24-inches).

G. The bottom tension wire shall be interlaced in the weave of the fabric, pulled taut and fastened to terminal posts.

3.02 MAINTENANCE AND REMOVAL

A. Maintain fencing in good condition. If damaged, immediately repair.

B. Remove temporary fencing upon completion of Work or when no longer required for security or control. Backfill holes and compact. Holes in pavement shall be surfaced to match existing paving. Repair damage caused by installation of temporary fencing.

END OF SECTION

SECTION 01 56 39

TREE PROTECTION AND TRIMMING

PART 1 – GENERAL

1.01 WORK INCLUDED:

A. This section includes the protection and trimming of trees that are to remain but interfere with, or are affected by, execution of the Work, whether temporary or new construction.

1.02 RELATED WORK:

A. SECTION 01 57 19 – ENVIRONMENTAL PROTECTION

B. SECTION 31 00 00 – EARTHWORK

C. SECTION 31 11 00 – CLEARING AND GRUBBING

D. SECTION 32 92 19 – SEEDING

E. SECTION 32 93 00 – TREES, ORNAMENTAL GRASSES, AND LANDSCAPING

1.03 QUALITY ASSURANCE:

A. Tree Pruning Standards: Comply with the National Arborist Association's "Pruning Standards for Shade Trees" except where more stringent requirements are indicated.

B. Tree trimming work shall be conducted by qualified and trained personnel. Where pruning of significant trees, major limbs, or work within tree protection zones is required, such work shall be performed under the direct supervision of a Massachusetts Certified Arborist.

1.04 SPECIAL REQUIREMENTS:

A. Dutch Elm diseased wood shall be disposed of in accordance with provisions of General Laws, Chapter 87, Section 5, and Chapter 132, Sections 8 and 11 as amended; and in accordance with any additional local regulations. All wood shall be removed from the site and be properly disposed of in accordance with state and local regulations.

B. No burning shall be permitted on the project site.

C. Prior to commencing work, the Contractor shall submit a plan to the Engineer for legal disposal of removed materials, in conformance with State and Federal regulations.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D448, size 24, with 90 to 100 percent passing a 2-½-inch (63-mm) sieve and not more than 10 percent passing a ¾-inch (19-mm) sieve.

B. Topsoil: Comply with Section 32 91 00, LOAM AND PLANTING PREPARATION. Provide at locations and to depths shown on the Drawings.

C. Filter Fabric: Manufacturer's standard, non-woven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Temporary Protection: Provide temporary fencing, barricades, or other suitable guards located outside the drip line (outer perimeter of branches) to protect remaining trees and other plants from damage.

B. Protect tree root systems from damage due to noxious materials caused by run-off or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.

C. Do not store construction materials, debris, or excavated material within the drip line of remaining trees. Do not permit vehicles or foot traffic within the drip line and prevent soil compaction over root systems.

D. Do not allow fires.

E. The Contractor shall coordinate tree trimming and tree protection work adjacent to utility poles, overhead wires, guy wires, service connections, and abutter improvements with the Owner, Engineer, affected utility companies, and abutters, as applicable. Tree trimming adjacent to overhead utilities shall not be performed unless authorized by the utility owner and performed by qualified personnel.

3.02 EXCAVATION:

A. Install shoring or other protecting support systems to minimize sloping or benching of excavations.

B. Do not excavate within tree drip line, unless otherwise indicated.

C. Where excavation for new construction is required within tree drip lines, hand excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.

1. Relocate roots in backfill areas wherever possible. If encountering large, main lateral roots, expose beyond excavation limits as required to bend and relocate without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately 3-inches (75 mm) back from new construction.
2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition and temporarily support and protect roots from damage until they are permanently relocated and covered with earth.

D. Where utilities trenches are required within tree drip lines, tunnel under or around the roots by drilling, auger boring, pipe jacking, or digging by hand.

1. Root Pruning: Do not cut main lateral roots to tap roots; cut only smaller roots that interfere with installation of new work. Cut roots with sharp pruning instruments; do not break or chop.

3.03 REGRADING:

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond tree drip line. Maintain existing grades within tree drip lines.

1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots to tap roots; cut only smaller roots. Cut roots cleanly with sharp pruning instruments; do not break or chop.

B. Minor Fill: Where existing grade is 6-inches (150 mm) or less below elevation of finish grade shown, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

C. Moderate Fill: Where existing grade is more than 6-inches (150 mm) but less than 12-inches (300 mm) below finish grade elevation, place a layer of drainage fill, filter fabric, and a final layer of topsoil on existing grade.

1. Carefully place drainage fill against tree trunk approximately 2-inches (50 mm) above finish grade elevation and extend not less than 18-inches (450 mm) from tree trunk on all sides. For balance of area within drip line perimeter, place drainage fill to an elevation 6-inches (150 mm) below grade.
2. Place filter fabric with overlapping edges of 6-inches (150 mm) minimum.
3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.04 TREE PRUNING:

A. If required, prune remaining trees to compensate for root loss caused by damaging or cutting root system as required by the Engineer in accordance with accepted horticultural practices.

B. Cut branches with sharp pruning instruments; do not break or chop.

3.05 TREE REPAIR AND REPLACEMENT:

A. Promptly repair trees damaged by construction operations to prevent progressive deterioration.

1. Provide new trees of size and species selected by the Engineer when trees over 6-inches (150 mm) in caliper, measured 12-inches (300 mm) above grade, are required to be replaced, due to abuse/damage/neglect of contractor.

3.06 DISPOSAL OF WASTE MATERIALS:

A. Burning on Owner's Property: Burning is not permitted on Owner's property.

B. Disposal: Remove excess excavated material, displaced trees, and excess wood chips from the Owner’s property. Remove all cut trees, branches, limbs, leaves, and associated wood debris from the site within twenty-four (24) hours of cutting or trimming. Do not stockpile or store tree debris on site.

END OF SECTION

SECTION 01 57 19

ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.01 DESCRIPTION:

A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.

B. The requirements set forth in this section apply to construction within the Project limits, including work adjacent to wetlands, resource areas, drainage ways, roadway crossings, boardwalk areas, disturbed shoulders, stockpile areas, staging areas, and other environmentally sensitive areas, unless otherwise specifically stated.

C. Perform the Work in accordance with the applicable requirements and conditions of the Owner-provided permits, approvals, and environmental determinations listed in Article 1.04 of Section 00 31 43, PERMITS, and attached thereto.

D. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.

1.02 RELATED WORK:

A. Section 01 14 19.16, DUST CONTROL

B. Section 01 33 23, SUBMITTALS

C. Section 31 00 00, EARTHWORK

D. Section 31 11 00, CLEARING AND GRUBBING

1.03 SUBMITTALS:

A. The Contractor shall submit details and literature fully describing environmental protection methods to be employed in carrying out construction activities within 100 feet of wetlands, resource areas, drainage ways, or other environmentally sensitive areas.

PART 2 - PRODUCTS

2.01 SILT FENCE:

A. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a mesh backing, and stapled to preweathered oak posts installed as shown on the drawings. The oak posts shall be 1-1/4-inches by 1-1/4-inches (Minimum Dimension) by 48-inches and shall be tapered. The bottom edge of the silt fence shall be buried as shown on the drawings.

B. Provide silt fence complying with Section 31 25 00, Paragraph 2.01.B, and the assembly requirements specified herein and shown on the Drawings. Submit product data demonstrating compliance.

C. Silt-fence fabric shall comply with the material and physical-property requirements of Section 31 25 00, Paragraph 2.01.B.

2.02 STRAW BALES:

A. Straw bales shall consist of certified seed free stems of agricultural grain and cereal crops and shall be free of grasses and legumes. Standard bales shall be 14-inches high, 18- inches wide and 36- to 40-inches long tied with polypropylene twine and weigh within 5 percent of 7 lbs. per cubic ft.

2.03 STRAW WATTLES:

A. Straw Wattles shall consist of a 100% biodegradable exterior jute or coir netting with 100% wheat straw interior filling as manufactured by GEI Works, Sebastian, Florida (Phone: 772-646-0597; website: www.erosionpollution.com), or approved equal.

2.04 CATCH BASIN PROTECTION:

A. To trap sediment and to prevent sediment from clogging drainage systems, catch basin protection in the form of a siltation sack (Siltsack as manufactured by ACF Environmental, Inc. or approved equal) shall be provided as approved by the Engineer.

2.05 COMPOST FILTER TUBES:

A. Provide compost filter tubes complying with Section 31 25 00, Paragraph 2.01.D, and Detail 1/L600.

PART 3- EXECUTION

3.01 NOTIFICATION AND STOPPAGE OF WORK:

A. The Engineer will notify the Contractor in writing of any non-compliance with the provisions of the Order of Conditions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the

Contractor or its authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Owner may order stoppage of all or part of the work through the Engineer until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop work orders shall be made unless it was later determined that the Contractor was in compliance.

3.02 AREA OF CONSTRUCTION ACTIVITY:

A. Insofar as possible, the Contractor shall confine its construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

3.03 PROTECTION OF WATER RESOURCES:

A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.

B. Special measures should be taken to insure against spillage of any pollutants into public waters.

3.04 CONSTRUCTION IN AREAS DESIGNATED AS WETLANDS ON THE DRAWINGS:

A. Insofar as possible, the Contractor shall make every effort to minimize disturbance within areas designated as wetlands or within 100-feet of wetland resource areas. Total easement widths shall be limited to the widths shown.

B. The Contractor shall perform its work in such a way that these areas are left in the condition existing prior to construction.

C. The elevations of areas designated as wetlands or resource areas shall not be unduly disturbed by the Contractor's operations outside the limits of work. If such disturbance occurs, the Contractor shall take all measures necessary to restore these areas to the elevations and conditions which existed prior to construction.

D. Where excavation or grading is required within or adjacent to wetlands or resource areas, topsoil and organic surface material shall be carefully removed, stockpiled separately where approved, protected from erosion, and reused for restoration where suitable and as directed by the Engineer.

E. The Contractor shall provide excavation support, matting, temporary access, or other

protective measures as required to minimize disturbance to wetlands, resource areas, adjacent vegetation, and unstable soils.

F. Excavated materials shall not be permanently placed or temporarily stored in areas designated as wetlands. Temporary storage areas for excavated material shall be as required by the Engineer.

G. Temporary gravel roadways within wetlands or resource areas are not permitted unless specifically shown on the Drawings or approved by the Engineer. Where temporary access is required in sensitive areas, the Contractor shall use timber mats, rubber mats, construction mats, or other approved low-impact methods capable of supporting equipment without undue disturbance, mixing, or compaction of underlying soils or vegetation

H. Provide continuous sediment-control barriers at the locations shown on the Drawings before disturbing adjacent soil. Where compost filter tubes are indicated, provide the materials and installation specified in Section 31 25 00 and Detail 1/L600. Alternate barrier types require the Engineer's prior approval and shall comply with applicable permit conditions. Maintain barriers until removal is authorized in accordance with Section 31 25 00.

3.05 PROTECTING AND MINIMIZING EXPOSED AREAS:

A. The Contractor shall limit the area of exposed soil during construction. Provide temporary and permanent stabilization in accordance with Section 31 25 00 and applicable permit requirements. Where newly graded subgrade or topsoil areas cannot be seeded within five (5) calendar days after grading, provide temporary mulch or other approved stabilization within that period, or sooner where required by applicable permits. Comply with any permit requirements for earlier initiation or completion of stabilization.

B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

3.06 LOCATION OF STORAGE AREAS:

A. The location of the Contractor's storage and stockpile areas for equipment and/or materials shall be limited to cleared portions of the job site or areas to be cleared as part of this project, including the designated stockpile area shown on the Drawings, and shall be coordinated with and approved in writing by the Owner and Engineer. Plans showing proposed storage and stockpile areas, access routes, and protection measures shall be submitted to the Engineer for review and approval prior to use. Storage or stockpiling outside approved areas is not permitted.

B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of baled straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.

C. There shall be no storage of equipment or materials in areas designated as wetlands.

D. The Engineer may designate a particular area or areas where the Contractor may store materials used in its operations.

E. Storage areas in cross-country locations shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

3.07 PROTECTION OF LANDSCAPE:

A. The Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the Owner. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The Contractor shall, in any event, be responsible for any damage resulting from such use.

B. Branches, limbs, and roots shall not be cut except with permission of the Engineer. Perform authorized pruning and root cutting in accordance with Section 31 13 13, without splitting or crushing. Notify the Engineer of injury to trees and perform corrective pruning or other treatment as directed, consistent with Sections 31 13 13 and 32 93 00. Do not apply grafting wax, tree-healing paint, or other wound dressings to pruning cuts or damaged tree tissue.

C. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by its blasting or other operations, the Engineer may require the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under the provisions of Section 31 11 00, CLEARING AND GRUBBING.

D. Protect cultivated hedges, shrubs, and plants designated to remain. Where temporary removal is necessary solely to protect vegetation designated to remain, obtain the Owner’s written authorization before disturbance. Carefully dig, ball, temporarily replant, and maintain such vegetation, then replant it in its original position when construction activities permit, unless another location is authorized in writing by the

Owner. Maintain replanted vegetation until growth is re-established.

This requirement does not apply to vegetation designated for permanent removal, removal and salvage without resetting, or relocation by others under Section 02 41 13 or the Drawings. Follow the assigned disposition and responsibility for each item. Do not replant private right-of-way encroachments under this paragraph. Where disposition or responsibility is unclear, protect the affected vegetation and obtain Written Direction before proceeding.

Replace vegetation designated to remain or be reset that is damaged by Contractor operations with material of kind and quality at least equal to that existing before the Work, at no additional cost to the Owner.

3.08 CLEARING AND GRUBBING:

A. The Contractor shall clear and grub only on the Owner's land or the Owner's easements, and only the area required for construction operations, as approved by the Engineer. Removal of mature trees (4-inches or greater DBH) will not be allowed on temporary easements.

B. The Contractor shall not remove trees in the Owner's temporary easements without permission of the Engineer.

3.09 DISCHARGE OF DEWATERING OPERATIONS:

A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.

B. Under no circumstances shall the Contractor discharge untreated water to wetlands, resource areas, drainage systems, streams, or waterways. Discharge from dewatering operations shall be filtered, settled, and discharged only to approved locations and in accordance with permits, the Contract Documents, and the Engineer’s direction.

C. Pumped water shall be filtered through filter fabric, straw bales, sediment bags, a vegetative filter strip, sediment basin, or other approved method to trap sediment resulting from construction operations.

3.10 DUST CONTROL:

A. During the progress of the work, the Contractor shall conduct its operations and maintain the area of its activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. If the Engineer decides it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed. Calcium chloride shall be as specified under Section 01 14 19.16, DUST CONTROL.

B. Calcium Chloride shall not be used for dust control within a drainage basin or in the vicinity of any source of potable water.

3.11 SEPARATION AND REPLACEMENT OF TOPSOIL:

A. Topsoil shall be carefully removed from disturbed areas where excavation or grading is required and separately stored for reuse as required. The topsoil shall be stored in an area acceptable to the Engineer and adequate measures shall be employed to prevent erosion of said material.

3.12 BALED STRAW:

A. To trap sediment and to prevent sediment from clogging drainage systems, baled straw shall be used where shown on the drawings. Care shall be taken to keep the bales from breaking apart. The bales should be securely staked to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically. Bales shall not be placed within a waterway unless specifically shown on the Drawings or approved by the Engineer.

3.13 ERECTION AND MAINTENANCE OF SILT FENCE:

A. Where indicated on the drawings or where required by the Engineer, the Contractor shall erect and maintain a temporary silt fence. In areas designated as wetlands, the Contractor shall line the limits of the construction easement with a silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.

3.14 SURFACE RESTORATION OF CROSS COUNTRY AREAS:

A. Surface restoration of disturbed areas shall be completed as soon as practicable after construction activities are complete in each area. Restoration shall conform to the Drawings and applicable specification sections, including Section 32 92 19, SEEDING, and Section 32 93 00, TREES, ORNAMENTAL GRASSES, AND LANDSCAPING, where applicable.

3.15 CATCH BASIN PROTECTION:

A. Catch basin protection shall be used for every catch basin, shown on the plans or as required by the Engineer, to trap sediment and prevent it from clogging drainage systems and entering wetlands. Siltation sack shall be securely installed under the catch basin grate. Care shall be taken to keep the siltation sack from breaking apart or clogging. All deposited sediment shall be removed periodically and at times prior to predicted precipitation to allow free drainage flow. Prior to working in areas where catch basins are to be protected, each catch basin sump shall be cleaned of all debris and protected. The Contractor shall properly dispose of all debris at no additional cost

to the Owner.

B. Maintain catch basin protection until removal is authorized in accordance with Section 31 25 00, Paragraph 3.01.C. Upon authorized removal, clean accumulated sediment and debris from the protection devices and affected catch basins and dispose of it in accordance with the Contract Documents and applicable permits.

3.16 STRAW WATTLES:

A. The wattles will be placed in a shallow trench (2-3 inches deep) and staked in the ground using wooden stakes driven at 4-foot intervals. The wooden stakes will be placed at a minimum depth of 24-inches into the ground.

B. The wattles shall be regularly inspected and before and after every forecasted major weather event. All deposited sediment shall be removed and not allowed to accumulate to the top of the wattles. Wattles damaged during construction shall be repaired or replaced as required by the Engineer at no additional cost to the Owner.

C. Maintain straw wattles until removal is authorized in accordance with Section 31 25 00, Paragraph 3.01.C. Following authorized removal, restore and stabilize areas disturbed by removal.

END OF SECTION

SECTION 01 74 13

CLEANING UP

PART 1 - GENERAL

1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of its work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon request by the Engineer provide adequate material, equipment and labor to clean up and make safe any and all areas deemed necessary by the Engineer.

1.02 RELATED WORK:

A. Section 01 11 00 CONTROL OF WORK AND MATERIALS

B. Section 01 14 00 SPECIAL PROVISIONS

C. Section 01 57 19 ENVIRONMENTAL PROTECTION

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

3.01 DAILY CLEANUP:

A. The Contractor shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.

B. Contractor shall keep existing roadways, driveways, shoulders, sidewalks, paths, multi-use path areas, boardwalk areas, and adjacent public areas free of mud, sediment, debris, loose aggregate, construction waste, and other hazards resulting from the Work.

C. Upon written notification by the Engineer, the Contractor shall within 24 hours clean up those areas, which in the Engineer's opinion are in violation of this section and the above referenced sections of the specifications.

D. If in the opinion of the Engineer, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

E. Contractor shall remove nails, screws, metal scraps, fasteners, wood debris, packaging, and

other sharp or hazardous materials from the work area and adjacent public areas daily.

3.02 MATERIAL OR DEBRIS IN DRAINAGE FACILITY

A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

3.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

A. On or before completion of the work, the Contractor shall, unless otherwise specifically required or permitted in writing, tear down and remove all temporary buildings and structures it built; shall remove all temporary works, tools and machinery or other construction equipment it furnished; shall remove all rubbish from any grounds which it has occupied; shall maintain and remove silt fence, straw wattles, straw bales, inlet protection, and other temporary erosion and sediment control measures in accordance with Section 31 25 00, Paragraph 3.01.C, regardless of construction completion; and shall leave the roads and all parts of the property and adjacent property affected by its operations in a neat and satisfactory condition.

3.04 RESTORATION OF DAMAGED PROPERTY:

A. The Contractor shall restore or replace, when and as required, any property damaged by its work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk and landscaping work. Materials, equipment, and methods for such restoration shall be as approved by the Engineer.

3.05 FINAL CLEANUP:

A. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the construction site to its original or specified condition. This cleanup shall include removing all trash and debris off of the premises. Before acceptance, the Engineer shall approve the condition of the site.

END OF SECTION

SECTION 01 78 00

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers administrative and procedural requirements for closing out the project, including, but not limited to:

1. Project as-built documents

2. Checkout and Certification

3. Startup and Testing

4. Final Cleaning

5. Substantial Completion

6. Closeout Procedures

7. Final Completion

8. Correction/Warranty Period

B. Closeout checklist to be completed by the Engineer.

1.02 RELATED WORK:

A. General Requirements in their entirety.

B. Section 01 74 13, CLEANING UP

C. Section 01 78 39, PROJECT AS-BUILT RECORD DRAWINGS

1.03 AS-BUILT DOCUMENTS:

A. Contractor shall maintain on site, separate from the documents used for construction, one set of the documents listed below, and as construction progresses, shall legibly record on these documents all changes made during construction.

1. Contract Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other Modifications to the Contract.

5. Reviewed shop drawings, product data, and samples.

6. Written interpretations and clarifications.

7. Field Orders.

8. Field test reports properly verified.

B. The completed set of as-built documents shall be submitted to the Engineer with the final Application for Payment.

C. The draft and completed set of as-built documents shall be submitted to the Engineer and Owner in conformance with the requirements of Section 01 78 39, PROJECT AS-BUILT RECORD DRAWINGS.

1.04 CHECKOUT AND CERTIFICATIONS:

A. Prior to checkout and certifications the following tasks shall be completed:

1. Construction shall be complete. For this purpose, completion of construction is defined as follows:

a. The Contractor has completed construction and erection of the work in conformance with the Contract Drawings and Specifications.

b. The Contractor has installed and adjusted operating equipment, systems, site improvements, or facilities, where applicable, as defined by the manufacturers' installation, operation and maintenance instructions.

2. All shop drawings shall have final approval.

3. All shop tests shall be complete and approved test results submitted to the Engineer.

1.05 START-UP AND TESTING:

A. Prior to start-up and testing, where applicable, the following tasks shall be complete:

1. All checkout and certifications shall be satisfactorily completed,

2. All operations and maintenance manuals shall be approved,

3. All preliminary training by the manufacturer's representative shall be completed,

4. An approved start-up procedure shall be in place.

1.06 FINAL CLEANING:

A. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

1. Clean the site, including landscape development areas of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to smooth, even textured surfaces.

2. Remove waste and surplus materials, rubbish, fencing equipment, temporary utilities and construction facilities from the site, unless otherwise required by the Engineer.

3. Comply with requirements of Section 01 74 13 CLEANING UP.

1.07 SUBSTANTIAL COMPLETION:

A. Substantial Completion is officially defined in the General and Supplementary Conditions. The date of substantial completion will be certified by the Engineer. This date will not be certified until the following requirements have been satisfied by the Contractor:

1. All Contract requirements are coordinated and the Work is complete, usable, safe, and ready for the Owner’s intended use, except for punch list items that do not prevent use of the Work.

2. All field tests have been satisfactorily completed and reports forwarded to the Engineer.

3. All final training has been completed by manufacturers' representatives, where applicable.

4. All spare parts, maintenance materials, warranties, and related closeout items required by the Contract Documents have been satisfactorily delivered to the Owner.

1.08 CLOSEOUT PROCEDURES:

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and is complete in accordance with Contract Documents and ready for Engineer's and Owner's inspection.

B. Accompany Engineer and Owner on inspection to verify conformance with the Contract Documents. Prepare a punch list of work items that have been determined by inspection

to not conform to Contract Documents. Punch list items shall include work items that are missing, incomplete, damaged, incorrect items, or improperly installed or constructed. The Contractor shall correct the punch list deficiencies by re-work, modifications, or replacement, as appropriate, until the items conform to the Contract Documents. The initial punch list shall be produced by the Contractor, with copies to the Engineer and Owner. When the Contractor has reduced the number of deficient items to a reasonable level, the Engineer will develop a definitive punch list for the use of the Contractor.

C. Provide submittals to Engineer that are required by governing or other authorities.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due. The Contractor shall submit the following documents with or prior to Final Application for Payment: Set of as-built documents, Contract Completion and Acceptance Certificate, Consent of Surety to Final Payment, Release and Waiver of Liens and Claims (SECTION 01 78 00 – ATT. A), Affidavit of Payment of Debts and Claims, and remaining releases, waivers, warranties/guarantees, and all other data required by the Contract Documents.

1.09 FINAL COMPLETION:

A. Prior to final completion, the following tasks shall be completed:

1. All items in the punch list shall be completed.

2. All Contract closeout documentation shall be submitted to and accepted by the Engineer.

1.10 CORRECTION/WARRANTY PERIOD:

A. During the correction period, the Contractor shall correct all deficiencies in equipment and materials.

B. During the warranty period, the Contractor shall perform all corrective work on warranty deficiencies.

C. Corrective work will be identified by the Engineer or Owner, as appropriate. The Contractor will be notified of the item(s) requiring corrective work.

D. The Contractor shall begin work on all corrective work within ten days of being notified of the deficiency by the Engineer and shall then work continuously until the deficiency is corrected. Upon completion of the corrective work, the Contractor shall submit a letter report to the Engineer describing the deficiency and the corrective action that was taken.

E. The Contractor shall coordinate all corrective work with the Engineer and/or the Owner.

1.11 COMPLETION CHECKLIST:

A. The Project Completion Checklist, which follows, and shall be completed as the project nears completion. When the project has been fully completed, Final Payment can be approved.

PROJECT COMPLETION CHECKLIST

Owner _____ Job No.

Project

As part of the project closeout, all items listed below must be checked off as being complete or otherwise accounted for. The person verifying completion of the item shall list the completion date and their initials.

Project Closeout Checklist		
	Date Completion Verified	Verified by
AS-BUILT DOCUMENTS HANDED OVER		
1. Contract Drawings		
2. Specifications		
3. Addenda		
4. Change Orders/Contract Modifications		
5. Reviewed Shop Drawings, Product Data and Samples		
6. Written Interpretations/Clarifications		
7. Field Orders		
8. Field Test Reports		
EQUIPMENT CHECKOUT AND CERTIFICATIONS		
1. Construction Complete per Drawings/Specifications		
2. Equipment Installed and Adjusted		
3. All Shop Drawings have Final Approval		
4. All Shop Tests Complete and Results Submitted		

Project Closeout Checklist		
	Date Completion Verified	Verified By
START-UP AND TESTING		
1. All Checkout and Certifications Complete		
2. All O&M Manuals Approved		
3. All Preliminary Training by Manufacturers Rep. Completed		
FINAL CLEANING		
1. All Construction Facilities Removed		
2. All Construction Debris Removed		
3. All Areas Swept/Cleared		
SUBSTANTIAL COMPLETION		
1. All Items Coordinated Into a Fully Operational System		
2. All Equipment Units Operational at Specified Efficiencies		
3. All Field Tests Completed and Reports Submitted		
4. All Final Training by Manufacturer's Rep. Completed		
5. All Spare Parts and Lubricants Provided		
CLOSEOUT PROCEDURES		
1. Written Certification Submitted that Work is Ready for Owner & Engineer Inspector		
2. Inspection by Owner, Engineer, Contractor completed		
3. Punch List of Nonconforming Items Prepared		
4. Documents Required by Governing or Other Authorities Submitted (List Them)		
5. Final Application for Payment Received		
6. Contract Completion and Acceptance Certificate Submittal		
7. Consent of Surety to Final Payment Submittal		
8. Release and Waiver of Liens and Claims Submitted		
9. Affidavit of Payment of Debts and Claims Submitted		
10. Warranties/Guarantees Submitted		

Project Closeout Checklist		
	Date Completion Verified	Verified By
11. Other Required Releases and Waivers Submitted (List Them)		
12. Permits Submitted (List Them)		
13. Weekly Payrolls Submitted as Required by Law		
FINAL COMPLETION		
1. All Items in Punch List Completed		
2. All Other Required Documentation Submitted (List It)		
CORRECTION/WARRANTY PERIOD		
1. Correction Period Start Date: _____ End Date: _____		
2. Specific Warranties Provided Item Warranty Duration		

Full name of persons signing their initials on this checklist:

_____

_____

_____

_____

END OF SECTION

SECTION 01 78 39

PROJECT AS-BUILT RECORD DRAWINGS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers the Contractor's As-Built Record drawings for the project. The As-Built Record drawings for the project shall include, but are not limited to:

A. The Contractor's construction coordination drawings for applicable project disciplines shall be submitted to the Engineer prior to construction of the applicable work. Coordination drawings shall include, but are not limited to, the following where applicable:

1. Civil/site work.
2. Grading and drainage.
3. Utilities.
4. Electrical, if applicable.
5. Boardwalk, foundations, railings, and related specialty items.
6. Signage, pavement markings, and traffic control elements.
7. Landscape restoration, seeding, and planting areas.

B. Draft Record Documents Review

Upon completion of project construction, the Contractor shall submit a complete draft set of Record Drawings to the Owner and Engineer for review in electronic PDF format and hard copy format when requested by the Engineer. The Owner and Engineer shall review the Record Drawings and provide comments to the Contractor. The Contractor shall modify the Record Drawings as necessary based on the comments provided by the Owner and Engineer.

C. Final Record Documents

Upon incorporation and acceptance of Draft Record Drawing comments from the Owner and Engineer, the Contractor shall submit the Final Record Drawings and documentation. The Contractor shall submit electronic PDF files and CAD files in a format acceptable to the Engineer, along with hard copies if requested by the Owner or Engineer. CAD files shall include necessary drawing files, reference files, line types, fonts, blocks, and other supporting files required to open and reproduce the record drawings. The actual file format and version shall be coordinated with the Engineer.

D. Pre- and Post-Construction Survey

Where required by the Contract Documents, permit requirements, or Engineer, the Contractor shall perform pre-construction and/or post-construction survey of the Project limits or specific areas of the Work. Survey shall be performed by or under the supervision of and certified by a Registered Land Surveyor in the State of Massachusetts. Electronic survey files shall be submitted to the Engineer in PDF and CAD format acceptable to the Engineer. The Contractor shall notify the Owner and Engineer at least 48 hours in advance of each survey.

1.02 RELATED WORK:

A. General Requirements in their entirety.

B. Division 02 through Division 33.

1.03 AS-BUILT DOCUMENTS:

A. Contractor shall maintain on site, separate from the documents used for construction, one complete set of the documents listed below, and as construction progresses, shall legibly record on these documents all changes made during construction.

1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other Modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Written interpretations and clarifications.
7. Field Orders.
8. Field test reports properly verified.

B. The completed set of documents shall include but are not limited to:

1. Significant deviations of any nature made during construction.
2. Final horizontal and vertical locations of the multi-use path, boardwalk, road crossings, driveway crossings, drainage structures, utilities, signage, pavement markings, limits of restoration, and other constructed improvements where changed from the Contract Drawings.
3. Field changes, substitutions, unforeseen conditions, abandoned items, removed items, and items installed in locations different from those shown on the Contract Drawings.

C. The completed set of as-built documents shall be submitted to the Engineer with the final Application for Payment.

PART 2 - MATERIALS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 92 13

OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. This section includes procedural requirements for compiling and submitting operation and maintenance data, where required by individual technical specification sections, to complete the project.

1.02 RELATED WORK:

A. Individual Technical Specification Sections Specific for Operation and Maintenance Data.

B. Section 01 33 23, SUBMITTALS

C. Section 01 78 00, PROJECT CLOSEOUT

1.03 FORMAT:

A. Prepare data in form of an instructional manual.

B. Binders: Commercial quality, 8 ½- x 11-inch three-ring binders with hardback, washable, plastic covers; two inch maximum ring size. When multiple binders are used, correlate data into related, consistent groupings. Provide a table of contents in each binder.

C. Cover: Identify each binder cover and spine with typed or printed title OPERATION AND MAINTENANCE INSTRUCTION; list title of Project facility; identify subject matter of contents.

D. Arrange contents by systems under section numbers and sequence of Table of Contents.

E. Provide tabbed flyleaf for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer’s printed data, or typewritten data - on 20-pound paper.

G. Drawings: Provide with reinforced punched, binder tab. Bind in with text; fold larger drawings to size of text pages.

H. Submit certification that the data and drawings provided pertain exactly to the model, size, and series product and equipment installed in the work.

I. All documents will be electronically scannable.

J. All products, systems, and drawings shall be cross-referenced with tag ID numbers, detail references, or other identifying information, where applicable.

K. The manual for each product, system, or piece of equipment requiring operation and maintenance data shall be a separate document or separate tab within the project closeout manual, as applicable:

1. Contents:

Table of Contents and Index

Brief description of each system and components

Starting and stopping procedures

Special operating instructions

Routine maintenance procedures

Manufacturer's printed operating and maintenance instructions, parts list, illustrations, and diagrams

One copy of each wiring diagram

One copy of each approved shop drawing and each Contractor's coordination and layout drawing

List of spare parts, manufacturer's price, and recommended quantity

Name, address and telephone number of local service representatives.

2. Material

Loose leaf on 60 pound, punched paper

Holes reinforced with plastic cloth or metal

Page size, 8 ½- x 11-inches

Diagrams, illustrations and attached foldouts as required, of original quality, reproduced by dry copy method

Covers: oil, moisture and wear resistant 9 x 12 size

1.04 QUALITY ASSURANCE:

A. Prepare instructions and data by personnel experienced in maintenance and operations of described products.

1.05 CONTENTS, EACH VOLUME (BINDER):

A. Table of Contents: Provide title of Contract, schedule of products and systems, indexed to content of the volume. A listing of all relevant tag ID numbers for each volume shall be placed immediately after the Table of Contents.

B. For each product or systems: List names, addresses, and telephone numbers of subcontractors and suppliers, including local source of suppliers and replacement parts.

C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

E. Text: As required to supplement product data, provide logical sequence of instructions for each procedure incorporating manufacturer' s instructions.

F. Warranties, Guarantees, and Bonds: Include copies of each, where applicable.

G. See O&M Manual Review Checklist at end of this specification section.

1.06 MANUAL FOR MATERIALS AND FINISHES:

A. Building Products, Applied Materials, and Finishes: Include product data with catalog number, size composition, and color and texture designations. Provide information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional Requirements: As specified in individual product specification sections.

1.07 MANUAL FOR EQUIPMENT AND SYSTEMS:

A. For each product, system, or item of equipment requiring operation and maintenance data, include manufacturer's product data, installation information, maintenance recommendations, warranty information, approved shop drawings, replacement parts information, and contact information for manufacturer and supplier.

B. Include electrical data, wiring diagrams, controls information, startup procedures, testing records, spare parts, and training information only where applicable and required by the Contract Documents.

1.08 SUBMITTALS:

A. Submit draft and final copies of operation and maintenance manuals as described in Section 01 33 23, SUBMITTALS.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

OPERATION AND MAINTENANCE MANUAL
REVIEW CHECKLIST

1. Name, address, telephone of the manufacturer	☐
2. Name, address, contact name, telephone of local representative	☐
3. Name, address, telephone of the contractor	☐
4. Exploded view/general arrangement of materials of construction	☐
5. Description of operation/operating principal	☐
6. Project specific Operating parameters	☐
7. Wiring Diagrams (If Applicable)	☐
8. Troubleshooting checklist	☐
9. Recommended spare parts list with prices, and ordering instructions	☐
10. Model number and the serial number of the model provided	☐
11. Performance curves or tabulated data, if applicable	☐
12. Routine Maintenance instructions/service instructions with recommended Intervals	☐
13. Assembly and disassembly instructions	☐
14. Recommended lubricants and lubrication schedule, if applicable	☐
15. Approved copies of Shop Drawings are to be included in the manual	☐
16. Startup/break-in and adjustment instructions, if applicable	☐
17. Warranty information	☐

Reviewed By: _____ Date: _____
Weston & Sampson Engineers

END OF SECTION

SECTION 02 41 13

SELECTIVE SITE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Selective removal, salvage, documentation, protection, storage, transfer, and resetting of existing site features affected by the Work.
2. Removal and resetting by the Contractor of only those existing signs expressly designated in the Contract Documents as REMOVE AND RESET, including designated municipal street-name signs, private-way signs, regulatory signs, warning signs, and directional signs.
3. Removal and salvage, without resetting by the Contractor, of granite pillars and private improvements or encroachments located wholly or partially within the public right-of-way, except where an item is expressly identified for resetting by the Contractor.
4. Disconnection, safe termination, removal, and salvage by the Contractor of private lighting and associated electrical components specifically identified for removal or salvage on the Drawings, in accordance with Article 3.6. Coordination with the Owner, utility owners, and separate contractors for work by others involving utility-owned lighting, utility poles, guy wires, guy anchors, overhead lines, and related appurtenances.
5. Removal, salvage, cleaning, storage, and resetting by the Contractor of existing cobbles expressly designated for resetting.
6. Removal, salvage, cleaning, storage, and resetting of existing driveway pavers affected by the Work, including preparation of subgrade and base, installation of setting beds, jointing, edge restraints, and furnishing matching replacement and supplemental pavers required to complete the restoration in accordance with Section 32 14 00.
7. Administration of an Owner-authorized opportunity for a specifically identified abutting property owner to arrange removal of designated trees before the Contractor performs such removal.
8. Protection of existing improvements designated to remain and lawful disposal of materials not designated for salvage, reuse, transfer, or relocation.

1.2 RELATED REQUIREMENTS

A. Section 01 12 16 – SCOPE AND SEQUENCE OF WORK: Work by the Owner, work by others, responsibility allocation, sequencing, and coordination requirements.

B. Section 01 31 19.23 – CONSTRUCTION MEETINGS: Preconstruction and progress-meeting coordination requirements.

C. Section 01 32 16 – CONSTRUCTION SCHEDULING: Construction scheduling, sequencing, utility coordination, work by others, and restoration activities.

D. Section 01 55 26.13 – TEMPORARY SIGNAGE AND TRAFFIC CONTROL: Temporary traffic-control devices, signs, barriers, access, and public protection.
E. Section 01 56 26 – TEMPORARY FENCING AND BARRIERS: Temporary fencing, barriers, and access-control requirements.
F. Section 01 56 39 – TREE PROTECTION AND TRIMMING: Protection and trimming of existing vegetation designated to remain.
G. Section 31 00 00 – EARTHWORK: Excavation, subgrade preparation, aggregate base, backfill, compaction, grading, and restoration.
H. Section 31 11 00 – CLEARING AND GRUBBING: Clearing, grubbing, removal, and disposal requirements.
I. Section 31 13 13 – TREE PRUNING AND STUMP REMOVALS: Tree pruning, designated tree removal, stump removal, and related work.
J. Section 32 14 00 – UNIT PAVING: Removal, salvage, resetting, supplemental materials, setting beds, bases, jointing, edge restraints, and tolerances for pavers, cobbles, and Belgian block.
K. Section 10 14 53 – TRAFFIC AND SITE SIGNAGE: Permanent traffic, regulatory, warning, shared-use-path, wayfinding, and site signage.
L. Section 32 17 23 – SHARED-USE PATH PAVEMENT MARKINGS: Permanent shared-use-path pavement markings and coordination with Owner/Town-provided roadway pavement markings.
M. Town of Nantucket Encroachment Policy and requirements of the Department of Public Works, to the extent applicable to the Work.
N. Requirements of utility owners having facilities within or adjacent to the Project limits.

1.3 DEFINITIONS

A. Contractor: The prime contractor under this Contract. References to the Contractor include its subcontractors, suppliers, employees, and persons for whom it is responsible.
B. Owner: The Town of Nantucket. Written direction under this Section shall be issued only by the Owner or the Owner’s authorized representative identified in the Contract Documents.
C. Property Owner: An abutting private property owner or leasehold owner. A Property Owner is not authorized to direct the Contractor or modify the Work.
D. Designated Sign: An existing sign that is expressly shown, scheduled, or directed in writing by the Owner to be removed and reset by the Contractor. The term includes only the sign panel, post, support, hardware, and foundation components specifically identified.
E. Private ROW Encroachment: A privately placed or privately owned sign, mailbox, granite pillar, fence, post, wall, gate, paver, cobble, decorative stone, irrigation component, lighting component, planting, landscape feature, or other improvement located wholly or partially within a public right-of-way, sidewalk easement, or bike-path easement.
F. Remove and Salvage: Carefully detach, clean as required, label, photograph, protect, and store or transfer an item for possible future use, return to its claimant, or relocation by others. Remove and Salvage does not include resetting.
G. Remove and Reset: Carefully detach, clean, protect, and reinstall an item within the limits of the Work at the location shown or directed in writing by the Owner.

H. Relocate by Others: Work performed under a separate arrangement by the Owner, utility owner, Property Owner, or another contractor. Unless expressly stated otherwise, relocation by others is not included in the Contractor's Work.

I. Written Direction: A written directive, approved submittal notation, field order, change order, or other written instruction issued by the Owner's authorized representative. Oral statements by Property Owners or third parties are not Written Direction.

1.4 CONTROLLING ALLOCATION OF RESPONSIBILITY

A. The Contractor shall reset Designated Signs, cobbles, pavers, and Belgian block required to be restored under Section 32 14 00. Reset other items only where expressly identified as REMOVE AND RESET in the Contract Documents or assigned by Written Direction. For items outside these assigned categories, a requirement to salvage, protect, or store does not include resetting. Temporary removal and replanting of vegetation designated to remain, when authorized in writing by the Owner solely for protection during construction, shall be performed by the Contractor in accordance with Section 01 57 19, Paragraph 3.07.D.

B. Except for the signs, cobbles, driveway pavers, and Belgian block assigned to the Contractor under Paragraph A, private improvements and Private ROW Encroachments shall not be reset by the Contractor within the public right-of-way unless expressly assigned by Written Direction.

C. No Property Owner, occupant, tenant, utility representative, or other third party may add to, delete from, relocate, or otherwise modify the Contractor's Work. The Contractor shall refer all such requests to the Owner and shall proceed only upon Written Direction.

D. The Contractor shall not infer responsibility from ownership, apparent use, proximity to a residence, or prior location. When the required disposition is unclear or conflicts with another Contract Document, stop work affecting the item, protect it, and submit a request for information before proceeding.

E. Resetting of a private-way sign or other Designated Sign at the Owner's direction does not constitute a representation by the Contractor or Owner concerning title, ownership, authorization, permit status, historical status, or a continuing private right to occupy the public right-of-way.

F. Work by others does not relieve the Contractor of its duties to provide timely notice, access, protection, sequencing, and coordination expressly assigned by the Contract Documents. Responsibility for the actual means, methods, execution, and completion of work by others remains with the party performing that work.

G. New trees, plantings, and other private improvements expressly identified in the Contract Documents as PROPERTY OWNER WORK shall be furnished and installed by the Property Owner under a separate arrangement at the Property Owner's expense. These items are excluded from the Contractor's Work. This exclusion does not apply to paving restoration assigned under Section 32 14 00, planting or restoration expressly assigned to the Contractor elsewhere in the Contract Documents, or repair and replacement required because of Contractor damage. Property Owner requests for additional work shall be referred to the Owner and shall not modify the Contractor's scope without Written Direction.

1.5 RESPONSIBILITY SCHEDULE

This schedule is intended to establish the minimum responsibility allocation. Detailed execution requirements in Part 3 remain applicable. In case of an unresolved discrepancy, obtain Written Direction before disturbing the affected item.

Existing Item	Contractor Responsibility	Reset by Contractor?	Responsibility of Owner / Utility / Property Owner / Others
Designated Signs, including designated municipal street-name, private-way, regulatory, warning, and directional signs	Inventory, remove, salvage, protect, provide temporary equivalent sign function where required, and reset at the location shown or directed. Replace components damaged by Contractor operations.	YES - only when expressly designated REMOVE AND RESET.	Owner confirms final location and disposition. Utility or third-party approval remains required where applicable.
Existing signs not expressly designated for resetting	Protect in place. If they conflict with the Work, stop and obtain Written Direction. If directed to remove, salvage and transfer as directed.	NO, unless added by Written Direction.	Owner determines disposition and whether separate authorization is required.
Granite pillars, caps, plaques, entrance markers, and associated private components	Document, carefully remove where shown, salvage, label, protect, and deliver or store as directed. Do not create a receiving foundation unless expressly shown.	NO.	Owner or Property Owner, under a separate arrangement and only with required authorization, is responsible for final relocation or resetting outside the right-of-way or at another approved location.
Mailboxes, fences, gates, walls, posts, landscape edging, irrigation, decorative stones, landscape ornaments, and other Private ROW Encroachments	Protect if remaining. Where removal is required, document, salvage when directed, and transfer or store in accordance with this Section.	NO, except where the Drawings expressly require removal and resetting or reinstallation by the Contractor.	Owner determines disposition. Property Owner is responsible for any authorized reinstallation under a separate arrangement. No reinstallation within the right-of-way without Owner authorization.

Existing Item	Contractor Responsibility	Reset by Contractor?	Responsibility of Owner / Utility / Property Owner / Others
Existing cobbles and pavers affected by the Work and required to be restored.	Carefully remove, sort, clean, store, protect, and reuse suitable units to the maximum extent practicable. Reconstruct base and setting bed; reinstall units, complete jointing, and provide required edge restraints to match existing paving and adjacent grades. Furnish and install matching replacement or additional units needed to complete the specified restoration at no additional cost to the Owner or Property Owner. Comply with Section 32 14 00.	YES.	Owner confirms restoration limits and pattern where not shown.
Private lighting designated for removal or salvage, including associated electrical components	Include disconnection by Contractor's licensed electrician, safe termination of affected wiring and conduit, removal, salvage, protection, storage, and restoration in accordance with Article 3.6.	NO.	Any future installation outside the public right-of-way is the Property Owner's responsibility, subject to required approvals. No reinstallation is included in this Contract or authorized by the Contract Documents.
Utility-owned lighting and associated facilities	Protect facilities and coordinate access, scheduling, and construction sequencing. Do not disconnect, remove, relocate, or alter utility-owned facilities.	NO.	Utility owner or its authorized contractor performs required disconnection, removal, relocation, reconnection, testing, and energization.
Utility poles, guy wires, guy anchors, overhead lines, and utility-owned attachments	Protect, coordinate, provide required notices, maintain safe access, and sequence the Work around utility relocation. Do not loosen, cut, remove, relocate, support, or alter the facilities except under the utility owner's written procedures and direct authorization.	NO.	The applicable utility owner is responsible for relocation of facilities shown for relocation, including poles, guy wires, guy anchors, and overhead lines.

Existing Item	Contractor Responsibility	Reset by Contractor?	Responsibility of Owner / Utility / Property Owner / Others
Trees identified for removal	Remove in accordance with Sections 31 11 00, CLEARING AND GRUBBING, and 31 13 13, TREE PRUNING AND STUMP REMOVALS, as applicable, unless the Owner issues a Property Owner Tree Removal Election Notice. Protect trees until the authorized removal window begins.	Not applicable.	A specifically identified Property Owner may arrange removal at its sole cost only after Owner authorization and in accordance with the Election Notice. Failure to complete by the deadline returns the work to the Contractor.
Property bounds and survey monuments	Protect in place. If disturbed or damaged by Contractor operations, restore or reset by a Professional Land Surveyor at no additional cost to the Owner.	YES, if damaged by Contractor.	Owner confirms acceptance of surveyor's restoration documentation.

1.6 PRECONSTRUCTION VERIFICATION AND INVENTORY

A. Before selective demolition, conduct a joint field review with the Owner. Review each item within the limits of disturbance and assign one disposition: protect in place, remove and reset by Contractor, remove and salvage without resetting, relocate by others, authorized Property Owner tree removal, or dispose.

B. Submit a photo inventory keyed to plan stationing, address or property frontage, and item number. Record apparent ownership or claimant only for identification; such notation does not determine legal ownership.

C. For each Designated Sign, record sign wording, sign type, size, orientation, support type, mounting height, lateral offset, condition, foundation type, and existing location.

D. For granite pillars, pavers, cobbles, and other salvaged items, record original location, orientation, pattern, exposed height, quantity, condition, and intended transfer or storage location.

E. The Contractor shall not remove an item until its disposition is confirmed in the approved inventory or by Written Direction, except where immediate action is necessary to protect life or property.

1.7 SUBMITTALS

A. Selective Demolition, Salvage, and Responsibility Plan: Annotated plan and schedule identifying each item, assigned disposition, responsible party, proposed sequence, and storage or transfer location.

B. Existing Conditions Documentation: Dated photographs and video of items to remain, be removed, be reset, be salvaged, or be relocated by others, including adjacent pavement, vegetation, walls, driveways, and private improvements.

C. Sign Inventory and Temporary Sign Plan.
D. Utility Coordination Log: Contacts, notices, meetings, utility work requests, anticipated relocation dates, restrictions, and written confirmations affecting lighting, poles, guy wires, guy anchors, and overhead facilities.
E. Property Owner Tree Removal Election Coordination Log, when applicable.
F. Transfer Receipts: Signed receipts identifying items delivered to the Owner, Property Owner, utility owner, or other authorized recipient.
G. Closeout Inventory: Final disposition and location of each salvaged or reset item, including photographs of completed resetting.

1.8 COMMUNICATION WITH PROPERTY OWNERS AND THIRD PARTIES

A. The Owner retains sole authority to determine the scope and disposition of items within the public right-of-way and to authorize access or work by a Property Owner or separate contractor.
B. The Contractor may coordinate dates, access, staging, and safety interfaces directly with a Property Owner or the Property Owner's contractor only after the Owner has issued Written Direction authorizing that coordination.
C. Direct coordination does not create contractual privity, transfer the Contractor's obligations, authorize extra work, or modify the Contract Sum or Contract Time.
D. The Contractor shall immediately provide the Owner copies of material written communications with Property Owners concerning removals, salvage, access, alleged damage, or requests to alter the Work.
E. Do not make commitments regarding ownership, compensation, replacement, legal rights, encroachment status, final location, or reinstallation of private property.

