

# PROJECT MANUAL & CONTRACT DOCUMENTS

Pare Project No.: 19131.00

## Roger Wheeler State Beach Boardwalk

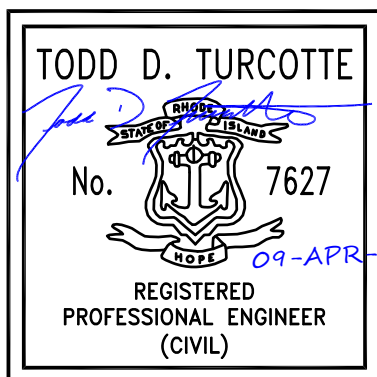
Prepared for:

Rhode Island Department of  
Environmental Management  
235 Promenade Street  
Providence, Rhode Island 02908

Prepared by:

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April 2024  
Issued For Bid



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**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**DIVISION 0  
CONTRACT**



TO: Rhode Island Department of Environmental Management  
235 Promenade Street  
Providence, RI 02908

PROJECT: Roger Wheeler State Beach Boardwalk  
Narragansett, Rhode Island  
  
PARE Project No. 19131.00

DATE: \_\_\_\_\_

SUBMITTED BY:

\_\_\_\_\_  
(full name)

\_\_\_\_\_  
(full address)

**1. OFFER:**

Having examined the Place of the Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by Pare Corporation, Engineer for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work, **Roger Wheeler State Beach Boardwalk**, for the Total Bid Price of:

Total Bid Price: \$.....dollars,

in lawful money of the United States of America and, we have included herewith, the unit price bid forms, and the required security deposit or Bid Bond as required by the Instruction to Bidders.

**See attached Bid Form for breakdown of Bid Items**

This project is exempt from all Rhode Island sales taxes.

The undersigned agrees that for extra work, if any, will be performed in accordance with Article 10 of the General Conditions of the Contract and will be paid for in accordance with Article 11 of the General Conditions of the Contract.

3.00 ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for thirty (30) days, excluding Saturdays, Sundays, and legal holidays, from the Bid closing date.

If this Bid is accepted by the Owner within the time period stated above, we will:

Execute the Agreement within three days of receipt of Notice of Award.

Furnish the required Performance Bond and Labor and Material Payment Bond within three (3) days of receipt of Notice of Award.

Commence work within ten (10) days of receiving a written notice to proceed.

If this Bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to the Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this Bid and the Bid upon which the Contract is signed.

In the event our Bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

4.00 CONTRACT TIME

If this Bid is accepted, the BIDDER hereby agrees to commence WORK under this Contract on or before a date to be specified in the NOTICE TO PROCEED. Further, The Contractor agrees that the WORK at **Roger Wheeler State Beach Phase I** shall be substantially complete by April 1<sup>st</sup>, 2025, and fully complete by May 1<sup>st</sup>, 2025 with field work not commencing until September 9<sup>th</sup>, 2024. The Contractor agrees that the WORK at **Roger Wheeler State Beach Phase II** shall be substantially complete by April 1<sup>st</sup>, 2026, and fully complete by May 1<sup>st</sup>, 2026 with field work not commencing until September 8<sup>th</sup>, 2025. All time frames are calculated from receipt of NOTICE TO PROCEED.

5.00 ADDENDA

The following Addenda have been received. The modifications to the Contract Documents noted therein have been considered and all costs thereto are included in the Bid Price.

Addendum # \_\_\_\_ Dated

Addendum # \_\_\_\_ Dated

Addendum # \_\_\_\_ Dated

Addendum # \_\_\_\_ Dated

6.00 BID FORM SIGNATURE(S)

The Corporate Seal of

---

(Bidder - please print the full name of your Proprietorship, Partnership, or Corporation)

was hereunto affixed in the presence of:

---

(Authorized signing officer      Title)

(Seal)

---

(Authorized signing officer      Title)