1.9 PROPERTY OWNER TREE REMOVAL ELECTION

A. Purpose: Permit a specifically identified abutting Property Owner, at the Owner's sole discretion, an opportunity to arrange removal of designated trees before the Contractor removes them. This procedure does not concede ownership of a tree located within the public right-of-way or grant a general right to perform work within the right-of-way.
B. Contractor Notice: Include the anticipated tree-removal date in the three-week look-ahead schedule and provide the Owner not less than 15 calendar days notice before the planned removal date for trees subject to a potential election, unless a different period is established in writing.
C. Election Notice: Only the Owner may issue a written Property Owner Tree Removal Election Notice. The notice shall identify the specific trees, authorized limits of work, whether stump and root removal are included, required disposition of wood and debris, access route, insurance and permit requirements, authorized work hours, and completion deadline.
D. Property Owner Responsibility: The Property Owner shall engage and pay its own qualified and insured tree contractor; obtain required approvals and permits; comply with the Election Notice; protect the public, utilities, adjoining property, and improvements; and remove authorized debris unless the Election Notice states otherwise.

E. No Work Before Authorization: Neither the Property Owner nor its contractor may enter the Project work zone or begin tree work until the Owner has issued the Election Notice and the Contractor has confirmed the approved access and work window.

F. Means and Methods: The Property Owner and its tree contractor are solely responsible for their means, methods, sequences, safety precautions, supervision, employees, equipment, and damage caused by their operations. The Contractor remains responsible for coordinating the interface with its Work and maintaining overall site access and public protection within its Contract responsibilities.

G. Completion Deadline: The Property Owner's authorized removal work shall be complete, debris removed, and the area made safe no later than the deadline in the Election Notice. If the work is incomplete, noncompliant, unsafe, or not commenced as scheduled, the Owner may revoke the election and direct the Contractor to proceed with removal under the Contract without further notice to the Property Owner.

H. Contractor Resumption: Before resuming work in the area, document the condition left by the Property Owner's contractor and notify the Owner of incomplete stump removal, debris, damage, unsafe conditions, or work outside the authorized limits.

I. Schedule and Cost: Effects of an Owner-authorized election on Contract Sum or Contract Time, if any, shall be determined only under the change and delay provisions of the Contract Documents. No oral representation constitutes approval of additional compensation or time.

1.10 UTILITY AND GUY-WIRE COORDINATION

A. The utility owner having ownership or control of a utility pole, guy wire, guy anchor, overhead line, or attachment is responsible for performing or authorizing relocation of that facility when shown for relocation.

B. The Contractor shall not cut, loosen, detach, remove, shift, temporarily support, relocate, or otherwise alter a utility pole, guy wire, guy anchor, overhead line, or utility-owned attachment unless the utility owner has provided written authorization and procedures and the work is expressly assigned to the Contractor by Written Direction.

C. Coordinate bike-path construction and utility relocation with the applicable utility owner to maintain public safety and avoid interruption of service. Provide the utility owner and Owner the Contractor's schedule, required access dates, excavation limits, and grade information sufficiently in advance to permit the utility work to be performed.

D. Provide at least 48 hours notice to the affected utility before working in the immediate vicinity of its poles, anchors, manholes, conduits, or related facilities, and provide any longer notice required by the utility owner or Contract Documents.

E. Before excavation, comply with Massachusetts Dig Safe notice requirements and preserve utility markings. Utility markings do not relieve the Contractor of responsibility for careful excavation, utility verification, and protection.

F. Do not excavate, grade, compact, stockpile, operate equipment, or place surcharge loads in a manner that reduces the stability of a pole, guy anchor, or utility facility. When pole holding, temporary support, or a changed work sequence may be required, stop and obtain direction from the utility owner and Owner.

G. Do not cover, bury, pave over, or render inaccessible an existing or relocated guy anchor, grounding component, handhole, or utility appurtenance unless approved in writing by the utility owner and Owner.
H. If a utility relocation is incomplete when the Contractor reaches the area, protect the facility, maintain safe access, notify the Owner immediately, and proceed in accordance with the Contract scheduling and change provisions. Do not independently alter the utility facility.

1.11 QUALITY ASSURANCE AND FIELD CONDITIONS

A. Use workers experienced in selective removal and salvage of comparable signs, granite, cobbles, and pavers.
B. Maintain required regulatory, warning, street-name, private-way, and directional sign functions throughout construction. Provide temporary signs where a Designated Sign is removed before permanent resetting.
C. Existing conditions shown are based on available survey and field information and may not identify every encroachment, concealed foundation, utility, irrigation component, or private improvement.
D. Promptly notify the Owner of unidentified items, disputed ownership, conflicting instructions, concealed utilities, unrecorded services, or conditions that differ from the approved inventory.
E. Repair or replace, at no additional cost to the Owner, items designated to remain, be salvaged, or be reset when damaged by Contractor operations.

PART 2 - PRODUCTS

2.1 SALVAGED MATERIALS

A. Existing items accepted for reuse shall be sound, clean, and free of damage that would impair appearance, function, or installation.
B. Do not reuse cracked, bent, heavily corroded, spalled, or otherwise unsuitable components without Owner approval.
C. Salvaged materials remain the property of the party determined by the Owner. Custody by the Contractor does not establish ownership.

2.2 REPLACEMENT AND SUPPLEMENTAL MATERIALS

A. Sign Posts and Hardware: Match existing type, size, finish, breakaway requirements, and corrosion resistance unless otherwise indicated.
B. Aggregate Base for Pavers and Cobbles: Well-graded, dense-graded crushed stone complying with the applicable earthwork or unit-paving specification; free of organic matter, clay lumps, and deleterious material.
C. Bedding and Jointing Materials for Cobbles: Materials specified for the proposed installation and compatible with the existing cobbles and intended use.
D. Concrete for Sign Foundations: Comply with the applicable cast-in-place concrete requirements and authority standards.

E. Replacement Materials: Match existing material, dimensions, finish, color, and performance when replacement is required because of Contractor damage.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify limits of selective demolition and the disposition assigned to each existing item before beginning removals.
B. Review discrepancies between field conditions, Drawings, and the approved inventory with the Owner. Do not proceed based on assumption.
C. Locate active electrical, communications, irrigation, and other utilities serving items to be removed or relocated. Arrange required mark-out, shutdown, disconnection, temporary service, and utility-owner attendance.
D. Do not begin removal of lighting, utility facilities, granite pillars, Private ROW Encroachments, or trees subject to an election until required coordination and Written Direction are complete.

3.2 PREPARATION AND PROTECTION

A. Provide barriers, fencing, warning devices, traffic controls, temporary access, and other measures required to protect the public, workers, adjoining property, and improvements to remain.
B. Protect trees, vegetation, walls, pavements, utilities, driveways, structures, survey monuments, and site features adjacent to removal operations.
C. Establish Owner-approved storage areas on stable ground outside drainage paths, active travel ways, root-protection zones, and areas needed by others. Separate materials by item number and claimed ownership.
D. Label salvaged items with durable, weather-resistant tags identifying inventory number, original station or frontage, date removed, and intended disposition.
E. Provide temporary support only when designed, authorized, and performed in accordance with the requirements of the party owning or controlling the supported facility.

3.3 SELECTIVE DEMOLITION - GENERAL

A. Perform removals carefully, using hand methods where necessary to protect items intended for salvage, resetting, transfer, or continued service.
B. Cut existing materials along straight, neat limits and avoid overbreak, undermining, and unnecessary disturbance.
C. Remove foundations, anchors, and abandoned components within the proposed construction section only where shown or directed. Do not remove utility-owned foundations, anchors, conduits, or grounding components without utility-owner authorization.
D. Temporarily fill, plate, barricade, or otherwise protect holes and voids until permanent construction is completed.
E. Do not burn removed materials on Site.

3.4 DESIGNATED SIGNS - REMOVE AND RESET

A. Remove and reset only Designated Signs. Private-way signs are included only when expressly designated for removal and resetting.

B. Before removal, complete the approved sign inventory, photograph each face and support, and mark panels, posts, brackets, and hardware to preserve correct pairing and orientation.

C. Remove sign panels, posts, anchors, and foundations carefully. Store panels vertically with protective separators and prevent bending, scratching, staining, or damage to reflective sheeting and lettering.

D. Provide and maintain temporary signs whenever removal of a Designated Sign would eliminate a required regulatory, warning, wayfinding, or identification function. Temporary signs shall provide an equivalent message and comply with authority requirements.

E. Reset signs at locations shown or directed in writing by the Owner. Maintain required visibility, lateral offset, mounting height, orientation, clear-zone requirements, breakaway characteristics, and accessible clearances.

F. Do not reset a sign where it obstructs the multi-use path, pedestrian access route, roadway sight triangle, driveway sight line, drainage, or required utility clearance. Notify the Owner and obtain a revised location.

G. Use new posts, foundations, or hardware only where shown, approved, or required to replace components made unsuitable by Contractor operations.

3.5 GRANITE PILLARS AND OTHER PRIVATE ROW ENCROACHMENTS

A. Granite Pillars: Record original location, orientation, exposed height, condition, associated frontage, caps, plaques, pins, and hardware before removal.

B. Lift granite using nonstaining straps, padded clamps, or other methods that do not chip, crack, scratch, or stain exposed surfaces. Do not place chains directly against exposed stone.

C. Store granite on timber blocking in a stable, protected location. Prevent direct contact between units and protect plaques and loose components separately.

D. The Contractor shall not reset granite pillars, construct replacement foundations, or relocate pillars onto private property unless expressly assigned by Written Direction.

E. Other Private ROW Encroachments: Where removal is required, carefully remove and salvage items identified by the Owner. Do not disassemble more than necessary, and retain associated fasteners and parts with the item.

F. Transfer salvaged private items to the Owner, an authorized Property Owner, or another recipient only as directed by the Owner and only after obtaining a signed transfer receipt.

G. If a Property Owner refuses delivery, cannot be identified, disputes ownership, or requests reinstallation, protect the item and refer the matter to the Owner. Do not discard, deliver to another person, or reinstall the item without Written Direction.

H. Do not reinstall Private ROW Encroachments within the public right-of-way except for Designated Signs, designated cobbles, and driveway pavers and Belgian block assigned to the Contractor under Paragraph 1.4.A, or other items expressly assigned by Written Direction. Perform resetting only within the locations and limits authorized by the Contract Documents.

3.6 EXISTING LIGHTING

A. Private Lighting: Include in the Contract Price the disconnection, safe termination, removal, and salvage of privately owned light posts, uplights, fixtures, and associated electrical components specifically identified for removal or salvage on the Drawings. Include associated wiring, conduit, attachments, and foundations within the indicated removal limits as necessary to complete the Work.

B. Electrical work shall be performed by the Contractor's licensed electrician in accordance with Section 02 41 19.16. Before removal, identify the source of supply, confirm the affected circuits and termination points, arrange authorized shutdowns, and verify de-energization. Disconnect and safely terminate affected wiring and conduit. Protect and maintain electrical services and equipment designated to remain.

C. Coordinate shutdowns, access, removal limits, and sequencing with the Owner and affected Property Owner. Obtain Owner authorization and required access permission before entering private property or accessing privately owned electrical equipment. Property Owner coordination shall not authorize changes to the Contract Work.

D. Carefully remove and salvage designated light posts and fixtures. Label, protect, store, and make salvaged items available to the applicable Property Owner as directed by the Owner. Dispose of associated materials not designated for salvage. Backfill and compact removal excavations and restore affected areas in accordance with the Contract Documents.

E. The Contractor shall not relocate, reinstall, or reconnect salvaged private lighting. Any future installation outside the public right-of-way shall be the Property Owner's responsibility, subject to required approvals. Salvage or return of an item does not authorize its reinstallation within the public right-of-way.

F. Utility-owned lighting and associated facilities shall be disconnected, removed, relocated, reconnected, tested, and energized only by the utility owner or its authorized contractor. The Contractor shall protect these facilities and coordinate access, scheduling, and construction sequencing.

G. If ownership, circuit routing, termination points, or removal limits are unclear, protect the affected facilities and obtain Written Direction from the Owner before disturbance. Promptly report concealed wiring, conduits, unrecorded services, and conflicts. Coordination and Written Direction confirming the designated private-lighting removal scope do not, by themselves, constitute additional work.

3.7 UTILITY POLES, GUY WIRES, GUY ANCHORS, AND OVERHEAD FACILITIES

A. Relocation of utility poles, guy wires, guy anchors, overhead lines, and utility-owned attachments shown for relocation shall be performed by the applicable utility owner.

B. The Contractor's Work is limited to notice, scheduling, access, protection, coordination, and construction sequencing unless Written Direction expressly assigns additional work.
C. Before working near a pole or guy anchor, verify that the utility owner has completed required relocation or issued written instructions for working around the facility.
D. Maintain utility access at all times. Do not stockpile materials, park equipment, construct pavement, or place fill where it interferes with utility operations or access to an anchor, pole, handhole, or grounding component.
E. Immediately stop work and notify the Owner and utility owner if excavation exposes an unmarked anchor, grounding system, conduit, or other facility, or if construction may affect pole stability or conductor clearance.
F. Repair costs, emergency response costs, and service-restoration costs resulting from Contractor damage or unauthorized interference shall be borne by the Contractor, subject to the Contract Documents.

3.8 PROPERTY OWNER TREE REMOVAL ELECTION - FIELD EXECUTION

A. Protect designated trees from disturbance until the Owner confirms whether an election will be issued or the election period has expired.
B. When an Election Notice is issued, establish the approved access and work limits, coordinate separation from the Contractor's operations, and confirm the completion deadline in writing.
C. Do not direct or control the Property Owner's tree contractor's means, methods, or safety program. The Contractor may enforce Project access restrictions, stop its own adjacent work, and notify the Owner of unsafe or noncompliant conditions.
D. Do not permit the Property Owner's tree contractor to remove additional trees, prune trees designated to remain, alter grades, disturb protected vegetation, damage utilities, or stockpile material outside the authorized limits.
E. After the Property Owner's work, jointly document the area with the Owner. Complete Contract work remaining within the limits, including stump or root removal, grading, erosion control, and restoration, only to the extent assigned by the Election Notice and Contract Documents.
F. If no valid election is issued, or if the election is revoked or expires, remove the trees and complete associated stump, root, clearing, grubbing, disposal, grading, and restoration work in accordance with Sections 31 11 00, CLEARING AND GRUBBING, and 31 13 13, TREE PRUNING AND STUMP REMOVALS, as applicable, and the Drawings.

3.9 COBBLES - SALVAGE AND RESET

A. Perform removal, salvage, replacement, and resetting of cobbles in accordance with Article 3.10 and Section 32 14 00.
B. Store in stable bins, pallets, or segregated piles at approved locations. Prevent mixing with unsuitable materials or with cobbles from other areas where a matching pattern is required.
C. Reconstruct subgrade and aggregate base to indicated lines and grades. Compact uniformly and provide positive drainage.

D. Reset to match the existing pattern, orientation, spacing, surface character, and adjacent elevations unless otherwise indicated. Set units firmly without rocking and fill joints with specified material.
E. Replace cobbles damaged or lost due to Contractor operations with matching units at no additional cost to the Owner.

3.10 COBBLES AND PAVERS – SALVAGE AND RESET

A. Document existing paving pattern, border configuration, materials, joint widths, grades, drainage, and transition conditions before removal.

B. Carefully remove, clean, sort, label, store, and protect existing pavers. Salvage and reuse suitable units to the maximum extent practicable. Prevent chipping, staining, loss, and mixing of paver types.

C. Complete the paver restoration required by Section 32 14 00, including excavation, subgrade preparation, aggregate base, setting bed, paver installation, jointing, edge restraints, and compaction appropriate to the paving assembly.

D. Furnish matching replacement and supplemental pavers wherever salvaged quantities are insufficient or units are damaged, lost, or unsuitable for reuse. Include all such materials and installation in the Contract Price, whether the shortage results from existing unit condition, removal losses, Contractor operations, or additional quantities required within the specified restoration limits. No additional payment by the Owner or Property Owner will be made for these materials or installation.

E. Submit proposed replacement and supplemental pavers for review in accordance with Section 32 14 00 before installation. Where an exact match is unavailable, obtain approval of the proposed closest available match.

F. Restore paving to the required lines, grades, slopes, pattern, and drainage conditions, with stable units and smooth transitions to adjacent surfaces. Reconstruct underlying materials and drainage features in accordance with Section 32 14 00.

G. Protect prepared bases, salvaged materials, and completed paving until acceptance. Correct damage and defective work caused by Contractor operations at no additional cost to the Owner or Property Owner.

3.11 STORAGE, TRANSFER, AND CHAIN OF CUSTODY

A. Keep a continuous inventory of each salvaged item from removal through resetting, delivery, or final transfer.
B. Do not place salvaged items on private property without authorization from the Owner and the receiving Property Owner.

C. For each transfer, obtain a dated receipt identifying the item, inventory number, condition, recipient, delivery location, and recipient signature.
D. Risk of loss or damage remains with the Contractor while an item is in the Contractor's custody. Custody ends only upon documented acceptance by the Owner or authorized recipient, except as otherwise provided by the Contract Documents.
E. Do not dispose of any publicly owned item, Private ROW Encroachment, Designated Sign, granite component, paver, cobble, or utility component without Written Direction.

3.12 REPAIRS AND RESTORATION

A. Repair demolition beyond authorized limits and match adjacent materials, finishes, grades, drainage, and construction.
B. Restore disturbed subgrade, pavement edges, shoulders, turf, planting areas, drainage features, and improvements not incorporated into the permanent Work.
C. Where removed items leave holes or voids outside subsequent construction limits, backfill with suitable material and compact to match surrounding conditions.
D. Replace signs, cobbles, pavers, granite, private items, lighting components, utility facilities, or other materials damaged by improper Contractor handling with matching materials acceptable to the Owner or controlling utility.

3.13 DISPOSAL AND CLEANING

A. Remove debris and materials not designated for salvage, reset, transfer, or relocation and dispose of them lawfully.
B. Maintain work and storage areas in a neat and safe condition. Remove loose fasteners, wire, broken masonry, vegetation debris, and other hazards daily.
C. At completion, reconcile sign and salvaged-material inventories with the Owner and remove temporary signs and protections only after permanent work and required transfers are accepted.

END OF SECTION

SECTION 02 41 19.16

MINOR ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes: Electrical demolition assigned to the Contractor in the Contract Documents, including disconnection, safe termination, removal, and salvage of designated private lighting and associated electrical components under Section 02 41 13, Article 3.6. Include this work in the Contract Price. Work specifically assigned to utility owners or others is excluded.
   1. Removal, disconnection, capping, protection, and disposal of existing electrical wiring, conduit, pull boxes, fixtures, equipment, and related electrical items where shown or required.
   2. Coordination with utility companies, Owner, Engineer, and abutters for electrical items, service connections, utility poles, overhead wires, guy wires, appurtenances, and related utility features affected by the Work.
   3. Protection of existing electrical utilities, utility poles, overhead wires, guy wires, service connections, and abutter electrical items to remain.
   4. Disposal of materials.
   5. Storage or return of removed materials designated for salvage by the Owner.
   6. Identification, protection, disconnection, and capping of existing electrical utilities.

B. Related Sections:
   1. Section 02 41 13 – SELECTIVE SITE DEMOLITION

C. C. Scope Exclusions: Work on utility-owned lighting, utility poles, guy wires, guy anchors, overhead lines, and other utility-owned facilities assigned to others under Section 02 41 13 is excluded from the Contractor's electrical demolition work. Relocation, reinstallation, and reconnection of salvaged private lighting are also excluded. These exclusions do not apply to the Contractor's disconnection, safe termination, removal, and salvage of designated private lighting under Section 02 41 13, Article 3.6. Provide required protection, notices, access, scheduling, and coordination for work by others.

1.2 CLOSEOUT SUBMITTALS:

A. Section 01 78 00 – Project Closeout: Requirements for submittals.

B. Project Record Documents: Record actual locations of capped utilities conduits and equipment abandoned in place.

1.3 PRE-INSTALLATION MEETINGS:

A. Convene minimum one week prior to commencing work of this section.

1.4 SCHEDULING:

A. Schedule work to coincide with new construction.

B. Cease operations immediately when structure appears to be in danger and notify Engineer. Do not resume operations until directed.

1.5 COORDINATION:

A. Conduct demolition to minimize interference with adjacent properties, roadways, driveways, utilities, pedestrian and bicycle routes, and portions of the Work to remain.

B. Coordinate and sequence demolition so as not to cause unauthorized shutdown or disruption of existing utilities, facilities, abutter services, or surrounding areas.

C. Identify salvage items in cooperation with Owner.

D. The Contractor shall coordinate with utility companies, the Owner, Engineer, and affected abutters prior to performing work adjacent to existing utility poles, overhead wires, guy wires, service connections, meters, electrical equipment, or other electrical items to remain, be relocated, or be removed by others.

E. Work involving utility-owned facilities shall not proceed until required utility company coordination, approvals, shutdowns, relocations, or protections are complete.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.

B. Verify termination points for demolished services.

3.2 PREPARATION:

A. Erect, and maintain temporary safeguards, including warning signs and lights, barricades, and similar measures, for protection of the public, Owner, Contractor's employees, and existing improvements to remain.

3.3 DEMOLITION:

A. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to the Engineer before disturbing existing installation.

B. For electrical demolition expressly assigned to the Contractor, arrange authorized shutdowns and have qualified electrical personnel disconnect and remove only the identified fixtures, equipment, switches, outlets, conduit, and wiring. Confirm the limits of removal and termination points before proceeding. Do not disconnect or remove existing lighting or utility facilities assigned to others under Section 02 41 13.

C. De-energize electrical equipment and circuits prior to demolition. Work on energized equipment shall not be permitted unless approved in writing and performed in accordance with NFPA 70E by qualified personnel.

D. Cap abandoned empty conduit at both ends.

E. The Contractor shall not remove, relocate, alter, or disconnect utility poles, overhead wires, guy wires, service connections, meters, transformers, or other utility-owned facilities unless the specific work is expressly assigned to the Contractor in the Contract Documents or by Written Direction and the utility owner has provided the required written authorization and procedures. Depiction of a utility relocation on the Drawings alone does not assign that work to the Contractor.

F. Protect and maintain electrical items serving abutters or facilities to remain. Coordinate any required shutdown, removal, or relocation with the utility owner, Owner, Engineer, and affected abutter. Such work shall be performed only by the party assigned responsibility under the Contract Documents or Written Direction.

3.4 CLEANING:

A. Remove demolished materials as work progresses and legally dispose of materials not designated for salvage.

B. Keep workplace neat.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section applies only to cast-in-place concrete associated with site improvements, including exterior flatwork, curbs, equipment pads, foundations, light pole bases, boardwalk footings/piers, anchor bolt setting, embedded items, and incidental site structures.

1.02 RELATED WORK:

A. Section 01 45 23, SPECIAL TESTING AND INSPECTIONS
B. Section 31 00 00, EARTHWORK
C. Section 31 05 19.13, GEOTEXTILE FABRICS
D. Section 32 34 13, PREFABRICATED STEEL BOARDWALK
E. Section 32 92 19, SEEDING
F. Items furnished under other Sections and installed under this Section include, but are not limited to: anchors, sleeves, castings, frames, posts, boardwalk base plates, anchor bolts, embedments, templates, and other embedded items shown on the Drawings or approved shop drawings.

1.03 REFERENCES:

A. The following standards form a part of these specifications:

American Concrete Institute (ACI)

ACI 301 Structural Concrete for Buildings

ACI 302 Recommended Practice for Concrete Floor and Slab Construction

ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Replacing Concrete

ACI 305 Recommended Practice for Hot Weather Concreting

ACI 306 Recommended Practice for Cold Weather Concreting

ACI 318 Building Code Requirements for Reinforced Concrete

ACI 347 Recommended Practice for Concrete Formwork

ASTM International (ASTM)

ASTM	C33	Concrete Aggregates
ASTM	C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM	C42	Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM	C87	Effect of Organic Impurities in Fine Aggregate on Strength of Mortar
ASTM	C94	Ready-Mixed Concrete
ASTM	C143	Standard Method for Slumps 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	C595	Standard Specification for Blended Hydraulic Cements
ASTM	D1751	Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM	D1752	Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

A. Shop drawings of the materials specified herein.

B. Statement of materials constituting the design of mixes which satisfy the specified strength for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the contract.

C. Provide one copy of the "Certificate of Delivery" for each load of concrete as it arrives on

the site, under the provisions of ASTM C94.

D. Submit reinforcing shop drawings showing bar sizes, quantities, spacing, bends, supports, concrete cover, and proposed splice and development details. Identify details requiring clarification before fabrication.

PART 2 - PRODUCTS

2.01 CONCRETE:

A. Concrete conforming to the requirements listed below shall be used where indicated on the drawings. Unless otherwise indicated on the Drawings, concrete for exterior site work shall be 3,000 psi minimum at 28 days. Provide concrete with a minimum compressive strength of 4,000 psi at 28 days for cast-in-place concrete transition walls at boardwalk approaches.

TABLE

Minimum Comp. Strength at 28 days (psi)	Maximum Water/Cement ratio (gallons per bag of cement)*	Cement Factor: 94 lb. Bags per cubic yard minimum**
3000	0.59 (6.9)	5.5
4000	0.48 (5.6)	6.5
5000	0.40 (4.7)	7.4

* Based on air-entrained concrete. If non-air-entrained concrete is called for, the listed maximum water/cement ratios may be increased slightly, as approved by the Engineer. The water is the total water in the mix, including free water on the aggregate.

** These are minimum amounts; increase as necessary to meet mix requirements.

B. Concrete shall conform to ASTM C94. One copy of the Certificate of Delivery required by ASTM C94 shall be delivered to the Engineer immediately upon arrival of each load of concrete at the site. The Contractor shall be responsible for the design of the concrete mixtures.

C. Standard compression tests of all proposed mixes shall be made by the testing laboratory or other satisfactory evidence shall be presented that the design mixes will attain the minimum strengths listed on the design drawings or called for herein, within the limitations of the ACI Code. No concrete shall be delivered to the job site until the Engineer has approved the design mixes.

D. All concrete (unless otherwise directed) shall contain an air-entraining agent. Air entrained concrete shall have an air content by volume of 3 to 6 percent for l-l/2-inch

aggregate and 4 to 8 percent for 3/4-inch aggregate. The air content shall be the responsibility of the testing laboratory and in accordance with ASTM C23l.

E. All concrete shall contain a mid-range water reducer to minimize cement and water content of the mix, at the specified slump, in accordance with ASTM C494.

F. Slump for all concrete shall be from 3-inch to 4-inch, except for concrete using a superplasticizer, when the maximum slump shall be 8-inches. Any concrete having a slump greater than 4-inches (8-inches with superplasticizer) shall be promptly removed from the site.

G. No calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixture other than those specified shall be used in concrete without the specific written permission of the Engineer in each case.

H. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.

2.02 CEMENT:

A. The cement shall be an approved brand of American manufactured Portland Cement, Type IIA conforming to ASTM Cl50. The brand name and type of cement proposed for use shall be submitted to the Engineer for approval immediately following award of contract. Only one color of cement, all of the same manufacture, shall be used for the work.

B. When the use of high-early-strength Portland cement (Type IIIA) is permitted by the Engineer the same strength requirements shall apply, but the indicated strengths shall be attained in 7 days instead of 28 days.

2.03 ADMIXTURES:

A. Air entraining agent shall be in accordance with ASTM C260.

B. Water reducing agent shall be a mid-range water reducer meeting ASTM C494, Type A.

C. Water reducing agent-retarder shall be in accordance with ASTM C494, Type D.

D. Superplasticizer agent shall be in accordance with ASTM C494, Type F or Type G and contain no more than 0.1% chloride ions. Product may be plant added or field added based on the best application considering distance, temperature and time.

2.04 AGGREGATES:

A. Except as otherwise noted, the aggregate shall conform to the requirements of ASTM

C33.

B. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM C33.

C. Coarse aggregate shall consist of well-graded crushed stone or washed gravel conforming to the requirements of ASTM C33.

D. The following designated sizes of aggregate shall be the maximum employed in concrete.

2-inch for mass concrete
1½-inch for reinforced sections 18-inch and over in thickness
3/4-inch for reinforced and unreinforced sections less than 18-inch thickness.

2.05 WATER:

A. Water for concrete shall be potable, free from injurious amounts of oil, acid, alkali, organic matter and other deleterious substances.

2.06 GROUT:

A. Grout shall be mixed in the proportions of one part Portland Cement to 2 parts sand, by volume. Only sufficient water shall be used to enable grout to barely hold its shape when squeezed into a ball in the hand. Aggregate for grout shall conform to the requirements of the reference specification for concrete. Prior approval of the Engineer shall be obtained for the use of proprietary grouts, and the instructions of the Engineer shall be followed in their use.

2.07 CURING MATERIALS:

A. Curing compound shall be a curing/hardener compound such as Acurion by AntiHydro, Sikaguard Cure/Hard by Sika, Super Diamond Clear by Euclid or approved equal.

B. Curing paper shall be a fiber-reinforced laminated Kraft bituminous product conforming to the requirements of ASTM Cl7l.

2.08 JOINT FILLER:

A. Preformed joint filler strip shall conform to ASTM Dl75l or Dl752, having a thickness as indicated on the drawings.

B. Fillers shall be provided in pieces of the full thickness required. Use of multiple layers of thin pieces to make-up the full thickness will not be permitted.

2.09 JOINT SEALANT:

A. Joint sealant, where indicated on the Drawings, shall be suitable for exterior horizontal

concrete paving applications and pedestrian/bicycle traffic.

2.10 REINFORCING STEEL:

A. Deformed reinforcing bars shall conform to ASTM A615/A615M, Grade 60, unless otherwise indicated on the Drawings or required by the approved delegated foundation design.

B. Provide reinforcing bars of the sizes, spacing, and configuration shown on the Drawings. Provide chairs, spacers, ties, and other supports necessary to maintain the specified concrete cover and reinforcement position during concrete placement.

C. Do not weld reinforcing bars unless specifically detailed and approved by the responsible structural engineer.

PART 3 - EXECUTION

3.01 GENERAL:

A. Under no circumstances shall concrete that has set or partially set before placing be used; and no retempering of concrete or grout will be permitted.

B. Concrete placement for exterior site work shall account for seasonal limitations, weather conditions, and site access constraints.

3.02 PREPARATION:

A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or other material which would tend to reduce the bond.

B. Vapor barriers are not required for exterior site concrete unless explicitly indicated on Drawings.

C. When no moisture barrier is used, the earth, concrete, masonry, or other water-permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

D. When joining fresh concrete to concrete which has attained full set, the latter shall be cleaned by chipping and washing off all dirt and scum and laitance. It then shall be moistened prior to placing new concrete.

E. Concrete surfaces that act as a seat for structural members (other than those resting on grout) shall be troweled to an extremely flat and level surface. If necessary, such surfaces shall be ground off to achieve the required flatness and level.

F. Fill concrete on top of concrete shall be placed in the locations indicated on the drawings or designated by the Engineer. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before the grout has dried or set. Fill concrete shall be brought to the lines and grades shown on the drawings or approved by the Engineer.

G. Concrete for thrust and anchor blocks shall be placed against undisturbed earth and wooden side forms shall be used to provide satisfactory lines and dimensions. Felt roofing paper shall be placed to protect joints. No concrete shall be placed so as to cover joints, bolts or nuts, or to interfere with the removal of the joints. Minimum bearing areas and dimensions shall be as shown on the drawings.

H. Forms for exterior concrete paving, curbs, pads, and other site concrete shall be straight, true to line and grade, securely staked or braced, clean, and mortar-tight. Forms shall be removed without damaging adjacent concrete and disturbed areas shall be restored.

I. Install and secure reinforcement in accordance with the Contract Drawings and reviewed reinforcing shop drawings. Maintain specified concrete cover. Splices, development lengths, hooks, and bar terminations shall conform to the responsible structural engineer's design and applicable ACI 318 requirements. Obtain clarification of missing reinforcement details before fabrication or placement.

3.03 MIXING:

A. Concrete shall be ready-mixed, or transit-mixed, as produced by equipment acceptable to the Engineer. No hand-mixing will be permitted. Adding water in controlled amounts during the mixing cycle shall be done only with the express approval of, and in the presence of the Engineer.

B. Ready-mix or transit-mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities for the respective conditions as stated on the nameplate. Discharge at the site shall be within 1-1/2 hours after cement was first introduced into the mix. Central mixed concrete shall be plant-mixed a minimum of 1-1/2 minutes per batch and then shall be truck-mixed or agitated a minimum of 8 minutes. Agitation shall begin immediately after the pre-mixed concrete is placed in the truck and shall continue without interruption until discharge. Transit-mixed concrete shall be mixed at mixing speed for at least 10 minutes immediately after charging the truck, followed by agitation without interruption until discharged.

C. All central plant and rolling stock equipment and methods shall conform to the latest Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers' Bureau of the National Ready-Mixed Concrete Association, as well as ACI 304 and ASTM C94.

D. Attention is called to the importance of dispatching trucks from the batching plant so that they shall arrive at the site of the work just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

3.04 INSTALLATION/APPLICATION/ERECTION:

A. Placing

1. No concrete shall be placed by pumping methods without the prior written approval of the Engineer. Should the Contractor be allowed to place concrete by pumping methods, procedures, mix design of concrete, and all other precautions shall be in accordance with ACI 304.2R and as approved by the Engineer.

2. Concrete shall be placed in alternate areas, as defined by the construction and control joints indicated on the design drawings. A minimum of 3 days shall elapse between placement of adjacent sections.

3. Segregation of the concrete shall be prevented during handling; should any segregation occur, the concrete shall be remixed before it is placed. Concrete shall be placed in the forms in horizontal layers not over l to 2 feet thick. Concrete shall not be allowed to drop freely more than 4 feet. If the free drop to the point of placement must exceed 4 feet, the Contractor shall obtain the approval of the Engineer for the proposed method of depositing the concrete. The concrete shall not be required to flow over distances greater than 3 feet in any direction in the forms or on the ground, unless otherwise permitted by the Engineer.

4. Unless otherwise noted, the work begun on any day shall be completed in daylight of the same day.

5. "Cold Joints" are to be avoided, but if they occur, they are to be treated as bonded construction joints.

6. Chutes for conveying concrete shall be of U-shaped design and sized to insure a continuous flow of concrete. Flat (coal) chutes shall not be employed. Chutes shall be metal or metal-lined, and each section shall have approximately the same slope. The slope shall not be less than 25 nor more than 45 degrees and shall be such as to prevent segregation of the ingredients. The discharge end of the chute shall be provided with a baffle plate or spout to prevent segregation. If the discharge end of the chute is more than 5 feet above the surface of the concrete in the forms, a spout shall be used, and the lower end maintained as near the surface of deposit as practicable. When the operation is intermittent, the chute shall discharge into a hopper. Chutes shall be thoroughly cleaned before and after each run, and the debris and any water shall be discharged outside the forms. Concrete shall not be allowed to flow horizontally more than 5 feet.

7. Concrete during and immediately after depositing shall be thoroughly compacted by means of suitable tools. Internal type mechanical vibrators shall be employed to produce the required quality of finish. Vibration shall be done by experienced operators under close supervision and shall be carried on long enough to produce homogeneity and optimum consolidation without permitting segregation of the solid constituents or "pumping" or migration of air. All vibrators shall be supplemented by proper wooden spade puddling adjacent to forms to remove included bubbles and honeycomb. This is essential for the top lifts of walls. All vibrators shall travel at least 10,000 rpm and be of adequate capacity. At least one vibrator shall be used for every 10 cubic yards of concrete per hour. In addition, one spare vibrator in operating condition shall be on the site.

8. Concrete slabs on the ground shall be well-tamped into place and foundation material shall be wet, tamped, and rolled until thoroughly compacted prior to placing concrete.

9. Concrete shall be deposited continuously in layers of such thickness that no concrete will be deposited on concrete that has hardened sufficiently to cause the formation of seams and planes of weakness within the section. If a section cannot be placed continuously, construction joints may be located at points as provided for in the drawings or approved by the Engineer.

10. Chutes, hoppers, spouts, adjacent work, etc., shall be thoroughly cleaned before and after each run, and the water and debris shall not be discharged inside the form.

B. Concrete Placing During Cold Weather

1. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. 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, and the concrete after placing shall be protected by covering, heat, or both. No accelerant shall be used to prevent freezing.

2. The temperature of concrete surfaces shall not be permitted to drop below 50ºF. for at least 7 days after placement of the concrete.

3. All details of the Contractor’s handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Engineer. All procedures shall be in accordance with the provisions of ACI 306.

C. Concrete Placing During Hot Weather

1. 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. The Contractor shall make every effort to minimize delays that will result in excessive mixing of the concrete after arrival on the job.

2. During periods of excessively hot weather (90°F, or above) ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement will not be acceptable, and will be rejected.

3. 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. The record 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 can be ascertained.

D. Pipes And Embedded Metals

1. Special care shall be taken to bring the concrete into solid contact with pipes and iron work embedded in the walls and floors, particularly underneath and around all pipes where a head of water exists, making watertight joints.

2. In general, such embedded items are not shown on the structural design drawings. Design drawings of the other trades shall be consulted for their location and details.

3. Anchor bolt location, size and details shall be verified with the equipment manufacturer's certified drawings before installation.

4. Anchor bolts, reglets, sleeves, edge angles and similar embedded items will be provided, delivered to the site under other Sections of the specification, for installation under this Section.

5. Where edge angles, etc., have nuts welded on to receive machine screws, the threads of the nuts shall be protected from concrete, and the concrete shall be excluded from the space to be occupied by the screw, by the use of wood plugs or other effective means.

6. Inserts required for hanging mechanical and electrical items shall be provided and installed in the forms under the mechanical and electrical sections of the specification.

7. Should the Contractor be allowed to leave openings in the concrete for pipes or ironwork, to await the arrival of items that would delay the prosecution of the work, the openings shall be subject to the approval of the Engineer. Appropriate construction joints shall be provided. In filling any such openings with concrete, a mixture of l: l-l/2 : 3 shall be used and a watertight bond shall be secured between the old and new concrete.

8. In bolting miscellaneous items to concrete after the concrete has set, expansion

bolts of an approved pattern and type shall be used. The Contractor shall submit to the Engineer, for approval, the types of expansion bolts. Expansion bolts shall not be used until they are approved.

E. Curing

1. Concrete curing shall be performed as specified in ACI 301 and as stated herein. All curing procedures shall have prior approval of the Engineer.

2. Concrete Floors

Concrete floor finishing requirements apply only where interior or enclosed concrete floors are explicitly indicated on the Drawings. Concrete floors which are to receive paint, concrete fill, mortar setting beds, grout fill, or any other subsequent finish shall be cured by one of the following procedures immediately after completion of placement and finishing:

a. Ponding or continuous sprinkling.

b. Application of absorptive mats or fabric kept continuously wet.

c. Application of sand kept continuously wet.

d. Application of waterproof sheet materials conforming to ASTM Cl7l.

e. Application of curing compounds conforming to ASTM C309, if it can be demonstrated to the Engineer's satisfaction that the compound is applicable and that it will not prevent bonding of the subsequent finish to be received. Compound shall be placed at a rate of 200 square feet per gallon, in two applications perpendicular to each other.

3. Curing procedure shall be continued for at least 7 days.

a. Moisture loss from surface placed against metal or wood forms shall be minimized by keeping forms wet until removal.

b. Curing shall be continued for at least 7 days. When forms are removed during the curing period, surfaces shall be cured by spraying or by the use of a curing compound as previously specified.

c. Surfaces shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary, 1/2-inch thick plywood sheets shall be used to protect the exposed surface.

F. Bracing And Supports

1. All concrete members shall be adequately and safely supported and braced until the

permanent supports and braces are installed.

2. Backfilling against exterior walls shall not be done until supporting slabs are in place and have attained 70 percent of design strength, otherwise walls shall be braced against earth lateral pressure, using a system approved by the Engineer.

3. Backfilling against retaining walls shall not commence until the wall concrete has reached its 28-day strength.

G. Removing Forms and Supports

1. Removal of forms shall take place in accordance with ACI 347, Section 3.6. Except as otherwise specifically authorized by the Engineer, forms shall not be removed until the concrete has aged for the following number of day-degrees or attained 50 percent strength. (Day-degrees equals the total number of days times the average daily air temperature at the surface of concrete. For example, 5 days at a daily average temperature of 60°F. equals 300 day-degrees.)

Location	Day-Degrees
Beams and Slabs	500
Walls and Vertical Surfaces	200

2. Shores under beams and slabs shall not be removed until the concrete has attained at least 70 percent of the specified cylinder strength and also sufficient strength to support safely its own weight and the construction loads upon it.

H. Patching

1. Defective concrete and honeycombed areas as determined by the Engineer shall be chipped down reasonably square and at least one-inch deep to sound concrete by means of hand chisels or pneumatic chipping hammers. Irregular voids or surface stones need not be removed if they are sound, free of laitance, and firmly imbedded in the parent concrete, subject to Engineer's final inspection. If honeycomb exists around reinforcement, chip to provide a clear space at least 1-inch wide all around the steel. For areas less than 1-1/2 inches deep, the patch may be made following the procedure for filling form tie holes, described in the subsection below, using adequately dry (non-trowelable) mixtures to avoid sagging. Thicker repairs will require build-up in 1-inch layers on successive days. Unless otherwise indicated, thicker repairs shall be made with Vertipatch mortar mixture blended with Acryl-Set, both by Master Builders, Inc., Cleveland, Ohio, or approved equal.

2. For concrete areas exposed to serious abrasion and/or impact forces, the Engineer may order the use of grout with a non-shrink metallic aggregate (Embeco by Master Builders, Inc.; Ironite by Fox Industries, Madison, IL; or approved equal) as an additive in the proportions listed below:

Material	Small Patches Volumes	Small Patches Weights	Large Formed Patches Volumes	Large Formed Patches Weights
Cement	1.0	1.0	1.0	1.0
Metal Aggregate	0.15	0.25	0.2	0.33
Sand	1.5	1.5	1.5	1.0
Pea Gravel	--	--	1.5	1.5

I. Finishing Of Formed Surfaces

1. All concrete that is to be left exposed to view shall be scraped to remove projecting imperfections left by voids in the forms.

2. To permit satisfactory finishing, forms shall be removed from the vertical faces of the concrete as early as is possible without damaging the surface. Immediately after stripping forms, any fins or projections left by the forms shall be chipped off, and the surfaces rubbed smooth.

3. Form tie holes and other voids and faults shall be patched. Voids shall be cleaned out, roughened, thoroughly wetted, coated with neat cement paste, and filled with mortar of cement and sand in the same proportions, materials, and color as used in the concrete. The surface of the patch shall be flush with the surrounding surface after finishing operations are complete. Surface shall be kept continuously damp until patches are firm enough to be rubbed without damage.

4. Rubbing shall be performed while the surface is wet using a carborundum or cement sand brick, to achieve a smooth uniform, even textured finish. Patched and chipped areas shall be blended to match as closely as possible the appearance of the rest of the surface. No cement wash or plastering will be permitted, and no mortar shall be used except as required above.

5. Where finishing is performed before the end of the curing period, concrete shall under no circumstances 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.

J. Testing

1. Concrete testing and inspection shall be performed by a Contractor-retained Independent Testing Agency acceptable to the Owner and Engineer. The Contractor shall pay for concrete testing and inspection required by the Contract Documents and shall provide access, coordination, and assistance as required. The Engineer shall be notified when samples are to be taken.

   a. The Testing Laboratory shall conform to the requirements of ASTM E329 as modified in 780 CMR R1 in the Massachusetts State Building Code. The Testing Laboratory shall be licensed or otherwise qualified as required by

applicable authorities having jurisdiction.

2. At least one slump test shall be performed from each truckload of concrete. The sample for slump shall be taken from the middle third of a truckload. Air content tests shall be made at the discretion of the Engineer. If the measured slump or air content falls outside the specified limits, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered to have failed the requirements of the specification and shall be immediately removed from the jobsite to be discarded.

3. The Contractor shall notify the Owner, Engineer, and Independent Testing Agency of each scheduled concrete placement at least forty-eight (48) hours in advance, excluding Saturdays, Sundays, and legal holidays, and coordinate the required pre-placement inspection and concrete testing. The Engineer will inspect the preparations for concrete, including the preparation of previously placed concrete, the reinforcing, and the alignment and tightness of formwork. No placement shall be made without the prior approval of the Engineer.

4. A minimum of four standard compression test cylinders shall be made and tested for **each 100 cubic yards or fraction thereof** for each type and design strength of concrete from each day's placement of concrete. One cylinder shall be tested at 7 days and two cylinders at 28 days. The fourth cylinder from each set shall be kept until the 28 day test report on the second and third cylinders in the same set has been received. The Engineer reserves the right to require test cylinders to be made for each truckload of concrete if the nature of the project or project experience indicates such additional tests are required for proper control of concrete quality; **such tests will be at the Owner's expense.**

5. The strength level shall be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength f'c, and no individual strength test (average of two cylinders) result falls below the specified strength f'c by more than 500 psi.

6. In the event the average compressive strength of the two 28 day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days.

K. Failure To Meet Requirements

1. The Engineer shall have the right to reject concrete represented by low strength tests or to agree to further testing of the concrete. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected or additional tests shall be conducted shall be final. All direct and indirect costs associated with further curing and testing of the concrete shall be at the Contractor's expense. All costs associated with removing rejected concrete, placing new concrete, and conducting tests on new concrete shall be at the Contractor's

expense.

2. If the Engineer agrees to consider further curing and/or testing of the concrete before making a final decision, the Contractor shall submit a detailed plan to the Engineer, including proposed criteria for acceptance of the concrete. The plan may include additional curing of the concrete, drilling and testing of cores, load testing of the structure, or a combination.

3. If additional curing is permitted before further inspection and testing, the Contractor shall provide any necessary materials and labor to further cure the suspect concrete.

4. If drilling and testing of cores is permitted, the Contractor shall be responsible for obtaining the cores, including provision of ladders, scaffolding, and such incidental equipment as may be required. If additional curing is permitted, cores shall be drilled after the curing period, and shall be in accordance with ASTM Methods C39 and C42. The Contractor shall repair all core holes to the satisfaction of the Engineer.

5. The burden of proof, including, but not limited to the work of cutting and testing the cores, inspection, evaluation, engineering, repair of the holes, or removal and replacement of the concrete in question, and all associated costs therefor, shall be at the expense of the Contractor.

6. If the suspect concrete still fails to meet specification requirements, the Engineer shall have the right to reject the concrete, have it removed and replaced, in accordance with paragraph 5 above, or to require mechanical strengthening of the concrete to satisfy project requirements. The Contractor shall submit a removal and replacement plan for review by the Engineer.

END OF SECTION

SECTION 10 14 53

TRAFFIC AND SITE SIGNAGE

PART 1 – GENERAL

1.01 WORK INCLUDED

A. The work of this Section consists of all traffic, regulatory, warning, shared-use path, wayfinding, and site signage and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to, the following:
   1. Traffic and regulatory signs.
   2. Shared-use path signs.
   3. Warning signs.
   4. Wayfinding and site signs.
   5. Sign posts, foundations, anchors, hardware, and related accessories.

1.02 RELATED WORK

A. Section 01 33 23, SUBMITTALS
B. Section 03 30 00, CAST-IN-PLACE CONCRETE
C. Section 31 00 00, EARTHWORK
D. Section 31 25 00, EROSION AND SEDIMENT CONTROL
E. Section 32 12 16.13, HOT MIX ASPHALT PAVEMENT
F. Section 32 17 23, SHARED-USE PATH PAVEMENT MARKINGS
G. Section 32 91 00, LOAM AND PLANTING PREPARATION
H. Section 32 92 19, SEEDING
I. Section 32 93 00, PLANTING AND LANDSCAPE RESTORATION

1.03 REFERENCES

A. Traffic, regulatory, warning, bicycle, pedestrian, and shared-use path signage shall comply with the Manual on Uniform Traffic Control Devices (MUTCD), latest edition, including MUTCD Part 9 for traffic control for bicycle facilities, and applicable MassDOT requirements.

B. All of the Contract Documents, including the General and Supplementary Conditions and Division 0 – Bidding Documents, Contract Forms, and Conditions of the Contract and Division 1 – General Requirements, are hereby incorporated into and made a part of this Section.

C. Carefully examine all Drawings and applicable Specification Sections for requirements affecting the work of this Section.

1.04 SAMPLES AND SUBMITTALS: IN ACCORDANCE WITH SECTION 01 33 23, SUBMITTALS, SUBMIT THE FOLLOWING:

A. At least thirty days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with requirements of this specification. Do not order materials until Engineer's approval of samples, certifications or test results have been attained. Delivered materials shall closely match the approved samples.

1. Shop Drawings: Submit detailed shop drawings for each item required to be fabricated or installed under work of this Section. Include plans, sections, and details as required to show completely materials, layout, jointing, clearances and connections for all items required. Submit shop drawings for the following:
   a. Signage

2. Material Samples: Submit samples for each material for the following:
   a. Lumber post – submit one (1) sample

PART 2 - PRODUCTS

2.01 SIGNS

A. The Contractor shall furnish and install all signs included in the schedule. Shop drawings for each sign will be produced for review, comment and approval prior to final manufacturing.

2.02 SIGN SCHEDULE

A. Contractor shall furnish and install signs shown on the Drawings and as required for a complete shared-use path signage system. Sign types may include, but are not limited to, the following, where shown on the Drawings or required by the Engineer:
   a. STOP signs at path/roadway crossings or other control points.
   b. Bicycle/shared-use path identification signs.
   c. Pedestrian/bicycle warning signs at crossings and approaches.
   d. Crossing warning signs.
   e. Yield, stop, or control signs for path users where indicated.
   f. Directional, wayfinding, or destination signs.
   g. Regulatory signs, including path rules, permitted/prohibited use, or speed/control signs.
   h. Object markers, advisory plaques, supplemental plaques, or other signs shown on the Drawings.
      1. Sign legends, sizes, colors, reflectivity, mounting heights, lateral clearances, and placement shall comply with MUTCD, MassDOT requirements, and the Contract Drawings.
      2. Where there is a conflict between the sign schedule, Drawings, MUTCD, MassDOT requirements, or field conditions, the Contractor shall notify the Engineer before fabrication or installation.
      3. Final sign locations shall be coordinated in the field with pavement edges, shoulders, curb ramps, road crossings, driveway crossings, boardwalk approaches, utilities, sight lines, accessible routes, and existing vegetation.

i. Signs used for traffic, regulatory, warning, bicycle, pedestrian, or shared-use path control shall be retroreflective and shall comply with MUTCD and applicable MassDOT requirements. Sign panels, posts, mounting hardware, anchors, and fasteners shall be suitable for exterior public use and coastal exposure.

2.03 LUMBER SIGN POSTS

A. Sign posts shall be 4”x4” pressure treated (PT) lumber, painted with exterior paint, color: California Paints Ultra Semi Gloss Charcoal Slate (40293 Deep Base), or approved equal, unless otherwise shown on the Drawings. Posts, anchors, foundations, fasteners, and mounting hardware shall be suitable for exterior coastal exposure.

B. Poured-in-place concrete footings, where required, shall conform to requirements of Section 03 30 00, CAST-IN-PLACE CONCRETE.

PART 3 - EXECUTION

3.01 LUMBER SIGN POSTS

A. Install lumber sign posts in conformance to details, and approved shop drawings. Measure on-site conditions to receive posts prior to preparing shop drawings.

B. Locate signs as shown on the Drawings and coordinate final placement with pavement edges, shoulders, curb ramps, road crossings, driveway crossings, boardwalk approaches, sight lines, utilities, accessible routes, and vegetation. Sign locations may be adjusted in the field as directed by the Engineer.

C. Install signs plumb, level, and at mounting heights and lateral offsets required by MUTCD, MassDOT requirements, and the Drawings.

D. Restore disturbed pavement, shoulders, loam, seed, planting, and adjacent areas resulting from sign installation to match adjacent conditions at no additional cost to the Owner.

END OF SECTION

SECTION 12 93 00

SITE FURNISHINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Documents, as listed in the Table of Contents, and applicable parts of Division 1, General Requirements shall be included in and made a part of this Section.

B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.02 SCOPE OF WORK

A. The work of this Section consists of the site furnishings indicated on the Drawings and/or as specified herein, including the following:

1. ADA Detectable Warning Mat

1.03 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Section 03 30 00 – Cast-In-Place Concrete
2. Section 31 00 00 – Earthwork
3. Section 32 12 16.13 – Hot Mix Asphalt Pavement

1.04 EXAMINATION OF CONDITIONS

A. The Contractor shall fully inform himself of existing conditions of the site before submitting their bid and shall be fully responsible for carrying out all site work required to fully and properly executing the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct to the best of the Landscape Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found therein.

1.05 SCHEDULING

A. The Contractor shall submit to the Landscape Architect, for approval by the Owner, a progress schedule for all work as specified herein.

1.06 QUALITY ASSURANCE

A. Materials and methods of construction shall comply with the following standards:

1. ASTM: American Society for Testing and Materials
2. ANSI: American National Standards Institute
3. FS: Federal Specifications

B. Qualifications of Workers: Use adequate numbers of skilled workers who are trained in the necessary crafts and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

C. Layout: After staking out the work, and before beginning final construction, obtain the Landscape Architect's approval for layout. Contractor shall make adjustments as determined by the Landscape Architect. Landscape Architect may make adjustments to layout as is required to meet existing and proposed conditions without additional cost to the contract price.

1.07 SUBMITTALS: IN ACCORDANCE WITH SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

A. Shop Drawings: Submit shop drawings for all products in accordance with Division 01 requirements.

B. Product Information: Provide manufacturer's data for all products showing installation and limitations in use. Supply Certificates of Compliance for all materials required for fabrication and installation, certifying that each material item complies with, or exceeds, specific requirements.

PART 2 - PRODUCTS

2.01 ADA DETECTABLE WARNING MAT

A. Detectable warning mats shall comply with applicable ADA, 521 CMR, PROWAG, and MassDOT requirements for truncated domes, dome size, spacing, alignment, visual contrast, slip resistance, and placement. The ADA detectable warning mat shall be manufactured by ADA Solutions, Inc., Chelmsford, MA, or approved equal.

Model: 2436REP, or as shown on the Drawings.
Color: Brick Red 20109, unless otherwise shown on the Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The installer shall examine previous work, related work, and conditions under which this work is to be performed and notify the Contractor in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means installer accepts substrates, subgrades, previous work, and conditions.

B. The Contractor shall be responsible for timing the delivery of all site improvement elements so as to minimize on-site storage time prior to installation. All stored materials must be protected from weather, careless handling and vandalism.

C. Contractor shall install and secure detectable warning mats in accordance with manufacturer's written instructions, approved shop drawings, and applicable accessibility requirements.

D. Detectable warning mats shall be installed flush with adjacent pavement or curb ramp surfaces, without lips, rocking, gaps, or abrupt changes in level. Final placement shall be coordinated with curb ramps, crossings, pavement markings, and adjacent pavement grades shown on the Drawings.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall make excavations of normal depth in earth for trenches, footings, and structures, shall backfill and compact such excavations to the extent necessary; shall furnish the necessary material and construct embankments and fills; shall dewater excavations as necessary to complete the work as described; and shall make miscellaneous earth excavations and do miscellaneous grading.

A.02 RELATED WORK:

A. Section 00 31 32, Subsurface Data

B. Section 00 31 43, PERMITS

A. Section 01 11 00, CONTROL OF WORK AND MATERIALS

B. Section 01 57 19, ENVIRONMENTAL PROTECTION

C. Section 31 05 19.13, GEOTEXTILE FABRICS

D. Section 31 11 00, CLEARING AND GRUBBING

E. Section 32 12 16.13, HOT MIX ASPHALT PAVEMENT

F. Section 32 34 13, PREFABRICATED STEEL BOARDWALK

G. Section 32 91 00, LOAMING AND PLANTING PREPARATION

H. Section 32 92 19, SEEDING

I. Section 32 93 00, PLANTING AND LANDSCAPE RESTORATION

1.03 REFERENCES:

ASTM International (ASTM)

ASTM C131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

ASTM	D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM	D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM	D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM	D6913	Standard Test Methods Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
ASTM	D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-aggregate by Nuclear Methods (Shallow Depth).

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges.

Code of Massachusetts Regulations (CMR) 310.40.0032 Contaminated Media and Contaminated Debris

Code of Massachusetts Regulations (CMR) 520 CMR 14.00 Excavation & Trench Safety Regulation

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

A. Material Test Reports: From a qualified independent testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
   1. Classification according to ASTM D 2487 and moisture content according to ASTM D 2216 of each on-site and borrow soil and/or fill material proposed for fill and backfill.
   2. Laboratory compaction curve according to ASTM D 1557 for each onsite and borrow soil and/or fill material proposed for fill and backfill.

1.05 PROTECTION OF EXISTING PROPERTY:

A. The work shall be executed in such manner as to prevent any damage to facilities at the site and adjacent property and existing improvements, such as but not limited to streets, curbs, paving, service utility lines, structures, monuments, benchmarks, observation wells, and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout and other hazards created by earthwork operations.

B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at its own expense, make good such damage or injury to the satisfaction of, and

without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations. The Contractor shall replace, at its own cost, existing benchmarks, observation wells, monuments, and other reference points, which are disturbed or destroyed.

C. Buried drainage structures and pipes, observation wells and piezometers, including those which project less than eighteen inches (18") above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment and shall be maintained at all times until completion of project.

1.06 DRAINAGE:

A. The Contractor shall provide, at its own expense, adequate drainage facilities to complete all work items in an acceptable manner. Drainage shall be done in a manner so that runoff will not adversely affect construction procedures or cause excessive disturbance of underlying natural ground or abutting properties.

1.07 FROST PROTECTION AND SNOW REMOVAL:

A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.

B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

1.08 GEOTECHNICAL FIELD AND LABORATORY TESTING:

A. The Contractor shall retain and pay for an independent geotechnical testing laboratory acceptable to the Owner and Engineer to perform the laboratory analyses and field testing of soil materials required by this Section. The Contractor shall coordinate testing locations and types with the Engineer and shall cooperate with the Engineer and testing laboratory during field testing and collection of soil samples for laboratory testing.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. GRAVEL BORROW:

1. Foundation Structural Fill: Gravel borrow used as structural fill beneath foundations shall conform to MassDOT Specification Section M1.03.0, Type B, and the applicable geotechnical recommendations.

2. Pavement Gravel Borrow: Gravel borrow within pavement layers designated in Section 32 12 16.13 – Hot Mix Asphalt Pavement shall conform to MassDOT Specification Section M1.03.0, Type C. Provide layer thicknesses and limits as indicated on the Drawings.
3. These designations do not replace separately specified dense graded crushed stone, crushed stone bedding, select backfill, or other materials. Where the required gravel-borrow type is not identified for a particular application, obtain clarification from the Engineer before placement.

B. DENSE GRADED CRUSHED STONE

Dense Graded Crushed Stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.7.

C. CRUSHED STONE/CRUSHED STONE BASE:

Crushed stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.0 (3/4-inch crushed stone) unless otherwise required.

D. SAND BORROW:

Sand Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.04.0.

E. BACKFILL MATERIALS:

1. Class B Backfill:

Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

Sieve Size	Percent Finer by Weight
3"	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

F. SPECIAL BEDDING MATERIAL:

1. The special pipe bedding material shall consist of a Foundation Separation Fabric installed on the trench bottom before backfilling with crushed stone as specified and as shown on the contract drawings. Foundation Separation fabric shall be as specified in Section 31 05 19.13, GEOTEXTILE FABRICS.

PART 3 - EXECUTION

3.01 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION:

A. Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures.

B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with a minimum 12-inch layer of compacted crushed stone wrapped all around in Foundation Separation Fabric. Costs of removal and replacement shall be borne by the Contractor.

C. The Contractor shall place a minimum of 12-inch layer of special bedding materials over the natural underlying soil to stabilize areas which may become disturbed as a result of rain, surface water runoff or groundwater seepage pressures, all at no additional cost to the Owner. The Contractor also has the option of drying materials in-place and compacting to specified densities.

3.02 EXCAVATION:

A. GENERAL:

1. The Contractor shall perform all work of any nature and description required to accomplish the work as shown on the Drawings and as specified.

2. Excavations, unless otherwise required by the Engineer, shall be carried only to the depths and limits shown on the Drawings If unauthorized excavation is carried out below required subgrade and/or beyond minimum lateral limits shown on the Drawings, restore the excavation at the Contractor’s expense using material approved by the Engineer for the affected foundation, pavement, or other application. Place and compact replacement material in accordance with the applicable requirements of the Contract Documents. Excavations shall be kept in dry and good conditions at all times, and all voids shall be filled to the satisfaction of the Engineer.

3. In all excavation areas, the Contractor shall strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, the Contractor shall first cut pavement as specified in paragraph 3.02 B.1 of this specification, strip pavement and pavement subbase separately from underlying soils. All excavated materials shall be stockpiled separately from each other within the limits of work.

   a. It is the intent of the Work to maximize reuse of existing on-site topsoil salvaged from forested areas to be cleared. Salvaged topsoil shall be stripped, stockpiled, protected, screened, and maintained for potential reuse.

   b. Salvaged on-site topsoil may be reused where appropriate for the intended application. Salvaged material used in restoration, seeding, or planting areas shall be tested, screened, blended, and amended as required to meet the requirements of Section 32 91 00 – Loam and Planting Preparation, Section 32 92 19 – Seeding, and Section 32 93 00 – Planting and Landscape Restoration.

   c. The Contractor shall not rely on assumed quantities of salvaged topsoil. If salvaged material is insufficient in quantity or unsuitable in quality to meet the requirements of the Work, the Contractor shall furnish and import additional approved loam borrow from approved sources, in accordance with Section 32 91 00, at no additional cost to the Owner.

4. The Contractor shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the Contractor's chosen method of dewatering, and which will allow visual observation of the bottom and backfill in the dry.

5. The Contractor shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as required by the Engineer. Unsuitable material includes topsoil, loam, peat, other organic materials, snow, ice, and trash. Unless specified elsewhere or otherwise required by the Engineer, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted special bedding materials or crushed stone wrapped all around in non-woven filter fabric.

6. Excavation, grading, stockpiling, equipment access, and backfill operations within or adjacent to wetland resource areas, wetland buffer zones, coastal resource areas, and other environmentally sensitive areas shall comply with applicable permits, Orders of Conditions, regulatory approvals, and the Contract Drawings. In the event of conflict, the more restrictive requirement shall govern.

B. TRENCHES:

1. Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of

pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.

2. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.

3. Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.

4. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.

5. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.

6. If, in the opinion of the Engineer, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures, the Contractor shall remove such disturbed subgrade to a minimum of 12 inches and replace with crushed stone wrapped in Foundation Separation Fabric. The cost of removal and replacement shall be borne by the Contractor.

7. The Contractor shall obtain a trench permit from the municipality where the trench is located prior to making any excavations of trenches (any subsurface excavation greater than three (3) feet in depth and fifteen (15) feet or less between soil walls as measured from the bottom).

8. All trenches required to be permitted must be attended, covered, barricaded, or backfilled. Covers must be road plates at least ¾-inch thick or equivalent, barricades must be fences at least 6-feet high with no openings greater than 4-inches between vertical supports and all horizontal supports required to be located on the trench-side of the fencing.

C. FOUNDATION EXCAVATION:

1. Excavations shall not be wider than required to set, brace, and remove forms for concrete, or perform other necessary work.

2. After the excavation has been made, and before forms are set for footings or other structures, and before reinforcing is placed, all loose or disturbed material shall be removed from the subgrade. The bearing surface shall then be compacted to meet the requirements of this specification.

3. If, in the opinion of the Engineer, the existing material at subgrade elevation is unsuitable for structural support, the Contractor shall excavate and dispose of the unsuitable material to the required width and depth as required by the Engineer. If, in the opinion of the Engineer, filter fabric is required; the Contractor shall place filter fabric, approved by the Engineer, as per manufacturer's recommendations. Crushed stone shall then be placed in lifts and compacted to required densities. Backfill shall be placed to the bottom of the proposed excavation.

D. EXCAVATION NEAR EXISTING STRUCTURES:

1. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.

2. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.

3. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.03 BACKFILL PLACEMENT AND COMPACTION:

A. GENERAL:

1. Prior to backfilling, the Contractor shall compact the exposed subgrade to a firm and unyielding condition with at least 4 passes of fully loaded, ten cubic yard dump truck over the subgrade or other acceptable compaction equipment subject to the approval of the Engineer.

2. After approval of subgrade by the Engineer, the Contractor shall backfill areas to required contours and elevations with specified materials.

3. The Contractor shall place and compact materials to the specified density in continuous horizontal layers, not to exceed nine (9) inches in uncompacted lifts. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557. The minimum degree of compaction for fill placed shall be as follows:

Location	Percent of Maximum Density
Below pipe centerline	95

Above pipe centerline	92
Below pavement (upper 3 ft.)	95
Embankments	95
Below pipe in embankments	95
Adjacent to structures	92
Below structures	95

4. The Engineer reserves the right to test backfill for conformance to the specifications and the Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated by the Engineer, engaged and paid for by the Contractor. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.

5. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.

6. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.

7. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.

B. TRENCHES:

1. Bedding as detailed and specified shall be furnished and installed beneath the pipeline prior to placement of the pipeline. A minimum bedding thickness shall be maintained between the pipe and undisturbed material, as shown on the Drawings.

2. As soon as practicable after the pipes have been laid, backfilling shall be started.

3. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of pipe. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that

material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

4. Class B backfill shall be placed from the top of the select backfill to the specified material at grade (loam, pavement subbase, etc.). Fill compaction shall meet the density requirements of this specification.

5. If the materials above the trench bottom are unsuitable for backfill, the Contractor shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.

6. Should the Engineer order crushed stone for utility support or for other purposes, the Contractor shall furnish and install the crushed stone as directed.

7. In shoulders of streets and roads, the top 12-inch layer of trench backfill shall consist of processed gravel for sub-base, satisfying the requirements listed in MassDOT standard specification M1.03.1.

C. BACKFILLING ADJACENT TO STRUCTURES:

1. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.

2. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.

3. Where backfill is to be placed on only one side of a structural wall, only hand-operated roller or plate compactors shall be used within a lateral distance of five feet (5') of the wall for walls less than fifteen feet (15') high and within ten feet (10') of the wall for walls more than fifteen feet (15') high.

3.04 DISPOSAL OF SURPLUS MATERIALS:

A. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.

B. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations,

and in accordance with arrangements made by it. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.

C. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.

D. The Contractor shall comply with Massachusetts regulations (310 CMR 40.0032) that govern the removal and disposal of surplus excavated materials. Materials, including contaminated soils, having concentrations of oil or hazardous materials less than an otherwise Reportable Concentration and that are not a hazardous waste, may not be disposed of at locations where concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and /or hazardous materials present in the soil being disposed or reused.

END OF SECTION

SECTION 31 05 19.13

GEOTEXTILE FABRICS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing of all labor, materials, and equipment necessary to install specified geotextile fabrics in locations shown on the drawings and as required by the Engineer.

1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

Shop drawings or working drawings and material specifications shall be submitted to the Engineer for review for each type of geotextile fabric furnished. General installation practices and installation schedule shall be included.

PART 2 - PRODUCTS

2.01 EROSION CONTROL FABRIC "A":

A. Erosion control fabric "A" shall be a nonwoven, needle-punched polypropylene geotextile intended for filtration beneath riprap. Apparent opening size, permittivity, and strength requirements shall be compatible with the underlying soil, riprap size, and installation conditions.

B. Erosion control fabric "A" shall be Mirafi 1100N nonwoven polypropylene geotextile by Solmax, or approved equal.

2.02 EROSION CONTROL FABRIC "B":

A. Surface erosion-control blankets for seeded slopes and restoration areas shall be fully biodegradable excelsior blankets complying with Section 32 92 19 and Detail 2/L600. Permanent synthetic erosion-control matting or netting shall not be substituted for the specified biodegradable blankets.

2.03 FILTER/DRAINAGE FABRIC:

A. The filter/drainage fabric shall be composed of continuous-filament fibers bonded together to form a sheet. The fabric shall be an average of 20 mils thick and possess the characteristics of Mirafi 140N.

B. The filter/drainage fabric shall be Mirafi 140N as manufactured by Solmax; Foss-65 by AJ Nonwovens; US 120NW, as manufactured by US Fabrics or approved equal.

2.04 FOUNDATION SEPARATION FABRIC:

A. Foundation separation fabric installed between excavation subgrade and crushed stone beneath foundations shall be Mirafi 160N by Solmax, or approved equal, in accordance with the geotechnical recommendations.

B. Submit manufacturer’s product data for the proposed fabric. Proposed equivalents shall demonstrate suitability for the specified separation application and compliance with the geotechnical recommendations, subject to review by the Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. GENERAL:

Installation of geotextile fabrics shall be strictly in accordance with manufacturer's instructions and specific layout plans and details reviewed by the Engineer. Geotextile fabrics and geogrids shall be installed only in locations shown on the Drawings, required by the Engineer, or necessary to separate, stabilize, filter, drain, or reinforce subgrade, aggregate base, drainage stone, riprap, boardwalk approach areas, and disturbed restoration areas.

B. EROSION CONTROL FABRIC “A”:

Erosion control fabric “A” shall be installed on detention basin slopes and at drainage swale ends prior to placement of riprap and at other locations as shown on the drawings or as required by the Engineer. The fabric in place shall cover the entire riprap area. Each width of fabric shall be overlapped by the subsequent width a minimum of two feet. The Contractor shall follow the manufacturer's installation recommendations to ensure proper completion of the fabric installation, including top toe-in and bottom toe wrap.

C. EROSION CONTROL FABRIC “B”:

Install surface erosion-control blankets in accordance with Section 32 92 19, Detail 2/L600, and the accepted manufacturer’s installation instructions. Coordinate anchoring, trenching, seams, and terminations with the selected blanket. Use the biodegradable anchors specified in Section 32 92 19.

D. FILTER/DRAINAGE FABRIC:

The filter/drainage fabric shall be installed in dewatering sump pits between the existing soil and crushed stone

E. FOUNDATION SEPARATION FABRIC:

Install foundation separation fabric over the prepared excavation subgrade before placing crushed stone beneath foundations. Provide coverage, overlaps, and placement in accordance with the geotechnical recommendations and manufacturer's written instructions. Protect fabric from displacement and damage during stone placement.

3.02 FINAL INSPECTION AND ACCEPTANCE:

A. The Contractor shall, at its expense, have a manufacturer's representative inspect the work at completion of the installation. Any work found to be unsatisfactory shall be corrected at the Contractor's expense.

B. The Engineer, at the Contractor's expense, reserves the right to have a manufacturer's representative inspect the installation process at any time during construction.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The Contractor shall do all required clearing and grubbing as indicated on the drawings or herein specified in the area required for construction operations on the Owner's land or in the Owner's permanent or temporary easements and shall remove all debris resulting therefrom.

B. Unless otherwise noted, all areas designated for clearing shall also be grubbed in accordance with Section 31 13 13 – TREE PRUNING AND STUMP REMOVALS.

C. The Contractor shall not clear and grub outside of the area required for construction operations.

1.02 RELATED WORK:

A. Section 01 57 19 – Environmental Protection: Protection of trees and shrubs designated to remain.

B. Section 31 13 13 – Tree Pruning and Stump Removals:
1. Stump removal and depth requirements.
2. Arborist qualifications.
3. Pruning, removals, debris handling, and tree protection.
4. Backfill and compaction requirements following stump grinding.

PART 2 - PRODUCTS: NOT APPLICABLE

PART 3 - EXECUTION

3.01 RIGHT TO WOOD AND LOGS:

The Owner shall have the right to cut and remove logs and other wood of value in advance of the Contractor's operations. All remaining logs and other wood to be removed in the course of clearing shall become the property of the Contractor.

3.02 CLEARING:

A. Unless otherwise indicated, clearing includes the removal of all trees, saplings, brush, vines, windfalls, dead trees and stubs over 1 foot high, surface debris, and other vegetative matter. Stump handling shall comply with 31 13 13 TREE PRUNING AND STUMP REMOVALS.

B. Mature trees (4 inches DBH or greater) within temporary easements shall not be removed unless specifically shown or approved by the Owner.

C. Trees, stumps, and stubs to be cleared shall be cut as close to the ground as practicable. Final stump removal, stump grinding, disposal of organic material, and backfilling shall be performed in accordance with Section 31 13 13 – TREE PRUNING AND STUMP REMOVALS.

D. Clearing shall be performed using methods that prevent damage to trees designated to remain. No equipment or materials shall be stored within the dripline of preserved trees, unless approved by the Owner.

3.03 GRUBBING:

A. Grubbing shall consist of the removal of stumps, roots, and organic matter that would interfere with construction, utility installation, structural fill, or long-term site stability.

B. All grubbing, stump removal, stump grinding depths, disposal of grindings, and backfilling shall conform entirely to Section 31 13 13 – TREE PRUNING AND STUMP REMOVALS. This includes:
   a. Stumps and roots within areas of proposed pavement, boardwalk approaches, foundations, structural fill, drainage improvements, utilities, and other improvements shall be removed or ground to a depth sufficient to avoid interference with the Work and to provide a stable subgrade, unless otherwise shown on the Drawings or directed by the Engineer. Organic material, stump grindings, and unsuitable material shall be removed and replaced with approved material compacted as specified.

C. All stump grindings and organic debris shall be removed from the excavation and disposed of offsite in accordance with federal, state, and local regulations.

D. Debris, trimmings, and other removed material shall be handled and disposed of in full compliance with Section 31 13 13, including the prohibition on on-site burning and special handling of diseased wood.

3.04 CLEANUP

A. The Contractor shall maintain the site in a clean and orderly condition throughout the work. At the end of each workday, all debris created by clearing and grubbing operations shall be collected, chipped, or removed from the site as required in 31 13 13.

B. Disturbed surfaces outside the limits of grading shall be restored as directed by the Owner.

END OF SECTION

SECTION 31 13 13

TREE PRUNING AND STUMP REMOVALS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The work of this Section includes the following:

1. Pruning - Class II, including the removal of all limbs necessary to execute the work required under this contract.

2. Removal of trees and stumps.

3. Coordination of pruning and removals adjacent to utility poles, overhead wires, guy wires, service connections, abutter improvements, roadways, driveways, and pedestrian/bicycle routes.

B. Refer to the Contract Drawings for general location of trees along the site perimeter. In general, all trees are to remain and be pruned in conformance with this Specification. Tree removals shall be limited to the area denoted on the plans and shall include the removal of individual trees that would impede the construction of proposed facilities.

1.02 QUALIFICATIONS OF CONTRACTOR:

A. This work shall be limited to individuals, partnerships and corporations who are actively engaged in the field of Arboriculture, and who demonstrate competence, experience and financial capability to carry out the terms of this project. The Owner may require proof of these qualifications.

B. Tree trimming and stump removal work shall be conducted by qualified and trained personnel. Where pruning of significant trees, major limbs, or work within tree protection zones is required, such work shall be performed under the direct supervision of a Massachusetts Certified Arborist.

1.03 PERSONNEL:

A. The Contractor shall submit each employee's name and title prior to the commencement of work. The Contractor shall advise the Owner of any changes in personnel assigned to this Contract.

B. The crew supervisor shall have a minimum of five (5) years climbing/pruning experience. At least one (1) crew person shall be an MCA and shall be certified in

CPR.

C. Each trimmer shall be experienced and highly qualified with the necessary tree worker skills to successfully complete the work of this Section, including the ability and training to perform aerial rescue. Said skill shall also include worker safety and ability in compliance with current OSHA and ANSI Z-133.1 Standards.

1.04 SPECIAL REQUIREMENTS:

A. Dutch Elm diseased wood shall be disposed of in accordance with provisions of General Laws, Chapter 87, Section 5, and Chapter 132, Sections 8 and 11 as amended; and in accordance with any additional local regulations. All wood shall be removed from the site and be properly disposed of in accordance with state and local regulations.

B. No burning shall be permitted on the project site.

C. Prior to commencing work, the Contractor shall submit a plan to the Owner for legal disposal of removed materials, in conformance with State and Federal regulations.

1.05 STANDARDS AND DEFINITIONS:

A. All pruning work shall be performed in accordance with the following:

1. The ANSI A300 ‘Standard Practices for Trees, Shrubs, and Other Wood Plant Materials’ of the Secretariat: National Arborist Association, Post Office Box 1094, Amherst, New Hampshire 03031.

2. American National Standards Institute (ANSI) Standard Z-133.1.

3. The standards and practices of the International Society of Arborists.

4. The standards and practices of the Massachusetts Arborist Association.

5. The standards and practices of the American Association of Nurserymen.

B. The term ‘Owner’ shall mean the Owner’s designated representative charged with carrying out the requirements of this Project, Architect, Engineer, Planner, or Tree Warden as referenced herein, rendering approvals for the Owner.

1.06 EXAMINATION OF SITE AND DOCUMENTS:

A. The Contractor shall be responsible for having a clear understanding of the existing site conditions and shall be responsible for fully carrying out the work of this Section, regardless of actual site conditions encountered.

1.07 ORDER OF WORK:

A. Based on the site conference, the Contractor shall submit a schedule of work for the Owner's review and approval prior to beginning work. Unless otherwise authorized by the Owner, failure of the Contractor to comply with the approved removal schedule shall be sufficient cause to give notice that the Contractor is in default of the contract.

1.08 PROTECTION OF THE VEGETATION TO BE PRESERVED:

A. The Contractor shall protect all existing trees, shrubs, lawns and other site features designated to remain. The placement of protection devices, such as snow fence enclosures, shall, however, be at the Contractor's discretion.

B. Damage no plant to remain by burning, pumping water, cutting of live roots or branches, or any other means. Neither vehicles nor equipment shall be parked within the dripline of trees to remain, or where ever damage may result to trees to be saved. Construction material shall not be stored beneath trees to be saved.

C. The Contractor shall be liable for any damage to any trees, shrub, lawn or other site features to remain, and shall immediately report to the Owner. Damaged shrubs or lawns shall be restored or replaced to match existing to remain to the satisfaction of the Owner.

D. The Contractor shall compensate the Owner for damages by installing replacement tree(s) of the size and species approved by the Owner and of sufficient quantity such that the sum of the Diameter at Breast Height (DBH) inches for replacement trees equals the total DBH inches of the damaged tree(s). Damaged shrubs shall be replaced with shrubs(s) of the same size, species, and quantity, unless determined otherwise by the Owner.

1.09 USE AND CARE OF THE SITE:

A. The Contractor shall leave the work site at the end of each working period in a condition satisfactory to the Owner.

B. Pavements shall be swept and lawns or other surfaces raked and/or otherwise cleaned of all material related to the work operation. Degree of clean-up required will be described by the Owner and will be based upon the character of the work area.

C. All trimmings or any other form of debris (except diseased materials or trimmings from Elms) shall be collected and chipped. The Contractor shall remove all materials and shall dispose of such materials off site in a legal manner.

D. Vehicles and equipment shall not be parked or stored within designated tree-protection areas. Outside these areas, parking and storage shall be permitted only in approved staging and equipment-storage areas in accordance with Section 01 57 19, Paragraph 3.06. The Contractor shall be fully and solely responsible for any damage to equipment or vehicles left at the site and shall obtain all necessary permits.

PART 2 - PRODUCTS

2.01 EQUIPMENT:

A. Equipment necessary for this Contract shall be properly maintained and in good operating condition to the Owner's satisfaction. The Contractor shall promptly remove and replace any equipment which the Owner deems to be in unsatisfactory condition or otherwise unsuitable.

B. Cutting tools shall be kept well sharpened to provide clean smooth cuts. Any tools utilized on any tree suspected to have cankers or other fungal, bacterial or viral diseases shall be sterilized or not used on any other specimen.

C. A disc chipper shall be used which will process material up to twelve (12) inches in diameter.

PART 3 - EXECUTION

3.01 PRUNING:

A. Under this Section, the Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the work in accordance with all local, state and federal regulations in force at the same time of this Contract and in accordance with tree pruning as specified herein.

B. The work of this Section consists of all pruning work and related items as specified herein and includes, but is not limited to:

1. Pruning - Class II throughout the designated areas, including limb removal required to allow for proper construction of the multi-use path, boardwalk, roadway and driveway crossings, utilities, signage, and related site improvements.

3.02 DESCRIPTION OF PRUNING WORK:

A. Pruning and trimming are generally described as the removal and disposal of limbs, branches and stubs which are either dead, potentially detrimental to the health of the tree or dangerous to pedestrians, visually deficient, interfering or otherwise objectionable as determined by the Owner.

B. The limits of all trees to be pruned have been identified on the plans or referenced elsewhere in this specification section.

C. Vehicle access shall be controlled and approved by the Owner.

D. If the Contractor discovers tree(s) which have not been marked for pruning, but whose condition is such that removal is warranted, whether due to death, disease, decay, or structural weakness, such tree(s) shall not be pruned and the Contractor shall immediately report these findings in writing to the Owner and await the Owner's direction before proceeding with work on the particular tree(s) in question.

E. All pruning shall be performed in a manner that maintains the natural aesthetic characteristics of the species and variety of trees. No topping or dehorning of trees or stubbing back of branches shall be permitted. All cuts shall be made to a lateral branch that is a minimum of one third (1/3) the size of the branch being removed, unless otherwise instructed by the Owner.

F. The use of climbing spurs or spiked shoes shall not be permitted and their use will result in rejection of the work and corrective action as directed by the Owner.

G. All cuts shall be made sufficiently close to the parent stem so that wound closure can be readily started under normal conditions. Cuts shall, however, never be made through the branch collar. Slab cuts and rip cuts will result in rejection of the work and corrective action as directed by the Owner.

H. All limbs over two (2) inches in diameter to be removed shall be precut to prevent splitting. Any branches that by falling would injure existing trees to remain or other objects shall be lowered to the ground by proper ropes.

I. On trees known to be diseased and where there is known to be danger of transmitting the disease on tools, tools shall be disinfected with alcohol or bleach after each cut between trees.

J. Lateral branches as well as occasional branch suckers ("water sprouts") may be retained. Complete removal of secondary laterals and branch suckers resulting in the stripping of major limbs, ("lion tailing") will not be permitted.

K. Tree paint to seal pruning cuts shall not be used.

L. All branches and limbs shall be manually lowered to the ground via rope and pulley. This practice must be consistent with the National Arborist Association Standards for Pruning. All grade-level artifacts and landscaping must be protected from damage.

3.03 REMOVALS:

A. The Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the removals work in accordance with all local, state, and federal regulations in force at the time of this contract and in accordance with tree and stump removals as specified herein.

3.04 DESCRIPTION OF REMOVAL WORK:

A. Removal is generally described as the removal of groups and individual trees and shrubs which interfere with the growth of more desirable types of trees; the clearing away of lesser growth that may obscure outstanding trees; and thinning out to provide space for healthy growth by the elimination of thinner, weaker trees.

B. The Contractor shall adhere to the specifications and provide suitable facilities for inspecting the work. Failure of the Owner to immediately reject unsatisfactory work or to notify the Contractor of deviations from the specification shall not relieve the Contractor of responsibility to correct or remedy unsatisfactory work.

C. The Contractor shall only work on trees designated by the Owner. No compensation will be made for work performed on any other tree or trees.

D. Trees designated to be removed shall be taken down and all leaves, branches and trunks of trees properly disposed of by chipping and removal from the premises.

E. Fell trees in a manner that allows all site features and those trees to be saved undamaged.

F. Remove all cut trees, branches, limbs, leaves, and associated wood debris from the site within twenty-four (24) hours of cutting or trimming. Do not stockpile or store tree debris on site.

G. Stump removal: Stumps and roots within areas of proposed pavement, boardwalk approaches, foundations, structural fill, drainage improvements, utilities, and other improvements shall be removed or ground to a depth sufficient to avoid interference with the Work and to provide a stable subgrade, unless otherwise shown on the Drawings or directed by the Owner. Organic material, stump grindings, and unsuitable material shall be removed and disposed of off-site. Resulting voids shall be backfilled with approved material and compacted as specified. Disturbed lawn or seeded areas shall be fine graded and restored with seed mix appropriate to the location, as required by the Owner and Contract Documents.

H. Excavation or grading within the branch spread of trees to be saved shall be performed as required by the Owner. Removal of pavement such as bituminous concrete in these zones shall be by hand tools and/or air spade to ensure root health for trees to remain.

I. All equipment to be used and all work to be performed must be in full compliance with all standards as promulgated by OSHA at the time of bidding, including but not limited to those regulations concerning noise levels, protective devices and operator safety.

J. The Contractor shall be solely responsible for pedestrian and vehicular safety and control within the work site and shall protect the public and its property from injury or damage that could be caused by the progress of the work. To this end the Contractor shall provide, erect, and maintain protective devices acceptable to the Owner, including but not limited to barricades, lights and warning signs.

K. Any practice employed by the Contractor that is obviously hazardous as determined by the Owner shall be immediately discontinued by the Contractor upon receipt of either written or oral notice from the Owner to discontinue such practice.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. Furnish all labor, materials, tools and equipment, and perform all operations necessary for erosion and sedimentation control work indicated on contract drawings and as specified herein.

1.02 RELATED WORK:

A. Section 01 14 19.16, DUST CONTROL

B. Section 01 57 19, ENVIRONMENTAL PROTECTION

C. Section 31 00 00, EARTHWORK

D. Section 31 05 19.13, GEOTEXTILE FABRICS

E. Section 32 91 00, LOAM AND PLANTING PREPARATION

F. Section 32 92 19, SEEDING

G. Section 32 93 00, PLANTING AND LANDSCAPE RESTORATION

1.03 PROJECT CONDITIONS:

A. Earthmoving activities in the project area shall be conducted in such a manner as to prevent accelerated erosion and the resulting sedimentation.

B. The Contractor shall implement and maintain erosion and sedimentation control measures as shown on the contract drawings or as required by the Owner or Engineer from the start of construction until disturbed areas are stabilized and vegetation has been accepted by the Engineer or Owner, to effectively prevent accelerated erosion and sedimentation.

C. Work within wetland resource areas, wetland buffer zones, coastal resource areas, and other environmentally sensitive areas shall comply with applicable permits, Orders of Conditions, regulatory approvals, and the Contract Drawings. In the event of conflict, the more restrictive requirement shall govern.

1.04 SUBMITTALS IN ACCORDANCE WITH SECTION 01 33 23, SUBMITTALS:

A. Submit product data and certification demonstrating compliance for compost filter tubes, straw wattles, and silt fence proposed for the Work. For compost filter tubes, include compost fill characteristics, tube diameter, exterior containment material, biodegradability, anchoring requirements, and manufacturer's installation and maintenance instructions.

1.05 GENERAL METHODOLOGY:

A. Erosion and sedimentation control methods shall consider all factors which contribute to erosion and sedimentation including, but not limited to, the following:

1. Topographic features of the Project area.

2. Types, depth, slope and areal extent of the soils.

3. Proposed alteration of the area.

4. Amount of run-off from the Project area and the upgradient watershed areas.

5. Staging of earthmoving activities.

6. Temporary control measures and facilities for use during earthmoving.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Straw wattles shall consist of 99.9% weed-free wheat, oat, barley, or rice straw, compacted. Diameter may vary +/- 13 percent. Wattle netting used within or adjacent to wetland resource areas, wetland buffer zones, coastal resource areas, or restoration areas shall be biodegradable and wildlife-safe, with no permanent synthetic or photodegradable plastic netting.

B. Silt Fence shall be a woven polypropylene and/or polyester material, which meets or exceeds the minimum average roll values requirements tabulated below:

Fabric Property	Test Method	Fabric Requirement
Tensile strength, lbs.		124 minimum

	ASTM D-4632 Grab	
Elongation at 50% minimum tensile strength	ASTM D-4632 Grab	15%
Permittivity, sec^{-1}	ASTM D-4491	0.10 sec^{-1} minimum
Apparent opening size, mm	ASTM D-4751	30 US Sieve
Ultraviolet degradation at 500 hours	ASTM D-4355	minimum 80% strength retained

C. Mulch, if used to protect the hydroseed from erosion, shall consist of cured straw free from primary noxious weed seeds, twigs, debris and rough or woody materials. Mulch shall be free from rot or mold and shall be acceptable to the Engineer or Owner. Alternately, mulch shall be specially processed cellulose homogeneous fiber containing no growth or germination-inhibiting factors. Processed cellulose fiber shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a slurry when sprayed on the ground. The material shall allow homogeneous absorption and percolation of moisture. The manufacturer shall show the air-dry weight content on each package of the cellulose fiber. Where newly graded subgrade or topsoil areas cannot be seeded within five (5) calendar days after grading, install mulch or other approved temporary stabilization within that period, or sooner where required by applicable permits. Comply with any permit requirements for earlier initiation or completion of stabilization.

D. Compost Filter Tubes: Provide compost-filled sediment-control tubes with a twelve (12) inch installed diameter, as shown in Detail 1/L600. Nine (9) inch tubes may be used on flatter surfaces only with the Engineer's prior approval. Fill shall consist of mature, stable compost manufactured for sediment filtration, free of trash, invasive plant propagules, and other deleterious materials. Submit the manufacturer's compost gradation and quality data for review. Exterior containment shall be fully biodegradable natural-fiber fabric or netting suitable for retaining the compost during handling, installation, and service. Permanent synthetic and photodegradable plastic containment shall not be permitted. Provide hardwood anchoring stakes and accessories in accordance with the detail and accepted manufacturer's installation instructions.

PART 3 - EXECUTION

3.01 CONSTRUCTION SEQUENCE:

A. Construction of erosion control measures as depicted on drawings will be completed prior to any site work.

B. Sediment barriers shall be used at locations shown on the drawings. Sediment barriers are temporary berms, diversions, or other barriers that are constructed to retain sediment on-site by retarding and filtering stormwater runoff.

C. Maintain temporary erosion and sediment controls until the areas served by those controls have achieved the permanent stabilization required by the Contract Documents and applicable permits, vegetation has been accepted by the Engineer or Owner where applicable, and any required authorization from the permitting authority has been obtained. Remove controls only after written authorization from the Engineer confirming that these conditions have been met. Completion of construction alone shall not authorize removal. Properly remove and dispose of accumulated sediment in locations approved by the Owner and permitted by applicable permits. Restore and stabilize areas disturbed by removal and provide temporary protection as necessary until those areas are stabilized.

D. The Engineer or Owner may order additional erosion and sediment controls be installed. The Contractor shall comply with Engineer or Owner's request and immediately install the required controls.

E. The Contractor shall inspect all erosion control measures after any storm event to ensure they are in proper working order.

F. Sediment barriers shall be repaired, replaced, or cleaned when damaged, undermined, overtopped, clogged, or when accumulated sediment reaches one-half the height of the barrier.

3.02 CONSTRUCTION METHODS:

A. Install compost filter tubes at sediment-barrier locations indicated on the Drawings, in accordance with Detail 1/L600 and the manufacturer’s written instructions. Place tubes along contours, perpendicular to runoff, and as close to the limit of soil disturbance as practicable within authorized work limits. Maintain continuous firm contact with the ground to prevent flow beneath the tubes. Overlap adjoining tube ends a minimum of three (3) feet and turn terminal ends uphill. Anchor securely using hardwood stakes placed outside the tubes or as required by the manufacturer. Do not install tubes in waterways or obstruct required drainage. Do not attach tubes or anchoring devices to existing trees. Straw wattles or silt fence may be used

where specifically shown or approved by the Engineer, subject to applicable permit requirements.

B. Straw mulch, if used, shall be applied at a rate of 100 pounds per 1,000 square feet.

C. On slopes, the Contractor shall provide protection against washouts by an approved method. Any washout, which occurs either in the Contractor's work area or in areas topographically below its work, shall be regraded and reseeded at the Contractor's expense until an accepted vegetative stand is established.

END OF SECTION

SECTION 31 37 00

RIPRAP

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers furnishing and installation of the riprap inlet apron at the proposed 18-inch RCP headwall, complete with excavation, subgrade preparation, geotextile underlayment, riprap stone, perimeter keying, grading, and incidental Work required for a complete and stable installation.

B. Riprap limits, thickness, elevations, stone size or gradation, and edge-key requirements shall be as shown on the Drawings.

C. Earthwork, headwall installation, pipe installation, erosion and sediment control, and restoration are specified under related Sections.

1.02 RELATED WORK:

A. Section 31 00 00, EARTHWORK.
B. Section 31 05 19.13, GEOTEXTILE FABRICS.
C. Section 31 25 00, EROSION AND SEDIMENT CONTROL.
D. Section 33 41 13.28, REINFORCED CONCRETE PIPE.
E. Section 33 42 16.13, PRECAST CONCRETE HEADWALLS.

1.03 REFERENCES:

A. The following standard forms a part of these specifications and indicates minimum standards required:

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges.

1.04 SUBMITTALS:

A. Submit a certified riprap gradation from the proposed quarry or material supplier identifying the source, minimum and maximum stone sizes, median stone size where specified, percentage by weight within each required size range, and conformance with the requirements shown on the Drawings.

B. Submit geotextile product data in accordance with Section 31 05 19.13.

C. Submit representative photographs of the proposed riprap material when requested by the

Engineer. Provide a physical sample only when specifically requested.

PART 2 - PRODUCTS

2.01 RIPRAP:

A. Riprap shall consist of hard, durable, angular stone resistant to weathering, splitting, abrasion, and degradation during handling and placement.

B. Riprap shall conform to the stone-size distribution or MassDOT material designation shown on the Drawings.

C. Where the Drawings specify a median stone size, provide riprap having the specified D50 and the complete approved gradation submitted under Article 1.04. D50 alone shall not be considered a complete material gradation.

D. Riprap shall be free from soil, loam, organic matter, debris, shale, soft stone, and excessive flat or elongated pieces.

E. Furnish a range of stone sizes capable of forming a stable, interlocking mass with minimal large voids. Do not use stone screenings or fine aggregate to conceal or choke the finished riprap surface.

2.02 GEOTEXTILE:

A. Geotextile beneath riprap shall be nonwoven Erosion Control Fabric “A” specified in Section 31 05 19.13, Paragraph 2.01.

B. Geotextile shall be resistant to puncture and damage caused by placement of the specified riprap.

C. Where Section 31 05 19.13 designates the required product as Erosion Control Fabric “A,” that designation shall apply.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION:

A. Excavate the riprap-apron area to the lines, grades, limits, and depths shown on the Drawings. Account for the full thickness of riprap and underlying materials so that the completed apron matches the required inlet and surrounding grades.

B. Remove loose, soft, saturated, organic, or otherwise unsuitable material. Prepare a smooth, firm, stable subgrade.

C. Do not place geotextile or riprap over standing water, frozen ground, loose soil, or unstable subgrade.

D. Maintain existing drainage flow through the culvert during excavation and installation. Prevent soil, riprap, geotextile, and construction debris from entering or obstructing the existing or proposed pipe.

E. Form perimeter keys, toe trenches, or buried apron edges as shown on the Drawings.

3.02 GEOTEXTILE INSTALLATION:

A. Install geotextile continuously beneath the entire riprap area in accordance with Section 31 05 19.13 and the manufacturer's written instructions.

B. Place geotextile smooth and in direct contact with the prepared subgrade, without wrinkles, folds, gaps, or bridging.

C. Overlap adjacent sheets as required by Section 31 05 19.13. Orient overlaps to prevent flowing water from entering beneath the upstream sheet.

D. Anchor geotextile temporarily as necessary to prevent displacement during riprap placement.

E. Repair torn, punctured, displaced, or contaminated geotextile before placing riprap.

3.03 RIPRAP PLACEMENT:

A. Place riprap to the limits, thickness, elevations, and configuration shown on the Drawings.

B. Place stone carefully to avoid damaging the geotextile, RCP, headwall, pipe penetration, and adjacent improvements. Do not dump stone directly against the headwall or pipe, and do not permit individual stones to strike exposed concrete surfaces or the pipe opening.

C. Place riprap to its full specified thickness in one operation. Do not place it in separate horizontal layers.

D. Distribute stone sizes throughout the completed apron to form a reasonably well-graded, stable, interlocking mass with minimal large voids and no concentrations of only large or small stones.

E. Hand place or mechanically rearrange individual stones as necessary around the headwall, pipe inlet, apron perimeter, and transitions.

F. Completely cover geotextile with the specified riprap thickness. Do not leave geotextile exposed outside the riprap limits, at the apron perimeter, or in areas lacking the required stone coverage.

G. Key apron edges into surrounding grade as shown. Blend the completed apron smoothly into the existing channel or surrounding ground without abrupt drops, perched edges, or concentrated side flow.

H. Remove stone projecting into the RCP opening or obstructing drainage flow.

I. Replace displaced stone and repair erosion, settlement, exposed geotextile, or instability occurring before acceptance.

J. At completion, verify that the riprap apron is stable, fully covers the geotextile, matches the required grades and thickness, provides an unobstructed flow from the RCP, and does not create a perched inlet, reverse slope, or concentrated flow around the sides of the headwall.

K. Remove loose stone, soil, and debris from the pipe opening and surrounding area before acceptance.

END OF SECTION

SECTION 32 12 16.13

HOT MIX ASPHALT AND RESIN-BOUND PAVEMENT

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. Under this Section, the Contractor shall furnish all necessary labor, materials, equipment, and transportation necessary to construct the following:

1. The hot mix asphalt pavement for the multi-use path, pedestrian walks, and service drives shall be composed of materials as specified herein and shall be constructed on a prepared base course to the depth, grade, and cross-section shown on the Drawings, as specified herein, and as required by the Engineer.

2. Unless otherwise indicated on the Contract Drawings, provide the following pavement sections:
   a. Multi-Use Path and Pedestrian Walk Pavement: Four (4) inches total compacted thickness of Superpave Surface Course – 9.5, SSC-9.5, placed in two equal two (2) inch lifts over twelve (12) inches of compacted Gravel Borrow conforming to MassDOT M1.03.0, Type C. The Type C gravel-borrow requirement applies to the pavement layers specified in this Section and shown on the Drawings. Foundation structural fill shall comply with Section 31 00 00 and the applicable geotechnical recommendations.
   b. Full-Depth Vehicular Pavement: Two (2) inches compacted thickness of Superpave Surface Course – 9.5, SSC-9.5, over three (3) inches compacted thickness of Superpave Intermediate Course – 19.0, SIC-19.0, over twelve (12) inches of compacted Gravel Borrow conforming to MassDOT M1.03.0, Type C. The Type C gravel-borrow requirement applies to the pavement layers specified in this Section and shown on the Drawings. Foundation structural fill shall comply with Section 31 00 00 and the applicable geotechnical recommendations.
   c. Standard Milling and HMA Overlay: Mill existing pavement to a nominal depth of two (2) inches, or as required to meet the lines, grades and pavement-quality requirements shown on the Drawings, and provide two (2) inches compacted thickness of Superpave Surface Course – 9.5, SSC-9.5.
   d. Resin-Bound Aggregate Pavement at Existing Tree-Root Protection Areas: Provide a two (2) inch finished thickness of resin-bound aggregate pavement over a minimum of four (4) inches of clean, open-graded No. 57 stone, with nonwoven separation geotextile beneath the stone, as shown in Detail 6/L601. Do not provide an HMA binder, base, or surface course beneath resin-bound aggregate pavement. Protect existing roots and existing root-zone soils during preparation and installation.
3. Any reference to hot mix asphalt (HMA) on the plans or in the specifications shall relate to this section.

1.02 REFERENCE STANDARDS AND SPECIFICATIONS:

A. Reference to the standards, specifications and tests of technical societies, organizations and governmental bodies are made in the Contract Documents.

1. AASHTO - American Association of State Highway and Transportation Officials (tests or specifications).

2. ASTM - ASTM International.

3. Mass. Standard Specs. - Latest edition of the MassDOT Standard Specifications for Highways and Bridges hereinafter referred to as "The MassDOT Standard Specifications."

1.03 SUBMITTALS: IN ACCORDANCE WITH SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

A. Asphalt emulsion product and application specification.

B. Submit complete job-mix formulas for SSC-9.5, SIC-19.0, and each other HMA mixture proposed for the Work at least two weeks before paving begins.

C. Submit product data, manufacturer’s written installation instructions, resin binder data, aggregate gradation, color sample, curing requirements, and warranty information for resin-bound aggregate pavement. Include written confirmation from the resin-system manufacturer that the proposed system is suitable for installation at two (2) inches finished thickness directly over the open-graded stone base shown in Detail 6/L601 and for the traffic and environmental exposures specified herein. Submit product data for the open-graded stone and nonwoven separation geotextile. Identify any conflict between the manufacturer’s requirements and the specified assembly before procurement or installation.

D. Submit sample of resin-bound aggregate pavement for color, texture, and finish review prior to installation.

E. Submit the resin-bound pavement installer’s qualifications, including documentation that the installer is approved or authorized by the resin-system manufacturer.

F. Submit a proposed resin-bound pavement field mockup identifying the aggregate blend, color, texture, surface finish, joint treatment and transition treatment.

G. Submit the proposed paving sequence, lift thicknesses, joint locations, milling limits, tack-coat product and application rates.

PART 2 - PRODUCTS

2.01 AGGREGATE SUBBASE MATERIALS:

A. Gravel Borrow: Gravel Borrow beneath multi-use path, pedestrian-walk and vehicular HMA pavement shall conform to MassDOT M1.03.0, Type C, and applicable requirements of Section 31 00 00, EARTHWORK.

B. Open-Graded Stone: Stone beneath resin-bound aggregate pavement shall be clean, washed, hard, durable, open-graded No. 57 stone, without added fines, and free of loam, clay, organic matter, and other deleterious materials. Do not use dense-graded aggregate or gravel borrow beneath resin-bound aggregate pavement.

C. Aggregate materials shall be placed to the compacted thicknesses shown on the Drawings and specified herein.

D. Nonwoven Separation Geotextile: Provide permeable nonwoven separation geotextile beneath the open-graded stone base as shown in Detail 6/L601. Submit the proposed product and installation requirements for review. Select geotextile suitable for separation and filtration between the open-graded stone and underlying site soils.

2.02 HOT MIX ASPHALT PAVEMENT:

A. General: Hot mix asphalt materials shall conform to applicable requirements of MassDOT Sections 460 and M3.11.03 and the mixture designations shown on the Drawings and specified herein.

B. Superpave Surface Course – 9.5, SSC-9.5: Provide SSC-9.5 for multi-use path surface-course lifts, full-depth vehicular pavement surface course, and standard milling and overlay work.

C. Superpave Intermediate Course – 19.0, SIC-19.0: Provide SIC-19.0 for the intermediate course of full-depth vehicular pavement.

D. Job-Mix Formulas: Each HMA mixture shall be produced in accordance with an accepted job-mix formula appropriate to the intended pavement course and compacted lift thickness.

2.03 ASPHALT EMULSION:

A. Asphalt emulsion tack coat shall be Type SS-1 or SS-1H as specified by the Asphalt Institute.

2.04 SEAL COAT:

A. Seal coats shall be within the composition limits for protective seal coat emulsion in accordance with MassDOT M3.03.3.

B. Silica sand when blended with seal coat emulsion shall be No. 30 silica sand.

2.05 RESIN-BOUND AGGREGATE PAVEMENT:

A. Resin-bound aggregate pavement shall consist of a UV-stable resin binder and clean, washed, kiln-dried and graded aggregate suitable for exterior pedestrian and bicycle pavement applications.

B. The resin-bound aggregate pavement shall be two (2) inches finished thickness, installed directly over the open-graded stone base shown in Detail 6/L601.

C. The system shall be suitable for the intended coastal environment, freeze-thaw exposure, pedestrian and bicycle traffic, and maintenance operations anticipated for the site.

D. Resin binder, aggregate, primer, mixing, batching, placement, troweling, curing and protection shall comply with the manufacturer's written requirements.

E. Color and aggregate blend shall be selected by the Landscape Architect from the manufacturer's standard available selections.

F. Aluminum Edge Restraint: Provide continuous L-shaped aluminum edge restraint at unrestrained edges of resin-bound aggregate pavement. Basis of design: Permaloc AsphaltEdge, 2-inch vertical wall by 2-1/4-inch horizontal base, black DuraFlex finish, or approved equal. Provide compatible connectors, anchorage, and accessories for a complete installation. Set the top of restraint flush with the finished pavement.

G. Submit product data and written confirmation from the edging and resin-bound pavement manufacturers that the proposed restraint and anchorage are suitable for the specified 2-inch resin-bound aggregate pavement over a minimum 4-inch open-graded No. 57 stone base. Submittals shall identify anchor material, corrosion protection, size, length, spacing, and required supporting-base conditions. Coordinate edging and anchor locations with existing tree roots. Where installation conflicts with roots, obtain an approved modified detail before proceeding. Do not cut roots, omit required anchorage, or interrupt the restraint without written authorization from the Owner's Representative.

PART 3 - EXECUTION

3.01 GENERAL:

A. Paving courses required for the Project shall be as shown on the Drawings and specified herein. Pavement thicknesses are measured in compacted inches. Except for the 3-inch SIC-19.0 intermediate course shown for full-depth vehicular pavement, individual HMA lifts shall not exceed 2-1/2 inches compacted thickness unless otherwise permitted by the accepted job-mix formula and applicable MassDOT requirements. Where the specified course thickness cannot be placed in a single compliant lift, place the course in multiple lifts.

B. Resin-bound aggregate pavement shall be installed only at tree root protection areas indicated on the Drawings. Pavement thicknesses specified are compacted/finished thicknesses.

C. Multi-use path finished cross slopes shall be a minimum of 1.0% and a maximum of 2.0%. Target 1.5% unless otherwise indicated on the grading plans. Construction tolerances shall not permit finished cross slopes outside these limits.

D. Maintain the full proposed paved width shown on the Drawings free of utility poles, hydrants, signs and other obstructions unless otherwise specifically indicated.

E. Verify pavement elevations, cross slopes and transitions at existing pavement, roadway crossings, driveway crossings, curb ramps, boardwalk approaches and other adjoining surfaces before beginning permanent paving.

3.02 AGGREGATE SUBBASE CONSTRUCTION:

A. Standard HMA Pavement Areas: Provide twelve (12) inches compacted thickness of Gravel Borrow, MassDOT M1.03.0 Type C, beneath multi-use path, pedestrian-walk and full-depth vehicular HMA pavement unless otherwise shown on the Drawings.

B. Resin-Bound Pavement at Existing Trees: Provide a minimum of four (4) inches finished thickness of clean, open-graded No. 57 stone beneath the two (2) inch resin-bound aggregate pavement. Install nonwoven separation geotextile beneath the stone. Do not install an HMA course beneath resin-bound pavement.

C. At standard HMA pavement areas, place aggregate subbase in uniform lifts and compact in accordance with Section 31 00 00, EARTHWORK. At resin-bound pavement areas, place and consolidate the open-graded stone in accordance with the accepted installation procedure and resin-system manufacturer’s written requirements, subject to the tree-root protection requirements below.

D. At existing tree-root protection areas, preserve existing roots and root-zone soils. Do not excavate or compact existing root-zone soils except as specifically directed in writing by the Owner. Where the specified pavement assembly cannot be installed without disturbing existing roots, stop work in the affected area and obtain an approved modified detail before proceeding.

E. Do not cut, tear, crush or remove existing roots to facilitate installation of aggregate subbase, HMA, resin-bound pavement or edge restraints unless specifically authorized in writing by the Owner.

F. When existing roots are encountered within the proposed pavement or aggregate-subbase limits, stop affected excavation and notify the Owner before proceeding.

3.03 TEMPORARY HOT MIX ASPHALT PAVEMENT:

A. Where specified and required by the Engineer and after placement and acceptance of the applicable aggregate subbase, the Contractor shall place temporary bituminous pavement. It shall consist of hot mix asphalt, one and one half (1 ½) inches thick, in accordance with MassDOT 460.

B. The temporary pavement shall be repaired as necessary to maintain the surface of the pavement until replaced by permanent pavement. When so required by the Engineer, the Contractor shall remove the temporary pavement and install or regrade the subbase for installation of permanent pavement.

3.04 PERMANENT HOT MIX ASPHALT PAVEMENT:

A. The hot mix asphalt mixtures shall be placed on the approved base only when, in the opinion of the Engineer, the course is sufficiently dry and weather conditions are suitable.

B. Where walls, curbing, edge restraints, or other suitable permanent supports are not present, secure proper alignment and compaction of HMA courses as shown on the Contract Drawings. Finish unsupported pavement edges with a neat, tamped 45-degree edge unless otherwise shown. Place and compact adjacent shoulder, loam, or restoration material to provide continuous edge support without creating abrupt grade changes, settlement, or drainage obstructions.

C. Multi-Use Path and Pedestrian Walks: Place SSC-9.5 to a total compacted thickness of four (4) inches in two equal two (2) inch lifts.

D. Full-Depth Vehicular Pavement: Place SIC-19.0 to a compacted thickness of three (3) inches and SSC-9.5 to a compacted thickness of two (2) inches. Where the three-inch intermediate course cannot be placed in a single lift under the accepted mix design or MassDOT requirements, place it in approved multiple lifts.

E. Standard Milling and Overlay: Mill existing pavement to a nominal depth of two (2) inches or to the depth required to meet the lines, grades and quality-assurance requirements shown on the Drawings. Clean the milled surface, apply tack coat and place two (2) inches compacted thickness of SSC-9.5.

F. Stagger joints between successive HMA lifts a minimum of six (6) inches.

G. Prior to completion of bituminous concrete overlay, the Contractor shall have the existing patched surfaces tack coated and leveled to eliminate all “birdbaths” or extreme lows which may create ponding or drainage problems. Leveling course (surface treatment) bituminous concrete applied as necessary, shall be raked and feathered and be properly rolled and compacted. The Contractor shall apply “level” lines, screeds, or use other measures to achieve the proper leveling surface suitable for overlay.

H. After completion, the hot mix asphalt courses shall conform to the thickness shown on the Contract Drawings or specified herein and shall be smooth, even, and of a dense and uniform structure. When tested with a sixteen (16) foot straight edge placed parallel to the centerline of the pavement, there shall be no deviation from a true surface in excess of one-quarter (1/4) inch. Finished pavement shall be free of birdbaths, abrupt lips, depressions, or irregularities that may create drainage issues or an unsafe condition for pedestrians, cyclists, or other path users. Transitions to existing pavement, boardwalk

approaches, curb ramps, crossings, and abutting surfaces shall be smooth, flush, and accessible.

I. Seal coat shall be applied only on parking lot and access drive pavement areas, unless otherwise indicated on the Drawings. Seal coat shall not be applied to multi-use path pavement unless specifically indicated on the Drawings. The surface area to be seal coated, as shown on the Drawings, shall be swept and air cleaned. The first coat shall be applied with eight (8) pounds of #30 silica sand blended with each gallon of emulsion applied at a rate of 0.15 gallons per square yard. The second coat shall be a straight sealer applied at the rate of 0.1 gallons per square yard.

3.05 RESIN-BOUND AGGREGATE PAVEMENT:

A. Install resin-bound aggregate pavement only at existing tree-root protection areas and other locations specifically shown on the Drawings.

B. Provide the following assembly, from top to bottom, as shown in Detail 6/L601:

1. Two (2) inches finished thickness of resin-bound aggregate pavement.
2. Minimum four (4) inches finished thickness of clean, open-graded No. 57 stone, without added fines.
3. Nonwoven separation geotextile.
4. Existing ground/root zone, protected from excavation and compaction except as specifically directed in writing by the Owner.

C. Before placing resin-bound pavement, verify that the open-graded stone base is stable, uniformly supported, at the required lines and grades, free of contamination, and acceptable to the resin-system manufacturer. Do not proceed where base preparation or installation would damage existing roots. Obtain direction from the Owner before proceeding with affected work.

D. Prepare, prime, proportion, mix, place, trowel, cure and protect resin-bound aggregate pavement in accordance with the manufacturer’s written requirements and accepted submittals.

E. Do not install during precipitation, when precipitation is anticipated before curing, when the substrate is wet, or when temperature or humidity is outside the manufacturer’s permitted limits.

F. Place resin-bound pavement to a uniform two (2) inch finished thickness. Set the finished surface flush with adjacent pavement and provide smooth transitions at adjoining surfaces, as shown on the Drawings.

G. Finished pavement shall be firm, stable, slip resistant, positive draining and free of loose aggregate, resin-rich areas, dry aggregate, cracking, delamination, ruts, depressions and abrupt changes in level.

H. Notify the Owner when existing roots occur within the proposed resin-bound pavement, open-graded stone base, geotextile, or edge-restraint installation limits. Do not cut, remove, or materially disturb roots without written direction. Where the specified assembly conflicts with existing roots, stop work in the affected area and obtain an approved modified detail before proceeding.

I. Protect completed resin-bound pavement from pedestrian, bicycle, vehicular and construction traffic until fully cured.

3.06 ASPHALT EMULSION TACK COAT:

A. Apply asphalt-emulsion tack coat between successive HMA lifts and where new HMA is placed against or over existing, milled or patched HMA surfaces.

B. Tack coat is not required between aggregate subbase and the initial HMA lift.

C. Clean receiving surfaces of dust, dirt, loose material, water and contaminants before applying tack coat.

D. Apply SS-1 or SS-1H asphalt emulsion uniformly at the accepted application rate. Avoid excessive application, puddling and tracking.

E. Apply only the quantity of tack coat that can be covered by HMA during the same workday. Do not apply when rain is anticipated or when the receiving surface is wet.

F. Protect adjacent curbing, pavement, resin-bound surfaces, structures, vegetation and private improvements from overspray and tracking.

3.07 GUARANTEE/WARRANTY:

A. The Contractor shall be solely responsible for protecting surfaces until final acceptance of the project by the Owner and shall take all necessary precautions to secure premises during the initial drying periods.

B. The pavement shall be guaranteed against defects in workmanship or quality for a period of one (1) year after final acceptance. The Contractor shall replace, repair, recoat, or otherwise make satisfactory to the Owner any unacceptable pavement and/or coating at no additional cost to the Owner.

END OF SECTION

SECTION 32 14 00

UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Work includes careful removal, salvage, storage, resetting, and extension of existing Belgian block edging and existing driveway pavers impacted by proposed bike path construction.

B. Work includes furnishing and installing supplemental Belgian block, pavers, base material, setting bed, jointing material, edge restraint, and related materials required to restore driveway aprons and edges to a complete and finished condition.

C. Reset materials shall match existing adjacent materials, patterns, grades, slopes, joint spacing, and appearance unless otherwise indicated on the Drawings.

D. Work includes investigation, protection, removal, salvage, resetting, and reconstruction of existing driveway paver aprons, Belgian block edging, and related underlying construction impacted by the proposed bike path work.

E. Existing driveway apron construction may include concrete slabs, mortar setting beds, bituminous setting beds, aggregate bases, edge restraints, drainage gaps, and/or weep holes. Contractor shall match and restore existing construction, drainage function, weep holes, grades, transitions, and appearance unless otherwise directed by the Landscape Architect.

F. Work includes sawcutting, selective demolition, removal and replacement of concrete base or haunching where encountered, resetting of salvaged pavers and Belgian block, furnishing supplemental matching materials where required, and restoration of driveway aprons to a complete, stable, free-draining, and finished condition.

1.2 QUALITY ASSURANCE

A. Contractor shall document existing conditions prior to disturbance, including photographs of each impacted driveway apron, Belgian block edge, paver pattern, limits, and grades.

B. Removal and resetting shall be performed by workers experienced with unit paving and Belgian block installation.

C. Contractor shall protect existing driveway improvements outside the limits of work. Damage caused by construction operations shall be repaired or replaced at no additional cost to the Owner.

D. Prior to disturbing each driveway apron, Contractor shall review existing conditions with the Landscape Architect and document the existing driveway construction, including paver type, Belgian block type, pattern, grades, slopes, edge restraints, visible concrete or mortar base, drainage paths, and weep holes.

E. Contractor shall not remove, fill, block, cover, or modify existing weep holes, drainage gaps, or drainage paths unless specifically approved by the Landscape Architect.

F. Where existing pavers or Belgian block are set over concrete, mortar, bituminous setting bed, or other rigid base, Contractor shall reconstruct the disturbed area to match the existing adjacent driveway construction and provide a stable transition suitable for vehicular use.

G. Contractor shall take particular care at private driveway aprons. Damage to existing driveway improvements outside the approved limits of disturbance, including pavers, Belgian block, concrete base, walls, drainage features, planting areas, and adjacent finishes, shall be repaired or replaced at no additional cost to the Owner.

H. Contractor shall distinguish between restoration required due to the Work and pre-existing damage, settlement, poor construction, unpermitted improvements, drainage deficiencies, or other existing conditions. Contractor shall document such conditions prior to disturbance and notify the Landscape Architect and Owner before proceeding.

1.3 SUBMITTALS

A. Product data for supplemental pavers, Belgian block, setting bed, aggregate base, jointing material, and edge restraint materials.

B. Representative samples of supplemental Belgian block and pavers where new material is required to match existing.

C. Existing condition photographs prior to removals.

D. Driveway Apron Restoration Plan: For each affected driveway apron, identify the address or station limits, paving materials, removal and restoration limits, existing construction, quantities anticipated for salvage and reuse, and replacement or supplemental materials required. Identify the proposed base, setting bed, jointing, edge restraints, drainage features, and installation methods for each paving assembly. Clearly distinguish Contractor paving restoration from separately identified Property Owner improvements. Include existing-condition photographs. Review of this plan does not transfer the Contractor’s specified paving responsibilities to the Property Owner.

E. Concrete repair/replacement materials and methods where existing pavers or Belgian block are set over concrete or where concrete base, haunching, or edge restraint is encountered.

F. Proposed method for maintaining or reconstructing existing weep holes, drainage gaps, or other drainage features encountered within the work area.

1.4 FIELD CONDITIONS

A. Weather Limitations for Bituminous Setting Bed:
   1. Install bituminous setting bed only when ambient temperature is above 40 deg F and when base is dry.
   2. Apply asphalt adhesive only when ambient temperature is above 50 deg F and when temperature has not been below 35 deg F for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.

B. Weather Limitations for Mortar and Grout:
   1. Cold-Weather Requirements. Comply with cold-weather construction requirements contained in ACI 530.2/ASCE 6/TMS 602.
   2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

1.5 PRIVATE IMPROVEMENTS WITHIN PUBLIC RIGHT-OF-WAY

A. Existing driveway aprons, pavers, Belgian block, walls, edging, plantings, irrigation, lighting, drainage features, utilities, decorative elements, and other private improvements may be located within the public right-of-way.

B. The presence of existing private improvements within the public right-of-way shall not be construed as confirmation that such improvements are permitted, authorized, accepted, or required to remain.

C. The Contract Documents do not represent or warrant the ownership, permitting status, legality, condition, construction, limits, or long-term acceptability of existing private improvements within the public right-of-way.

D. Work under this Section is limited to removal, salvage, resetting, reconstruction, and restoration of existing driveway pavers, Belgian block, and related materials only where directly impacted by the proposed Work and only to the extent required to complete the proposed bike path improvements.

E. The Contractor shall not perform additional restoration, replacement, upgrades, betterments, or repairs to private improvements within the public right-of-way beyond the limits of Work shown on the Drawings or specifically directed by the Owner.

F. Where private improvements within the public right-of-way conflict with the proposed Work, the Contractor shall notify the Landscape Architect and Owner before proceeding. The Owner shall determine whether the improvement is to be protected, removed, reset, modified, or left in place.

G. The Contractor shall not take direction from private property owners regarding changes to the Work, additional restoration, upgrades, or modifications within the public right-of-way unless such direction is confirmed in writing by the Owner.

H. Review by the Landscape Architect of existing conditions, restoration plans, or completed restoration work is for general conformance with the Contract Documents and does not constitute acceptance of private improvements within the public right-of-way, confirmation of property rights, confirmation of permitting status, or assumption of responsibility for pre-existing conditions.

I. Existing conditions outside the approved limits of disturbance, including private improvements located within the public right-of-way, shall remain the responsibility of others unless specifically identified in the Contract Documents for removal, resetting, reconstruction, or restoration.

PART 2 - PRODUCTS

2.1 SALVAGED MATERIALS

A. Existing Belgian block and unit pavers removed as part of the Work shall be carefully salvaged and reused to the maximum extent practicable. Supplemental materials shall be provided only where salvaged quantities are insufficient or existing units are unsuitable for reuse.

B. Contractor shall carefully remove, clean, stockpile, and protect salvaged materials for resetting.

C. Broken, cracked, stained, or otherwise unsuitable materials shall not be reset unless accepted by the Landscape Architect.

D. Suitable salvaged materials shall not be replaced with new materials unless approved by the Landscape Architect.

2.2 SUPPLEMENTAL MATERIALS – WHERE REQUIRED

A. Where supplemental material is required, natural granite Belgian paving block used within driveway paving shall match the existing adjacent material in size, proportions, color, texture, finish, weathered appearance, and general character.

B. Supplemental Belgian block used as edging shall match existing adjacent Belgian block in size, color, texture, finish, and general appearance.

C. Supplemental unit pavers of other types shall match existing adjacent pavers in material, manufacturer where identifiable, size, color, texture, thickness, pattern, and finish to the greatest extent practicable.

D. Where an exact match is not available, Contractor shall submit the proposed closest available match for review prior to installation.

E. Include in the Contract Price all replacement and supplemental pavers and Belgian block required to complete the restoration and extensions specified in the Contract Documents. This includes units needed because existing units are unsuitable for reuse, units are damaged or lost during the Work, or salvaged quantities are insufficient. Furnish and

install these materials at no additional cost to the Owner or Property Owner. This requirement does not authorize expansion of the Work beyond the specified restoration limits.

2.3 BASE AND SETTING MATERIALS

A. Aggregate base shall be dense-graded crushed stone, compacted in lifts, except at locations detailed in Detail 4/L601, where aggregate base shall be 12 inches of compacted gravel borrow conforming to MassDOT M1.03.0, Type C.

B. Setting bed shall be sand, stone dust, or material matching the existing driveway installation, as approved, except at locations detailed in Detail 4/L601, where the setting bed shall be 1½ inches nominal compacted stone dust. Coordinate base elevation with the thickness of salvaged units to achieve the required finished grades.

C. Jointing material shall match existing adjacent joints unless otherwise approved, except at locations detailed in Detail 4/L601, where joints shall be filled and consolidated with stone dust.

D. Provide edge restraints as indicated on the Drawings and specified in Article 2.5. Where a specific edge restraint is detailed, provide that restraint in lieu of matching the existing restraint material. Where no specific restraint is detailed, match the existing adjacent construction and provide a restraint suitable for the intended driveway use.

2.4 CONCRETE BASE, HAUNCHING AND DRAINAGE FEATURES

A. Where existing driveway pavers or Belgian block are set over concrete, mortar, bituminous setting bed, concrete haunching, or other rigid base, replacement materials shall match the existing adjacent construction unless otherwise approved.

B. Concrete used to repair or replace existing base, haunching, or edge restraint shall be suitable for exterior vehicular driveway use and shall match the thickness, configuration, support, and function of the existing adjacent construction.

C. Do not cover, block, remove, or fill existing weep holes, drainage openings, or drainage gaps. Where existing weep holes or drainage openings are disturbed, reconstruct them to match the existing size, spacing, location, and function unless otherwise directed.

D. Where the existing condition includes weep holes through concrete, edging, walls, or other restraints, provide sleeves, formed openings, or other approved means to maintain the drainage path.

E. Where existing drainage conditions are unclear, stop work in the affected area and notify the Landscape Architect prior to reconstruction.

2.5 EDGE RESTRAINTS

A. Steel Edge Restraints: Provide galvanized steel-angle edge restraints only at brick paving locations indicated on the Drawings. Angles shall be 2½ inches high by 5 inches

horizontal leg by 3/16 inch thick. Attach to the top of the concrete base at 15 inches o.c., with the top of the angle a minimum of ½ inch below the finished face of brick pavers.

B. Salvaged Granite Cobble Paving: At locations indicated in Detail 4/L601, provide continuous aluminum edge restraint, ¼ inch thick by 8 inches deep, with black anodized finish and 18-inch-long anchor stakes spaced at a maximum of 24 inches on center. Provide compatible connectors and anchorage accessories to form a continuous restraint. Submit product data and installation information demonstrating suitability for the salvaged granite cobble paving, supporting base, and vehicular driveway application. Steel-angle edge restraints specified for brick paving do not apply unless specifically indicated on the Drawings.

2.6 EXPANSION JOINT FILLER

A. Joint Filler: Asphalt Expansion Joint complying with ASTM D994, ½" thick.
   1. Provide ½" high temporary joint spacer cap for proper configuration and ready to seal. Snap-Cap by W.R. Meadows or approved equal.

B. Horizontal Joint Sealant: One-component, low modulus, neutral-curing silicone or urethane joint sealant.
   1. Manufacturer:
      a. DOWSIL 790 by Dow Corning.
      b. Pecora 300 SL by Pecora.
      c. Dymonic 100, by Tremco.

2.7 BITUMINOUS SETTING-BED MATERIALS

A. Primer for Base: ASTM D2028/D2028M, cutback asphalt, grade RC 70 Tack Coat by reliable Contracting Co. Inc., or as recommended by brick or unit paver manufacturer.

B. Fine Aggregate for Setting Bed: ASTM D1073, No. 2 or No. 3.

C. Asphalt Cement: ASTM D3381/D3381M, Viscosity Grade AC-10 or Grade AC-20.

D. Neoprene-Modified Asphalt Adhesive: Paver mastic adhesive consisting of oxidized asphalt combined with 2 percent neoprene and 10 percent long-fibered mineral fibers containing no asbestos, by Hanover Architectural Products, or as recommended by brick or unit paver manufacturer.

E. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 (1.18-mm) sieve and no more than 10 percent passing No. 200 (0.075-mm) sieve.

2.8 BITUMINOUS SETTING-BED MIX

A. Mix bituminous setting-bed materials at an asphalt plant in approximate proportion, by weight, of 7 percent asphalt cement to 93 percent fine aggregate unless otherwise indicated. Heat mixture to 300 deg F.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing grades, limits of disturbance, driveway drainage, and proposed bike path grades prior to removal.

B. Notify Landscape Architect of conflicts between existing driveway grades and proposed bike path grades before proceeding.

C. Prior to removals, verify whether existing pavers and Belgian block are installed over aggregate base, sand setting bed, stone dust, mortar setting bed, bituminous setting bed, concrete slab, concrete haunching, or other base condition.

D. Verify and document existing drainage conditions, including weep holes, drainage gaps, surface flow, and driveway apron pitch. Notify the Landscape Architect of existing drainage features prior to disturbance.

E. Do not proceed with removal or reconstruction where the proposed bike path grades conflict with existing driveway drainage, weep holes, or driveway transitions until reviewed by the Landscape Architect.

F. Identify and document existing private improvements within the public right-of-way that may be affected by the Work, including pavers, Belgian block, walls, edging, plantings, irrigation, lighting, drainage features, utilities, and decorative elements. Notify the Landscape Architect and Owner of conflicts before disturbing such improvements.

3.2 REMOVAL AND SALVAGE

A. Carefully sawcut, remove, and salvage existing Belgian block and pavers only within the limits required to construct the proposed work and restore the driveway apron.

B. Remove materials in a manner that minimizes damage to existing units intended for reuse.

C. Stockpile salvaged materials neatly on site in a protected location approved by Owner.

D. Carefully remove pavers and Belgian block to expose existing setting bed and base condition. Do not damage concrete slabs, concrete haunching, mortar beds, drainage openings, weep holes, or adjacent driveway improvements scheduled to remain.

E. Where concrete base, concrete haunching, mortar setting bed, or bituminous setting bed is encountered, sawcut and remove only the minimum amount necessary to complete the proposed bike path work and driveway apron restoration.

F. Existing weep holes, drainage gaps, and drainage paths shall be protected during removals. If damaged or removed as part of the work, reconstruct to match the existing condition unless otherwise directed.

3.3 PREPARATION

A. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

B. Sweep concrete substrates to remove dirt, dust, debris, and loose particles.

3.4 INSTALLATION/RESETTING

A. Reinstall salvaged Belgian block and pavers to match existing adjacent layout, pattern, alignment, grades, slopes, and joint spacing.

B. Extend driveway paver aprons where required to meet the new bike path edge and restore a continuous finished driveway surface.

C. Reuse suitable salvaged materials to the maximum extent practicable. Provide supplemental matching materials only where salvaged quantities are insufficient or existing units are unsuitable for reuse.

D. Set Belgian block true to line and grade. Provide stable edge restraint suitable for vehicular use.

E. Compact aggregate bases to provide firm, stable support. Prepare sand or other unbound setting beds and seat paving units using methods appropriate to the paving material and accepted Driveway Apron Restoration Plan. Install bituminous setting beds in accordance with Article 3.5. For mortar-set paving, restore the supporting base and provide compatible exterior mortar bedding and jointing materials suitable for vehicular use. Match existing bed thickness and joint configuration unless otherwise indicated. Fully support units, maintain drainage openings and movement joints, and cure and protect the installation in accordance with the mortar manufacturer’s written instructions. Do not plate-vibrate mortar-set units. Reset units shall not rock, settle, pond water, or create abrupt transitions.

F. Finished driveway aprons shall provide smooth transitions to the proposed bike path, adjacent driveway, roadway, and landscape areas.

G. Where pavers or Belgian block were previously installed over concrete, mortar, bituminous setting bed, concrete haunching, or other rigid base, reconstruct disturbed areas to match the existing adjacent construction.

H. Maintain existing drainage function at each driveway apron. Do not create ponding, trapped water, blocked weep holes, or reverse drainage toward private driveways, buildings, walls, or landscape areas.

I. Where existing weep holes or drainage openings are present, reset pavers, Belgian block, concrete, and edge restraints to maintain the existing weep hole locations, openings, and drainage path.

J. Where supplemental pavers, Belgian block, concrete base repair, mortar, bituminous setting bed, or edge restraint is required, provide materials and workmanship matching the existing adjacent driveway construction to the greatest extent practicable, except where a different material or construction is specifically indicated on the Drawings or specified herein. Provide aluminum edge restraint at locations indicated in Detail 4/L601.

K. Finished driveway apron restoration shall be neat, stable, flush, and consistent with the existing high-quality residential driveway construction. Transitions to the proposed bike path shall be smooth and shall not create tripping hazards, rocking pavers, loose Belgian block, ponding, or visual mismatches.

L. Restoration of private driveway improvements within the public right-of-way shall not include upgrades, betterments, expansion of private improvements, or correction of pre-existing defective conditions unless specifically shown on the Drawings or directed in writing by the Owner.

M. For salvaged units, existing weathering, color variation, and minor chips consistent with adjacent paving are acceptable. Do not reinstall units with cracks or deterioration that impair stability or serviceability. Supplemental units shall match the approved salvaged paving in material, dimensions, color, and texture.

N. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

O. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
   1. For concrete pavers, a block splitter may be used.

P. Joint Pattern: Match and continue existing unit paver joint pattern.

Q. Tolerances:
   1. Manufactured pavers: Install in accordance with the manufacturer’s written tolerances for the applicable paving assembly. Where supplemental units are installed within existing paving, match adjacent surface character and the approved sample panel while maintaining stable units and smooth transitions without abrupt projecting edges or ponding.
   2. Salvaged granite cobbles and Belgian block: Match the surface character of adjacent existing paving while maintaining the indicated grades and smooth transitions. Before resetting, prepare a representative sample panel for approval by the Landscape Architect. Establish acceptable joint widths and surface variation in the approved panel and document the accepted limits. Reset units shall be stable, without rocking, abrupt projecting edges, or depressions that retain water.

R. Expansion and Control Joints.
   1. Provide ½” joint with joint filler at change in paver materials, at locations indicated, and at width recommended for proper installation. Install joint filler before setting pavers.

a. Make top of joint filler ½" below top of pavers, using temporary joint spacer caps.

S. Provide edge restraints appropriate to each paving assembly, as indicated on the Drawings. Retain or reconstruct existing concrete edging or haunching where required to restore the existing assembly. Provide steel-angle restraints only where specifically indicated. Coordinate edge restraints with existing drainage openings and weep holes.

T. Joint Widths: For new manufactured pavers installed with sand-filled joints, provide joints between 1/16 inch and 1/8 inch wide, unless the manufacturer requires otherwise. Where units have spacer bars, install in accordance with the manufacturer's instructions. For salvaged pavers, granite cobbles, and Belgian block, match adjacent existing joint spacing and the approved sample panel. For mortar-jointed paving, provide joint widths indicated in the applicable details.

Applicability of Paragraphs U through W: The following vibration and sand-jointing requirements apply only to manufactured pavers installed on an unbound aggregate base and sand setting bed with sand-filled joints, where permitted by the paving manufacturer. These requirements do not apply to mortar-set paving, bituminous-set paving, or salvaged granite cobbles and Belgian block. Equipment, compaction force, and number of passes shall be compatible with the units and the manufacturer's written instructions.

U. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz. Use vibrator with neoprene mat on face of plate or other means as needed to prevent cracking and chipping of pavers. Perform at least three passes across paving with vibrator.
1. Compact pavers when there is sufficient surface to accommodate operation of vibrator, leaving at least 36 inches of uncompacted pavers adjacent to temporary edges.
2. Before ending each day's work, compact installed concrete pavers except for 36-inch width of uncompacted pavers adjacent to temporary edges (laying faces).
3. As work progresses to perimeter of installation, compact installed pavers that are adjacent to permanent edges unless they are within 36 inches of laying face.
4. Before ending each day's work and when rain interrupts work, cover pavers that have not been compacted and cover leveling course on which pavers have not been placed with non-staining plastic sheets to protect them from rain.

V. 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.

W. Do not allow traffic on installed pavers until sand has been vibrated into joints.

X. Seat salvaged granite cobbles and Belgian block individually using methods that do not damage the units or underlying construction. Provide setting-bed and joint materials matching the existing assembly, unless otherwise indicated. Fill joints fully using materials and procedures appropriate to that assembly.

Y. For paving with unbound sand or aggregate-filled joints, inspect joints 30 days after installation and replenish joint material as needed. Use methods appropriate to the paving assembly; do not apply the vibration requirements of Paragraphs U through W to other assemblies.

3.5 BITUMINOUS SETTING-BED APPLICATIONS

The requirements of this Article apply only where a bituminous setting bed is indicated or where an existing bituminous setting bed is being reconstructed. Do not apply these requirements to mortar-set or sand-set paving.

A. Apply primer for base (tack coat) to concrete slab or binder course immediately before placing setting bed.

B. Prepare for setting-bed placement by locating 3/4-inch-deep control bars approximately 11 feet apart and parallel to one another, to serve as guides for striking board. Adjust bars to subgrades required for accurate setting of paving units to finished grades indicated.

C. Place bituminous setting bed where indicated, in panels, by spreading bituminous material between control bars. Spread mix at a minimum temperature of 250 deg F. Strike setting bed smooth, firm, even, and not less than 3/4 inch thick. Add fresh bituminous material to low, porous spots after each pass of striking board. After each panel is completed, advance first control bar to next position in readiness for striking adjacent panels. Carefully fill depressions that remain after removing depth-control bars.
   1. Roll setting bed with power roller to a nominal depth of 3/4 inch. Adjust thickness as necessary to allow accurate setting of unit pavers to finished grades indicated. Complete rolling before mix temperature cools to 185 deg F.
   2. Small areas may use plate tamper, where approved by Landscape Architect.

D. Apply neoprene-modified asphalt adhesive (paver mastic) to cold setting bed by squeegeeing or troweling to a uniform thickness of 1/8-inch. Proceed with setting of paving units only after adhesive is tacky and surface is dry to touch.

E. Place pavers carefully by hand in straight courses, maintaining accurate alignment and uniform top surface. Protect newly laid pavers with plywood panels on which workers can stand. Advance protective panels as work progresses but maintain protection in areas subject to continued movement of materials and equipment to avoid creating depressions or disrupting alignment of pavers. If additional leveling of paving is required, and before treating joints, roll paving with power roller after sufficient heat has built up in the surface from several days of hot weather.

F. Joint Treatment:
   1. For new manufactured pavers, provide joint widths and jointing materials indicated on the Drawings and compatible with the manufacturer’s requirements for bituminous-set installation.
   2. For salvaged pavers, granite cobbles, Belgian block, and supplemental matching units, match adjacent existing joint widths and materials and the accepted sample panel.

3. Where sand-filled joints are required, sweep dry joint sand into joints until completely filled and remove excess sand. Do not apply the plate-vibration requirements for sand-set paving to bituminous-set paving.
4. Where another joint treatment is required to restore the existing assembly, submit compatible materials and installation procedures in the Driveway Apron Restoration Plan before installation.

3.6 FIELD QUALITY CONTROL

A. Finished work shall match existing adjacent driveway construction in appearance and workmanship.

B. Remove and reset units that are uneven, unstable, misaligned, damaged, or inconsistent with adjacent work.

C. Contractor shall be responsible for correcting settlement or displacement of reset materials during the correction period.

D. Landscape Architect shall review restored driveway apron work prior to final acceptance.

E. Reconstructed areas shall match existing adjacent driveway work in pattern, color blend, joint spacing, grades, edge restraint, drainage function, and overall appearance.

F. Contractor shall correct any settlement, rocking pavers, loose Belgian block, blocked weep holes, ponding, mismatched materials, damaged materials, or uneven transitions during the correction period at no additional cost to the Owner.

3.7 REPAIRING, POINTING, AND CLEANING

A. Remove and reset loose or unstable unit pavers. Remove and replace units with cracks, deterioration, or other damage that impairs stability or serviceability, and units that do not meet the accepted appearance requirements. For salvaged units, existing weathering, color variation, and minor chips consistent with adjacent paving and accepted under Paragraph 3.4.M shall not be grounds for rejection or replacement. Reuse suitable salvaged units to the maximum extent practicable; provide supplemental matching units only where suitable salvaged units are unavailable. Install replacement units to match the adjoining paving assembly, joint treatment, and approved sample panel.

END OF SECTION

SECTION 32 17 23

SHARED-USE PATH PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

A. Provide all equipment, materials, labor, layout, surface preparation, and installation necessary for permanent shared-use-path pavement markings as indicated on the Drawings and specified herein, including path centerlines, bicycle/shared-use-path symbols, legends, arrows, and other markings located on shared-use-path pavement surfaces.

B. Permanent pavement markings located on public roadway pavement surfaces, including roadway crosswalks, stop bars, lane lines, centerlines, edge lines, roadway symbols, and other roadway markings, shall be furnished and installed by the Owner/Town and are not included in the Contractor's Work. The Contractor shall coordinate the timing and layout interface of Owner/Town pavement-marking work with the completed Contract Work.

1.3 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section.

Specification Sections that directly relate to work of this Section include, but are not limited to:

1. Section 01 33 23 – SUBMITTALS
2. Section 01 55 26.13 – TEMPORARY SIGNAGE AND TRAFFIC CONTROL
3. Section 10 14 53 – TRAFFIC AND SITE SIGNAGE
4. Section 32 12 16.13 – HOT MIX ASPHALT PAVEMENT

1.4 REFERENCES

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. Pavement markings shall comply with the Manual on Uniform Traffic Control Devices, latest edition, including MUTCD requirements for bicycle facilities, pedestrian crossings, shared-use paths, and traffic control devices.

2. Pavement markings shall comply with applicable MassDOT requirements, including Section 860, Reflectorized Pavement Markings, and the Contract Drawings.

3. Where requirements conflict, notify the Engineer prior to installation.

1.5 LAYOUT OF WORK

A. Prior to installation, the Contractor shall field layout proposed pavement markings for review by the Engineer. Final layout shall be coordinated with signs, roadway crossings, driveway crossings, boardwalk approaches, accessible routes, curb ramps, pavement edges, sight lines, utilities, and existing vegetation.

B. Pavement markings shall not be installed until final layout is accepted by the Engineer.

1.6 COORDINATION WITH TRAFFIC AND SITE SIGNAGE

A. Pavement markings shall be coordinated with Section 10 14 53, TRAFFIC AND SITE SIGNAGE, and shall provide a complete, consistent traffic control and shared-use path wayfinding system.

B. Bicycle/shared-use-path symbols, warning markings, legends, and other Contractor-installed pavement markings shall align with permanent signs, regulatory controls, crossing locations, and sight-distance requirements shown on the Drawings or directed by the Engineer.

1.7 SUBMITTALS

A. Lists of proposed equipment, including descriptive data, and notifications of proposed Contractor actions as specified in this section. List of removal equipment shall include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation.

1.8 DELIVERY AND STORAGE

A. All materials shall be delivered and stored in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which shall be plainly legible at time of use.

1.9 EQUIPMENT

A. All machines, tools and equipment used in the performance of the work shall be approved and maintained in satisfactory operating condition. Equipment operating on roads shall

display low speed traffic markings and traffic warning lights.

1.10 TRAFFIC CONTROL

A. Traffic Controls: Guidance for traffic control procedures can be obtained from the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways.

B. Place traffic cones, barricades, or other temporary controls along newly installed pavement markings to prevent pedestrian, bicycle, and vehicular traffic from damaging the markings. Remove protection only after markings have sufficiently cooled, cured, or set in accordance with the manufacturer's recommendations.

1.11 WEATHER LIMITATIONS

A. Pavement surface shall be free of snow, ice, or slush. Surface temperature shall be at least 40 degrees F and rising at the beginning of operations, except those involving shot or sand blasting. Operation shall cease during thunderstorms. Operation shall cease during rainfall, except for water blasting and removal of previously applied chemicals. Water blasting shall cease where surface water accumulation alters the effectiveness of material removal.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pavement markings shall be reflectorized thermoplastic pavement markings unless otherwise specifically indicated on the Drawings or approved by the Engineer. Thermoplastic pavement markings shall conform to applicable MassDOT requirements, including Section 860, Reflectorized Pavement Markings, MUTCD requirements, and manufacturer's written recommendations.

B. Marking materials shall be suitable for exterior roadway and shared-use path applications and shall comply with MUTCD, MassDOT requirements, and manufacturer's recommendations.

C. Colors, widths, dimensions, legends, symbols, and patterns shall be as shown on the Drawings. Where not shown, markings shall comply with MUTCD and applicable MassDOT requirements.

D. Provide reflective media where required for Contractor-installed shared-use-path pavement markings in accordance with the Drawings, applicable MassDOT requirements, and manufacturer's recommendations.

2.2 TEMPORARY PAINT MATERIAL

A. Temporary paint markings, where approved by the Engineer, shall be used only for temporary traffic control or temporary layout markings and shall not be used for

permanent pavement markings.

2.3 APPLICATION EQUIPMENT

A. Application Equipment for Marking Materials

1. Application equipment shall provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the extrusion shoe or spray gun shall prevent accumulation and clogging. All parts of the equipment which come into contact with the material shall be easily accessible and exposable for cleaning and maintenance. All mixing and conveying parts up to and including the extrusion shoes and spray guns shall maintain the material at the required temperature with heat-transfer oil or electrical-element-controlled heat.

2. The application equipment shall be constructed to ensure continuous uniformity in the dimensions of the stripe. The applicator shall provide a means for cleanly cutting off stripe ends squarely and shall provide a method of applying "skip lines". The equipment shall be capable of applying varying widths of traffic markings.

B. Mobile and Maneuverable: Application equipment shall be mobile and maneuverable to the extent that straight lines can be followed, and normal curves can be made in a true arc. The equipment used for the placement of pavement markings shall be of two general types:

1. Mobile Application Equipment: The mobile applicator shall be defined as a truck mounted, self-contained pavement marking machine that is capable of applying thermoplastic pavement markings. The unit shall be equipped to apply the marking material at widths varying from 3 to 12 inches, and in varying thicknesses. The mobile unit shall be capable of operating continuously and of installing a minimum of 20,000 lineal feet of longitudinal markings in an 8-hour day.

a. The mobile unit shall be equipped with an electronic programmable line pattern control system. The control system shall be capable of applying skip or solid lines in any sequence, through any and all of the extrusion shoes, or the spray guns, and in programmable cycle lengths. In addition, the mobile unit shall be equipped with an automatic counting mechanism capable of recording the number of lineal feet of markings applied to the pavement surface with an accuracy of 0.5 percent.

2. Portable Application Equipment: The portable applicator shall be defined as hand operated equipment, specifically designed for placing special markings such as crosswalks, stop bars, legends, arrows, and short lengths of lane, edge and centerlines. The portable applicator shall be equipped with all the necessary components so as to be capable of extruding a line of 3 to 12 inches in width, and in varying thicknesses and of generally uniform cross section.

2.4 SURFACE PREPARATION EQUIPMENT

A. Sandblasting Equipment: shall include an air compressor, hoses, and nozzles of proper size and capacity for cleaning surfaces to be painted. The compressor shall be capable of furnishing not less than 150 cfm of air at a pressure of not less than 90 psi at each nozzle used, and shall be equipped with traps that will maintain the compressed air free of oil and water.

B. Water blast Equipment: The water pressure shall be specified at 2600 psi at 140 degrees F in order to adequately clean the surfaces to be marked.

C. Marking Removal Equipment: shall be mounted on rubber tires and shall be capable of removing markings from the pavement without damaging the pavement surface or joint sealant. Water blasting equipment shall be capable of producing an adjustable, pressurized stream of water. Sandblasting equipment shall include an air compressor, hoses, and nozzles. The compressor shall be equipped with traps to maintain the air free of oil and water.

D. Shot blasting Equipment: shall be capable of producing an adjustable depth of removal of marking and pavement. Each unit shall be self-cleaning and self-contained, shall be able to confine dust and debris from the operation, and shall be capable of recycling the abrasive for reuse.

E. Chemical Equipment: shall be capable of application and removal of chemicals from the pavement surface and shall leave only non-toxic biodegradable residue.

2.5 REFLECTIVE MEDIA DISPENSER

A. The reflective-media dispenser shall be attached to the pavement-marking applicator and shall operate automatically and simultaneously through the same control mechanism. The dispenser shall be adjustable and capable of distributing reflective media uniformly over the full length and width of the stripe at the application rate required by applicable MassDOT requirements and the approved pavement-marking manufacturer’s written instructions, at all operating speeds of the applicator.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Surfaces to receive markings shall be clean, dry, sound, and free of dirt, dust, oil, grease, curing compounds, loose aggregate, vegetation, debris, and other materials that may interfere with adhesion.

B. New asphalt pavement shall be allowed to cure in accordance with marking material manufacturer’s recommendations prior to installation.

C. Existing markings to be removed or modified shall be removed by methods that do not damage pavement surfaces or joint sealants.

3.2 APPLICATION

A. Install pavement markings in the locations, colors, widths, symbols, legends, and patterns shown on the Drawings.
B. Bicycle/shared-use-path symbols, arrows, legends, and other special path markings shall be installed using templates or layout methods that provide straight, uniform, sharply defined markings.
C. Markings shall be installed in accordance with MUTCD, applicable MassDOT requirements, and manufacturer's written recommendations.
D. Do not install markings when pavement or weather conditions are outside manufacturer's recommended limits.
E. Apply reflective media uniformly at the rate required by applicable MassDOT requirements and the approved pavement-marking manufacturer's written instructions. Submit the proposed reflective-media type, application rate, and supporting manufacturer's instructions to the Engineer for review before installation. Resolve any conflicting requirements with the Engineer before application.

3.3 PROTECTION OF MARKINGS

A. Protect markings from pedestrian, bicycle, and vehicular traffic until sufficiently cooled, cured, or set in accordance with the manufacturer's recommendations.

B. Replace or repair smeared, tracked, damaged, misaligned, or defective markings at no additional cost to the Owner.

END SECTION

SECTION 32 34 13

PREFABRICATED STEEL BOARDWALK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. This section is only a portion of the Contract Documents. All of the Contract Documents, including Conditions of the Contract and Division 01 General Requirements, apply to this section.

1.02 DESCRIPTION OF WORK

A. The work of this Section includes, but is not limited to, furnishing and installing a prefabricated/pre-engineered duplex-coated structural steel-framed raised boardwalk system supported on cast-in-place concrete footings or piers, including MoistureShield Vision capped composite decking, frames, railings, edge protection, concrete footing coordination, saddle brackets or base plates, anchor bolts, connections, hardware, transitions, shop drawings, signed and sealed calculations, installation records, cleaning, repair, protection, and related work required for a complete installation as shown on the Drawings and specified herein. Provide a minimum clear usable boardwalk width of 10 feet, measured between the nearest inward projections of the completed railing assemblies, including posts, caps, fascia, and hardware.

B. The Contractor shall furnish all labor, materials, equipment, services, temporary works, layout, surveying, excavation, concrete footings or piers, reinforcing, anchor bolts and embedded items, unloading, storage, hoisting, crane services, specialty access equipment, assembly, installation, site restoration, and other work required for a complete and operational boardwalk system, whether or not such items are included in the boardwalk manufacturer’s material-supply package. The Contractor shall coordinate and procure the boardwalk manufacturer’s supply package as part of the Work.

C. Manufacturer exclusions shall not relieve the Contractor of responsibility for furnishing and completing the Work required by the Contract Documents. Include all required engineering, freight, bonding, taxes, and permits in accordance with the Contract Documents. Supplier allowances and payment terms shall not modify the Contractor’s obligations or the payment requirements established by the Contract Documents.

D. Include in the Base Bid all boardwalk testing and inspection costs assigned to the Contractor under Section 01 45 23 and Attachment F, including required fabrication and field inspections, reports, coordination, access, and reinspection of corrected Work. Comply with the requirements for independent agency retention and reporting. Manufacturer exclusions shall not relieve the Contractor of these obligations.

1.03 RELATED WORK

A. Carefully examine all the Contract Documents for requirements that affect the work of this Section. Other specification sections that directly relate to the work of this Section include, but are not limited to the following:

1. Section 01 33 23 – Submittals
2. Section 01 45 23 – Special Testing and Inspections
3. Section 01 56 00 – Construction Zone Safety Plan
4. Section 01 57 19 – Environmental Protection
5. Section 01 78 00 – Project Closeout
6. Section 01 78 39 – Project As-Built Record Drawings
7. Section 03 30 00 – Cast-in-Place Concrete
8. Section 31 00 00 – Earthwork
9. Section 31 05 19.13 – Geotextile Fabrics
10. Section 31 25 00 – Erosion and Sedimentation Control
11. Section 32 12 16.13 – Hot Mix Asphalt Pavement
12. Section 32 91 00 – Loam and Planting Preparation
13. Section 32 92 19 – Seeding
14. Section 32 93 00 – Planting and Landscape Restoration

1.04 BOARDWALK DESIGN

A. Structural design of the boardwalk structure(s) shall be performed by or under the direct supervision of a licensed Professional Engineer and done in accordance with recognized engineering practices and principles. The design Engineer shall be a Professional Engineer registered in the Commonwealth of Massachusetts. Design shall utilize AASHTO LRFD Specifications for Pedestrian Bridges, latest edition, and other applicable codes and standards.

B. Design Responsibility. The boardwalk manufacturer shall be responsible for the delegated structural design of the prefabricated boardwalk system, including structural steel framing, support legs, cross-bracing, railings, connections, base plates, anchorages, and determination of support reactions.

The Contractor shall be responsible for the delegated structural design of the cast-in-place concrete footings or piers. Footing design shall be prepared and signed and sealed by a Professional Engineer registered in the Commonwealth of Massachusetts and shall be based on support reactions, loads, connection requirements, and

tolerances provided by the boardwalk manufacturer, together with available geotechnical information, frost requirements, and site conditions.

The boardwalk manufacturer and Contractor shall coordinate framing, support legs, base plates, anchor bolts, footing locations, elevations, and other interface conditions required for a complete structural system.

C. General Design Loads. Design the prefabricated boardwalk system for all applicable loads, load combinations, serviceability requirements, deflection limits, vibration and dynamic-response criteria, fatigue considerations, thermal movements, construction loads, environmental loads, railing and guard loads, connection forces, anchorage forces, and support reactions required by the governing codes, referenced design standards, Contract Drawings, and site conditions. The boardwalk delegated-design Engineer shall determine and document the applicability of each design criterion in the signed and sealed calculations and shall provide all support reactions and other design information required for coordination with the Contractor's footing design Engineer. Vehicular loading and vehicle-impact loading shall be provided where indicated on the Contract Drawings or required by applicable codes or authorities having jurisdiction.

1. Dead Load.

   The boardwalk structure shall be designed for the dead load of all permanent boardwalk components, including frames, decking, railings, edge protection, base plates, anchor bolts, connections, hardware, and other permanent appurtenances shown on the Drawings or required for a complete installation.

2. Uniform Live Load - Pedestrian Live Load.

   Main Members: Main supporting members shall be designed for a pedestrian live load of 90 pounds per square foot of walkway area. The pedestrian live load shall be applied to those areas of the walkway to produce maximum stress in the member being designed.
   Secondary Members: Decking and supporting floor systems, including secondary stringers, floor beams and their connections to main supporting members shall be designed for a live load of 90 pounds per square foot, with no reduction allowed.

3. Concentrated Loads.

   Design the complete boardwalk system, including decking, main and secondary supporting members, connections, anchorage, and foundations, for an 8,000-pound gross-weight maintenance vehicle. Verify governing wheel, axle, or track loads, contact areas, and spacing for the intended maintenance equipment. Apply vehicle loads at positions producing the maximum effect on each component and include applicable load combinations and dynamic allowances required by the governing codes and referenced design standards. Coordinate vehicle-loading criteria with L602, Note 2, and document the criteria and resulting support reactions in the delegated-design calculations.

Design railings and edge protection for applicable concentrated loads required by the governing codes and referenced design standards. Provide vehicle-access controls where indicated on the Drawings.

4. Railings.

   Railings, guards, edge protection, infill panels, posts, connections, and anchorage shall be designed for applicable pedestrian bridge, building code, accessibility, and public safety loading requirements. Railings and edge protection shall be coordinated with the Drawings, boardwalk height, adjacent grades, wetland/resource area constraints, and required accessibility clearances.

1.05 SUBMITTALS

A. Submit the following in accordance with Section 01 33 23 – Submittals:

1. Boardwalk Review and Approval: Submit the coordinated boardwalk shop drawings, signed and sealed structural calculations, footing design, product data, finishes, and installation information to the Engineer for concurrent Engineer and Town review. Allow thirty (30) calendar days after receipt of a complete coordinated submittal for each review cycle, including resubmittals. This is the combined Town and Engineer review period and is not an additional period beyond Section 01 33 23.

   1) Do not release boardwalk components for fabrication or begin affected foundation construction until the Engineer has returned the applicable submittals with a disposition permitting the Work to proceed and the Town has provided written approval through the Engineer. Expiration of the review period shall not constitute approval. Include submittal preparation, review, corrections, resubmittals, fabrication, and delivery in the construction schedule. Town approval and Engineer review shall not relieve the Contractor, manufacturer, or delegated-design engineers of their respective responsibilities.

2. Shop drawings for all boardwalk components, including steel frames, decking, railings, edge protection, base plates, anchor bolts, connections, transitions, hardware, and installation details. Shop drawings shall be signed and sealed by a Professional Engineer registered in the Commonwealth of Massachusetts.

3. Structural calculations for the prefabricated boardwalk system, including frames, support legs, cross-bracing, decking support system, railings, edge protection, connections, base plates, anchorages, and support reactions. Calculations shall be signed and sealed by a Professional Engineer registered in the Commonwealth of Massachusetts.

4. Concrete footing/pier structural calculations and design information, including footing layout, footing sizes, top-of-footing elevations, design bearing assumptions, reinforcing, frost protection, anchor bolt layout, anchor bolt embedment requirements, and required installation tolerances. Footing calculations shall be prepared under the Contractor’s responsibility and signed

and sealed by a Professional Engineer registered in the Commonwealth of Massachusetts. Design shall be coordinated with the support reactions and interface requirements provided by the boardwalk manufacturer.

5. Manufacturer's product data, material data sheets, finish information, decking data, railing data, hardware data, and system performance information. Decking slip-resistance test data, including applicable test methods, classifications, and results for both longitudinal and transverse directions. Proposed equal decking products shall provide documentation demonstrating slip-resistance performance equal to or greater than the basis-of-design decking.
6. Installation plan, including proposed construction access, equipment, installation sequence, resource area protection measures, means and methods for minimizing disturbance, and proposed staging areas.
7. Welding certifications and evidence that structural welding will be performed by American Welding Society certified welders.
8. Duplex coating system data and certifications, including hot-dip galvanizing and exterior coating information for steel frames, support legs, base plates, exposed steel, hardware, and connections.
9. Manufacturer's written warranties for metal framing, decking, railings, connections, coatings, galvanizing, hardware, and other boardwalk system components.
10. Maintenance data and closeout information required under Division 01.
11. Certification of steel origin, only if required by the Contract Documents, funding source, or applicable procurement requirements.
12. Field installation records, including concrete footing layout verification, footing elevations, anchor bolt locations, embedded item locations, and any field modifications.

1.06 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall be responsible for receiving, unloading, inspecting, handling, storing, protecting, transporting within the Site, hoisting, and setting all boardwalk materials. Provide all cranes, lifting equipment, specialty access equipment, temporary access, rigging, operators, and related labor necessary for installation.

1.07 COORDINATION

A. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work as necessary to assure the steady progress of the work of this Contract.

B. Substrates: Proceed with work only when subgrade preparation work is complete.

1.08 GUARANTEE

A. In addition to the requirements of the General Conditions and Supplementary Conditions, the Contractor shall provide manufacturer's standard written warranties for each product and system component included in this Section. Warranties shall be submitted to the Engineer prior to final acceptance.

B. The boardwalk manufacturer shall warrant the structural steel frame against defects in materials and workmanship for the manufacturer's standard warranty period. Decking, railings, edge protection, base plates, anchor bolts, brackets, coatings, galvanizing, connections, hardware, and other non-frame components shall be warranted in accordance with the respective manufacturer's written warranties.

C. Manufacturer's warranties shall not limit the Contractor's obligations under the Contract Documents. Defective work, defective materials, premature failure, improper installation, damaged coatings, damaged galvanizing, loose connections, noncompliant transitions, or other deficiencies shall be repaired or replaced at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 GRADING AND COMPACTION OF SUB-BASE

A. Do all necessary grading in addition to that specified under Section 31 00 00 - EARTHWORK to bring subgrade or foundation after final compaction to required grades and sections to obtain a foundation of uniform bearing surface. In absence of specific requirements, compact foundation by such means as shall provide firm base and ensure against settlement of superimposed work.

B. Sub-base preparation, including material, shall be of properly approved quality as specified under Section 31 00 00 - EARTHWORK. Start of work under this Section shall constitute acceptance of the foundation conditions to which this work is to be applied. Any defects in work resulting from such conditions shall be corrected under this Section 32 34 13, Prefabricated Steel Boardwalk, at no additional cost to the Owner.

2.02 CONCRETE FOOTINGS / PIERS FOR RAISED BOARDWALK

A. Concrete footings or piers for the raised boardwalk shall be cast-in-place concrete and shall be constructed in accordance with Section 03 30 00 – Cast-in-Place Concrete and the Contract Drawings. Concrete footings or piers shall be the required permanent footing type for this Project. Alternate footing systems, including helical piles, wood piles, driven steel piles, diamond piers, or other footing types, shall not be used unless specifically accepted by the Engineer through the substitution process.

B. The boardwalk manufacturer shall be responsible for delegated structural design of the prefabricated boardwalk framing and support leg system and shall provide the Contractor with support reactions, base plate requirements, anchor bolt requirements, connection geometry, and required tolerances.

The Contractor shall be responsible for delegated structural design of the cast-in-place concrete footings or piers based on the boardwalk manufacturer's design

information. Anchor bolts and embedded items shall be accurately located and secured prior to concrete placement.

C. Footings shall be founded on approved, compacted subgrade or suitable bearing material as required by the Contract Documents. Unsuitable materials encountered at footing excavations shall be removed and replaced as directed by the Engineer.

D. Footings shall extend to the required depth for frost protection and shall be sized and reinforced as required by the signed and sealed delegated footing design. Footing locations, elevations, and general configuration shall be coordinated with the Contract Drawings and approved boardwalk shop drawings.

E. Concrete shall achieve the required design strength prior to installation of boardwalk frames, decking, railings, or other supported components, unless otherwise approved by the Engineer.

F. Delegated footing design shall be based on available geotechnical information, boardwalk manufacturer support reactions, Contract Drawings, frost protection requirements, and site-specific conditions encountered during construction.

G. The Contractor shall furnish and perform all layout, survey, excavation, dewatering where required, subgrade preparation, formwork, reinforcing steel, concrete, anchor bolts, embedded items, backfill, compaction, curing, protection, testing, and restoration required to construct the boardwalk footings or piers. Concrete footings or piers are not included in the boardwalk manufacturer's material-supply package and shall be provided by the Contractor as part of the Contract Price.

2.03 ELEVATED BOARDWALK

Basis of design: Modular Trail Structures prefabricated elevated boardwalk system, or approved equal. The Contract Drawings shall govern the overall boardwalk dimensions, alignment, elevations, and limits of work. Final system configuration shall be coordinated through the delegated design and approved shop drawings.

Modular Trail Structures
Madison, WI
Representative Brian Kuehn
brian@modulartrails.com
608-609-9277

a. Qualified Equals. Requests for approval of an equal boardwalk manufacturer, supplier, system, design, or material shall be received by the deadline established for bidder questions and submitted through the method specified in the Instructions to Bidders. Requests shall include complete supporting documentation demonstrating compliance with this Section, Division 01 requirements, and the qualification criteria below. Late or incomplete requests may be rejected without review. The Engineer will review timely, complete requests, and any approved equals will be identified by written addendum issued by the final-addendum deadline established in the bidding documents.

Only approval issued by addendum shall constitute acceptance of a proposed equal for bidding purposes.

i. Contractor/Supplier shall show evidence that all structural welding must be performed by American Welding Society (AWS) certified welders.

ii. Contractor/Supplier shall identify any structural fabrication subcontractors or outside fabrication entities proposed for the Work. Structural fabrication shall not be transferred to entities not included in the approved submittal without prior approval by the Engineer.

iii. Boardwalk manufacturer shall have a minimum of ten (10) years of demonstrated experience manufacturing prefabricated structural steel boardwalk systems of similar type, size, and complexity.

iv. Boardwalk manufacturer shall list the last five (5) comparable boardwalk projects completed, including the names, addresses, and phone numbers of project contacts. Provide a brief description of each project and its respective contract amount.

B. Refer to drawing details for dimensions and installations.

C. The general specifications for the boardwalk are as follows:

a. Prefabricated/pre-engineered modular elevated boardwalk system consisting of duplex-coated structural steel frame modules and MoistureShield Vision capped composite decking, or approved equal.

b. System to be prefabricated and test assembled off-site at the manufacturing plant.

c. Boardwalks shall be shipped to the site and assembled into place. Boardwalks shall be installed overtop of existing terrain with minimal disturbance to the ground plane.

d. Boardwalk shall provide a minimum clear usable width of 10 feet, measured between the nearest inward projections of the completed railing assemblies, including posts, caps, fascia, and hardware.

e. Boardwalks shall have railings and infill panels that meet all applicable regulations and codes. Boardwalk system warranties shall meet or exceed the warranty requirements specified herein. Contractor shall submit written manufacturer warranties for metal framing, decking, railings, connections, and other system components.

D. Materials:

a. General: Materials and components shall be designed and selected by the boardwalk manufacturer to satisfy the design loads, performance requirements, durability requirements, approved shop drawings, and applicable codes specified herein.

b. Structural Frame: Provide duplex-coated structural steel framing. Complete all fabrication and welding prior to hot-dip galvanizing. Hot-dip galvanize completed fabricated assemblies in accordance with applicable ASTM requirements, followed by preparation and application of the manufacturer's approved exterior paint/coating system over the galvanized surface. The completed duplex coating system shall be suitable for the coastal marine environment and shall be applied in accordance with the coating manufacturer's written requirements.

c. Decking: Provide MoistureShield Vision capped composite decking, or approved equal. Decking shall be suitable for exterior public boardwalk applications and continuous exposure to moisture and weather. Provide decking profile, supports, fastening system, spacing, and installation in accordance with the decking manufacturer's written requirements and approved boardwalk structural design.

   Decking shall provide documented slip resistance in both longitudinal and transverse directions. Proposed equal products shall provide current test data demonstrating slip-resistance performance equal to or greater than the basis-of-design decking.

   Provide manufacturer-approved corrosion-resistant fasteners and accessories compatible with the decking and supporting boardwalk system.

d. Support Legs and Bracing: Provide duplex-coated structural steel support legs and bracing. Support-leg sizes, configuration, spacing, connections, and cross-bracing requirements shall be determined by the boardwalk manufacturer based on boardwalk geometry, support conditions, and applicable design loads. Complete fabrication, galvanizing, and coating in accordance with the duplex coating requirements specified herein.

e. Boardwalk walking surfaces, approaches, transitions, railings, edge protection, running slopes, cross slopes, openings, and changes in level shall comply with applicable accessibility requirements and the Contract Drawings.

E. Walkway:

a. Walkways shall be assembled from prefabricated modular sections sized to provide a minimum clear usable width of 10 feet between the nearest inward projections of the completed railing assemblies, including posts, caps, fascia, and hardware. Each modular section shall consist of a frame and deck section prefabricated according to the approved shop drawings and ready to install upon delivery. Frames shall be prefabricated duplex-coated structural steel and supported on cast-in-place concrete footings or piers with saddle brackets, base plates, anchor bolts, connections, and support details as indicated on the Drawings and approved shop drawings.

b. Each support post, leg, base plate, anchor bolt, and connection shall be designed for the applicable loads specified in this Section. Final support spacing, framing configuration, support-leg configuration, and boardwalk connection requirements shall be determined by the signed and sealed boardwalk design. Concrete footing design, reinforcing, and foundation requirements shall be determined by the Contractor's footing design engineer based on the support reactions and interface requirements provided by the boardwalk manufacturer. Footing layout, anchor bolt configuration, elevations, and tolerances shall be coordinated between the boardwalk manufacturer and Contractor.

F. Locking System

a. Boardwalk sections shall be connected using the manufacturer's standard connection or locking system, designed to provide a stable, continuous, accessible walking surface while accommodating the grades, slopes, and transitions shown on the Drawings.

b. Connections shall be designed to transfer required loads between modular sections and shall allow for maintenance, removal, or replacement of individual sections where required. The connection system shall be compatible with the approved boardwalk system, concrete footing supports, decking, railings, edge protection, and accessibility requirements.

c. Connection details shall be shown on the shop drawings and included in the signed and sealed structural calculations.

G. Railings and Infill

a. Provide boardwalk guardrail system with welded wire mesh infill as indicated on the Drawings and approved shop drawings. Provide Ipe wood top cap and Ipe interior fascia as part of the railing system. Ipe components shall be exterior-grade, naturally durable hardwood suitable for the coastal environment, with stainless steel or manufacturer-approved concealed/corrosion-resistant attachment hardware.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Work within wetland resource areas, wetland buffer zones, coastal resource areas, and other environmentally sensitive areas shall comply with applicable permits, Orders of Conditions, regulatory approvals, and the Contract Drawings. In the event of conflict, the more restrictive requirement shall govern.

B. Boardwalk installation shall be performed from previously installed boardwalk sections or approved construction access routes to minimize disturbance to existing grades, vegetation, wetland buffer vegetation, and resource areas. No equipment,

materials, or construction activity shall occur outside the approved limits of work unless specifically authorized by the Engineer.

C. The Contractor shall be responsible for installation of the complete boardwalk system. Installation shall be performed by qualified personnel experienced with the specified boardwalk system and, where required by the boardwalk manufacturer to maintain the warranty, by a factory-authorized or factory-certified installer. The boardwalk manufacturer's material-supply scope and exclusions shall not relieve the Contractor of responsibility for complete installation of the boardwalk system.

D. All materials and construction practices for foundations, railings, edge protection, decking, transitions, and approaches shall comply with applicable codes, accessibility requirements, industry standards, approved shop drawings, and manufacturer's written instructions.

E. Boardwalk approaches and transitions to adjacent walks, paths, pavement, or trails shall be flush and accessible. Changes in level, openings, running slope, cross slope, and gaps shall comply with applicable accessibility requirements and the Contract Drawings.

F. Products shall be installed in accordance with manufacturer's written instructions and recommendations to maintain warranty.

G. Field cutting, drilling, or modification of galvanized steel components shall not be permitted unless specifically approved by the Engineer. Where approved, damage to galvanizing and the exterior coating shall be repaired in accordance with the duplex coating manufacturer's written repair procedures. Repairs to galvanized surfaces shall comply with ASTM A780 where applicable. Restore the complete corrosion-protection system at repaired areas. Welding of steel components shall not be performed within wetland resource areas, wetland buffer zones, or other environmentally sensitive areas. Field welding shall not be permitted unless specifically approved by the Engineer and performed in accordance with approved procedures.

H. Concrete footing locations, elevations, anchor bolt locations, and embedded items shall be verified as suitable and adequate before installation of boardwalk framing. Do not install boardwalk frames, decking, railings, or related components until concrete footings have achieved the required strength and the footing layout, elevations, and anchorage have been accepted for installation.

I. Boardwalk installation shall be coordinated with concrete curing, site grading, approach paving, restoration, and protection of adjacent resource areas. Work shall remain within the limits of work shown on the Drawings.

3.02 CLEANING, REPAIR AND PROTECTION

A. Repair minor damages to eliminate all evidence of repair. Remove and replace work that cannot be satisfactorily repaired. Site improvements, vegetation, wetlands, wetland buffer vegetation, coastal resource areas, erosion controls, path surfaces, pavement, boardwalk components, utilities, and other work damaged by the Contractor shall be restored at no additional cost to the Owner.

B. Provide temporary protection to ensure that the work will be without dirt, stains, damage or deterioration at time of final acceptance. Clean up stains and spills as they occur. Remove protections and clean as necessary immediately before final acceptance.

C. Upon completion of the work and before acceptance, the Contractor shall remove and dispose of in an approved manner all surplus materials, rubbish, etc. which the Contractor may have accumulated during the course of the work and shall leave the site in a clean and orderly condition. The Contractor shall not abandon any material at or near the site regardless of whether or not it has any value.

END OF SECTION

SECTION 32 91 00

LOAM AND PLANTING PREPARATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 apply to the work of this Section.

1.02 DESCRIPTION OF WORK

A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all planting work and related items as indicated on the Contract Documents and as specified in this Section and includes, but is not limited to, the following:

1. Subgrade preparations.
2. Loam from off-site, if on-site loam is insufficient.
3. Sampling and testing of on-site and off-site loam.
4. Sand.
5. Modifying, screening, placing, spreading and grading of loam.
6. Fine grading.
7. Inspection and acceptance.
8. Cleaning and protection.

B. Soil preparation for disturbed restoration areas associated with the shared-use path, raised boardwalk, boardwalk approaches, access routes, staging areas, and appurtenant work.

C. Protection, preparation, and restoration of loam and planting soil within or adjacent to wetland buffer zones, coastal resource areas, and environmentally sensitive areas.

1.03 RELATED WORK

A. Carefully examine the site and all of the Contract Documents for requirements that affect the work of this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions. Other specifications sections that directly relate to the work of this Section include, but are not limited to, the following:

1. Section 03 30 00, CAST-IN-PLACE CONCRETE
2. Section 31 00 00, EARTHWORK
3. Section 32 12 16.13, HOT MIX ASPHALT PAVEMENT
4. Section 32 92 19, SEEDING
5. Section 32 93 00, PLANTING AND LANDSCAPE RESTORATION

B. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work, as necessary to assure the steady progress of all work of the Contract.

1.04 REFERENCES

A. American Society for Testing and Materials (ASTM):

D 75	Practice for Sampling Aggregates
D 422	Test Method for Particle-Size Analysis of Soils
D698-00a	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3)
D1557	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb rammer and 18-in. drop

B. O.A.C.: Association of Official Agricultural Chemists.

C. MassDOT Standard Specifications for Highways and Bridges, latest edition.

D. ANSI Z60.1, American Standard for Nursery Stock, latest edition.

1.05 SUBMITTALS

A. At least 30 days prior to ordering materials, the Contractor shall submit to the Landscape Architect representative samples, certifications, manufacturer's product data and certified test results for materials as specified below. No materials shall be ordered or delivered until the required submittals have been reviewed and approved by the Landscape Architect. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The Landscape Architect reserves the right to reject, on or after delivery, any material that does not meet these Specifications.

B. Existing On-Site loam: Sample and test existing on-site loam. The Contractor shall sample the existing loam soils of the construction site in the following manner:

1. The Contractor shall provide a one cubic foot representative sample per each 1,000 cubic yard on-site stockpile of existing loam for testing. All stockpile sampling shall be per ASTM D 75 and Appendixes for securing samples from stockpiles.

2. Preparation of Samples: Contractor shall place these soil slices into a large, clean plastic container and mix thoroughly. Contractor shall take one cup of soil mixture and dry it at room temperature (do not dry samples in an oven or on a stove or radiator). Once soil is dry, place soil in sandwich size zip-type plastic bag and close it tightly. Label each sample on outside of bag, identifying sample by soil type and acre. Provide an approved site plan showing locations of stockpiles cross referenced to soil samples and test results.

C. Loam from off-site, if on-site loam is insufficient: The Contractor shall provide a one cubic foot representative sample per each 1,000 cubic yard proposed stockpile of loam borrow for testing. All stockpile sampling shall be per ASTM D 75 and Appendixes for securing samples from stockpiles.

D. Testing will be at the Contractor's expense. Contractor shall deliver all samples to testing laboratories via overnight courier and shall have the testing report sent directly to the Landscape Architect. Perform all tests for gradation, organic content, soil chemistry, and pH by the UMass Soil and Plant Nutrient Testing Laboratory, or another approved soil testing laboratory. Testing reports shall include the following tests and recommendations:

1. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.

2. Organic matter content shall be determined by loss on ignition using the testing laboratory's documented procedure for mineral soils. Test the soil fraction passing the No. 10 sieve. Oven-dry samples to constant mass before ignition and determine organic matter content from the subsequent ignition mass loss, expressed as a percentage of the oven-dry soil mass. The laboratory report shall identify the procedure used, including drying and ignition temperatures and durations. Use the same procedure for all soil acceptance testing under this Section.

3. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, extractable Aluminum, Lead, Zinc, Cadmium, Copper, Soluble Salts, and pH and buffer pH. A Conductivity Meter shall be used to measure Soluble Salts in 1:2 soil/water (v/v). Except where otherwise noted, nutrient tests shall be for available nutrients.

4. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish lawn and planting work as specified.

E. Compost: Submit supplier's certification of contents.

F. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications.

G. Acidulant: Submit supplier's certification that the acidulant being supplied conforms to these Specifications.

H. Fertilizer:

1. Submit product data of seeding/sodding and planting fertilizer and certificates showing composition and analysis. Submit fertilization rates for fertilizer product based upon soil testing, analysis, and recommendations as specified,

performed and paid for under in this Section.

1.06 REGULATORY REQUIREMENTS

A. Strictly comply with all applicable codes, regulations and requirements having jurisdiction.

B. All fertilizer applications shall be performed by a licensed applicator in strict conformance with all local, state and federal regulations. Notify the Owner's Project Representative at least two (2) weeks prior to scheduled date of application.

1.07 EXAMINATION OF CONDITIONS

A. The Contractor and any sub-Contractor responsible for the execution of the Work of this Section, shall review the subgrades and elevations to verify that the subgrades have been prepared as required by the Contract Documents, prior to proceeding with the spreading of the planting loam. Carefully review the requirements of this Section, to understand the requirements of percolation testing, compaction, slope and absence of debris of the subgrade prior to spreading of the loam borrow.

B. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to sampling and testing of all materials prior to final planting installation.

1.08 DEFINITIONS/QUALITY ASSURANCE

A. The following definitions shall apply to the work of this Section.

The following size distributions of mineral particles by diameter and sieve size shall apply to the following conventional names of soil types:

Conventional Name	Retained on U.S. Sieve No.	Diameter (mm)
Very coarse sand	#18	1 - 2
Coarse sand	#35	0.5 - 1
Medium sand	#60	0.25 - 0.5
Fine sand	#140	0.10 - 0.25
Very fine sand	#270	0.05 - 0.10
Silt	by hydrometer	0.002 - 0.05
Clay	by hydrometer	Less than 0.002

B. Subgrade: Soil material and levels resulting from the approved rough grading work.

C. Existing Topsoil: In place soil on the site that will be stripped, screened and amended and re-used as a component of soil blends. The upper 6-12 inches of topsoil stripped from the project site and stockpiled for soil blending. Contractor is responsible for ensuring neither B-horizon subsoils nor subgrade is stripped with the topsoil.

D. Imported Base Loam: Base Loam obtained by an approved soil supplier for off-site manufacture of soil blends to be imported to the project site.

E. Lawn and Planting Soils: Lawn and Planting Soils are composed of a blend of stripped topsoil, organic material and sand. The quality of the blend depends on the quality of the original components. Locate and obtain approval of sources for base loam, organic material and sand that meet the Specification requirements. Contractor is then responsible for mixing the components. Approximate mixing ratios depend on the initial materials, and with the approval of the Landscape Architect or their representative, in order to meet Specification requirements for Lawn and Planting Soils.

F. Contractor is solely responsible for quality control of the Work.

G. The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the Work, including the preparation, mixing and installation of custom Planting Soil and planting mixes.

H. Soil work shall be performed by a firm that has sufficient earthwork machinery at the job site simultaneously to amply provide for the vigorous execution of the site work without interruption or delay, except for unforeseen circumstances, such as weather. Machinery operators shall be well experienced in this type of work.

I. Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities.

J. Comply with all requirements for control of silt and sediment during soil installation work as indicated in the contract documents. Provide additional silt and sediment control to maintain silt and sediments within the working area as required by the progress of the work or as directed by the Landscape Architect.

K. Pre-installation Conference: Conduct conference at project site prior to the start of any work related to Planting Soil preparation and shall meet the requirements of this Section.

1.09 DELIVERY

A. Material shall not be handled or hauled, placed or compacted when it is wet as after a heavy rainfall, early spring or if frozen. Soil shall be handled only when the moisture content is compliant with this Specification. Protection of stockpiles during the winter and spring months is essential. The Landscape Architect, Soil Scientist and the Owner shall be consulted to determine if the soil is too wet to handle.

B. Sequence deliveries to avoid delay. On-site storage space is permissible only with written notice from the Owner. Deliver materials only after preparations for placement of soil have been completed.

C. Prohibit vehicular and pedestrian traffic on or around stockpiled soil.

D. Soil that is to be stockpiled longer than two weeks, whether on or off site, shall not be placed in mounds greater than ten feet high. Windrows are the preferred manner of stockpiling.

E. Vehicular access to the site is restricted. Before construction, the Contractor shall submit for approval a plan showing proposed routing for deliveries and site access.

PART 2 - PRODUCTS

2.01 LOAM

A. Loam: The Contractor shall provide additional loam as necessary to complete the work of this Section from off-site sources if there is not sufficient material on site suitable to complete the Work. The Contractor shall submit samples and an analysis from each proposed source of material. Provide loam that is fertile, friable, natural loam reasonably free from subsoil, clay lumps, brush, litter, roots, stones and other foreign materials.

B. Loam shall be one of the following sandy loams; “coarse sandy loam”, “sandy loam”, “fine sandy loam”, determined by mechanical analysis ASTM D-422 and based on the USDA Classification System, and as defined in this Section. It shall be uniform in composition, without admixture of subsoil. It shall be free of stones greater than one inch, lumps, plants and their roots, debris and other extraneous matter, such as glass, brick, metals, plastics, etc. as determined by the Landscape Architect.

1. Planting loam for trees, shrubs, groundcover and vines, and perennials shall have the following grain size distribution for material passing the #10 (2.0 mm) sieve:

US Sieve No.	Percent Passing by Weight	
	Maximum	Minimum
10	-------	100
18	93	75
35	80	50
60	56	29
140	32	19
270	23	18

1) Percent Gravel in the loam mix shall be <15%.
2) D80/D30 = <8.0 .
3) Organic Matter = 5.0 – 10.0%
4) pH shall be between 5.5 – 6.5.

2. Planting loam for general lawns shall have the following grain size distribution for material passing the #10 (2.0 mm) sieve:

US Sieve No.	Percent Passing by Weight	
	MAX	MIN
10	---	100
18	93	75
35	80	50
60	56	29
140	32	19
270	23	18

1) Percent Gravel in the loam mix shall be <15%.
2) Organic Matter = 3.5 – 8.0%.
3) pH shall be between 6.3 – 6.8.
4) Saturated hydraulic conductivity of the mix shall not be less than 2.5 inches per hour according to ASTM D5856-95 (2000) when compacted to a minimum of 88% Standard Proctor, ASTM 698.

C. One hundred percent by weight shall pass a one-inch (1") sieve opening, and the maximum retained on the 1/4" sieve shall be 20 percent by weight of the total sample.

D. Organic Matter Content: Loam shall meet the organic matter range specified above for the applicable planting or lawn soil blend. Determine organic matter content by loss on ignition on the soil fraction passing the No. 10 (2.0 mm) sieve, in accordance with the testing procedure specified under the submittal requirements of this Section. Use the same procedure for all soil acceptance testing.

E. The pH value shall be as noted in the soil blends above.

1. Loam borrow shall be pH adjusted for particular planting applications and shall be adjusted prior to delivery to the Project sites as recommended by UMASS Soil & Plant Tissue Laboratory test results.

    1) When pH of loam borrow is higher than the specified range, use aluminum sulfate, sulfur, ferrous sulfate, or another approved acidifying amendment to adjust pH downward to required levels.
    2) When pH of loam borrow is lower than the specified range, use limestone to adjust pH upward to required levels.
    3) Regardless of amendment selected, the Contractor, not the Owner, shall be responsible for obtaining the specified pH by seeding and/or planting time.

F. Loam shall be uncontaminated by salt water, foreign matter and substances harmful to plant growth. Topsoil shall not have levels of extractable aluminum greater than 200 parts per million except for acid-loving plants. Cation Exchange Capacity (CEC) shall be between 10 and 15.

G. All planting loam provided from off-site sources shall be brought to the site meeting all specification requirements, unless field amendment is approved by the Landscape Architect based on soil test recommendations.

H. To assure planting loam purchased and screened loam stockpiled fulfills specified requirements regarding textural analysis, organic matter content, and pH, soil testing results will be obtained by the Contractor and submitted to the Landscape Architect for approval before any soil is delivered to the site.

2.02 SOIL ADDITIVES.

A. Soil additives shall be used to counteract soil deficiencies as recommended by the soils analysis. Soil additives, amendments, fertilizer, lime, compost, acidulants, gypsum, and similar materials shall not be used within wetland resource areas, wetland buffer zones, coastal resource areas, or other environmentally sensitive areas unless specifically shown on the Drawings, approved by the Landscape Architect, and allowed by applicable permits and regulatory approvals.

B. Lime: Provide approved agricultural limestone containing not less than 85% of total carbonates with a minimum of 30% magnesium carbonates. Lime shall meet Massachusetts Department of Food and Agriculture standards for Fine-Sized Classification so that 50% passes a 100 mesh, 60% passes through a 60-mesh sieve, and 95% will pass a 20 mesh sieve.

C. Aluminum Sulfate shall be unadulterated, 57% (Ortho Division, Chevron Chemical Company), or approved equal.

D. Sand additive shall be comprised of clean, coarse, granular sand, subangular to sub-round, free from organic matter and deleterious substances. Sand shall be washed sand in accordance with the table below.

SIEVE SIZE	% passing
No. 4	100
No.8	90-100
No. 16	80-100
No. 30	25-60
No. 50	0-25
No. 100	0-5
No 200	0-3

1. The sand should have a coefficient of uniformity (D60/D10) of less than 4.0

2. Amend existing loam to achieve requirements as described above.

E. Compost: Provide compost as needed to raise the Organic Content of the topsoil to within specified range. Compost shall be:

1. Organic Matter for amending planting soils shall be a stable, humus-like material produced from the aerobic decomposition and curing of Leaf Yard Waste Compost, composted for a minimum of one year (12 months). The leaf yard waste compost shall be free of debris such as plastics, metal, concrete or other debris. The leaf yard waste compost shall be free of stones larger than 1/2", larger branches and roots. Wood chips over 1" in length or diameter shall be removed by screening. The compost shall be a dark brown to black color and be capable of supporting plant growth with appropriate management practices in conjunction with addition of fertilizer and other amendments as applicable, with no visible free water or dust, with no unpleasant odor, and meeting the following criteria as reported by laboratory tests.
   The ratio of carbon to nitrogen shall be in the range of 12:1 to 25:1.

2. Stability shall be assessed by the Solvita procedure. Protocols are specified by the Solvita manual (version 4.0). The compost must achieve a maturity index of 6 or more as measured by the Solvita scale. Stability tests shall be conducted by Woods End Research Laboratory, Mt. Vernon, Maine.

3. Organic Content shall be at least 20 percent (dry weight). One hundred percent of the material shall pass a 1/2-inch (or smaller) screen. Debris such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry shall not be visible and shall not exceed one percent dry weight. Organic content shall be determined by weight loss on ignition.

4. pH: The pH shall be between 6.5 to 7.4 as determined from a 1:1 soil-distilled water suspension using a glass electrode pH meter American Society of Agronomy Methods of Soil Analysis.

5. Salinity: Electrical conductivity of a one to five soil to water ratio extract shall not exceed 2.5 mmhos/cm (dS/m).

6. The compost shall be screened to 1/2-inch maximum particle size and shall contain not more that 3 percent material finer that 0.002mm as determined by hydrometer test on ashed material.

7. Nutrient content shall be determined by the Soil Testing Laboratory and utilized to evaluate soil-required amendments for the mixed soils. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Iron, Manganese, Lead, Soluble Salts, Cation Exchange Capacity, soil reaction (pH), and buffer pH.

8. Acceptance of composted products shall be based on the following submittals by the Contractor:

   1) Approval of a Material Source.
   2) A copy of the Composting Permit for the Material Source selected.

3) Certification by the supplier that the compost product meets state EPA guidelines and that it originates from 100 percent recycled vegetation material, no Bio-Solids will be accepted, that has been aerobically composted.

F. Bone meal shall be fine ground, steam cooked, packing house bone with a minimum analysis of 23% phosphoric acid and 4% nitrogen.

G. Fertilizers: Commercial fertilizer shall be a complete fertilizer complying with all State and Federal Fertilizer laws. Fifty-percent of available nitrogen shall be in a slow-release form as is found in certain urea-form products, or natural organic forms, or a combination of both. The salt index of the fertilizer shall not exceed 35. It shall contain the following percentages by weight.

	Lawns	
Nitrogen	(N)	10%
Phosphorus	(P)	10%
Potash	(K)	10%

H. Fertilizer shall be delivered and mixed as specified, in standard size unopened containers, showing weight, analysis in compliance with Massachusetts Department of Food and Agriculture regulations, and name of manufacturer. It shall be stored in a weatherproof storage place, in such a manner that it will be kept dry, and its effectiveness not impaired.

I. Fertilizer for planting shall be formulated for top-dressing, soil surface application to plants. Fertilizer shall be designed and certified by the manufacturer to provide controlled release of fertilizer continuously for not less than 9 months. One hundred percent of the nitrogen content shall be derived from organic materials. Nitrogen source shall be coated to ensure slow release. Fertilizer percentages of weight of ingredients shall be as recommended by the soil testing and analysis specified, performed, and paid for under this Section, Loam and Planting Preparation.

J. Gypsum ($CaSO4 \cdot 2H2O$) shall be agricultural grade, granular form. Gradation shall conform to the following:

Sieve Designation	Percent Passing by Weight
No. 8 (2.36 mm)	100
No. 16 (1.18 mm)	97
No. 30 (0.60 mm)	82
No. 50 (0.30 mm)	46
No. 100 (0.15 mm)	21

PART 3 - EXECUTION

3.01 KICKOFF MEETING:

A. At least 10 working days prior to the start of work, the Contractor shall request a landscape construction kickoff meeting with the owner's representative, landscape architect and any other parties involved with landscape construction. Contractor shall articulate the means and methods of subgrade preparation, soil placement and other steps outlined in the Specification.

B. Coordinate activities with other project contractors so that there is no soil disturbance from traffic or other construction activities subsequent to placement.

C. Pre-Installation Examination Required: The Contractor shall examine previous work, related work, and conditions under which this work is to be performed and shall notify Landscape Architect and Soil Scientist in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions.

D. Examination of Subgrade: The subgrade shall be examined by the Contractor prior to the start of soil installation. Any deficiencies shall be noted and related to the Landscape Architect. Deficiencies include, but shall not be limited to the following:

1. Construction debris present within the planting areas.
2. The subgrade is at incorrect depths for installing the designed soil profile.
3. Incomplete irrigation.
4. Incomplete lighting and exterior electrical installation.
5. Conflict with underground utilities.
6. Subgrade contaminated with oils, compressible material, silt or clay.

E. Confirm that the subgrade is at the proper elevation and prepared as required. Subgrade elevations shall slope parallel to the finished grade as shown on the drawings

1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Provide protection measures as required for public safety.

2. All subgrade areas to be filled with Soil shall be free of construction debris, refuse, vegetation, compressible or decay able materials, all stones greater than three inches, concrete washout or soil crusting films of silt or clay that reduces or stops drainage from the soil into the subsoil; and/or standing water. Such material shall be removed from the site.

3. The subgrade must slope toward the bottom of slopes and subdrains. Subgrade levels shall be adjusted as required to ensure that all planted areas have adequate drainage.

F. Do not proceed with the installation of soil, until all utility work in the area has been installed

1. The Contractor shall identify the locations of underground utilities prior to

proceeding with soil work and shall protect all utilities from damage.

3.02 WORKING AROUND UTILITIES

A. Carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.

B. Known underground and surface utility lines are indicated on the utility drawings – See Civil and Landscape Architect's plans. Contact the local Dig Safe organization and give them their required time to respond and mark the property. Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand-excavate as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

C. Perform work in a manner that will protect utilities from damage. Hand-excavate as required and provide adequate means of support and protection of utilities during soil installation operations. Maintain grade stakes set by others until parties concerned mutually agree upon removal. The Contractor shall repair all utilities damaged by soil operations at the Contractor's expense.

3.03 FILLING AND COMPACTION.

A. Verify that the subgrade preparations have been reviewed and accepted, including removal of all existing vegetation prior to placement of planting soils.

1. Notify the Landscape Architect of soil placement operations at least seven calendar days prior to the beginning of work.

B. Perform drainage testing at two separate stages: prepared subgrade before placement of loam, and installed loam after placement and compaction of each lift. Perform prepared-subgrade testing in accordance with the requirements below. Perform installed-loam testing in accordance with the requirements under FINE GRADING. Do not use an installed-loam test as a substitute for a required subgrade test.

1. Prepared-Subgrade Testing: Before placing loam, test the prepared subgrade in proposed lawn areas and formal planting beds at a minimum frequency of one test per 10,000 square feet, with a minimum of three tests per planting area. The Landscape Architect shall review test locations and may require additional tests where poorly draining or compacted conditions are observed. Testing may be waived by the Landscape Architect for limited restoration areas where soils are restored in-kind and no drainage concerns are observed. Perform testing using the following procedure:

1) Dig a hole in the installed subgrade soil that is a minimum of 8 inches in diameter and 8 inches deep.

2) Place a 6 inch deep by 6 inch diameter plastic bucket with a minimum of 50 holes in the sides and bottom to allow free flowing of water, in

the excavated hole. Fill the 1-inch space between the bucket and hole sidewall and bottom with concrete sand. Fill the bucket with water and let it drain completely. Immediately refill the bucket with water and measure the rate of fall in the water level.

3) In the event that the water drains at a rate less than the following, till the soil to a depth required to break the over compaction:

i. Prepared subgrade beneath lawn areas: minimum 2.0 inches per hour.

ii. Prepared subgrade beneath planting beds: minimum 2.0 inches per hour.

2. In the event that percolation testing indicates that the Subsoil, Placed Fills or ordinary borrow has been over compacted and will not drain, the contractor shall loosen up the top eighteen inches (18") of the subgrade to be planted, seeded, or sodded by ripping or other mechanical means. Recompact the borrow by driving a small, tracked bulldozer over the area at low speeds so that the tracks of the bulldozer pass over the affected area and the soil is compacted to a density that will percolate as specified under the work of this Section.

1) Under no circumstances shall wheeled vehicles be driven over subsoil, placed fills or ordinary borrow that have been shown to percolate or subsoil, placed fills or ordinary borrow that has been loosened and shown to percolate.

3. Perform sufficient percolation tests in areas of poorly draining or compacted subsoil or compacted placed fills as directed by the Landscape Architect to ensure that these underlying soils drain. Likewise, perform sufficient percolation tests after ripping and loosening to ensure that the soils are no longer too compact to drain.

C. Subsoil or ordinary borrow shall have been excavated and filled as required by the Contract Documents. Do not damage the work previously installed. Maintain all required angles of repose of materials adjacent to the loam as shown on the Contract Documents. Do not over excavate compacted subgrades of adjacent pavement or structures during loaming operations.

D. Confirm that the subgrade is at the proper elevation and that no further earthwork is required to bring the subgrade to proper elevations. Subgrade elevations shall slope parallel to the finished grade and or toward any subsurface drain lines as shown on the Contract Documents. Provide a written report to the Landscape Architect that the subgrade has been placed to the required elevations and that the subgrade drains water at the rates specified under the required percolation tests specified, performed and paid for under this Section, Loam and Planting Preparation. Perform no work of placing and spreading loam until elevations have been confirmed and written report

has been accepted by the Landscape Architect.

E. Clear the subgrade of all construction debris, trash, rubble and any foreign material. In the event that fuels, oils, concrete washout or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Such construction debris, trash, rubble and foreign material shall be removed from the site and disposed of in a legal manner. Fill any over excavation with approved fill and compact to the required subgrade compaction levels.

F. Do not proceed with the installation of loam until all utility work in the area has been installed.

G. Protect adjacent walls, walks and utilities from damage or staining by the loam. Use 0.5-inch plywood and or plastic sheeting to cover existing concrete, metal and masonry work and other items as directed during the progress of the work. Clean up all trash and any soil or dirt spilled on any paved surface at the end of each working day.

3.04 FINE GRADING

A. Immediately prior to dumping and spreading loam, the subgrade shall be in a friable condition, cleaned of all stones greater than 2 inches and all debris or rubbish. Such material shall be removed from the site, not raked to the edges and buried. Notify the Landscape Architect that the subsoil has been cleaned and request his/her attendance on site to review and approve subgrade conditions prior to spreading loam borrow.

B. Loam borrow delivered to the site shall be protected from erosion at all times. Materials shall be spread immediately. Otherwise, Materials that sit on site for more than 24 hours shall be covered with tarpaulin or other soil erosion control system acceptable to the Landscape Architect and surrounded by silt fence.

C. No loam borrow shall be handled, planted, or seeded in any way if it is in a wet or frozen condition. A moist loam borrow is desirable.

D. Soil additives shall be spread and thoroughly incorporated into the layer of loam by harrowing or other methods reviewed by the Landscape Architect. Soil additives, amendments, fertilizer, lime, compost, acidulants, gypsum, and similar materials shall not be used within wetland resource areas, wetland buffer zones, coastal resource areas, or other environmentally sensitive areas unless specifically shown on the Drawings, approved by the Landscape Architect, and allowed by applicable permits and regulatory approvals. The following soil additives shall be incorporated:

1. Ground limestone or acidulant as required by soil analysis to achieve the required pH as described in this Section. Spread limestone at the rate required by soil analysis up to a maximum limit of 200 pounds per 1,000 square feet. Should recommendations of soil analysis require greater rates of application than 200 pounds per 1,000 square feet, a surface application of limestone not in excess of 50 pounds per 1,000 square feet shall be made to the established

lawn during the season after Final Acceptance. This second application of limestone shall be performed and paid for under the work of Section 32 92 19 SEEDING AND 32 93 00 PLANTING AND LANDSCAPE RESTORATION, at rates determined under the testing requirements of this Section, Loam and Planting Preparation.

2. Fertilizer: Provide the initial fertilizer application only where recommended by the soil analysis and permitted by the environmental restrictions of this Section. Fertilizer analysis, application rate, and incorporation method shall follow the soil-testing laboratory's written recommendations and be submitted to the Landscape Architect for review before application. Furnish and apply the initial fertilizer under this Section and coordinate its timing with seeding and planting. No automatic second or third fertilizer application is required. Any supplemental fertilization shall be supported by soil-test recommendations and approved by the Landscape Architect before application.

3. Compost, sand or other soil amendments as required by soil analysis.

E. Loam shall be sampled and tested as specified, performed and paid for under the work of this Section, to verify application and incorporation of limestone, fertilizer and other soil amendments.

F. After loam and required additives have been spread, carefully prepare the loam by scarifying, harrowing, or tilling the loam to integrate soil additives into the top 8 inches of the loam. Remove all large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Remove from unscreened soils all stones over 3/4 inch in diameter from the top 6 inches of the loam bed. Loam shall also be free of smaller stones in excessive quantities as determined by the Landscape Architect and as specified herein.

G. Sufficient grade stakes shall be set for checking the finished grades. Stakes must be set in the bottom of swales and at the top of slopes. Deviation from indicated elevations that are greater than one-tenth of a foot shall not be permitted. Connect contours and spot elevations with an even slope. Finish grades shall be smooth and continuous with no abrupt changes at the top or bottom of slopes.

H. During the compaction process, all depressions caused by settlement or rolling shall be filled with additional loam and the surface shall be regraded and rolled until presenting a smooth and even finish corresponding to the required grades.

I. The Contractor shall install loam in successive horizontal lifts no thicker than 6 inches (6") in turf areas and 12 inches (12") in plant bed areas to the desired compaction as described herein. The Contractor shall install the soil at a higher level to anticipate any reduction of loam borrow volume due to compaction, settling, erosion, decomposition, and other similar processes during the warranty period. The Landscape Architect will ensure that the full depths of loam for lawn and plant beds are obtained by digging holes in the loam at the same frequency as for compaction

testing.

1. Compact loam to the required density as specified.

2. Maximum dry density for loam shall be determined in accordance with ASTM D698. The following percentages of minimum to maximum dry densities shall be achieved for fill materials or prepared subgrades.

In lawn, plant beds and tree pits:

	MIN	MAX
Soils within planting areas in top eighteen inches of finished grade	80%	85%
Soils within Lawn Areas in top eighteen inches of finished grade	84%	86%

3. The surface area of each lift shall be scarified by raking prior to placing the next lift.

J. In addition to the range cited above, compact each lift sufficiently to reduce settling but not enough to prevent the movement of water and feeder roots through the soil. The loam borrow in each lift should feel firm to the foot in all areas and make only slight heel prints. At completion of the loam borrow installation, the soil should offer a firm, even resistance when a soil sampling tube is inserted from lift to lift. Installed-Loam Testing: After placement and compaction of each loam lift, and before covering that lift with additional soil, perform percolation testing using the following procedure. The minimum acceptable rate for this installed-loam test shall be one inch per hour. Test each lift at a minimum frequency of one test per 10,000 square feet of lawn area and one test per 2,500 square feet of tree and shrub planting area, with at least one test for each applicable area receiving loam. The final lift shall be tested before seeding or planting.

1. Dig a hole in the installed soil that is a minimum of 4 inches in diameter. Holes in 6-inch lift in turf areas shall be 4 inches deep. Holes in 12-inch lifts in plant beds shall be 8 inches deep. Do not penetrate through the lift being tested.

2. Fill the hole with water and let it drain completely. Immediately refill the hole with water and measure the rate of fall in the water level.

3. Where the measured rate is less than one inch per hour, loosen the affected loam lift, recompact within the specified density range, and retest. Do not cover the affected lift or proceed with seeding or planting until satisfactory results have been obtained. Restore test holes with approved loam compacted consistently with the surrounding lift.

K. Select equipment and otherwise phase the installation of the loam to ensure that wheeled equipment does not travel over subsoil, placed fills or ordinary borrow or already installed soil. Movement of tracked equipment over said soils will be reviewed and considered for approval by the Landscape Architect. If it is determined

by the Landscape Architect that wheeled equipment must travel over already installed soil, provide a written description of sequencing of work that ensures that compacted soil is loosened and uncompacted as the work progresses or place one-inch thick steel plate ballast (or equivalent ballast approved by the Landscape Architect) over the length and width of any travel way to cover loam borrow to protect it from compaction.

L. Disturbed areas outside the limit of lawn work shall be graded smooth and spread with a minimum of 6 inches of loam to the finished grade.

1. Periphery Lawn and undisturbed soil areas and other areas depicted on the plans, shall remain protected for the duration of the Work. Any areas that become disturbed shall be returned to pre-construction conditions at no additional cost to the Owner.

2. When working within or adjacent to the wood line, Contractor shall use manual tools, air spade or other minimally invasive excavation equipment to perform all work within Existing Soil Areas to preserve the integrity of existing root systems.

M. Contractor shall be responsible for maintaining all stockpiles of existing, on-site loam on the site until final placement of all loam has been approved by the Landscape Architect in writing. No loam shall be removed from the site unless approved by the Landscape Architect in writing. Upon written approval by the Landscape Architect, Contractor shall remove all excess, unused existing on-site loam from the site and dispose of it in a legal manner.

N. The contractor shall install erosion control matting where required on the drawings and specified under this Section.

3.05 PROTECTION

A. The Contractor shall protect landscape work and materials from damage due to landscape operations, operations by other Contractors or trespassers. Maintain protection during installation until acceptance. Treat, repair or replace damaged Planting Soil installation work immediately.

B. Provide all means necessary, including fences, to protect all soil areas from compaction and contamination by trash, dust, debris, and any toxic material harmful to plants or humans after placement. Any area that becomes compacted, shall be de-compacted and tilled to the extent determined by the soil scientist and recompressed to the density ranges specified. Any uneven or settled areas shall be filled, re-graded and re-compacted to meet the requirements of this Specification. Soil that becomes contaminated shall be removed and replaced with specified soil material.

C. Phase the installation of the planting soil such that equipment does not have to travel over already installed planting soil. Use of haul roads is acceptable provided that the haul road is completely re-worked to meet the requirements of this Specification.

Under no circumstances shall heavy equipment or trucks be allowed to traverse placed topsoil or prepared subgrade unless said equipment is tracked or has low ground pressure tires. Apply filter fabric covering and planking or other engineering controls over soil to minimize compaction and collect dust and debris in any area where the Contractor must work after the installation of Planting Soil.

D. Till compacted Planting Soil and replace Planting Soil that has become contaminated as determined by the Landscape Architect. Planting Soil shall be tilled or replaced by the Contractor at no expense to the Owner.

3.06 COORDINATION AND EXCESS MATERIALS

A. Coordinate activities with other project contractors so that there is no soil disturbance from traffic or other construction activities after placement.

B. Excess Soil and Materials: Remove the excess soil and materials from the site at no additional cost to the Owner unless otherwise requested.

3.07 CLEAN-UP

A. During installation, keep pavements clean and work area in an orderly condition.

B. Keep the site free of trash and debris at all times. Immediately dispose of wrappings or waste materials associated with products necessary for the completion of the work.

C. All trash and debris shall be removed from the site.

D. Once installation is complete, remove any excess soil from pavements or embedded in fixtures.

3.08 ACCEPTANCE

A. Confirm that the final grade of the loam borrow is at the proper finish grade elevations. Adjust grade as required to meet the contours and spot elevations noted on the Plans. Request the presence of the Landscape Architect to inspect final grade. Do not proceed with the remaining work of this Contract until the Landscape Architect has given his/her written approval of the final grade.

B. Placed lawn and planting soils must be capable of infiltrating water at the minimum rate provided in this Specification for each type of planting soil.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section includes furnishing all labor, materials, equipment, seed and incidental materials necessary to accomplish all grass seeding and related work, complete in place, maintained, and accepted, in accordance with the Contract Drawings and Specifications. All grassed areas disturbed by the Contractor's operations shall be repaired as herein specified.

B. The Contractor shall bear the responsibility and cost of furnishing and applying water or any other substances, as necessary to ensure the sustainability of grass seeded areas, as part of the work of this contract.

1.02 RELATED WORK:

A. Section 32 91 00, LOAM AND PLANTING PREPARATION

B. Section 32 93 00, TREES, ORNAMENTAL GRASSES, AND LANDSCAPING

1.03 SUBMITTALS:

In accordance with requirements of Section 00 72 00 GENERAL CONDITIONS 6.17 SHOP DRAWINGS AND SAMPLES, the Contractor shall submit the following to the Engineer for review and approval:

A. Information for seed mixes including the following:

1. Name and address of the seed supplier.

2. Source of origin and dates of harvest for each of the various types of seed

3. Certification of seed mix composition and proportion, indicating named seed varieties by percent, percent germination, purity, and percent crop seed, percent inert matter, and percent weed seed content.

4. Estimated number of seeds per pound of each type of seed in the mix

B. Information detailing proposed limestone, fertilizers, insecticides, herbicides, fungicides, mulch materials, hydroseeding materials (as required), and slope protection material (as required) to be applied to seeded areas.

C. Watering, fertilizing and maintenance schedule.

D. Marked up prints indicating the square footage of all proposed seeded areas with quantities of various soil additives and amendments, and quantities of seed for each area prior to beginning work.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. LOAM:

1. Loam shall be as specified in Section 32 91 00, LOAM AND PLANTING PREPARATION .

B. SEED:

1. Seed shall be of the species and mixtures specified for the applicable use, the previous year's crop, clean, and high in germinating value. Weed seed content shall be less than 0.5 percent and include no noxious weeds. Seed shall be obtained from a reliable seed company and shall be accompanied by certificates of compliance relative to mixture purity and germinating value. Seed shall be furnished and delivered in new, clean, sealed and properly labeled containers. All seed shall comply with applicable State and Federal laws. Seed that has become wet, moldy or otherwise damaged shall not be accepted.

2. Seed mixes for roadside shoulders, disturbed path edges, restoration areas, buffer areas, and areas adjacent to resource areas shall be low-maintenance, drought-tolerant, and suitable for sandy coastal soils. Seed mixes shall be coordinated with the Drawings, permit requirements, and Engineer, and shall not include invasive species or species prohibited by applicable authorities.

3. Grass seed for lawn areas shall conform to the following requirements:

Botanical and Common Names	Proportion by Weight	Germination Rate	Purity Minimum
Chewing's Fescue (Festuca rubra commutata)	30%	70%	97%
'Kentucky 31' Tall Fescue (Festuca arundinacea 'Kentucky 31')	30%	90%	98%
Kentucky Bluegrass (Poa pratensis)	20%	80%	85%
Perennial Ryegrass (Lolium perenne)	20%	90%	98%

4. Grass seed for slopes and other areas not normally mowed shall conform to the following requirements:

Botanical and Common Names	Proportion by Weight	Germination Rate	Purity Minimum
Creeping Red Fescue (Festuca rubra)	50%	85%	95%
'Kentucky 31' Tall Fescue (Festuca arundinacea 'Kentucky 31')	30%	85%	95%
Perennial Ryegrass (Lolium perenne)	10%	90%	98%
Red Top (Agrostis alba)	5%	85%	92%
Ladino White Clover (Trifolium repens 'Ladino'	5%	85%	96%

C. TEMPORARY COVER CROP:

1. Temporary cover crop shall conform to the following requirements:

Botanical and Common Names	Proportion by Weight	Germination Rate	Purity Minimum
Annual Ryegrass (Lolium multiflorum)	90%	85%	98%
Creeping Red Fescue (Festuca rubra)	4%	85%	95%
Perennial Ryegrass (Lolium perenne)	3%	90%	98%
Red Clover (Trifolium pratense)	3%	90%	98%

Other Crop Grass	0.5% max.
Noxious Weed Seed	0.0%; none permitted
Inert Matter	1.0% max.

D. MULCH:

1. Materials to be used in mulching seeded areas shall be free of weed seed and shall conform to the following requirements:

    a. Straw Mulch shall consist of stalks or stems of grain after threshing.
    b. No hay mulch or salt hay shall be used.

E. HYDROSEED MULCH, TACKIFIERS AND WATER RETENTION AGENTS:

1. Wood fiber mulch for Hydroseed application shall be a manufactured product of natural wood cellulose fibers with a non-toxic green marking dye incorporated to ensure uniform distribution. Mulch shall be packed in sealed original containers, clearly labeled with brand name and manufacturer. It shall have delivered moisture content less than 12 percent.

2. Hydroseed tackifier shall be a powdered starch-based product approved by the Engineer. Hydroseed tackifier shall be applied in conjunction with the hydroseed slurry in accordance with the manufacturer's recommendations.

3. A moisture retaining polymer shall be added to the hydroseed slurry in accordance with the manufacturer's recommendations.

F. SLOPE EROSION PROTECTION:

1. Erosion-control blanket shall consist of naturally seed-free curled wood excelsior fibers forming a uniform blanket with fully biodegradable natural-fiber netting and stitching. Polypropylene, photodegradable plastic, and other synthetic plastic netting shall not be permitted. Provide a product with manufacturer-published performance suitable for the slope gradients, slope lengths, and runoff conditions at the installation locations. Submit product data and installation instructions for review before installation. Install on prepared and seeded soil at locations shown on the Drawings, in accordance with the manufacturer's requirements for anchorage, trenching, seams, and termination.

2. Secure erosion-control blankets with fully biodegradable stakes or anchors approved by the blanket manufacturer for the specified blanket, soil conditions, and slope. Anchors shall be a minimum of six inches long, or longer where required to achieve secure embedment. Install at the spacing and pattern recommended by the blanket manufacturer. Metal wire staples and permanent or photodegradable plastic anchors shall not be used.

G. WATER:

1. Water shall be suitable for irrigation and free from substances harmful to plant growth. The Town shall make water available at a Town-designated source in accordance with Section 01 14 00, Article 3.01. The Contractor shall fill its water truck or tanks at that source and furnish all labor, equipment, transportation, distribution, and application required for the watering specified in this Section. Include all such costs, except the Town-furnished water itself, in the Base Bid. Continue watering throughout the establishment and maintenance periods required by this Section.

PART 3 - EXECUTION

3.01 GENERAL:

A. All work shall be performed by skilled workers with a minimum of 2 years of seeded lawn construction and establishment experience and under the full-time supervision of a qualified foreman.

B. Seeding operations shall not begin less than 4 days after the application of lime and fertilizer and the seedbed areas are reviewed and approved by the Engineer.

C. Permanent seeding shall be performed during suitable spring 2027 soil and weather conditions. Schedule soil preparation and permanent seeding sufficiently in advance of the May 28, 2027 Contract completion date to allow germination, establishment, inspection, and correction of deficiencies required for acceptance under Article 3.05. Submit the proposed seeding and establishment schedule as part of the Progress Schedule. Provide supplemental watering, mulch, and temporary erosion protection as required. Temporary cover crop or temporary stabilization shall not constitute completion of permanent seeding.

D. If there is a delay in seeding, during which weeds grow, or soil is washed out, the Contractor shall eliminate the weeds by physical means, or replace the soil before sowing the seed, without additional compensation. Immediately before seeding is begun, the soil shall be lightly raked.

E. Seed shall be sown at the approved rate, on a non-windy day by machine, or as approved by the Engineer.

F. The surface shall be kept moist by a fine spray until the seed shows uniform germination over the entire area. Wherever poor germination occurs in areas larger than 3 square feet, the Contractor shall reseed, roll, and water as necessary to obtain proper germination.

G. The Contractor shall not defer permanent seeding to a subsequent planting season without the Owner's prior written authorization. If unsuitable soil or weather conditions prevent scheduled seeding, promptly notify the Engineer in writing, identify the affected areas, and submit proposed temporary stabilization measures and a revised seeding and

establishment schedule. Maintain affected areas against erosion and deterioration pending permanent seeding. Approval of temporary stabilization or a revised planting schedule does not, by itself, extend the Contract Time. Any adjustment to the Contract Time shall be authorized in accordance with the Contract Documents.

H. Protection of all newly loamed and graded areas is required and shall be accomplished by whatever means necessary such as mulch applied with a tackifier, or by other means approved by the Engineer. The Contractor shall be responsible for the prevention of siltation in areas beyond the limit of work and for all means of protection throughout the maintenance period at no additional cost to the Owner.

I. Disturbed areas shall be temporarily or permanently stabilized as soon as practicable after final grading and in accordance with permit requirements, erosion and sediment control requirements, and as directed by the Engineer.

3.02 BROADCAST SEEDING, PLACING MULCH AND SLOPE EROSION PROTECTION:

A. The seed mix shall be broadcast at 6 pounds per 1000 square feet, or as recommended by the seed supplier, or as required by the Engineer. Seed shall be divided into 2 equal amounts and uniformly distributed in 2 applications at right angles to each other. Seed shall then be raked lightly into the soil to a depth of l/4-inch.

B. If mulch is not necessary the seed shall be directly firmed into the soil with a roller that will apply pressure between 75 and 100 pounds per linear foot of width.

C. Straw Mulch shall be used based on time of seeding as previously specified over all seeded areas, as designated on the plans, or as otherwise required. If mulch is to be used, it shall be loosely spread to a uniform depth at a rate of 4-1/2 tons per acre to provide ¼-inch of cover, or as otherwise required. The seed and mulch shall then be firmed into the soil with a roller that will apply a pressure between 75 and 100 pounds per foot of width.

D. Straw Mulch may be applied by mechanical apparatus, if in the judgment of the Engineer, the apparatus spreads the mulch uniformly and forms a suitable mat to control slope erosion. The apparatus shall be capable of spreading at least 80 percent of the straw in lengths of 6-inches or more, otherwise it shall be spread by hand without additional compensation.

E. Slope erosion control blankets shall be placed as indicated on the plans or as required by the Engineer.

3.03 HYDROSEEDING:

A. Prior to the start of hydroseeding, the Contractor shall furnish to the Engineer, in writing, the weights of seed, mulch, tackifier (as required) and moisture retention agent (as required) per 100 gallons of water to be used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above.

If the results of hydroseeding operations are unsatisfactory, the Contractor will be required to abandon this method and to apply the seed and mulch by other means.

B. Seed shall be incorporated with the mulching material to obtain a minimum hydroseeded sown coverage of 200 pounds of the specified seed mix per acre, as recommended by the seed suppliers, or as required by the Engineer.

C. Wood fiber mulch shall be uniformly spread over certain selected seeded areas at the minimum rate of 1,400 pounds per acre unless otherwise directed. Mulch shall be placed by spraying from an approved spraying machine with pressure sufficient to cover the entire area in a single operation.

D. The Contractor shall immediately cleanup hydroseed oversprays from plant materials, pavements, furnishings, etc., to the satisfaction of the Engineer.

3.04 MAINTENANCE:

A. The Contractor shall be responsible to regularly water seeded areas with the equivalent of 1-inch minimum of rainfall per week, or as necessary to develop and sustain dense, green growth.

B. The Contractor shall be responsible for securing all seeded areas from physical damage as necessary, including warning signs, barriers, temporary fencing, or other means of protection, through the guarantee period until final acceptance. All damaged areas shall be repaired to reestablish healthy vigorous growth of vegetation to the satisfaction of the Engineer, at no additional cost to the Owner. All temporary barriers shall remain the property of the Contractor and shall be removed by the Contractor upon final acceptance by the Engineer.

C. Pavement shall be kept clean and clear of cuttings and debris at all times during the maintenance period to the satisfaction of the Engineer.

3.05 INSPECTION AND PRELIMINARY ACCEPTANCE:

A. Seeded areas may be inspected for preliminary acceptance during the same planting season in which permanent seeding is performed. Preliminary acceptance shall require dense, vigorous, substantially uniform growth of the specified vegetation, stable soil surfaces without erosion, and correction of bare or poorly germinated areas in accordance with Paragraph 3.01.F. Seed application alone shall not constitute acceptance. Complete the required establishment, inspections, and corrective work before the May 28, 2027 Contract completion date unless otherwise authorized through the Contract's time-adjustment provisions. Continue watering, weeding, mowing where applicable, and protection until acceptance as required by this Section.

B. The Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of inspection for preliminary acceptance. The Engineer shall recommend preliminary acceptance of the work of this Section only after completion and

re-inspection of all necessary repairs, renewals, or replacements.

C. Inspection and acceptance of seeded areas may be requested and granted in part, provided the areas for which acceptance is requested are relatively substantial in size, and with clearly definable boundaries. Acceptance and use of these areas by the Owner shall not waive any other provisions of this Contract.

3.06 GUARANTEE:

A. Seeded areas shall be guaranteed until final acceptance of the project, or, in the case of late summer or fall planting, the guarantee period shall extend through the following spring.

B. When the work is accepted in part, the guarantee period shall extend from each partial acceptance to the terminal date of the last guarantee period. All guarantee periods terminate at one time.

C. Guarantee shall not apply to the replacement of seeded vegetation resulting from the removal, loss, or damage due to occupancy of the project in any part; vandalism or acts of neglect on the part of others; physical damage by animals, vehicles, etc.; and Acts of God, including but not limited to, catastrophic fire, hurricanes, riots, war, etc.

D. If the Town-designated water source becomes unavailable or its use is curtailed, promptly notify the Owner and coordinate an alternate supply in accordance with Section 01 14 00, Article 3.01. Obtain written authorization before incurring additional costs for an alternate supply. Trucking and application of water from the designated Town source are included in the Base Bid and shall not be separately reimbursed.

3.07 FINAL INSPECTION AND FINAL ACCEPTANCE:

A. At the end of the guarantee period, the Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of final inspection for final acceptance.

B. The Engineer shall recommend final acceptance of the work of this Section only after completion and re-inspection of all necessary repairs, renewals or replacements.

END OF SECTION

SECTION 32 93 00

PLANTING AND LANDSCAPE RESTORATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section includes furnishing all labor, materials, equipment, plants, and incidental materials necessary to perform all operations related to planting, landscape restoration, and protection of existing vegetation, including trees, shrubs, vines, herbaceous plants, ground covers, and restoration planting associated with the shared-use path, raised boardwalk, boardwalk approaches, access routes, staging areas, and appurtenant work, complete in place, maintained, and accepted, in accordance with the Contract Drawings and Specifications.

B. The Contractor shall perform and bear the cost of all watering and other specified maintenance necessary to establish and maintain plant materials. The Town shall furnish water at a designated source as specified in Section 01 14 00, Article 3.01. The Contractor shall include all costs of collecting, transporting, distributing, and applying that water in the Base Bid.

C. Work shall include restoration of all planting areas disturbed by construction of the shared-use path, raised boardwalk, boardwalk approaches, abutments, railings, construction access, staging, grading, and related work, unless otherwise noted.

D. Contractor shall protect existing trees, shrubs, grasses, wetland buffer vegetation, and other vegetation to remain. Disturbance outside the approved limits of work shall be restored at no additional cost to the Owner.

E. Work within wetland resource areas, wetland buffer zones, coastal resource areas, and other environmentally sensitive areas shall be performed in accordance with applicable permits, Orders of Conditions, regulatory approvals, and the Contract Drawings. In the event of conflict, the more restrictive requirement shall govern.

1.02 RELATED WORK:

A. Section 32 91 00, LOAMING AND PLANTING SOIL PREPARATION

B. Section 32 92 19, SEEDING

1.03 SUBMITTALS:

In accordance with requirements of Section 01 33 23 SUBMITTALS, the Contractor shall submit the following:

A. Prior to planting, State nursery inspection certificates for all plant materials.

B. Product data for the following materials, where proposed or required by the Drawings: mulch, soil amendments, stabilization materials, staking/guying materials, anti-desiccant, and pest or weed control products.

C. Product data and source information for all native restoration plant material, including botanical name, common name, size, quantity, and nursery/source location.

D. Proposed planting and restoration schedule, including seasonal limitations and protection measures for work within coastal, wetland buffer, and environmentally sensitive areas.

E. Product data for erosion-control blanket, coir matting, or other stabilization materials used in planting areas, where applicable. Products used in restoration areas shall be biodegradable and wildlife-safe, with no permanent synthetic netting.

PART 2 - PRODUCTS

2.01 PLANT MATERIALS:

A. The Contractor shall furnish and plant all plant materials as shown on the plans and in the quantities and sizes listed thereon. No substitutions shall be permitted without the written approval of the Engineer. Plant materials used for restoration areas shall be native to Nantucket and/or coastal Massachusetts, suitable for sandy soils, drought, wind, salt exposure, and coastal environmental conditions, unless otherwise approved by the Engineer.

B. Plants larger than those specified in the Plant List may be used if approved by the Engineer. However, use of such oversized plants shall not be considered grounds for any increase in the contract price. If the use of larger plants is approved, the required spread of roots or ball of earth shall be increased in proportion to the size of the plant and plant pits shall be increased as necessary.

C. All plants shall be certified to have passed all required Federal and State inspection laws requiring ensuring freedom from plant diseases and insect infestations. The Contractor shall obtain clearance from applicable governing agencies, as required by law, before planting any plants delivered from outside the state in which they are to be planted.

D. All plants shall be nursery-grown under climatic conditions and environmental stresses similar to those in the locality of the project. All plants shall originate from nurseries that are no more than one Hardiness Zone higher (as established by the Arnold Arboretum, Jamaica Plain, MA) than where the plant is to be installed. Plants also shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard for Nursery Stock, ANSI-Z60.1, latest edition. All plants shall be legibly tagged with their proper botanical name. Plant materials shall be nursery-propagated or legally

sourced. Collection of plant material from the wild shall not be permitted unless specifically approved by the Engineer and allowed by applicable regulations.

E. No heeled-in plants or plants from cold storage shall be used. All plants shall be typical of their species or variety and shall have a normal habit of growth. Plants shall be sound, healthy, and vigorous, well branched and densely foliated when in leaf; shall be free of disease, insects, eggs or larvae; and shall have healthy, well-developed root systems. All parts of the plant shall be moist and shall show active green cambium when cut.

F. All nursery plants shall be balled and burlapped or container-grown and shall have been acclimatized for at least one growing season. Container-grown stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together, firm and whole, after removal from the container. No plants shall be loose in the container. Container-grown plants shall have no girdling roots and shall not be in a root-bound condition. Plants shall remain in their container until planted.

G. Care shall be exercised in digging and preparing field-grown plants for shipment and planting. Balled and burlapped materials shall have solid unbroken balls of earth of sufficient size to encompass all fibrous feeding roots necessary to ensure successful recovery and development of the plants. Balls shall be firmly wrapped in untreated biodegradable burlap and tied securely with wire cages and/or jute twine. Roots or balls of plants shall be adequately protected at all times from sun and drying winds. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during planting, or after the burlap, staves, wire cage, rope, or platform in connection with its transplanting have been removed. Soil characteristics (i.e., composition, texture, pH, etc.) of all field-grown plants shall closely match those of the soil where plant materials are to be planted.

H. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the Plant List in the Drawings. The branching height for deciduous trees installed adjacent to shared-use paths, boardwalks, boardwalk approaches, sidewalks, or walks shall provide required vertical clearance and shall be 7 feet minimum unless otherwise shown on the Drawings, having been pruned to this height at least 1 year prior to transplanting. Except when a clump is designated, the trunk of each tree shall be a single trunk growing from a single, unmutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. The trunk shall be free from sunscald, frost cracks, or wounds resulting from abrasions, fire, or other causes. All pruning cuts shall comply with acceptable horticultural practices. No pruning wounds having a diameter of more than 1½-inches shall be present. Any such wounds must show vigorous bark growth on all edges. Evergreen trees shall be branched to within 1 foot of the ground. No tree that has had its leader cut or die shall be accepted.

I. Caliper measurements for tree trunks shall be taken 6-inches above ground for trees up to and including 4-inch caliper size and at 12-inches above ground for larger sizes.

J. Shrubs shall meet the requirements for spread and/or height stated in the Plant List on the Drawings. The measures for height are to be taken from the crown or root flare to the average height of the top of the shrub mass (not the longest branch). The fullness of each shrub shall correspond to the trade classification "No. 1". Single stemmed or thin plants will not be accepted. The side branches must be generous, well-twigged and the plant as a whole must be well-bushed to the ground. The plants must be in a moist, vigorous condition, free from dead wood, bruises or other root or branch injuries.

K. Herbaceous plants, vines and groundcovers shall be of the size, age and/or condition designated in the Plant List on the Drawings. Plants adjacent to the shared-use path and raised boardwalk shall be selected and installed to avoid encroachment into the required clear width, shoulders, railings, sight lines, drainage swales, and other operational areas at installation and at mature size.

L. Plants shall be delivered only after preparations for planting have been completed. Plants shall be handled and packed in a horticulturally approved manner and all necessary precautions shall be taken to ensure that plants arrive on-site in a healthy vigorous condition. Trucks used for transporting plants shall be equipped with covers to protect plants from windburn, desiccation, and overheating during transport. Plants that have not been thoroughly watered shall not be accepted at the planting site. Any plants delivered to the site in a dry or wilted condition shall be rejected and replaced at no expense to the Owner. All plant materials shall be protected, watered and otherwise maintained prior to, during, and upon delivery to the site.

M. Plants shall be subject to inspection and approval by the Engineer at the place of growth, or upon delivery, for conformity to specification requirements as to quality, size, variety, and condition. Inspection and selection of plants before digging shall be at the option of the Engineer. The Contractor, or his representative, shall be present, if requested by the Engineer, for inspection of plants at the Nursery. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of work, for size and condition of balls and roots, disease, insects and latent defects or injuries. Rejected plants shall be removed immediately from the site. Certificates of inspection of plant materials shall be furnished as may be required by Federal, State and other authorities to accompany shipments.

2.02 LOAM:

Loam shall be as specified in Section 32 91 00, LOAMING AND PLANTING SOIL PREPARATION. Imported loam and planting soil used for restoration areas shall be suitable for the specified native/coastal plant materials and shall be free of invasive plant parts, weed seeds, debris, and deleterious materials.

2.03 SOIL ADDITIVES AND AMENDMENTS:

A. Soil additives and amendments shall not be used within wetland resource areas, wetland buffer zones, coastal resource areas, or other environmentally sensitive areas unless

specifically shown on the Drawings, approved by the Engineer, and allowed by applicable permits and regulatory approvals.

B. LIMESTONE:

Limestone shall comply with Section 32 91 00 – Loam and Planting Preparation. Provide limestone only where recommended by the soil-testing laboratory and permitted by the Contract Documents. Submit the proposed product, application rate, and application method to the Landscape Architect for review before use. Coordinate application with the work of Section 32 91 00; do not provide a duplicate application under this Section. Comply with the restrictions on soil additives and amendments in Paragraph 2.03.A.

C. FERTILIZER:

1. Fertilizer shall comply with Section 32 91 00 – Loam and Planting Preparation. Provide fertilizer only where recommended by the soil-testing laboratory and permitted by the Contract Documents. Submit the proposed product, analysis, application rate, and application method to the Landscape Architect for review before use. Coordinate the initial application with the work of Section 32 91 00; do not provide a duplicate application under this Section.

D. Organic Compost shall be a standard commercial product comprised of fully decomposed, 100 percent plant-derived, natural organic matter. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Compost shall be free of sticks, stones, weed seeds, roots, mineral or other foreign matter and delivered air dry. It shall be free from excessive soluble salts, heavy metals, phytotoxic compounds, and/or substances harmful to plant growth and viability. Organic compost shall comply with the material, testing, and pH requirements of Section 32 91 00 – Loam and Planting Preparation.

E. Sphagnum Peat Moss shall not be used unless specifically approved by the Engineer.

F. Humus shall be natural humus, reed peat, or sedge peat. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Humus shall be free of sticks, stones, weeds, roots, mineral or other foreign matter and/or toxic substances harmful to plant growth and viability. It shall be low in wood content, free from hard lumps and excessive amounts of zinc and delivered air dry in a shredded or granular form. The acidity range for humus shall be 5.5 to 7.5 pH, and the organic matter content shall be not less than 85 percent, as determined by loss on ignition. The minimum water holding capacity shall be 200 percent by weight on an oven-dry basis.

G. Manure shall be well-rotted, leached, cow manure not less than 8 months or more than 2 years old. It shall be free of sawdust, shavings, or refuse of any kind and shall not contain more than 25 percent straw. It shall contain no substances harmful to plant growth. The

Contractor shall furnish information regarding chemical disinfectants, if any, that may have been used in storage of the manure.

2.04 PLANTING SOIL MIXTURE:

Provide planting soil complying with Section 32 91 00 – Loam and Planting Preparation. Determine the need for compost and other amendments, and their proportions, from testing of the proposed soil and the soil-testing laboratory's written recommendations. The completed mixture, after incorporation of amendments, shall satisfy the applicable gradation, organic-content, pH, soluble-salt, and drainage requirements of Section 32 91 00. Submit the proposed mixture proportions and supporting test results to the Landscape Architect for review before placement. Do not add compost or other amendments where the unamended soil already meets the specified requirements unless recommended by the soil-testing laboratory and approved by the Landscape Architect. Comply with all restrictions on amendments in environmentally sensitive areas.

2.05 WATER:

Water shall be suitable for irrigation and free from substances harmful to plant growth. The Town shall make water available at a Town-designated source in accordance with Section 01 14 00, Article 3.01. The Contractor shall fill its water truck or tanks at that source and furnish all labor, equipment, transportation, distribution, and application required for the watering specified in this Section. Include all such costs, except the Town-furnished water itself, in the Base Bid. Continue watering throughout the establishment and maintenance periods required by this Section.

2.06 MULCH:

Mulch shall be fibrous pliable shredded soft bark mulch, not exceeding ½-inch in width. It shall be 98 percent organic matter with a pH range between 3.5 and 4.5 and a moisture content not to exceed 35 percent. It shall be free of weeds, weed seeds, debris, and other materials harmful to plant growth and viability. Organic mulch shall be aged no longer than 2 years.

2.07 MATERIALS FOR STAKING, GUYING, AND WRAPPING:

A. Tree stakes shall be sound, untreated 2 x 3 (nominal) x 8-foot length Douglas Fir reasonably free of knots. No paint or stain shall be used in conjunction with tree stakes. Tying material shall be flexible braided nylon webbing, ¾-inch wide and have a tensile strength of 900 pounds. Webbing shall be 'ArborTie', or approved equal.

B. Drive anchors and guy wire assemblies shall be suitable for protecting trees and shall be sized in accordance with the manufacturer's recommendations. No materials shall be used for guying that will girdle, chafe, or otherwise injure trees.

C. Tree wrap shall be duplex, waterproof kraft paper crinkled to 33-1/3 percent stretch, 4 to

6-inch wide strips. Tying materials shall be jute twine, 2-ply for shrubs and trees less than 3-inch caliper; 3-ply for larger plants.

2.08 TREE PAINT:

Tree paint shall not be used.

2.09 ANTI-TRANSPIRANT/ANTI-DESICCANT:

Anti-transpirant or anti-desiccant shall be 'Wilt-Pruf', as manufactured by Nursery Specialty Products, Inc., Groton Falls, NY, or approved equal. It shall be delivered in original sealed manufacturer's containers and used in accordance with the manufacturer's instructions.

2.10 INSECTICIDES:

A. No insecticides shall be used on-site without the Contractor notifying and obtaining the prior approval of the Engineer. Insecticides shall not be used within wetland resource areas, wetland buffer zones, coastal resource areas, or other environmentally sensitive areas unless specifically approved by the Engineer and allowed by applicable permits and regulatory approvals.

B. Insecticides shall be EPA registered and approved for use in public open spaces. All insecticides shall be handled by State licensed applicators only, delivered in the original sealed manufacturer's containers, and used in accordance with the manufacturer's instructions.

C. Insecticide use shall be limited and selective, only to control specific insect infestations, as identified by the Contractor or the Engineer that may result in the disfigurement, decline, or death of plant materials.

2.11 HERBICIDES:

A. No herbicides shall be used on-site without the Contractor notifying and obtaining prior approval of the Engineer.

B. Herbicides shall be EPA registered and approved for use in public open spaces. All herbicide shall be handled by State licensed applicators only, delivered in the original sealed manufacturer's containers, and used in accordance with the manufacturer's instructions.

C. Herbicides shall be used only where specifically approved by the Engineer and permitted by applicable regulatory approvals. Herbicides shall not be used within wetland resource areas, wetland buffer zones, coastal resource areas, or other environmentally sensitive areas unless expressly permitted.

D. Herbicide use shall be limited and selective, only to control specific weed infestations that have been identified by the Contractor or the Engineer.

2.12 FUNGICIDES:

A. No fungicides shall be used on-site without the Contractor notifying and obtaining prior approval of the Engineer. Fungicides shall not be used within wetland resource areas, wetland buffer zones, coastal resource areas, or other environmentally sensitive areas unless specifically approved by the Engineer and allowed by applicable permits and regulatory approvals.

B. Fungicides shall be EPA registered and approved for use in public open spaces. All fungicides shall be handled by State licensed applicators only, delivered in the original sealed manufacturer's containers, and used in accordance with the manufacturer's instructions.

C. Fungicide use shall be limited and selective, only to control specific fungal pathogenic disease infestations, as identified by the Contractor or the Engineer, that may result in the disfigurement, decline, or death of plant materials.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Prior to beginning planting or restoration work, Contractor shall review limits of work, vegetation protection areas, wetland/resource area limits, and restoration areas with the Engineer.

B. All plants shall be subject to inspection and approval by the Engineer upon delivery to the site. No materials shall be planted until approval is received.

C. All work shall be performed by skilled workers with a minimum of 2 years planting experience, in accordance with accepted horticultural/nursery practices, under the full-time supervision of a Certified Nurseryman or Arborist.

D. All balled and burlapped plants that cannot be planted immediately upon delivery shall be set on the ground and the root balls shall be well protected with soil, wet moss, or other acceptable material. All foliage shall be protected and covered with perforated shade materials.

E. Planting Season: Schedule initial planting for the spring planting period of April 1 through May 15, 2027, when soil and weather conditions are suitable for the species and stock furnished. Complete planting sufficiently in advance of the May 28, 2027 Contract completion date to allow for inspection and correction of deficiencies.

Deciduous trees and shrubs shall preferably be planted while dormant. Balled-and-

burlapped and container-grown plants may be installed after dormancy when suitable for the species and stock condition, provided root balls remain intact and adequate watering and protection are provided. Where bare-root stock is expressly permitted, install while dormant and before bud break. Schedule herbaceous plants and groundcovers according to species-specific temperature and frost requirements.

Do not plant in frozen, excessively wet, or otherwise unsuitable soil. Planting outside the specified spring period requires the Engineer's prior written approval. Submit proposed species, stock condition, installation dates, and supplemental protection and watering measures for review. Approval of an alternate planting period does not, by itself, extend the Contract Time or authorize deferral of required planting until fall. Maintenance and guarantee requirements shall remain applicable.

F. All plant locations and outlines for planting beds shall be staked out for review and potential adjustment by the Engineer before any excavation is begun. In the event that rock, underground construction work or obstructions are encountered in any proposed planting pit or bed, the Engineer may select alternate locations. Where locations cannot be changed, the obstruction shall be removed, subject to the Engineer's approval, to a depth of not less than 3 feet below grade and not less than 6-inches below the bottom of the root ball when plant is properly set at the required grade. Removal of boulders or obstructions greater than 1 cubic yard in size shall be subject to approval and will be paid for by the Owner. No ledge will be removed to create planting pits or beds. No clearing, grubbing, pruning, or vegetation removal shall occur outside the approved limits of work unless specifically authorized by the Engineer. Existing vegetation to remain shall be protected throughout construction.

G. All planting pits shall be excavated with sloped walls, wider at the top than at the bottom, and scarified to eliminate glazing. Tree pits shall be at least 2 feet greater in diameter than the root ball of earth or root system. Shrub pits shall be at least 1 foot greater than the diameter of the root ball. Planting pits shall not be deeper than the height of the root ball.

H. When excavation occurs in areas of heavily compacted earth, stones, concrete chunks or other foreign matter, pits shall be dug at least 3 times the width of the rootball. Excavated material from plant pits shall be disposed of as required.

I. Container plants shall be removed from their growing container before planting. If roots are densely matted, the outer root mass shall be scored, sliced vertically, with a sharp knife to separate roots. All herbaceous plants and groundcovers shall be evenly spaced to produce a uniform effect and staggered in rows at intervals designated on the contract drawings.

J. Shrubs and trees shall be set in the center of planting pits, plumb and straight, and at such a level that after settlement the crown of the roots will be 1 inch above the surrounding finished grade. Root balls shall not be loosened, broken, or damaged. When balled-and-burlapped plants are set, planting mixture shall be compacted around the bases of the root

balls to fill all voids. All tying materials, twine, and rope shall be cut and removed. Biodegradable burlap shall be laid back or cut away from the top half of the root ball. If a wire basket is present, cut and remove the basket completely from the sides of the root ball after setting the plant in its final position. The portion beneath the root ball may remain to avoid disturbing the root ball. Perform removal carefully to maintain root-ball integrity and plant stability. Roots of bare-root plants shall be properly spread out, and planting mixture shall be carefully worked among them. Broken or frayed roots shall be cleanly cut.

K. Backfill plant pits with planting mixture in layers of not more than 9-inches and firmly tamp each layer and water to sufficiently settle the backfilled soil before the next layer is put in place. When the planting pit is 2/3 backfilled, the hole shall be flooded and watered thoroughly so that the water level reaches the top of the planting pit. Allow water to soak in, then complete the backfilling operation. Immediately after planting pit is backfilled, a shallow basin 3-inches deep and slightly larger than the pit shall be formed with a ridge of soil for water retention. Form a common basin for plant materials throughout mass planting beds. After planting, lightly till the soil in planting beds between planting pits and rake smooth to eliminate compaction of soils.

L. All planting hole basins shall be flooded with water twice within the first 24 hours of planting, and watered not less than twice per week until final acceptance of the work.

M. All thin barked deciduous trees shall be wrapped after they are planted and before they are staked. Prior to wrapping, inspect trees for injury to trunks or improper pruning. Take corrective measures as necessary. Wrap trunks of all trees spirally from bottom to top with tree wrap and secure top and bottom at 2-foot intervals with jute twine. The wrapping shall overlap and entirely cover the trunk from the ground to the height of the second branches and shall be neat and snug. Overlap shall be approximately 2-inches.

N. Stake trees immediately after planting as detailed. All staking apparatus shall be adequate to hold the tree in a vertical position under severe weather conditions. All staking apparatus and tree trunk wrapping shall be removed and disposed of off-site by the Contractor at the end of one growing season.

O. Immediately after planting and staking operations are complete, all plant pit basins and plant beds shall be covered with approved mulch to the depths designated on the plans. Mulch shall not contact tree bark, cover tree root flares, or shrub crowns. No mulch shall be applied prior to the first watering.

P. The pruning of trees and shrubs shall only be permitted to remove dead or dying branch limbs and tips, sucker growth, water sprouts, crossing or rubbing branches, broken or damaged branches, diseased or insect infested limbs, and to preserve the natural character of the plant. Plant materials shall be pruned in accordance with American Nurserymen Association Standards and as required by the Engineer. Questionable weak limbs and branch removals that may disfigure the plant shall be left to the discretion of the Engineer. The tree leader shall never be permitted to be cut. Pruning shall be done with clean, sharp

tools. All large pruning cuts that are ½-inch in diameter or larger shall be made along the bark branch ridge. Pruning cuts shall not breach or otherwise interfere with the branch collar. All pruning cuts less than ¼-inch diameter shall be made with hand pruners as close to the main stem as possible without damaging the cambium or bud. Tree paint shall not be used to cover pruning cuts.

Q. As the work proceeds, the Contractor shall remove all debris from the site, including but not limited to branches, rock, paper, and rubbish. All areas shall be kept clean, neat and in an orderly condition at all times. Prior to final acceptance, the Contractor shall cleanup the entire area to the satisfaction of the Engineer.

R. Planting and restoration adjacent to the shared-use path, raised boardwalk, boardwalk approaches, abutments, and railings shall be performed in a manner that avoids damage to boardwalk foundations, piles, abutments, railings, path pavement, shoulders, and drainage features.

S. Plantings shall not obstruct required path or boardwalk clear width, sight lines, railings, signs, drainage features, or safe use of the shared-use path.

T. Contractor shall prevent the spread of invasive plant material during construction. Equipment used in areas containing invasive vegetation shall be cleaned prior to use in other areas of the site. Invasive plant material shall be removed and disposed of off-site in accordance with applicable regulations and as directed by the Engineer.

U. Disturbed planting areas outside the limits of proposed plantings shall be restored with loam and seed in accordance with Section 32 92 19 – Seeding, unless otherwise noted.

3.02 MAINTENANCE:

A. Maintenance shall begin immediately after installation of each plant and continue through the applicable guarantee period until final acceptance of the planting work under Article 3.05. Maintenance during the guarantee period shall run concurrently with that period and shall not delay its commencement. Maintain plants by watering, pruning, weeding, cultivating, maintaining mulch, and providing other care required by this Section. Apply fertilizers and pesticides only as otherwise permitted by the Contract Documents. Maintain and adjust tree supports as required. Correct defective work promptly when weather and seasonal conditions permit.

B. Settled plants shall be reset to proper grade and position, planting pits and common basins restored, and dead materials removed and replaced. Planting beds and individual basins shall be neat in appearance, maintained to their original layout lines and kept free of weeds. Mulch shall be replaced as required to maintain proper depths.

C. Contractor shall make arrangements to provide sufficient water to maintain all trees, shrubs and plant materials until final acceptance. Plants shall be sprayed with anti-transpirant or anti-desiccant if required by seasonal conditions or as required by the

Engineer.

D. Planting areas shall be protected against trespass and damage of any kind during the maintenance period. This shall include the furnishing and installation of approved temporary fencing if necessary. If any plants become damaged during the maintenance period, they shall be treated or replaced as required by the Engineer at no additional cost to the Owner.

E. Maintenance shall include watering, weeding, repair of erosion, replacement of mulch, repair of disturbed planting soil, and protection of planting/restoration areas adjacent to the shared-use path and raised boardwalk until final acceptance.

F. Contractor shall keep plantings and restoration areas clear of encroachment into the shared-use path, boardwalk, shoulders, railings, signs, and drainage features during the maintenance period.

3.03 INSPECTION AND PRELIMINARY ACCEPTANCE:

A. Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of inspection for preliminary acceptance. The Engineer shall recommend preliminary acceptance of the work of this Section only after completion and re-inspection of all necessary repairs, renewals or replacements.

B. Inspection and acceptance of plantings may be requested and granted in part, provided the areas for which acceptance is requested are relatively substantial in size, and with clearly definable boundaries. Acceptance and use of these areas by the Owner shall not waive any other provisions of this Contract.

3.04 GUARANTEE:

A. Guarantee plant materials for one year beginning on the date of the Owner's written preliminary acceptance of the planting work under Article 3.03, subject to the partial-acceptance and replacement-plant provisions below. Maintenance shall continue during the guarantee period in accordance with Article 3.02. Completion of maintenance is not a prerequisite to commencement of the guarantee. Seeded restoration areas shall be maintained, guaranteed, and accepted in accordance with Section 32 92 19 – Seeding.

B. When the work is accepted in part, the guarantee period shall extend from each partial acceptance to the terminal date of the last guarantee period. All guarantee periods terminate at one time.

C. Plants shall be healthy, free of pests and disease. Plants shall exhibit vigorous growth, shall bear foliage of normal density, size and color and shall have no less than seventy-five percent (75%) of their branches alive at the end of the guarantee period. If the leader of any single-leader species is dead, the entire plant shall be considered dead.

D. Any plant required under this Contract that is dead or unsatisfactory, as determined by the Engineer, shall be removed from the site. These shall be replaced as soon as weather permits during the specified planting season, at no additional cost to the Owner, until the plants live through one year.

E. All replacements shall be plants of the same kind and size as specified on the Plant List. They shall be furnished and planted as specified above.

F. The guarantee of all replacement plants shall extend for an additional one-year period from the date of their acceptance as replacement.

G. Guarantee shall not apply to the replacement of unacceptable plants resulting from the removal, loss, or damage due to occupancy of the project in any part; vandalism or acts of neglect on the part of others; physical damage by animals, vehicles, etc.; and Acts of God, including but not limited to, catastrophic fire, hurricanes, riots, war, etc.

H. If the Town-designated water source becomes unavailable or its use is curtailed, promptly notify the Owner and coordinate an alternate supply in accordance with Section 01 14 00, Article 3.01. Obtain written authorization before incurring additional costs for an alternate supply. Trucking and application of water from the designated Town source are included in the Base Bid and shall not be separately reimbursed.

3.05 FINAL INSPECTION AND FINAL ACCEPTANCE OF PLANTING WORK:

A. At the end of the applicable guarantee period, the Contractor shall provide written notice to the Engineer not less than 10 days before the requested final inspection of the planting work.

B. The Engineer shall recommend final acceptance of the planting work only after the applicable guarantee and maintenance obligations have been fulfilled and required repairs, renewals, and replacements have been completed and reinspected. Replacement plants shall remain subject to their applicable guarantee and maintenance requirements.

C. Final acceptance under this Article applies to the planting work following its guarantee period and is separate from completion of the overall construction project. Initial planting, preliminary acceptance, and correction of deficiencies required for preliminary acceptance shall be completed by the May 28, 2027 Contract completion date, unless the Contract Time is modified in accordance with the Contract Documents. Continuing maintenance, guarantee obligations, and the final planting inspection may extend beyond that date and shall remain enforceable after project completion and final payment.

D. References to “final acceptance” in Articles 3.02 through 3.05 mean final acceptance of the planting work under this Article.

END OF SECTION

SECTION 33 41 13.28

REINFORCED CONCRETE PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers extension of the existing 18-inch reinforced concrete culvert with one standard manufacturer's pipe section having an approximate laying length of 8 feet, from the existing pipe cut location to the proposed precast concrete headwall.

B. Work includes:
1. Field verification of the existing RCP diameter, outside dimensions, wall configuration, invert elevation, slope, alignment, and visible condition.
2. Sawcutting and preparation of the existing RCP designated to remain.
3. Protection of the existing RCP culvert throughout construction.
4. Furnishing and installation of one standard approximately 8-foot-long section of 18-inch RCP, or the manufacturer's standard laying length required to complete the extension shown on the Drawings.
5. Watertight connection between the cut existing RCP and proposed RCP extension.
6. Connection and sealing of the proposed RCP at the precast concrete headwall.
7. Cleaning and inspection of the existing and proposed pipe following installation.
8. Temporary maintenance or diversion of existing drainage flow, dewatering, and protection of the existing culvert from sediment, concrete, grout, and construction debris during the Work.

C. Excavation, bedding, backfill, and compaction are specified in Section 31 00 00, EARTHWORK.

D. Precast concrete headwall requirements are specified in Section 33 42 16.13, PRECAST CONCRETE HEADWALLS.

1.02 RELATED WORK:

A. Section 02 41 13, SELECTIVE SITE DEMOLITION.

B. Section 31 00 00, EARTHWORK.

C. Section 31 05 19.13, GEOTEXTILE FABRICS.

D. Section 31 25 00, EROSION AND SEDIMENT CONTROL.

E. Section 31 37 00, RIPRAP.

F. Section 33 42 16.13, PRECAST CONCRETE HEADWALLS.

G. Section 01 57 19, ENVIRONMENTAL PROTECTION.

1.03 QUALITY ASSURANCE:

A. Pipe shall be manufactured by an established manufacturer regularly engaged in the production of reinforced concrete storm-drain pipe.

B. Pipe shall be manufactured and tested in accordance with ASTM C76 for the diameter, wall designation, and class shown on the Drawings.

C. Provide manufacturer's certification that the pipe, reinforcement, and concrete materials comply with the specified requirements and that factory-formed joints and gaskets, where used, comply with the specified joint requirements.

D. Pipe is subject to inspection after delivery and before installation.

E. Reject pipe having structural cracks, exposed reinforcement, excessive spalling, damaged joint surfaces, dimensional deficiencies, or other defects affecting structural capacity, alignment, installation, or joint performance.

F. Promptly remove rejected pipe from the Site and replace it at no additional cost to the Owner.

1.04 REFERENCES:

A. The following standards form a part of this specification and indicate the minimum standards required:

ASTM International (ASTM)

ASTM	C33	Standard Specification for Concrete Aggregates
ASTM	C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM	C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

1.05 SUBMITTALS:

A. Product Data: Submit product information for the proposed RCP identifying:
1. Manufacturer.

2. Pipe diameter.
3. Pipe class.
4. Wall designation.
5. Actual laying length.
6. Bell-and-spigot configuration.
7. Joint and gasket materials.
8. Unit weight.
9. Manufacturer's handling and installation instructions.

B. Shop Drawings: Submit:
1. Proposed pipe layout and actual laying length.
2. Proposed sawcut location on the existing RCP.
3. Proposed connection between the field-cut existing RCP and proposed RCP extension.
4. Pipe-to-headwall interface and pipe penetration.
5. Required closure, coupling, collar, joint-wrap, reinforcement, grout, sealant, or other connection materials.
6. Bedding or support requirements differing from those shown on the Drawings.

C. Certifications: Submit manufacturer's certification that the pipe complies with ASTM C76 and that factory-formed joints and gaskets, where used, comply with ASTM C443.

D. Existing-Pipe Verification: Before ordering the proposed pipe section or connection materials, submit field measurements and photographs documenting:
1. Existing pipe inside diameter.
2. Existing pipe outside diameter.
3. Pipe wall configuration.
4. Existing invert elevation.
5. Existing pipe slope and alignment.
6. Proposed cut location.
7. Distance from the proposed cut location to the proposed headwall.
8. Required pipe penetration into the headwall.
9. Visible condition of the existing pipe.

E. Do not order pipe or connection materials until field conditions have been verified and discrepancies have been resolved.

1.06 DELIVERY, HANDLING AND STORAGE:

A. Deliver, handle, and store pipe in a manner that prevents cracking, chipping, deformation, contamination, and damage to bells, spigots, gaskets, and joint surfaces.

B. Handle pipe only with equipment and lifting devices suitable for the pipe weight and configuration.

C. Do not lift pipe using hooks, chains, or other devices that may damage joint surfaces or concrete.

D. Store pipe on firm, level supports in approved areas.

E. Do not store pipe over existing or newly installed pipes, utilities, drainage structures, or unstable ground.

F. Store gaskets in their original packaging and protect them from sunlight, ozone, oil, excessive heat, freezing, deformation, and contamination in accordance with the manufacturer's written instructions.

PART 2 - PRODUCTS

2.01 REINFORCED CONCRETE PIPE

A. Proposed pipe shall be 18-inch-diameter reinforced concrete pipe conforming to ASTM C76.

B. Pipe shall conform to ASTM C76, Class III, Wall B.

C. Furnish one standard pipe section having an approximate laying length of 8 feet, or the manufacturer's standard laying length necessary to complete the installation shown.

D. The approximate extension length shown on the Drawings is not intended to override the manufacturer's actual laying length. Determine the final required pipe length from field measurements, the approved cut location, and the approved headwall Shop Drawings.

E. Do not unnecessarily relocate the headwall or change the pipe alignment solely to accommodate a particular pipe length without written authorization.

F. Field cutting of the proposed new RCP is prohibited unless specifically accepted by the Engineer and permitted by the pipe manufacturer. Where accepted, make a neat sawcut normal to the pipe centerline, trim exposed reinforcement, and repair and protect the cut face in accordance with the pipe manufacturer's written recommendations and the approved connection detail.

G. Pipe-end configurations shall be compatible with the approved existing-to-new pipe connection and the proposed headwall opening. Coordinate the orientation of the bell, spigot, or pipe barrel through the Shop Drawings. Do not locate a pipe bell within the headwall opening unless specifically shown on the approved Shop Drawings.

H. The interior surface shall be smooth and free from projections, offsets, roughness, cracks, exposed reinforcement, or irregularities that interfere with drainage flow.

I. Pipe shall be permanently marked with the following:

1. Manufacturer's name or trademark.
2. Date of manufacture.
3. Pipe diameter.
4. Pipe class.
5. Wall designation.
6. Applicable ASTM designation.

J. Minor cosmetic repairs may be accepted only where permitted by ASTM C76 and completed by the manufacturer using an accepted repair procedure.

K. Pipe having defects affecting structural integrity, joint performance, alignment, or serviceability shall be rejected.

2.02 FACTORY-FORMED PIPE JOINTS

A. Factory-formed joints between proposed RCP sections, if required, shall be bell-and-spigot rubber-gasket joints conforming to ASTM C443.

B. Gaskets shall be furnished or approved by the pipe manufacturer and shall be compatible with the pipe-joint configuration.

C. Joint surfaces shall be accurately formed and free of cracks, chips, laitance, dirt, or other defects that interfere with proper gasket seating.

D. Furnish lubricant recommended by the pipe and gasket manufacturer.

E. Factory-formed joint requirements do not apply to the field-cut existing-to-new connection specified in Article 2.03.

2.03 CONNECTION TO EXISTING REINFORCED CONCRETE PIPE

A. Provide a watertight connection specifically designed or detailed for joining the field-cut end of the existing 18-inch RCP to the proposed RCP extension. The connection shall accommodate the field-verified pipe dimensions, condition, alignment, and proposed change in slope. Submit manufacturer's documentation or an engineered connection detail demonstrating watertight performance under anticipated service conditions for Engineer approval before installation.

B. Acceptable connection methods include:
1. Manufactured external concrete-pipe coupling compatible with the field-verified pipe dimensions.
2. Manufactured external concrete-pipe joint-wrap or sealing system.
3. Reinforced cast-in-place concrete closure collar detailed on approved Shop Drawings.
4. Another engineered watertight connection accepted by the Engineer.

5. Each listed connection method is acceptable only where demonstrated to satisfy the watertight performance requirement of Article 2.03.A. A joint wrap or closure collar providing only soil-tight performance is not acceptable.

C. Mortar applied only to the interior or exterior of an unreinforced butt joint is not acceptable.

D. Connection materials shall be compatible with the outside dimensions, wall configuration, surface condition, and alignment of the existing and proposed pipes.

E. The connection shall:
1. Maintain the pipe flow line and alignment.
2. Prevent migration of soil, bedding, and backfill material into the pipe.
3. Accommodate minor dimensional differences between the existing and proposed pipes.
4. Remain stable during backfill and compaction.

F. Provide stainless-steel hardware where included in a manufactured coupling system.

G. External joint wraps, sealing membranes, and flexible coupling materials shall not be relied upon to structurally support, align, or suspend either pipe. Existing and proposed pipes shall be independently and continuously supported on properly prepared bedding before the connection is installed.

H. Provide a continuous circumferential seal without gaps, folds, wrinkles, punctures, or discontinuities. Prepare concrete surfaces and provide the minimum seal width required by the connection-system manufacturer.

I. Where a reinforced concrete closure collar is proposed, submit:
1. Collar dimensions.
2. Reinforcement size and configuration.
3. Concrete strength.
4. Pipe-surface preparation.
5. Formwork and placement procedures.
6. Curing requirements.
7. Required time before backfilling.

2.04 PIPE-TO-HEADWALL INTERFACE

A. Coordinate the proposed pipe diameter, outside dimensions, alignment, invert elevation, and penetration with the approved precast headwall Shop Drawings.

B. Provide a smooth, factory-formed headwall opening sized for the proposed pipe.

C. Seal the annular space between the pipe and headwall in accordance with Section 33 42 16.13, PRECAST CONCRETE HEADWALLS.

D. Do not use the headwall opening to support the pipe or compensate for improper pipe bedding or alignment.

E. Provide continuous bedding and support beneath the pipe through the headwall interface.

PART 3 - EXECUTION

3.01 EXAMINATION AND FIELD VERIFICATION

A. Before ordering pipe and connection materials, expose and verify the existing RCP conditions identified in Paragraph 1.05.D.

B. Verify the proposed headwall location, face elevation, pipe invert, pipe penetration, surrounding grades, and riprap-apron limits.

C. Notify the Engineer if:
1. The existing pipe dimensions differ from those shown or assumed.
2. The existing pipe is cracked, displaced, deteriorated, or otherwise unsuitable for the proposed connection.
3. The required pipe length differs materially from the approximate length shown.
4. The existing pipe slope or invert does not permit installation at the proposed line and grade.

D. Do not cut the existing pipe, order the pipe section, or fabricate the connection until discrepancies have been resolved.

3.02 PROTECTION OF EXISTING PIPE

A. Protect the existing RCP culvert from impact, vibration, displacement, cracking, settlement, entry of debris, and other damage caused by Contractor operations.

B. Do not operate demolition or excavation equipment in a manner that transfers damaging impact or vibration to the pipe designated to remain.

C. Support and protect exposed portions of the existing pipe during removal of the existing headwall and excavation for the proposed extension.

D. Immediately notify the Engineer if the existing pipe is damaged or displaced.

E. Repair or replace existing pipe damaged by Contractor operations at no additional cost to the Owner.

3.03 CUTTING AND PREPARATION OF EXISTING RCP

A. Sawcut the existing RCP at the location shown on the Drawings or accepted in the field by the Engineer.

B. Make the cut neat and substantially perpendicular to the pipe centerline.

C. Do not fracture, hammer-break, or excessively spall the portion of pipe designated to remain.

D. Prepare the cut edge and exterior pipe surface as required by the approved connection detail or connection-system manufacturer.

E. Remove loose concrete, exposed wire fragments, soil, mortar, and debris.

F. Clean the interior of the retained pipe before installing the proposed extension.

G. Sawcutting of reinforced concrete pipe is expected to expose reinforcement at the cut face. Neatly trim protruding reinforcement as required by the approved connection detail and completely encapsulate or otherwise protect exposed reinforcement using the approved connection system, closure collar, nonshrink grout, corrosion-protection material, or pipe-manufacturer-approved repair material.

H. If cutting reveals cracking, delamination, corrosion, broken reinforcement, loss of concrete, or deterioration extending beyond the intended cut face, stop Work and notify the Engineer before proceeding.

3.04 PIPE BEDDING

A. Prepare trench subgrade and pipe bedding in accordance with Section 31 00 00, EARTHWORK, and the details shown on the Drawings.

B. Do not place pipe on frozen, saturated, loose, disturbed, or unstable subgrade.

C. Provide uniform support beneath the full length of the pipe barrel.

D. Excavate bell holes only where required for proper joint or connection assembly.

E. Do not permanently support pipe on blocks, wedges, bricks, lumber, isolated stones, couplings, or the headwall opening.

3.05 PIPE INSTALLATION

A. Install the proposed RCP extension at the line, slope, and invert elevations shown on the Drawings.

B. Match the existing pipe flow line and provide a continuous invert without offsets, reverse slopes, or sags.

C. Carefully lower pipe into position using approved lifting equipment and devices.

D. Do not roll or drop pipe into the excavation.

E. Keep the pipe interior free of soil, stone, concrete, grout, and debris.

F. Do not force or excessively deflect the pipe to align with the existing pipe or headwall opening.

G. Securely close open pipe ends whenever pipe installation is not actively in progress.

H. Take necessary precautions to prevent pipe flotation or displacement.

3.06 EXISTING-TO-NEW PIPE CONNECTION

A. Install the approved connection only after the existing and proposed pipes are independently supported and properly aligned.

B. Do not use the connection system to pull misaligned pipes together or to compensate for improper bedding, slope, or elevation.

C. Install manufactured coupling or joint-wrap systems in strict accordance with the manufacturer's written instructions and approved Shop Drawings.

D. Where a reinforced concrete closure collar is used:
1. Clean and prepare pipe surfaces.
2. Install reinforcement in accordance with approved Shop Drawings.
3. Secure pipes against movement during concrete placement.
4. Place and consolidate concrete without damaging or displacing the pipes.
5. Protect and cure the collar for the required period before backfilling.

E. Complete the connection so that soil, bedding, and backfill material cannot enter through the joint.

F. Remove protruding concrete, grout, sealant, or connection material from the pipe interior.

3.07 HEADWALL CONNECTION

A. Coordinate pipe installation with the precast headwall installation.

B. Extend the pipe into or through the headwall opening as shown on the approved Shop Drawings.

C. Maintain full pipe-barrel support adjacent to and through the headwall interface.

D. Seal the pipe penetration in accordance with Section 33 42 16.13.

E. Do not backfill around the headwall or pipe interface until the pipe alignment, penetration, and seal have been reviewed.

3.08 BACKFILL AND COMPACTION

A. Backfill and compact the pipe trench in accordance with Section 31 00 00, EARTHWORK.

B. Place pipe-zone backfill uniformly along both sides of the pipe in controlled lifts.

C. Prevent displacement or damage to the pipe, existing-to-new connection, and headwall penetration.

D. Use hand-operated compaction equipment adjacent to the pipe connection and headwall.

E. Do not operate heavy compaction equipment directly above the pipe until the minimum required backfill cover has been placed.

F. Correct pipe movement, misalignment, connection damage, or loss of support before continuing backfill.

3.09 REPAIR AND REJECTION OF PIPE

A. Reject pipe having:
1. Structural cracks.
2. Exposed reinforcement.
3. Damaged bell, spigot, or joint surfaces.
4. Excessive spalling.
5. Dimensional deficiencies.
6. Defects affecting structural capacity, alignment, or joint performance.

B. Minor cosmetic imperfections may be repaired only where permitted by ASTM C76 and accepted by the Engineer.

C. Repairs shall be performed by the manufacturer or its authorized representative using an accepted repair procedure.

D. Do not install repaired pipe until the repair has been reviewed and accepted.

3.10 FIELD QUALITY CONTROL

A. Before backfilling, provide the Engineer an opportunity to review:
   1. Pipe bedding and support.
   2. Pipe line and slope.
   3. Invert continuity.
   4. Existing-to-new connection.
   5. Pipe-to-headwall interface.
   6. Visible condition of the pipe.

B. Correct displaced, misaligned, cracked, improperly supported, or improperly connected pipe before backfilling.

C. After installation, clean the existing culvert and proposed extension of soil, stone, concrete, grout, sealant, and construction debris introduced by the Work.

D. Verify that drainage flows freely through the completed installation without obstruction, offset, or reverse slope.

E. Record the following for inclusion in the Project record documents:
   1. Actual pipe extension length.
   2. Existing-to-new connection location.
   3. Final upstream and downstream invert elevations.
   4. Pipe class and wall designation.
   5. Connection-system manufacturer and product, where applicable.

F. Infiltration, exfiltration, pressure, and low-pressure air testing are not required for this gravity storm-drain extension. Acceptance shall be based on visual inspection, verified invert elevations, alignment, completed connections, and unobstructed drainage flow. Additional testing shall be required only by written modification of the Contract Documents, except that testing and corrective Work resulting from visible defects or Contractor-caused damage shall be performed at no additional cost to the Owner.

END OF SECTION

SECTION 33 42 16.13

PRECAST CONCRETE HEADWALLS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers the design where specified, manufacture, furnishing, delivery, and installation of a straight precast reinforced concrete headwall for the proposed 18-inch reinforced concrete pipe, complete with reinforcement, pipe opening, lifting devices, joints between precast components, grout, sealants, foundation preparation, and related accessories.

B. The Work includes:
1. Removal and lawful disposal of the existing concrete headwall where shown.
2. Excavation and preparation of the headwall foundation.
3. Dewatering and temporary maintenance or diversion of existing drainage flow.
4. Crushed-stone leveling course or foundation material shown on the Drawings.
5. Installation and alignment of the precast concrete headwall.
6. Sealing the proposed RCP within the headwall opening.
7. Backfill and compaction adjacent to the headwall.
8. Grouting of lifting holes and joints.
9. Coordination with riprap apron, geotextile, pipe installation, and restoration.
10. Cleaning and incidental Work necessary for a complete installation.

C. Reinforced concrete pipe, pipe bedding, pipe joints, and the connection between existing and proposed RCP are specified in Section 33 41 13.28, REINFORCED CONCRETE PIPE, and Section 31 00 00, EARTHWORK.

1.02 RELATED WORK:

A. Section 02 41 13, SELECTIVE SITE DEMOLITION.
B. Section 31 00 00, EARTHWORK.
C. Section 31 05 19.13, GEOTEXTILE FABRICS.
D. Section 31 25 00, EROSION AND SEDIMENT CONTROL.
E. Section 31 37 00, RIPRAP.
F. Section 33 41 13.28, REINFORCED CONCRETE PIPE.

1.03 QUALITY ASSURANCE:

A. Precast headwall components shall be manufactured by an established manufacturer regularly engaged in producing structural precast concrete drainage products in a permanent plant equipped to meet the design and quality requirements of this Section.

B. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Inspection may be made at the place of manufacture, on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if they fail to meet any of the specification requirements. Any sections which are rejected shall be immediately removed from the job site by the Contractor.

C. Where the complete structural design and reinforcement are not shown on the Drawings, design the headwall and connections under the supervision of a Professional Engineer licensed in the Commonwealth of Massachusetts.

1.04 REFERENCES:

A. The following standards form a part of this specification, as referenced:

ASTM International (ASTM)

ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

American Concrete Institute (ACI)

ACI 318 Building Code Requirements for Structural Concrete

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

A. Product Data: Submit manufacturer's product data, concrete mix information, reinforcement information, lifting instructions, recommended installation procedures, grout, and sealant materials.

B. Shop Drawings: Submit shop drawings showing:
1. Overall headwall dimensions.
2. Wall thickness and profile.
3. Pipe-opening diameter, location, and invert elevation.
4. Reinforcement size, spacing, cover, and configuration.
5. Configuration and connection of separate precast components.
6. Lifting devices and handling requirements.
7. Foundation or leveling-course requirements.
8. Connection and sealing details at the 18-inch RCP opening.
9. Exposed-edge chamfers and surface finish.
10. Unit weights and installation requirements.

C. Design Calculations: Where delegated design is required, submit calculations and Shop Drawings signed and sealed by a Professional Engineer licensed in the Commonwealth of Massachusetts.

D. Installation Plan: Submit proposed procedures for removal of the existing headwall, flow maintenance, excavation, headwall installation, pipe coordination, backfill, and riprap installation.

E. Certifications: Submit certification that the precast concrete strength and reinforcement comply with the approved Shop Drawings and this Section.

1.06 DELIVERY AND STORAGE:

A. Handle precast units only at manufacturer-designated lifting points. Do not lift, transport, or support units in a manner that causes cracking, spalling, permanent deformation, or damage to exposed surfaces.

B. Store units on firm, level blocking in an approved location. Protect exposed faces, edges, reinforcement, lifting devices, and pipe openings from damage and contamination.

C. Do not store units over existing or newly installed pipes, utilities, drainage structures, or unstable ground.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS:

A. Provide a straight precast reinforced concrete headwall without wingwalls, having the dimensions, configuration, pipe opening, top profile, and elevations shown on the Drawings.

B. The completed headwall shall have the wall profile, top configuration, and exposed appearance shown in Detail 1/L603.

C. Design the headwall for self-weight, handling, transportation, installation, earth pressures, backfill, anticipated surcharge, pipe-interface forces, and other loads applicable to the installed condition.

D. Unless expressly shown otherwise, vehicular live loading directly over the headwall is not anticipated. Notify the Engineer if the manufacturer’s proposed configuration requires assumptions not shown in the Contract Documents.

2.02 PRECAST CONCRETE HEADWALLS:

A. Configuration: Provide a straight precast reinforced concrete headwall without wingwalls, matching the profile and configuration shown in Detail 1/L603. A projecting top cap is not required.

B. Dimensions: Headwall length, height, thickness, pipe-opening location, and finished elevations shall be as shown on the Drawings and approved Shop Drawings. Headwall thickness shall be not less than 12 inches unless a different thickness is shown.

C. Concrete: Minimum compressive strength shall be 5,000 psi at 28 days.

D. Exterior Durability: Concrete shall be air entrained and proportioned for exterior freeze-thaw exposure. Concrete mix design, water-cementitious-material ratio, air content, cementitious materials, and admixtures shall be appropriate for the project exposure and shall be identified in the submitted mix design.

E. Reinforcement: Reinforcing steel shall be Grade 60 deformed bars conforming to ASTM A615. Reinforcement size, spacing, development, and concrete cover shall comply with the approved structural design.

F. Pipe Opening: Provide a smooth, factory-formed circular opening sized and positioned for the proposed 18-inch RCP. Locate the opening to provide the pipe invert and alignment shown on the Drawings.

G. Annular Space: Size the factory-formed pipe opening and annular space to accommodate the connection detail shown on the Drawings and approved Shop Drawings. Provide a nonshrink-grout and compatible flexible-sealant connection unless a manufactured pipe-to-structure connection is approved by the Engineer. Where a manufactured connection is approved, opening dimensions and clearances shall comply with the connection manufacturer’s written requirements.

H. Multiple Precast Components: Where the headwall is furnished in more than one piece:
1. Provide continuous, fully bearing joints.
2. Set components in nonshrink grout or approved bedding material.
3. Provide dowels, keys, anchors, or other positive connections required by the structural design.
4. Finish exposed joints uniformly and prevent open joints, offsets, or differential movement.

I. Surface Finish: Exposed concrete surfaces shall have a uniform, smooth gray formed finish. The completed headwall shall have the profile, proportions, chamfers, and exposed appearance shown on the Drawings. Surfaces shall be free of honeycombing, large air voids, fins, stains, cracks, exposed reinforcement, abrupt form offsets, and visually inconsistent repairs.

J. Exposed Edges: Provide uniform chamfers at exposed corners and edges unless otherwise shown on the Drawings.

K. Top Surface: Provide the top profile and elevation shown on the Drawings. Finish exposed top surfaces uniformly and without depressions that retain water.

L. Lifting Devices: Provide manufacturer-designed lifting devices adequate for the unit weight and handling conditions. Locate lifting devices on concealed surfaces where practicable.

M. Identification: Mark the manufacturer and date of manufacture on a concealed or buried surface. Do not place identifying marks on the exposed front face.

N. Repair and Rejection: Minor surface imperfections may be repaired only using procedures accepted by the Engineer. Reject units having structural cracks, exposed reinforcement, excessive spalling, dimensional deficiencies, or damaged exposed faces.

PART 3 - EXECUTION

3.01 GENERAL:

All precautions for water courses outlined in Section 01 57 19 ENVIRONMENTAL PROTECTION must be strictly adhered to. Provide bypass pumping, temporary flow diversion, dewatering, and erosion and sediment controls as necessary to maintain drainage flow, keep the installation area stable, and prevent sediment discharge.

3.02 PRECAST CONCRETE HEADWALL INSTALLATION

A. Examination: Before fabrication or installation, field verify the existing and proposed pipe alignment, invert, outside diameter, condition, headwall location, finished grades, foundation conditions, and riprap-apron limits. Notify the Engineer of discrepancies before proceeding.

B. Existing Headwall Removal: Remove the existing headwall without damaging the existing RCP designated to remain. Protect the retained pipe from impact, displacement, cracking, and entry of debris.

C. Foundation Preparation: Excavate to the lines and elevations shown. Remove loose, disturbed, organic, or unsuitable material. Prepare a firm, level, uniformly compacted foundation.

D. Leveling Course: Install and compact crushed-stone leveling material to the dimensions and elevations shown on the Drawings. Do not use isolated blocks, wood shims, loose stone, or other point supports beneath the headwall.

E. Setting: Carefully lower the headwall into position using manufacturer-designated lifting devices. Set the headwall plumb, level, and at the line, orientation, and elevation shown.

F. Pipe Coordination: Coordinate placement of the proposed 18-inch RCP with the headwall opening. Provide continuous pipe support through the structure interface. Do not force, jack, or excessively deflect the pipe to align with the opening.

G. Pipe Penetration: Clean and prepare the pipe and opening.

1. Grouted Connection: Fill the annular space with approved nonshrink grout, leaving the recess required for compatible flexible sealant as shown on the approved connection detail. Finish exposed grout neatly and install the sealant in accordance with the approved detail and sealant manufacturer's written instructions.

2. Manufactured Connection: Install the approved manufactured pipe-to-structure connection in accordance with the approved Shop Drawings and connection manufacturer's written instructions. Do not fill the annular space with grout unless required by the approved connection detail and permitted by the connection manufacturer.

H. Component Joints: Set separate precast headwall components, where approved. Install dowels, anchors, keys, or other connections shown on the approved Shop Drawings. Remove excess grout and finish exposed joints smoothly and uniformly.

I. Backfill: Do not backfill until the headwall position, pipe penetration, joints, and foundation have been reviewed. Place backfill uniformly on both sides and behind the headwall in controlled lifts. Prevent displacement, rotation, cracking, or unbalanced loading.

J. Compaction: Use hand-operated compaction equipment adjacent to the headwall and pipe. Do not operate heavy equipment close enough to impose damaging loads on the structure.

K. Lifting Holes: Clean and fill lifting recesses and unused lifting holes with nonshrink grout. Finish exposed repairs flush and uniform with adjacent surfaces.

L. Riprap Coordination: Install geotextile and riprap apron after the headwall is secured and pipe-interface work is complete. Place riprap carefully so that individual stones do not strike, chip, stain, displace, or otherwise damage the headwall, pipe penetration, or exposed grout and sealant.

M. Completion: Remove concrete, grout, soil, debris, and staining from exposed surfaces. Leave the pipe opening unobstructed and the headwall, riprap, and surrounding grades in a complete and stable condition.

END OF SECTION

APPENDIX A

GEOTECHNICAL ENGINEERING REPORT

150 Dow Street, Tower 4, Suite 540, Manchester, NH 03101
Tel: 603.263.9296

April 20, 2026

Town of Nantucket
c/o Antone Almeida, PE
Project Manager
Weston & Sampson Engineers, Inc.
1 Washington Street, 10th Floor
Boston, MA 02108

Re: Geotechnical Engineering Report
Proposed Tom Nevers Road Multi-Use Path – Elevated Boardwalk
Nantucket, Massachusetts

Dear Antone:

Weston & Sampson Engineers, Inc.'s (Weston & Sampson) geotechnical team is pleased to present this geotechnical engineering report for the elevated boardwalk section of the proposed Tom Nevers Multi-Use Path in Nantucket, Massachusetts. Our understanding of the project is based on review of a progress print of the plans for the Tom Nevers Multi-Use Path dated November 20, 2025; selected drawings from this plan set related to the boardwalk are included in *Attachment A*. We understand the project includes construction of an approximately 350-foot-long elevated boardwalk section, between about STA 61+60 and 65+10,_along a portion of the proposed 2.8-mile-long multi-use path. The purpose of our geotechnical study was to investigate subsurface conditions at the proposed boardwalk and provide geotechnical design and construction recommendations for the elevated boardwalk structure.

PROJECT UNDERSTANDING

The project site for the proposed boardwalk is generally bound by Tom Nevers Road to the southwest, residential properties along Sandpiper Way West to the north, and residential properties along Flintlock Road to the east, as shown on *Figure 1 – Locus Map*. The proposed boardwalk alignment is offset between about 14 and 57 feet north of Tom Nevers Road. The site is undeveloped and densely wooded with low trees and brush. An existing 18-inch reinforced concrete pipe (RCP) culvert with a concrete headwall conveys intermittent flow beneath Tom Nevers Road to the southwest. Subsurface stormwater drainage and overhead electric and communication utilities are also present along Tom Nevers Road.

According to the Existing Conditions Plan included in the November 20, 2025 plan set, the proposed boardwalk alignment crosses a natural low-point with ground surface elevations ranging from approximately elevation (El.) 34 at the low point of this area to about El. 41 at the north abutment and El. 40 at the south abutment. Gentle grades are present at both sides of the valley. Elevations indicated herein are in feet and reference the North American Vertical Datum of 1988 (NAVD88).

We understand the proposed boardwalk structure will carry the proposed Tom Nevers Multi-Use Path across the valley and the intermittent wetland area contained within, joining proposed, at-grade, asphalt concrete (AC)-paved sections of the path north of Tom Nevers roadway. We assume the proposed boardwalk will be a 10-foot wide, elevated timber boardwalk with 3.5-foot guardrails. We understand the boardwalk will be elevated up to about El. 42.3 which is about 8 feet above the natural low point.

Anticipated structural loads were not made available to us at the time of this report.

SUBSURFACE INFORMATION

Surficial Geology

Information from the U.S. Geological Survey "Surficial Materials Map of the Siasconset Quadrangle, Massachusetts" (2018) compiled by Byron D. Stone and Mary L. DiGiacomo-Cohen indicates that native soils in the project area include coarse glacial stratified deposits which may contain gravel deposits, sand and gravel deposits, and sand deposits.

According to the 1983 "Bedrock Geologic Map of Massachusetts" compiled by Richard Goldsmith, Nicholas M. Ratcliffe, Peter Robinson, and Rolfe S. Stanley, bedrock at the site consists of Triassic-age sedimentary and volcanic rocks at extreme depth; reportedly, over 1,500 feet deep.

Subsurface Explorations

Subsurface conditions in the project area were explored on November 12 and 13, 2025 by advancing three (3) borings (B-1 through B-3) to depths of 39 feet and four (4) shovel test pits (TP-1 through TP-4) to depths of 0.7 to 1.2 feet at the approximate locations shown in *Figure 2– Site Plan*. Weston & Sampson geotechnical field staff observed drilling activities, excavated the test pits, and prepared boring and test pit logs.

The borings were advanced within Tom Nevers Road due to difficult access to the proposed boardwalk alignment. The borings were completed by Northern Drill Service, Inc. of Northborough, Massachusetts using an ATV-mounted Geoprobe 7822DT drill rig and rotary wash drilling methods. Standard penetration tests (SPTs) were conducted in each boring by driving a split spoon sampler with an automatic hammer in general accordance with ASTM D1586. The borings were advanced using a 4-inch (inside diameter) driven, flush-joint casing and tri-cone roller bit.

The test pits were completed to investigate shallow subsurface conditions and determine the presence and thickness of any surficial topsoil or organics along the proposed boardwalk alignment. The test pit explorations were completed by Weston & Sampson geotechnical field staff using a round point shovel.

Following completion of the explorations, the borings were backfilled with cuttings and the surface patched with asphalt cold patch and the test pits were backfilled with excavated soil.

Subsurface Conditions

Subsurface conditions encountered in the borings generally consisted of asphalt concrete (AC) pavement overlying variable, granular fill soils overlying native sand to the depths explored. The fill soils present below Tom Nevers Road are likely associated with the road construction and are not expected below the boardwalk alignment. Fill soils were not encountered in the test pits.

Descriptions of the subsurface conditions encountered in the borings and test pits are included in the boring logs in *Attachment B* and in the test pit logs in *Attachment C*. The major strata encountered in the borings and test pits are described below. Variations may occur and should be expected outside and between boring locations.

Test Pits:

Topsoil – Approximately 2 to 3 inches of topsoil was encountered at the ground surface in each test pit.

Silty Sand – A layer of native silty sand was encountered below the topsoil in TP-3. This layer consisted of mostly fine to medium sand with little non-plastic fines and occasional roots.

Sand – Native sand was encountered below the topsoil in TP-1, TP-2, and TP-4 and below the silty sand in TP-3. The native sand generally consisted of mostly fine to medium or fine to coarse sand with trace to few non-plastic fines, trace fine gravel and trace to occasional roots. Each test pit was terminated in the native sand.

Borings:

Surficial Materials – Approximately 6 to 7 inches of AC pavement was encountered at the ground surface in each boring.

Fill – Undocumented, granular fill was encountered below the AC pavement in each boring to depths ranging from approximately 4.2 to 4.7 feet. The fill primarily consisted of mostly fine to coarse sand with trace to little gravel and trace to little non-plastic fines.

Sand – A layer of native sand was encountered below the fill in each boring. This layer generally consisted of brown to tan, mostly fine to medium or fine to coarse sand with trace non-plastic fines, and trace to little gravel.

Groundwater

Groundwater levels could not be accurately determined from sample moisture because water was introduced into the borehole during drilling. Upon drilling completion, B-2 was left open for several hours to allow groundwater in the borehole to stabilize. Upon re-measuring, the borehole had collapsed to a depth of 35 feet, corresponding to an approximate elevation of El. 6. Boreholes in sand with limited fines often collapse below the water table. The collapse depth in B-2 is consistent with the mapped groundwater elevation for the site as indicated on the *Groundwater Elevations and Groundwater Flows* figure included in *Attachment D*. This figure was compiled by the Town of Nantucket GIS staff.

We anticipate that groundwater levels will fluctuate with season, variations in precipitation, construction in the area, and other factors. Perched groundwater conditions could exist close to the ground surface, especially during and after extended periods of wet weather.

GEOTECHNICAL DESIGN RECOMMENDATIONS

General

Based on the subsurface conditions encountered in our explorations, we anticipate 2 to 3 inches of topsoil overlying loose to medium dense native sand will be encountered in excavations at the site. Dense root zones may extend below the topsoil into the underlying native sand.

Based on our current understanding of the proposed project as described herein and our experience on similar projects with similar subsurface conditions we recommend supporting the boardwalk structure on shallow spread foundations or driven displacement piles. Primary considerations for the selected foundation type include scour impacts, lateral capacity requirements, and ease of construction.

Shallow foundations will be more susceptible to scour and potential undermining due to hydraulic action. We understand the site has minimal or no base flow but the presence of the 18-inch RCP culvert below Tom Nevers Road indicates occasional flow. Hydraulic analyses should be completed to determine anticipated storm flows, water depths and extents, and resulting scour potential. Scour protection measures may also be incorporated into the project and may include riprap placement around the base of foundations, grouted riprap, gabion baskets, or increased foundation embedment. Foundation locations should be sited outside of the wetted channel as much as practicable to minimize scour impacts.

Shallow Foundations

Based on the subsurface conditions encountered in our explorations, the proposed structures can be supported by shallow spread footings bearing on native undisturbed sand. Foundation subgrade preparation recommendations are provided below.

Footings founded as recommended herein can be designed using an allowable bearing pressure of 4,000 psf. The allowable bearing pressure can be increased by one-third to resist transient wind and seismic loads provided the vertical component of the resultant of all forces due to load eccentricities remains within the middle third of the footing.

Resistance to lateral loads can be obtained by a passive equivalent fluid pressure of 200 pounds per cubic foot (pcf), ignoring the top 12 inches of embedment, and by a footing base friction coefficient of 0.35. Passive pressure may be relied upon to resist lateral loads only if measures are in place to prevent future removal or disturbance of the soil in front of the footing (such as scour). We recommend a minimum factor of safety of 1.5 when using sliding friction alone. A larger magnitude of movement is required to engage passive resistance than sliding friction. Therefore, a minimum factor of safety of 2.0 is recommended when using passive pressure in addition to friction to resist lateral loads. The resistance values discussed above are only applicable where the concrete for footings is either cast directly against undisturbed native soils or Structural Fill or are backfilled with properly compacted soil.

Foundations for proposed structures should be designed in accordance with the provisions of the current edition of the Massachusetts State Building Code (MSBC). Footings should be embedded at least 4 feet below the nearest proposed adjacent ground surface exposed to freezing. If scour is anticipated, the anticipated scour depth should be added to the 4-foot minimum embedment depth for footings.

Shallow foundations constructed as recommended herein are anticipated to undergo total and differential settlements of less than 1-inch and ½-inch, respectively. The majority of foundation settlement is expected to occur during construction.

Driven Displacement Piles

As discussed above, the elevated boardwalk can also be supported on driven displacement piles (such as timber, precast concrete, or steel pipe piles) which develop their capacity through a combination of side friction and end-bearing resistance in the bearing strata. Driven piles will require sufficient embedment to resist compression, uplift, and lateral forces.

Resistance to Vertical and Lateral Loads
The following design parameters can be used for design of deep foundations.

Design Parameter	Native Sand
Total Unit Weight	110 lbs/ft^3
Friction Angle	32 degrees
Coefficient of Passive Earth Pressure (Rankine)	3.25
Horizontal Modulus of Subgrade Reaction (For L-Pile Analysis)	80 lbs/in^3 (above groundwater 50 lbs/in^3 (below groundwater)
Allowable Unit Skin Resistance (Axial Pile Capacity[1])	150 lbs/ft^2
Allowable End Bearing Resistance (lbs/ft^2)	8 kips/ ft^2

Notes:
Allowable Unit Skin Resistance values provided herein are assumed for an embedment length of 20 feet and a 2.5 factor of safety. Field load testing at the site will provide greater level of accuracy than the estimated allowable skin resistance provided in the table and should be used in lieu of the estimate value. A 2.0 factor of safety may be used with commensurate pile load testing.

Geotechnical axial capacity of driven piles should be computed based on skin frictional resistance within the native sand, neglecting side resistance to the frost depth (4 feet) or scour depth, whichever is deeper. Lateral resistance in the top 2 feet of pile embedment should be neglected.

The pile installation contractor should be responsible for selecting appropriate construction methods to meet the requirements of the project design drawings and specifications.

Pile Driving Criteria
A Professional Engineer licensed in the Commonwealth of Massachusetts and engaged by the contractor should perform wave equation analyses (WEAP) to develop requirements for the pile hammer system planned for installing the piles, and to estimate the anticipated driving resistance, pile stresses during driving, and termination criteria based on the design pile capacity. The termination criteria should

include both a minimum tip elevation based upon the soil profile along the length of the boardwalk and driving criteria. The results of this analysis should be submitted to the Geotechnical Engineer for review.

Piles should be driven until they meet the termination criteria. Adjustment of the termination criteria may be required during pile construction. The penetration into the bearing stratum required to achieve the required axial resistance may be greater or less than that estimated based on conditions encountered during installation.

The contractor should drive all piles of the same type using the same pile driving equipment. Pile installation should be observed by Weston & Sampson and continuous installation records should be maintained for all driven production piles.

Ductile Iron Piles (DIPs)

DIPs are a pre-fabricated driven pile system consisting of modular sections of hollow, ductile iron pipe, with a bell-and- spigot style connection. Standard pile diameters range from about 4 to 6.5 inches. The piles can be installed with a medium-sized excavator using a high-frequency percussion hammer, resulting in very low ground vibrations. The pile sections can be grouted with a central rebar for additional capacity. DIPs can derive their capacity in either end-bearing or friction. Friction piles are installed with an oversized grout shoe and grouted during driving to create a frictional bond zone between the piles and the surrounding soils.

DIPs are advantageous in that they can be rapidly installed while also generating low ground vibrations and minimal impacts to nearby sensitive structures. DIPs are not recommended for use in areas where subsurface obstructions are anticipated. DIPs are expected to be more costly than traditional driven piles but can be installed much quicker leading to shorter schedule times.

Design of DIPs should be the responsibility of a specialty foundation contractor engaged by the general site contractor, who is experienced in design, construction, and testing of DIPs in similar subsurface conditions to those anticipated for this project. We anticipate the DIPs will be designed as friction piles generating resistance within the native sand. The DIP design should be stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts and include calculations that demonstrate adequate vertical and lateral geotechnical and structural capacities. A factor of safety of 2.0 should be used to calculate the allowable geotechnical resistance based on the results of successful verification load testing. Weston & Sampson should be contacted for full-time observation of DIP installation and to evaluate minimum embedment depths and allowable capacities.

Concrete Pads

We anticipate that concrete pads may be place at the transition between the ground supported trail and the elevated boardwalk. We recommend removing the existing topsoil within the footprint of proposed concrete pads and at least 3 feet beyond their perimeter. Concrete pads should be supported on a minimum 12-inch-thick layer of 3/4 inch crushed stone wrapped in filter fabric and placed on properly prepared subgrades of native, inorganic Sand.

Based on subgrade preparation procedures recommended herein and the existing soils conditions, exterior concrete slabs-on-grade can be designed using a maximum allowable bearing pressure of 2,000 psf and a modulus of subgrade reaction for a 1-ft by 1-ft area (kv1) of 150 pounds per square

inch per inch of deflection. Post-construction total settlements of slabs-on-grade are estimated to be less than 1 inch.

Fill below concrete slabs-on-grade should extend a minimum of 1 foot beyond the sides of the pads in all directions and be sloped at 2H:1V or flatter. Crushed stone should be placed in 6-inch maximum lifts with each lift compacted until well-keyed.

Seismic Design

Seismic site class is determined in accordance with the International Building Code (IBC) using a weighted average of SPT blow counts in the upper 100 feet of soil at a site. Our site class determination is based on the actual conditions encountered in our borings above a depth of 39 feet, and interpolated conditions based on mapped surficial geology and assumed SPT blowcounts below 39 feet. Based on the results of our explorations and analyses and depths of proposed structures, we recommend that the subject project be evaluated using parameters associated with Site Class D. The structural engineer shall determine the seismic site parameters (S1 and Ss) based on the site location and site coefficients (Fa and Fv) based on the seismic site parameters and Site Class.

Liquefaction is the sudden drop in shear strength between soil particles that can occur in saturated, cohesionless soils as a result of ground acceleration during a seismic event. Liquefaction typically results in soil densification and subsequent settlement of overlying features and structures. Conditions most likely to contribute to liquefaction include a soil matrix containing loose, uniform medium to fine sand (poorly graded sand) below the groundwater table. Based on the soil and groundwater conditions encountered in our explorations, the risk of liquefaction induced structurally damaging ground deformations is low.

CONSTRUCTION CONSIDERATIONS

Site Preparation

Prior to earthwork construction, the site should be prepared by removing existing vegetation along the elevated boardwalk to the limits indicated on the contract documents. Existing organic materials should be removed below the concrete pads at the ends of the boardwalk.

Root balls from trees may extend several feet deep and grubbing operations can cause considerable subgrade disturbance. In general, roots greater than 1-inch in diameter should be removed below foundation areas.

Over excavated areas should be brought back to grades with compacted crushed stone or free-draining Structural Fill as described below.

Subgrade Preparation and Protection

Following stripping and site preparation, subgrades supporting structural improvements and/or pavements should be proof compacted. Soft, loose, or disturbed areas will require additional re-compaction or over-excavation, stabilization, and backfill with compacted Structural Fill.

Footing subgrades in granular materials should be proof compacted with at least 5 passes by a minimum 2-ton double drum trench compactor 12-ton smooth drum vibratory roller. Hand operated

equipment may be used in smaller areas. All subgrades should be observed by Weston & Sampson prior to placement of fill, rebar, and concrete.

Soils containing more than trace amounts of silt are highly susceptible to softening and disturbance by construction activity during wet or freezing weather. Subgrade protection should be the responsibility of the Contractor and special precautions and protective measures appropriate for the weather and traffic conditions during construction should be used during earthwork construction to preserve the integrity of subgrades. Construction traffic should not operate directly on subgrades.

A few inches of angular crushed stone can be placed and compacted at the base of footing excavations to protect subgrades from disturbance during construction and wet weather conditions. If foundation construction occurs during freezing conditions, insulating blankets, heaters, or other suitable measures should be employed to prevent foundation subgrades from freezing until the foundations are backfilled sufficiently to prevent frost from reaching the footing subgrades and penetrating beneath foundation elements.

Pile Load Testing

If traditional, impact driven piles are selected, a minimum of two indicator piles should be installed with pile dynamic analyzer (PDA) testing performed in accordance with ASTM D4945. Production pile lengths and driving criteria should be determined based on data obtained from the driving of indicator piles. Pile driving equipment used to install indicator piles should be the same as what the Contractor proposes to use for installation of production piles.

For DIPs designed to develop capacity in side friction, pile capacities should be verified using tension load testing completed in accordance with ASTM D3689. Tension load testing should be completed on a minimum of two piles. Test piles should be loaded up to 200 percent of the design load. For piles designed to develop capacity in end bearing, full scale compression testing should be completed in accordance with ASTM D1143.

Groundwater and Surface Water Controls

Groundwater is not expected to be encountered at the anticipated excavation depths for the project. The project is located within a natural low area that likely has occasional surface flow during and following storms and extended periods of wet weather. A flow bypass system may be necessary to control and convey flow through the work area. The Contractor should be prepared to manage and control infiltrating surface water during foundation excavation as well as control surface water from entering excavations to provide a dry and stable subgrade.

The Contractor should be responsible for managing surface flow based on their proposed methods and equipment used for excavation to achieve the desired objectives (that is, maintaining a dry condition within the work area and at the bottom of excavations during installation of structures, preparation of stable subgrades, etc.).

Dewatering and flow bypass efforts should satisfy requirements of local, state, and federal environmental and conservation authorities.

Temporary Slopes

All slopes and excavations should be constructed in accordance with applicable OSHA and local safety standards. Temporary slopes up to 10 feet high can be inclined up to 1.5H:1V provided no seepage or sloughing is present. Equipment should not be allowed to induce vibration or infiltrate water above the slopes and no surcharges should be located within 20 feet of slope crests. Temporary slopes should be expected to ravel somewhat, depending on weather conditions, soil conditions, seepage, and duration of exposure.

Fill Materials and Placement

We recommend the following fill materials be used for this project:

Structural Fill – Well graded sand and gravel with a maximum particle size of 4 inches and less than approximately 10 percent fines (such as MassDOT M1.03.0, type B Gravel Borrow or M2.01.7 Dense-graded Crushed Stone) are recommended for use as Structural Fill beneath shallow foundations. Structural Fill should be placed in maximum 12-inch-thick lifts (measured prior to compaction) with each lift compacted to at least 95 percent of maximum dry density as determined by ASTM D1557 (modified Proctor) for the specific fill material.

Ordinary Fill – Well graded sand and gravel with a maximum particle size of 6 inches and less than approximately 20 percent fines (such as MassDOT M1.01 Ordinary Borrow) is recommended for use as Ordinary Fill. Ordinary Fill should be placed in maximum 12-inch-thick lifts (measured prior to compaction) with each lift compacted to at least 92 percent of maximum dry density as determined by ASTM D1557 (modified Proctor) for the specific fill material.

Crushed Stone - Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious or organic material. The crushed stone shall be uniformly blended and shall conform to the requirements provided in MassDOT Standard Specifications section M2.01.0. Crushed stone should be placed and compacted to a firm and unyielding condition with at least 4 passes of a vibratory compactor.

A minimum 12-inches of crushed stone should be placed below concrete pads and other rigid site improvements not founded below the frost depth, such as at the boardwalk abutments.

A geosynthetic separation layer should be placed between the excavation subgrade and crushed stone backfill. We recommend that a geosynthetic used for stabilization consist of a non-woven geosynthetic such as Mirafi 160N or equivalent.

Reuse of On-Site Soils - Fill and natural soils excavated from the site that are free of organics, contamination (including metals, VOCs, SVOCs, etc.), and other deleterious materials may be suitable for reuse as Structural or Ordinary Fill provided the grain size distribution meets the requirements provided above. Use of on-site materials as Structural or Ordinary Fill should be evaluated on a case-by-case basis during construction by the Geotechnical Engineer.

The moisture content of fill materials should be within 3 percent of the optimum moisture content. Moisture conditioning, if required, could consist of drying by scarification and frequent mixing in thin lifts during warm, dry conditions.

Density testing should be completed on each lift of fill during construction to confirm adequate compaction. In addition to density testing, we recommend that the fill lifts pass a proof roll using a fully loaded 10-wheel dump truck or equipment of similar size and weight and observed by the Geotechnical Engineer. In confined areas and where only hand-guided compaction equipment can be used, the lift thickness should be reduced to not more than six inches and the maximum particle size reduced to three inches.

LIMITATIONS

Observation of Construction

Satisfactory earthwork and foundation performance depends to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to evaluate whether actual subsurface conditions differ from those anticipated. In addition, full-time construction observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications.

The recommendations in this report are preliminary as actual subsurface conditions may differ from those interpreted based on our subsurface explorations. In order for our recommendations to be considered final, we must be retained to observe the actual subsurface conditions encountered during construction. Our observations will allow us to interpret the actual conditions present during construction and adapt our recommendations if needed.

Variations of Subsurface Conditions and Use of Report

We have prepared this report for use by the owner, members of the design and construction team for the subject project and site, only. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a warranty of the subsurface conditions and are not applicable to other sites.

Explorations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect subsurface conditions that may exist outside or between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, reevaluation will be necessary and we should be consulted.

Site development plans and design details were considered preliminary at the time this report was prepared. If changes are made in site grades, configuration, design loads, or type of construction for the structure, the conclusions and recommendations may not be applicable. We should be consulted

to review final design drawings and specifications to see that our recommendations are suitably followed. If design changes are made, we should be retained to review our conclusions and recommendations and provide a written evaluation or modification. Additional geotechnical engineering analyses and explorations may be necessary.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, is given. For additional information on the use of this report, please refer to the document titled "Important Information about This Geotechnical-Engineering Report" included in *Appendix E*.

It has been a pleasure assisting you with this project and we look forward to our continued involvement. Please call if you have any questions.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.

Matthew J. Zanchi, PE (NH)
Geotechnical Project Manager

Jennifer MacGregor, PE (MA)
Technical Leader

Attachments:

Figure 1 – Locus Map
Figure 2 – Site Plan
~~Attachment A – Select Sheets from November 20, 2025 Tom Nevers Multi-Use Path Plans~~
Attachment B – Boring Logs
Attachment C – Test Pit Logs
Attachment D – Groundwater Elevations and Groundwater Flows
Attachment E – Important Information about This Geotechnical-Engineering Report

Removed to avoid confusion with the current Tom Nevers Road Multi-Use Path bid documents.

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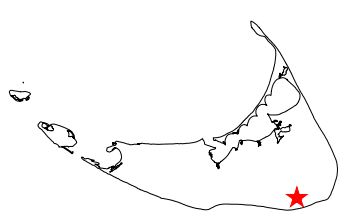


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FIGURE 1
LOCUS MAP

TOM NEVERS ROAD
MULTI-USE PATH

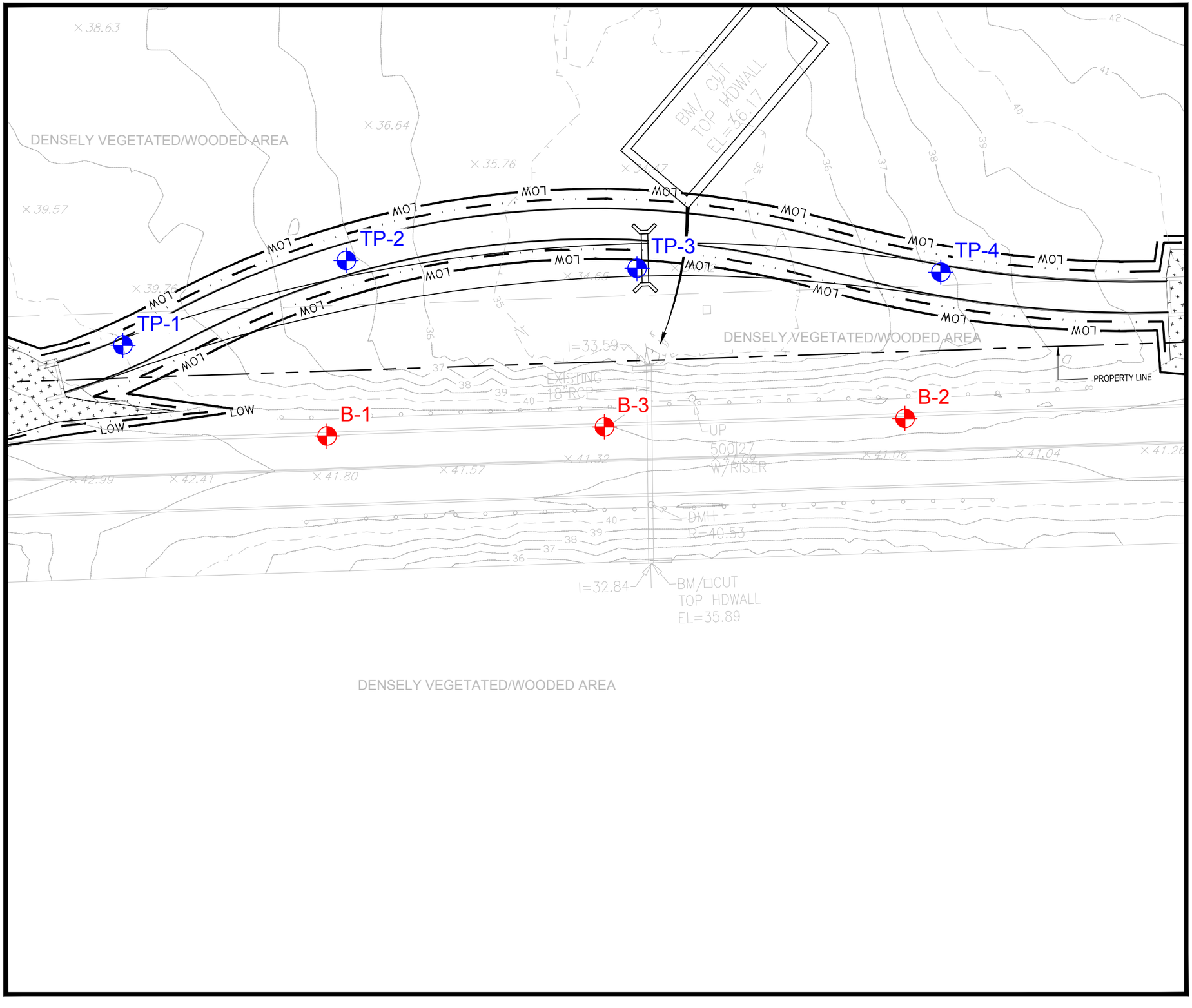
TOWN OF NANTUCKET, MASSACHUSETTS



SCALE IN FEET

0 400 800

\\wse03.local\WSE\Projects\MA\Nantucket MA\Tom Nevers Road– Bike Path\Technical\Geotech\3.0 Figures\CADD\Figure 1 – Locus Map.dwg



Weston & Sampson Engineers, Inc.
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www.westonandsampson.com

NOTES

1. THIS PLAN IS BASED ON A PERMITTING SET, PREPARED BY WESTON & SAMPSON, DATED OCTOBER 31, 2025, TITLED TOM NEVERS MULTI-USE PATH.
2. BORINGS WERE COMPLETED BY NORTHERN DRILL SERVICE, INC. OF NORTHBOROUGH, MA ON NOVEMBER 12 AND NOVEMBER 13, 2025.
3. TEST PITS WERE COMPLETED BY WESTON & SAMPSON ENGINEERING STAFF USING A ROUND POINT SHOVEL ON NOVEMBER 12, 2025.
4. ALL BORINGS WERE OBSERVED BY WESTON & SAMPSON GEOTECHNICAL ENGINEERING STAFF.
5. BORING AND TEST PITS LOCATIONS SHOWN ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS RELATIVE TO EXISTING SITE FEATURES.

LEGEND

B-X	DESIGNATION AND APPROXIMATE LOCATION OF BORING
TP-X	DESIGNATION AND APPROXIMATE LOCATION OF TEST PIT

GRAPHIC SCALE

30 15 0 30 60

SCALE: 1"=30'

ORIENTATION

TITLE

SITE PLAN

PROJECT

TOM NEVERS MULTI-USE BIKE TRAIL DESIGN

TOM NEVERS RD, NANTUCKET, MA 02554

DATE	02/26
DRWN BY	JP
CHKD BY	MJZ
PRJ. NO.	ENG22-1221
REV. NO.	-

FIGURE

FIGURE 2

P:\MA\Nantucket MA\Tom Nevers Road- Bike Path\Technical\Geotech\3.0 Figures\CADD\Figure 2 - Site Plan.dwg

ATTACHMENT B

Boring Logs

Weston & Sampson

Tom Nevers Multi-Use Bike Trail Design
Tom Nevers Road, Nantucket, MA

BORING ID: B-1

WSE Project: ENG22-1221

CONTRACTOR:	**Northern Drill Service, Inc.**	BORING LOCATION:	**See Attached Figure**	DATE START:	**November 13, 2025**
FOREMAN:	**Steve Perry**	ADVANCE METHOD:	**Rotary Wash Drilling**	DATE FINISH:	**November 13, 2025**
LOGGED BY:	**Joseph Payson**	AUGER DIAMETER:	**N/A**	GROUND EL:	**42.0 ± (NAVD88)**
CHECKED BY:	**Jennifer MacGregor, PE**	SUPPORT CASING:	**Driven Flush-Joint Casing (4" ID)**	FINAL DEPTH:	**39.0 ft.**
EQUIPMENT:	**Geoprobe 7822DT, ATV Mounted**	CORING METHOD:	**N/A**	GRID COORDS:	**N:92031.0 ± / E:1777362.0 ±**
SPT HAMMER:	**Automatic (140-lb.)**	BACKFILL MATERIAL:	**Drill Cuttings and Asphalt Patch**	GRID SYSTEM:	**NAD83 State Plane (MA)**

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				● N-Value, Raw (bpf) ⊠ Organic Content (%) 10 20 30 40 ⊕ Moisture Content (%) ▶ Plastic Limit, PL (%) ◀ Liquid Limit, LL (%) 25 50 75 100		Surface: Asphalt concrete pavement.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
		S-1 20/24	25 8 8 7	16		Asphalt- 6" thick. **Poorly graded sand (SP)** - Medium dense; tan with brown; moist; mostly fine to medium SAND, trace fine gravel, trace nonplastic fines. **[FILL]**		Groundwater could not be accurately measured due to introduction of drilling fluid in borehole.
		S-2 21/24	12 13 12 13	25		**Poorly graded sand with gravel (SP)** - Medium dense; brown; moist; mostly fine to coarse SAND, little fine to coarse gravel, trace nonplastic fines. **[FILL]**		
		S-3 23/24	8 7 4 4	11		**Poorly graded sand with silt (SP-SM)** - Medium dense; brown; moist; mostly fine to medium SAND, few nonplastic fines, trace fine gravel. **[FILL]** *Change to fine to coarse sand at 3.75 ft*		
5						**Poorly graded sand (SP)** - Medium dense; tan; moist; mostly fine to coarse SAND, few fine gravel, trace nonplastic fines. *Change to light brown to tan, fine to coarse sand; and trace fine gravel at 4.75 ft*	37	
		S-4 9/24	6 5 6 8	11		**Poorly graded sand (SP)** - Medium dense; tan; moist; mostly fine to coarse SAND, trace nonplastic fines.		
10							32	
		S-5 7/24	10 13 12 11	25				
15							27	
		S-6 0/24	8 12 11 13	23				[20.0 - 22.0] No Recovery.
20							22	

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
		S-7 0/24	8 8 6 7	14		**Poorly graded sand (SP)** - Medium dense; tan; moist; mostly fine to coarse SAND, trace nonplastic fines.		[25.0 - 27.0] No Recovery.
		S-8 7/24	5 5 6 8	11				
30		S-9 5/24	7 9 12 13	21		*Change to little fine to coarse gravel at 30 ft*	12	
35		S-10 0/24	10 8 7 7	15		**Poorly graded sand (SP)** - Loose; tan; moist; mostly fine to coarse SAND, trace nonplastic fines.	7	[35.0 - 37.0] No Recovery.
		S-11 4/24	6 5 3 5	8				
40							2	**Exploration ended at 39.0 ft.**
45							-3	
50							-8	

GEOTECHNICAL TEST DATA
- ● N-Value, Raw (bpf)
- ⊠ Organic Content (%)
- 10 20 30 40
- ⊕ Moisture Content (%)
- ▶ Plastic Limit, PL (%)
- ◀ Liquid Limit, LL (%)
- 25 50 75 100

Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.

Weston & Sampson

Tom Nevers Multi-Use Bike Trail Design
Tom Nevers Road, Nantucket, MA

BORING ID: B-2

WSE Project: ENG22-1221

CONTRACTOR:	**Northern Drill Service, Inc.**	BORING LOCATION:	**See Attached Figure**	DATE START:	**November 12, 2025**
FOREMAN:	**Steve Perry**	ADVANCE METHOD:	**Rotary Wash Drilling**	DATE FINISH:	**November 12, 2025**
LOGGED BY:	**Joseph Payson**	AUGER DIAMETER:	**N/A**	GROUND EL:	**41.0 ± (NAVD88)**
CHECKED BY:	**Jennifer MacGregor, PE**	SUPPORT CASING:	**Driven Flush-Joint Casing (4" ID)**	FINAL DEPTH:	**39.0 ft.**
EQUIPMENT:	**Geoprobe 7822DT, ATV Mounted**	CORING METHOD:	**N/A**	GRID COORDS:	**N:91853.5 ± / E:1777522.9 ±**
SPT HAMMER:	**Automatic (140-lb.)**	BACKFILL MATERIAL:	**Drill Cuttings and Asphalt Patch**	GRID SYSTEM:	**NAD83 State Plane (MA)**

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA (N-Value, Raw (bpf); Organic Content (%); Moisture Content (%); Plastic Limit, PL (%); Liquid Limit, LL (%))	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
						Surface: Asphalt concrete pavement.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
		S-1 20/24	22 5 6 7	11		Asphalt- 6" thick.		Groundwater could not be accurately measured due to introduction of drilling fluid in borehole.
		S-2 20/24	4 4 5 11	9		**Poorly graded sand with silt (SP-SM)** - Medium dense; brown; moist; mostly fine to medium SAND, few nonplastic fines, trace fine gravel. **[FILL]**		
		S-3 21/24	10 6 6 6	12		**Poorly graded sand (SP)** - Loose to medium dense; brown; moist; mostly fine to coarse SAND, trace coarse gravel, trace nonplastic fines. **[FILL]**		
5						**Silty sand (SM)** - Loose to medium dense; dark brown; moist; mostly fine to medium SAND, little nonplastic fines, trace fine gravel. **[FILL]**	36	
						Poorly graded sand (SP) - Medium dense; tan; moist; mostly fine to coarse SAND, few fine to coarse gravel, trace nonplastic fines.		
10		S-4 0/24	8 7 8 8	15		*Change to fine to medium sand and fine gravel at 10 ft*	31	[10.0 - 12.0] No Recovery.
		S-5 2/24	5 8 9 14	17				
15		S-6 15/24	8 9 9 10	18			26	
20		S-7 0/24	7 7 6 7	13			21	[20.0 - 22.0] No Recovery.
						Poorly graded sand with gravel (SP) - Medium dense; tan; moist; mostly fine to coarse SAND, little fine to coarse gravel, trace nonplastic fines.		

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
		S-8 11/24	8 8 8 8	● N-Value, Raw (bpf) ⊠ Organic Content (%) 10 20 30 40 ⊕ Moisture Content (%) ▶ Plastic Limit, PL (%) ◀ Liquid Limit, LL (%) 25 50 75 100 16		**Poorly graded sand with gravel (SP)** - Medium dense; tan; moist; mostly fine to coarse SAND, little fine to coarse gravel, trace nonplastic fines.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
30		S-9 0/24	3 7 7 11	14		**Poorly graded sand (SP)** - Loose to medium dense; tan; moist; mostly fine to coarse SAND, few fine and coarse gravel, trace nonplastic fines.	11	[30.0 - 32.0] No Recovery.
		S-10 11/24	7 13 14 15	27				
35		S-11 0/24	9 8 6 6	14			6	[35.0 - 37.0] No recovery. [35.0] Borehole left open upon completion for groundwater stabilization. Borehole collapsed to depth of 35 feet.
		S-12 4/24	6 5 4 6	9				
40							1	**Exploration ended at 39.0 ft.**
45							-4	
50							-9	

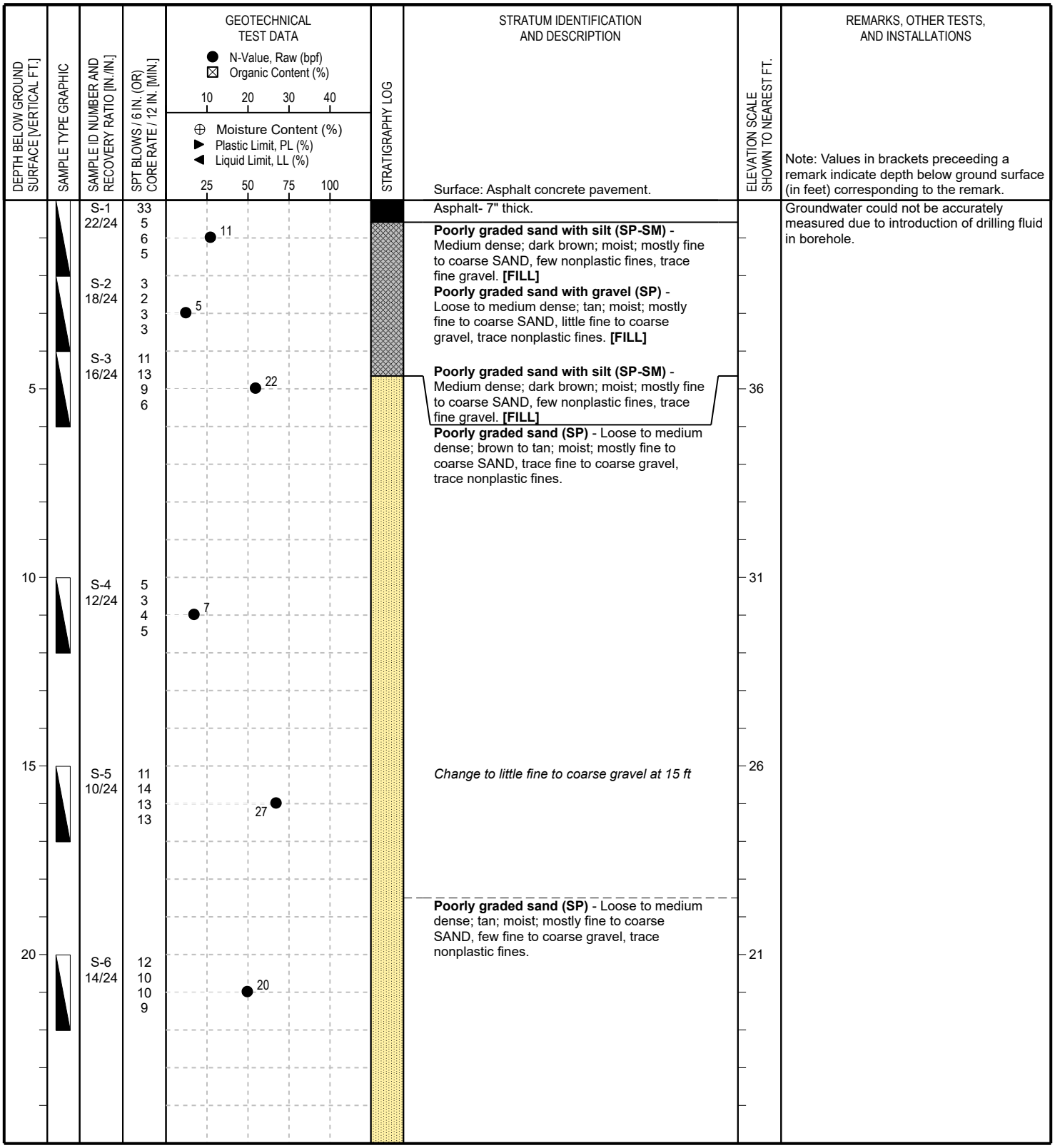
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Tom Nevers Multi-Use Bike Trail Design
Tom Nevers Road, Nantucket, MA

BORING ID: B-3

WSE Project: ENG22-1221

CONTRACTOR:	Northern Drill Service, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	November 12, 2025
FOREMAN:	Steve Perry	ADVANCE METHOD:	Rotary Wash Drilling	DATE FINISH:	November 13, 2025
LOGGED BY:	Joseph Payson	AUGER DIAMETER:	N/A	GROUND EL:	41.0 ± (NAVD88)
CHECKED BY:	Jennifer MacGregor, PE	SUPPORT CASING:	Driven Flush-Joint Casing (4" ID)	FINAL DEPTH:	39.0 ft.
EQUIPMENT:	Geoprobe 7822DT, ATV Mounted	CORING METHOD:	N/A	GRID COORDS:	N:91963.9 ± / E:1777423.4 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (MA)



Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
		S-7 0/24	8 8 6 6	14		**Poorly graded sand (SP)** - Loose to medium dense; tan; moist; mostly fine to coarse SAND, few fine to coarse gravel, trace nonplastic fines.		[25.0 - 27.0] No Recovery.
		S-8 6/24	5 4 5 5	9		*Change to trace fine gravel at 27 ft*		
30		S-9 7/24	7 7 8 8	15		*Change to little fine to coarse gravel at 30 ft*	11	
35		S-10 0/24	8 6 5 5	11			6	[35.0 - 37.0] No Recovery.
		S-11 6/24	5 5 5 5	10		*Change to few fine gravel at 37 ft*		
								Exploration ended at 39.0 ft.
40							1	
45							-4	
50							-9	

GEOTECHNICAL TEST DATA
- N-Value, Raw (bpf)
- Organic Content (%)
- Moisture Content (%)
- Plastic Limit, PL (%)
- Liquid Limit, LL (%)

Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.

GUIDE TO SUBSURFACE EXPLORATION LOGS

Weston & Sampson℠

INDEX SHEET 1 GENERAL INFORMATION

GENERAL NOTES AND USE OF LOGS

1.) Explorations were made by ordinary and conventional methods and with care adequate for Weston & Sampson's study and/or design purposes. The exploration logs are part of a specific report prepared by Weston & Sampson for the referenced project and client, and are an integral part of that report. Information and interpretations are subject to the explanations and limitations stated in the report. Weston & Sampson is not responsible for any interpretations, assumptions, projections, or interpolations made by others.

2.) Exploration logs represent general conditions observed at the point of exploration on the date(s) stated. Boundary lines separating soil and rock layers (strata) represent approximate boundaries only and are shown as solid lines where observed and dashed lines where inferred based on drilling action. Actual transitions may be gradual and changes may occur over time.

3.) Soil and rock descriptions are based on visual-manual examination of recovered samples, direct observation in test pits (when permissible), and laboratory testing (when conducted).

4.) Water level observations were made at the times and under the conditions stated. Fluctuations should be be expected to vary with seasons and other factors. Use of fluids during drilling may affect water level observations. The absence of water level observations does not necessarily mean the exploration was dry or that subsurface water will not be encountered during construction.

5.) Standard split spoon samplers may not recover particles with any dimension larger than 1-3/8 inches. Reported gravel conditions or poor sample recovery may not reflect actual in-situ conditions.

6.) Sections of this guide provide a general overview of Weston & Sampson's practices and procedures for *identifying* and *describing* soil and rock. These procedures are predominantly based on ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*, the International Society of Rock Mechanics (ISRM) standards, and the *Engineering Geology Field Manual* published by the Bureau of Reclamation. Not all aspects of this guide relating to description and identification procedures of soil and rock may be applicable in all circumstances.

SAMPLER GRAPHICS

- Split Spoon (Standard) 2" OD, 1-3/8" ID
- Split Spoon (Oversize) 3" OD, 2-3/8" ID
- Shelby or Piston Tube 3" OD, 2-7/8" ID
- Double-Tube Rock Core Barrel 2" Core Diameter
- Direct Push with Acetate Liner Various Liner Sizes
- A — Auger Sample *(from cuttings or hand auger)*
- G — Grab Sample *(manual, from discrete point)*
- C — Composite Sample *(multiple grab samples)*

WELL GRAPHICS

- Cement concrete seal around casing or riser pipe
- Bentonite seal around casing or riser pipe
- Cement grout seal around casing or riser pipe
- Soil backfill around riser pipe or beneath screen
- Gravel backfill around screen or riser pipe
- Sand backfill around screen or riser pipe (filter sand)
- Solid-wall riser; Sch. 40 PVC, 1" ID unless noted otherwise
- Slotted screen; Sch. 40 PVC, 1" ID with machined slots

CAVING / SEEPAGE TERMS

The following caving and/or seepage terms may appear on a test pit log.

Caving Term	Criteria
Minor	less than 1 cubic ft.
Moderate	1 to 3 cubic ft.
Severe	greater than 3 cubic ft.

Seepage Term	Criteria
Slow	less than 1 gpm
Moderate	1 to 3 gpm
Fast	greater than 3 gpm

KEY TO WATER LEVELS

- Observed in exploration during advancement.
- Measured in exploration at completion, prior to backfilling or well installation.
- Measured in exploration after the stated stabilization period, prior to backfilling, or in well installation if noted.

DEFINITIONS OF COMMON TERMS

Sample Recovery Ratio - The length of material recovered in a drive or push type sampler over the length of sampler penetration, in inches (e.g. 18/24).

Standard Penetration Test (*SPT*) - An in-situ test where a standard split-spoon sampler is driven a distance of 12 or 18 inches (after an initial 6-inch seating interval) using a 140-lb. hammer falling 30 inches for each blow.

SPT Blows - The number of hammer blows required to drive a split-spoon sampler each consecutive 6-inch interval during a *Standard Penetration Test*. If no discernable advancement of a split spoon sampler is made after 50 consecutive hammer blows, 50/X indicates *sampler refusal* and is the number of blows required to drive the sampler X inches.

SPT N-Value (*N*) - The uncorrected blow count representation of a soil's penetration resistance over a 12-inch interval after an initial 6-in. seating interval, reported in blows per foot (bpf). The N-value is correlated to soil engineering properties.

Auger Refusal - No discernable advancement of the auger over a period of 5 minutes with full rig down pressure applied.

Casing Refusal (Driven) - Casing penetration of less than 6 inches after a minimum 50 blows of a drop hammer weighing 300 lbs. or a minimum 100 blows of a drop hammer weighing 140 lbs.

PID Measurement - A measurement (electronic reading) taken in the field using a photoionization detector (PID) to detect the presence of volatile organic compounds in a soil sample. Values are reported as benzene equivalent units in parts per million (ppm) unless noted otherwise.

Rock Quality Designation (RQD) - A qualitative index measure of the degree of jointing and fracture of a rock core taken from a borehole. The RQD is defined as the sum length of solid core pieces 4 inches or longer divided by the run (cored) length, expressed as a percentage. Higher RQD values may indicate fewer joints and fractures in the rock mass.

Fill (Made Ground) - A deposit of soil and/or artificial waste materials that has been placed or altered by human processes.

LABORATORY TESTS AND FIELD MEASUREMENTS

MC	Moisture Content	IC	1D Incremental Consolidation
OC	Organic Content	VS	Laboratory Vane Shear
PL	Plastic Limit	US	Unconfined Compression
LL	Liquid Limit	TC	Triaxial Compression
GC	Gravel Content	PP	Pocket (Hand) Penetrometer
SC	Sand Content	TV	Torvane (Hand Vane)
FC	Fines Content	PID	Photoionization Detector
DS	Direct Shear	FID	Flame Ionization Detector

BORING ADVANCEMENT METHODS

Hollow-Stem Auger Drilling - Utilizes continuous flight auger sections with hollow stems to advance the borehole. Drill rods and a plug are inserted into the auger stem to prevent the entrance of soil cuttings into the augers.

Rotary Wash Drilling - Utilizes downward pressure and rotary action applied to a non-coring bit while washing the cuttings to the surface using a circulating fluid injected down the drill rods. The borehole is supported with either steel casing or the drilling fluid. Where a casing is used, the borehole is advanced sequentially by driving the casing to the desired depth and then cleaning out the casing. The process of driving and cleaning the casing is commonly referred to as the 'drive-and-wash' technique.

Continuous Sampling - Includes a variety of methods and procedures during which the borehole is advanced via continuous recovery of soil samples. *Direct Push* sampling is a common method that uses static downward pressure combined with percussive energy to drive a steel mandrel into the ground at continuous intervals while recovering soil samples in disposable acetate liners.

Rock Coring - Utilizes downward pressure and rotary action applied to a core barrel equipped with a diamond-set or tungsten carbide coring bit. During conventional coring, the entire barrel is retrieved from the hole upon completion of a core run. Wireline coring allows for removal of the inner barrel assembly containing the actual core while the the drill rods and outer barrel remain in the hole. Various types and sizes of core barrels and bits are used.

GUIDE TO SUBSURFACE EXPLORATION LOGS

Weston & Sampson℠

INDEX SHEET 2
SOIL DESCRIPTION

SOIL CONSTITUENTS

Naturally occurring soils consist of one or more of the following matrix constituents defined in terms of particle size.

Constituent		U.S. Sieve Size			Observed Size (in.)		
Gravel	(Coarse)	3/4 in.	-	3 in.	3/4	-	3
Gravel	(Fine)	No. 4	-	3/4 in.	1/5	-	3/4
Sand	(Coarse)	No. 10	-	No. 40	1/16	-	1/5
Sand	(Medium)	No. 40	-	No. 10	1/64	-	1/16
Sand	(Fine)	No. 200	-	No. 40	1/300	-	1/64
Fines	(Silt or Clay)	Smaller than		No. 200	Less than		1/300

SOIL IDENTIFICATION

Soil identification refers to the grouping of soils with similar physical characteristics into a category defined by a **group name** and corresponding **group symbol** based on estimation of the matrix soil constituents to the nearest 5% and simple manual tests. Proportions of cobbles, boulders, and other non-matrix soil materials are not considered during this procedure but are included in the overall soil description if observed or thought to be present. Refer to the following descriptions and tables adapted from ASTM D2488.

Coarse-Grained Soil - Coarse-grained soils contain fewer than 50% fines and are identified based on the following table.

Primary Constituent	Fines Percent	Type of Fines and Gradation		Group Symbol	Group Name [1]
GRAVEL *% gravel > % sand*	≤ 5%	well graded		GW	Well graded gravel
		poorly graded		GP	Poorly graded gravel
	10%	clayey fines	well graded	GW-GC	Well graded gravel with clay
			poorly graded	GP-GC	Poorly graded gravel with clay
		silty fines	well graded	GW-GM	Well graded gravel wth silt
			poorly graded	GP-GM	Poorly graded gravel with silt
	15% to 45%	clay fines		GC	Clayey gravel
		silt fines		GM	Silty gravel
SAND *% sand ≥ % gravel*	≤ 5%	well graded		SW	Well graded sand
		poorly graded		SP	Poorly graded sand
	10%	clayey fines	well graded	SW-SC	Well graded sand with clay
			poorly graded	SP-SC	Poorly graded sand with clay
		silty fines	well graded	SW-SM	Well graded sand with silt
			poorly graded	SP-SM	Poorly graded sand with silt
	15% to 45%	clay fines		SC	Clayey sand
		silt fines		SM	Silty sand

[1] If soil is a gravel and contains 15% or more sand, add "with sand" to the group name. If soil is a sand and contains 15% of more gravel, add "with gravel" to the group name.

Inorganic Fine-Grained Soil - Fine-grained soils contain 50% or more fines and are identified based on the following table.

Plasticity Criteria	Dry Strength	Coarse Fraction S = Sand, G = Gravel		Group Symbol	Group Name [1]
Medium	Medium to high	< 15% S + G		CL	Lean clay
		≥ 30%	% S ≥ % G	CL	Sandy lean clay
		S + G	% S < % G	CL	Gravelly lean clay
Non-plastic	None to low	< 15% S + G		ML	Silt
		≥ 30%	% S ≥ % G	ML	Sandy silt
		S + G	% S < % G	ML	Gravelly silt
High	High to very high	< 15% S + G		CH	Fat clay
		≥ 30%	% S ≥ % G	CH	Sandy fat clay
		S + G	% S < % G	CH	Gravelly fat clay
Low to Medium	Low to medium	< 15% S + G		MH	Elastic silt
		≥ 30%	% S ≥ % G	MH	Sandy elastic silt
		S + G	% S < % G	MH	Gravelly elastic silt

[1] If soil contains 15% to 25% sand or gravel, add "with sand" or "with gravel" to the group name.

Organic Fine-Grained Soil - Fine-grained soils that contain enough organic particles to influence the soil properties are identified as Organic Soil and assigned the group symbol **OL** or **OH**.

Highly Organic Soil (Peat) - Soils composed primarily of plant remains in various stages of decomposition are identified as Peat and given the group symbol **PT**. Peat usually has an organic odor, a dark brown to black color, and a texture ranging from fibrous (original plant structure intact or mostly intact) to amorphous (plant structure decomposed to fine particles).

SOIL DESCRIPTION

Soils are *described* in the following general sequence. Deviations may occur in some instances.

Identification Components

(1) Group Name and Group Symbol

Description Components

(2) Consistency (Fine-Grained) or Apparent Density (Coarse-Grained)
(3) Color (*note, the term "to" may be used to indicate a gradational change*)
(4) Soil Moisture
(5) Matrix Soil Constituents (Gravel, Sand, Fines)
  └► Proportion (*by weight*), particle size, plasticity of fines, angularity, etc.
(6) Non-Matrix Soil Materials and Proportions (*by volume*)
(7) Other Descriptive Information (Unusual Odor, Structure, Texture, etc.)
(8) [Geologic Formation Name or Soil Survey Unit]

SPT N-VALUE CORRELATIONS

Consistency	SPT N-Value	Apparent Density	SPT N-Value
Very soft	0 - 2	Very loose	0 - 5
Soft	2 - 4	Loose	5 - 10
Medium stiff	4 - 8	Medium dense	10 - 30
Stiff	8 - 15	Dense	30 - 50
Very stiff	15 - 30	Very dense	> 50
Hard	> 30		

SOIL MOISTURE

Dry..... Apparent absence of moisture; dry to the touch.
Moist..... Damp but no visible water.
Wet..... Visible free water; saturated.

PROPORTIONS / PERCENTAGES

Proportions of gravel, sand, and fines (excluding cobbles, boulders, and other constituents) are stated in the following terms indicating a range of percentages by weight (to nearest 5%) of the minus 3-in. soil fraction and add up to 100%.

Mostly ..... 50% - 100%
Some ..... 30% - 45%
Little ..... 15% - 25%
Few ..... 5% - 10%
Trace..... Less than 5%

Proportions of cobbles, boulders, and other non-matrix soil materials including artificial debris, roots, plant fibers, etc. are stated in the following terms indicating a range of percentages by volume (to the nearest 5%) of the total soil.

Numerous ..... 40% - 50%
Common ..... 25% - 35%
Occasional ..... 10% - 20%
Trace..... Less than 5%

PLASTICITY (FINES ONLY)

Non-plastic.....Dry specimen ball falls apart easily. Cannot be rolled into thread at any moisture content.
Low.....Dry specimen ball easily crushed with fingers. Can be rolled into 1/8-in. thread with some difficulty.
Medium.....Difficult to crush dry specimen ball with fingers. Easily rolled into 1/8-in. thread.
High.....Cannot crush dry specimen ball with fingers. Easily rolled and re-rolled into 1/8-in. thread.

COBBLES AND BOULDERS

Cobbles - Particles of rock that will pass a 12-in. square opening and be retained on a 3-in. sieve.

Boulders - Particles of rock that will not pass a 12-in. square opening.

Note: Where the percentage (by volume) of cobbles and/or boulders cannot be accurately or reliably estimated, the terms "with cobbles", "with boulders", or "with cobbles and boulders" may be used to indicate observed or inferred presence.

GUIDE TO SUBSURFACE EXPLORATION LOGS

Weston & Sampson℠

INDEX SHEET 3
ROCK DESCRIPTION

ROCK DEFINITION

Where reported on an exploration log, *rock* is defined as any naturally formed aggregate of mineral matter occurring in larges masses or fragments. This definition of rock should not be taken as a replacement for any definitions relating to rock and/or rock excavation defined in construction documents. Intensely weathered or decomposed rock that is friable and can be reduced to gravel size particles or smaller by normal hand pressure is identified and described as soil. Poorly indurated formational materials which display both rock-like and soil-like properties are identified and described as rock followed by the soil description. In such cases, the term "poorly indurated" or "weakly cemented" is added to the rock name (e.g. weakly cemented sandstone).

ROCK IDENTIFICATION

Rock is identified by a combination of *rock type* (igneous, metamorphic, or sedimentary) followed by the the *rock name* (e.g. granite, schist, sandstone).

ROCK DESCRIPTION

Rock descriptions are presented in the following general sequence. The detail of description is dictated by the complexity and objectives of the project.

Identification Components

(1) Rock Type and Name

Description Components

(2) Rock Grain Size (*for clastic sedimentary rock*)
(3) Crystal Size (*for igneous and metamorphic rock*)
(4) Bedding Spacing (*for sedimentary rock*)
(5) Color
(6) Hardness and Weathering Descriptors
(7) Fracture Density
(8) [Geologic Formation Name]

ROCK QUALITY DESIGNATION

$$\text{RQD (\%)} = \frac{\Sigma \text{ Length of intact core pieces} \geq 4 \text{ inches}}{\text{Total length of core run (inches)}} \times 100$$

The RQD should correlate with the fracture density in most cases. Higher RDQ values generally indicate fewer joints and fractures.

GRAIN / CRYSTAL SIZE

Grain Size for Clastic Sedimentary Rock

The names of clastic sedimentary rocks are generally based on their predominant clast or grain size (e.g. fine sandstone, medium sandstone, coarse gravel conglomerate, cobble conglomerate, siltstone, claystone).

Crystal Size for Igneous and Metamorphic Rock

Grain Size Description	Average Crystal Size (in.)
Very coarse grained (pegmatitic)	Greater than or equal to 3/8
Coarse-grained	Between 3/16 and 3/8
Medium-grained	Between 1/32 and 3/16
Fine-grained	Between 1/250 and 1/32
Aphanitic	Less than or equal to 1/250

BEDDING SPACING

Bedding Description	Thickness / Spacing
Massive	Less than 10 ft.
Very thickly bedded	3 ft. to 10 ft.
Thickly bedded	1 ft. to 3 ft.
Moderately bedded	4 in. to 1 ft.
Thinly bedded	1 in. to 4 in.
Very thinly bedded	1/4 in. to 1 in.
Laminated	Less than 1/4 in.

Note: Bedding is generally only applicable to sedimentary or bedded volcanic rocks.

HARDNESS

Hardness	Criteria
Extremely hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very hard	Cannot be scratched with a pocketknife or sharp pick with difficulty. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with with a pocketknife or sharp pick with difficulty. Breaks with heavy hammer blows.
Moderately hard	Can be scratched with a pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily with a pocketknife or sharp pick. Breaks with light to moderate manual pressure.
Very soft	Can be readily indented, grooved, or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

WEATHERING (INTACT ROCK)

Weathering Description	Discoloration and/or Oxidation	General Characteristics
Fresh	Body of rock and fracture surfaces are not discolored or oxidized.	Rock texture unchanged. Hammer rings when crystalline rocks are struck.
Slightly weathered	Discoloration or oxidation limited to surface of, or short distance from, fractures. Most surfaces exhibit minor to complete discoloration.	Rock texture preserved. Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately weathered	Discoloration or oxidation extends usually throughout. Fe-Mg minerals appear rusty. All fracture surfaces are discolored or oxidized.	Rock texture generally preserved. Hammer does not ring when rock is struck. Body of rock slightly weakened.
Intensely weathered	Discoloration or oxidation throughout. Feldspar and Fe-Mg minerals altered to clay to some extent. All fracture surfaces are discolored or oxidized and friable.	Rock texture altered by chemical disintegration. Can usually be broken with moderate to heavy manual pressure or by light hammer blow . Body of rock is significantly weakened.
Decomposed	Discoloration or oxidation throughout but resistant minerals such as quartz may be unaltered. All feldspar and Fe-Mg minerals are completely altered to clay.	Resembles a soil; partial or complete remnant rock structure may be preserved. Can be granulated by hand. Resistant minerals may present as stringers or dikes.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures
Very slightly fractured	Core lengths greater than 3 ft.
Slightly fractured	Core lengths mostly from 1 ft. to 3 ft.
Moderately fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely fractured	Core lengths mostly from 1 in. to 4 in.
Very intensely fractured	Mostly chips and fragments

Note: Fracture density is based on the fracture spacing in recovered core, measured along the core axis (excluding mechanical breaks).

ATTACHMENT C

Test Pit Logs

Weston & Sampson

Tom Nevers Multi-Use Bike Trail Design

TEST PIT ID: TP-1

WSE Project: ENG22-1221

Tom Nevers Road, Nantucket, MA

CONTRACTOR:	**Weston & Sampson Engineers**	TEST PIT LOCATION:	**See Attached Figure**	DATE START:	**November 12, 2025**
OPERATOR:	**Joseph Payson**	PLAN DIMENSIONS:	**Length: 1.0 ft. , Width: 1.0 ft.**	DATE FINISH:	**November 12, 2025**
LOGGED BY:	**Joseph Payson**	SEEPAGE REMARKS:	**No Seepage Observed**	GROUND EL:	**40.0 ± (NAVD88)**
CHECKED BY:	**Jennifer MacGregor, PE**	CAVING REMARKS:	**No Caving Observed**	FINAL DEPTH:	**0.8 ft.**
EQUIPMENT:	**Round Point Shovel**	BACKFILL MATERIAL:	**Excavated Soil**	GRID COORDS:	**N:92093 ± / E:1777345 ±**
BUCKET TYPE:	**N/A**	OTHER COMMENTS:		GRID SYSTEM:	**NAD83 State Plane (MA)**

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
			Surface: Forest debris.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
			Topsoil- 3" thick.		
			Poorly graded sand with silt (SP-SM) - Dark brown; moist; mostly fine to coarse SAND, few nonplastic fines, trace fine gravel; trace roots.		
					Exploration ended at 0.8 ft.

TEST PIT PHOTOGRAPHS



Sidewall



Sidewall (cont.)

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

Weston & Sampson

Tom Nevers Multi-Use Bike Trail Design

TEST PIT ID: TP-2

WSE Project: ENG22-1221

Tom Nevers Road, Nantucket, MA

CONTRACTOR:	**Weston & Sampson Engineers**	TEST PIT LOCATION:	**See Attached Figure**	DATE START:	**November 12, 2025**
OPERATOR:	**Joseph Payson**	PLAN DIMENSIONS:	**Length: 1.0 ft. , Width: 1.0 ft.**	DATE FINISH:	**November 12, 2025**
LOGGED BY:	**Joseph Payson**	SEEPAGE REMARKS:	**No Seepage Observed**	GROUND EL:	**37.2 ± (NAVD88)**
CHECKED BY:	**Jennifer MacGregor, PE**	CAVING REMARKS:	**No Caving Observed**	FINAL DEPTH:	**0.7 ft.**
EQUIPMENT:	**Round Point Shovel**	BACKFILL MATERIAL:	**Excavated Soil**	GRID COORDS:	**N:92059 ± / E:1777409 ±**
BUCKET TYPE:	**N/A**	OTHER COMMENTS:		GRID SYSTEM:	**NAD83 State Plane (MA)**

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
			Surface: Forest debris.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
			Topsoil- 2" thick.		
			Poorly graded sand with silt (SP-SM) - Dark brown to gray; moist; mostly fine to medium SAND, few nonplastic fines; trace roots.		
					Exploration ended at 0.7 ft.
				33	

TEST PIT PHOTOGRAPHS



Sidewall



Overview

Weston & Sampson

Tom Nevers Multi-Use Bike Trail Design

TEST PIT ID: TP-3

WSE Project: ENG22-1221

Tom Nevers Road, Nantucket, MA

CONTRACTOR:	**Weston & Sampson Engineers**	TEST PIT LOCATION:	**See Attached Figure**	DATE START:	**November 12, 2025**
OPERATOR:	**Joseph Payson**	PLAN DIMENSIONS:	**Length: 1.0 ft. , Width: 1.0 ft.**	DATE FINISH:	**November 12, 2025**
LOGGED BY:	**Joseph Payson**	SEEPAGE REMARKS:	**No Seepage Observed**	GROUND EL:	**34.3 ± (NAVD88)**
CHECKED BY:	**Jennifer MacGregor, PE**	CAVING REMARKS:	**No Caving Observed**	FINAL DEPTH:	**1.2 ft.**
EQUIPMENT:	**Round Point Shovel**	BACKFILL MATERIAL:	**Excavated Soil**	GRID COORDS:	**N:91991 ± / E:1777470 ±**
BUCKET TYPE:	**N/A**	OTHER COMMENTS:		GRID SYSTEM:	**NAD83 State Plane (MA)**

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
			Surface: Forest debris.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
			Topsoil- 2" thick.		
			Silty sand (SM) - Brown; moist; mostly fine to medium SAND, little nonplastic fines; occasional roots.		
			Poorly graded sand with silt (SP-SM) - Light brown; moist; mostly fine to medium SAND, few nonplastic fines.		
					Exploration ended at 1.2 ft.
				30	

TEST PIT PHOTOGRAPHS



Overview



Sidewall

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

Weston & Sampson

Tom Nevers Multi-Use Bike Trail Design

TEST PIT ID: TP-4

WSE Project: ENG22-1221

Tom Nevers Road, Nantucket, MA

CONTRACTOR:	**Weston & Sampson Engineers**	TEST PIT LOCATION:	**See Attached Figure**	DATE START:	**November 12, 2025**
OPERATOR:	**Joseph Payson**	PLAN DIMENSIONS:	**Length: 1.0 ft. , Width: 1.0 ft.**	DATE FINISH:	**November 12, 2025**
LOGGED BY:	**Joseph Payson**	SEEPAGE REMARKS:	**No Seepage Observed**	GROUND EL:	**36.8 ± (NAVD88)**
CHECKED BY:	**Jennifer MacGregor, PE**	CAVING REMARKS:	**No Caving Observed**	FINAL DEPTH:	**1.0 ft.**
EQUIPMENT:	**Round Point Shovel**	BACKFILL MATERIAL:	**Excavated Soil**	GRID COORDS:	**N:91914 ± / E:1777525 ±**
BUCKET TYPE:	**N/A**	OTHER COMMENTS:		GRID SYSTEM:	**NAD83 State Plane (MA)**

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
			Surface: Forest debris.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
			Topsoil- 2" thick.		
			Poorly graded sand with silt (SP-SM) - Gray; moist; mostly fine to coarse SAND, few nonplastic fines; occasional roots.		
			Poorly graded sand (SP) - Brown; moist; mostly fine to medium SAND, trace nonplastic fines.		
					Exploration ended at 1.0 ft.
				32	

TEST PIT PHOTOGRAPHS



Sidewall



Sidewall (cont.)

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

ATTACHMENT D

Groundwater Elevations and Groundwater Flows

N

W E

S

1 inch = 2,302 feet

5,400 2,700 0 5,400 Feet

Hydrological data provided from 1990 Public Water Resource Protection Plan provided by Horsley Witten Hegemann, Inc.

Legend

- Surface Gauge
- Ground Water Flow

Type

- Inferred
- Visible
- Dome Area

Please send identification of any errors and corresponding corrections to:
GIS Coordinator
Town of Nantucket
2 Fairgrounds Rd
Nantucket, MA 02554

Groundwater Elevations and Groundwater Flows

The data on this mapsheet represents the efforts of the Town of Nantucket and other cooperating organizations to record and compile pertinent geographical and related information utilizing the capabilities of the Nantucket Geographic Information System (GIS). The GIS staff maintains an ongoing program to record and correct errors in these data that are brought to its attention. The Town of Nantucket makes no claims as to the absolute validity or reliability of these data or their fitness for any particular use.

8/22/2024

Town of Nantucket - GIS Mapsheet

Nantucket governmental agencies will not necessarily approve applications based soley on GIS data. Applicants for permits and licensesmust inquire of the relevant agency for applicable requiements.

The presence of information of this mapsheet does not necessarily imply public right-of-way or the right of public access.

The planimetric data on this mapsheet is based primarily upon interpretation of April, 2018 aerial photography. It was compiled to meet the ASPRS Standard for Class I Map Accuracy for 1"=100' scale maps.

The parcel boundaries are based primarily upon the Tax Assessor's data through September, 2023.

ATTACHMENT E

Important Information about This Geotechnical-Engineering Report

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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APPENDIX B

STORMWATER REPORT

Stormwater Report

Applicant/Project Name: Town of Nantucket

Project Address: Tom Nevers Road

Application Prepared by:
Firm: Weston & Sampson, Inc.
Registered PE James Pearson, P.E.

Below is an explanation concerning Standards 1-10 of the Massachusetts Stormwater Handbook as they apply to the Tom Nevers Bike Path Project:

General:
The Tom Nevers Multi-Use Path Project encompasses the development of a 2.1-mile multi-use trail designed to connect the existing Siasconset Bike Path along Milestone Road to Tom Nevers Park, following the existing right-of-way along Tom Nevers Road. This initiative introduces a newly paved asphalt path tailored for multiple uses, enhanced with pavement markings, directional/informational signage and kiosks. Additional features include fencing, guardrails, retaining walls, site furnishings, elevated boardwalk and native plantings to enrich the corridor's aesthetic and functionality. Complementary roadway improvements will be undertaken where the path affects existing alignments, alongside the installation of stormwater management systems to support sustainable drainage.

Construction access will initiate from Tom Nevers Road and terminate perpendicularly meeting the existing two-lane Siasconset bike path running parallel to Milestone Road. The alignment has been carefully designed to correspond with the current pedestrian crosswalk that leads to the inbound bus stop located along Milestone Road.

No excavation, modification, or disturbance to Milestone Road, Siasconset Bike Path or the existing bus stop will be required for the successful completion of the work. The contractor is required to always provide a minimum of 5 feet clear for bike path access during construction. All construction activities will comply with applicable municipal and environmental regulations, and appropriate measures will be taken to maintain public safety.

Standard 1: No New Untreated Discharges

The proposed project will create no new untreated discharges. New impervious areas will be created, but stormwater will discharge toward pervious areas adjacent to the pathway. Native soils consist of sand, which will facilitate rapid infiltration. The proposed pathway is designed to slope away from Milestone Road, and no runoff from the pathway is directed onto Milestone Road or any MassDOT storm drain infrastructure.

Standard 2: Peak Rate Attenuation

As a bicycle and pedestrian path, the project is only subject to this standard to the maximum extent practicable. Due to the fact that the pathway will shed stormwater onto

adjacent sand areas, there will be some degree of natural peak rate attenuation. With limited space in the road right-of-way for dedicated stormwater detention BMPs and given the highly permeable quality of the onsite soils, we believe that this approach is reasonable.

Standard 3: Recharge

As noted in the Standard 2 explanation, the pathway will shed stormwater onto adjacent sandy areas where rapid infiltration can occur. This standard has been met to the maximum extent practicable.

Standard 4: Water Quality

As discussed above, the project is a bicycle and pedestrian pathway which is required to meet this standard only to the maximum extent practicable. Water quality will be safeguarded by the limited use of the pathway for bicycle and pedestrian traffic only, and by allowing for the shedding of stormwater onto adjacent pervious areas.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

Not Applicable. There are no LUHPPLs in the work area.

Standard 6: Critical Areas

There will be no new discharge to critical areas.

Standard 7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

The project involves a bicycle and pedestrian pathway which under this standard is only required to meet certain standards to the maximum extent practicable. The approach to this is discussed under each applicable standard herein.

Standard 8: Construction Period Pollution Prevention and Erosion and Sediment Control

A detailed Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan will be included. To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction. These measures will include silt fencing, compost filter tubes, stabilized construction entrances, and/or other appropriate controls to filter dewatering discharge as deemed necessary by site conditions.

Standard 9: Operation and Maintenance Plan

An operations and maintenance plan is not needed since there will not be any new regulated stormwater management systems put in place in the project work area. The Town will be responsible for maintaining the pathway.

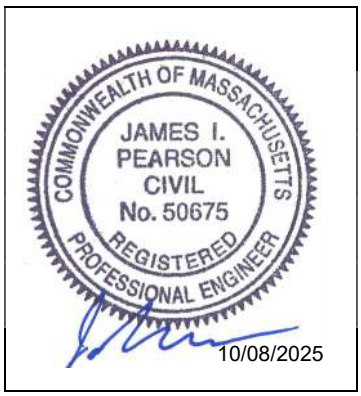
Standard 10: Prohibition of Illicit Discharges

By the nature of the proposed work, there will be no illicit discharges. There will be no opportunity for illicit discharges into the system.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including any relevant soil evaluations, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan, the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement 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



10/08/2025

Signature and Date