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

**RFQ1913100 Roger Wheeler State Park Boardwalk Unit Prices**

Vendor Name



Fill in all pricing and upload to the Attach Document section of Solicitation

Unit Price	Description	Unit Price	Unit Measure	Quantity	Extended Price
1	Contract Bonds		LS	1	
2	General Requirements		LS	1	
3	Mobilization and Demobilization (Maximum of 5% of Total Bid Price)		LS	1	
4	Erosion and Sediment Controls		LS	1	
5	Control of Water		LS	2	
6A	Demolition and Removal of Structures		LS	1	
6B	Demolish and Remove Bituminous Pavement		LS	1	
7A	16-Inch Diameter Concrete Piles		EA	128	
7B	12-Inch Diameter Concrete Piles		EA	134	
7C	Cast in Place Concrete Beams		LF	3,137	
7D	Concrete Retaining Wall		LF	1,226	
7E	Precast Concrete Boardwalk Decking		SF	17,580	
7F	Concrete Ramps		EA	6	
7G	Precast Concrete Staircases		EA	13	
8	Aluminum Rail		LF	3,970	
9A	Timber Shade Structures		EA	2	
9B	Concrete Benches		EA	8	
10A	Concrete Sidewalk		SF	10,250	
10B	Concrete Curbing		LF	1,025	
11	Footwashing Stations & Spigots		EA	2	
12A	12" PVC C909 Water Main		LF	1,550	
12B	10" PVC C909 Water Main		LF	20	
12C	Gate Valves and Boxes		EA	3	
12D	Fire Hydrant Assemblies		EA	2	
12E	2" Polyethylene (PE) Services		LF	70	
12F	4" Polyethylene (PE) Services		LF	70	
12G	Polyethylene (PE) Tubing		LF	800	
12H	Cellular Concrete Pipe Abandonment		LF	1,350	
12I	Remove and Dispose Asbestos Cement Pipe		LF	300	
12J	Test Pits		CY	40	
12K	Rock Removal		CY	300	
12L	Temporary Trench Pavement		TONS	150	
12M	Full-Depth Trench Pavement		TONS	400	
13	Pavement Markings		LS	1	

**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**DIVISION 1  
GENERAL CONDITIONS**

**SECTION 01000**

**GENERAL INSTRUCTIONS**

**PART 1 - GENERAL**

1.01 SCOPE

- A. The work covered under this project consist of the furnishing of all plant, labor, equipment, hardware and materials, for the Roger Wheeler State Beach Boardwalk, Narragansett, Rhode Island, complete in strict accordance with Specifications and accompanying drawings and subject to all terms and conditions of contract.

1.02 DESCRIPTION

- A. The scope of work of the project is provided on Sheet1.0 – Notes of the Contract Drawings. The Contractor shall submit for approval the manufacturer's printed recommendations for the storage, protection, handling and installation of the precast elements, reinforcing steel, pipe, hydrants, and appurtenances, which shall be strictly adhered to by the Contractor.
- B. The contractor shall complete the scope of work in two phases with the westerly half of the site to be completed first, followed by completion of the eastern half of the site. The contractor may elect to complete both phases of the project during one season but must submit a plan and schedule for approval by the Owner.
- C. The BASE BID is comprised of the following:

Phase I – West Portion (Station 0+00 to near Station 6+25)

1. Mobilize equipment and personnel to the job site;
2. Install erosion controls and temporary security fencing;
3. Remove, stockpile, and protect for reuse all signage;
4. Remove, stockpile, and relocate timber handicap ramps offsite;
5. Install new watermain onsite and abandon existing watermain along the length entire length of the project;
6. Install and protect new hydrants on either side of site.
7. Remove, stockpile, and relocate timber stairs off site;
8. Sawcut and remove pavement within the area of the proposed sidewalk;
9. Install new concrete retaining wall, piles, stringers, decking, ramps, and stairs;
10. Install conduit and water lines onsite.
11. Install aluminium fencing/rails, timber shade structures, benches, foot-washing stations;
12. Form and place concrete sidewalk and curbing;
13. Paint new parking lot layout;
14. Site clean-up and restoration of areas as necessary;
15. Demobilization;

Phase II – East Portion (Station 6+25 to near Station 14+00.46)

1. Mobilize equipment and personnel to the job site;
2. Install erosion controls and temporary security fencing;
3. Remove, stockpile, and protect for reuse all signage;

4. Remove, stockpile, and relocate timber handicap ramps off site;
5. Remove, stockpile, and relocate timber stairs off site;
6. Sawcut and remove pavement within the area of the proposed sidewalk;
7. Install new concrete retaining wall, piles, stringers, decking, ramps, and stairs;
8. Install aluminium fencing/rails, benches, and timber shade structures;
9. Form and place concrete sidewalk and curbing;
10. Paint new parking lot layout;
11. Site clean-up and restoration of areas as necessary;
12. Demobilization;
13. Project close-out.

1.03 WORK COMMENCEMENT

- A. Contractors are advised that mobilization is to commence Monday September 9, 2024 for Phase I Work and Monday September 8, 2025 for Phase II Work, or as otherwise agreed in writing by the Owner.
- B. The Contractor is to make every effort to ensure that sufficient materials and equipment are delivered to site in a prompt and orderly fashion.

1.04 DATUM

- A. Datum used for this project is the North American Vertical Datum of 1988 (NAVD88).
- B. Bidders are advised to consult the Tide Tables issued by NOAA to keep informed of the tidal condition affecting work. Though no work is proposed within the waterways, tides may affect groundwater elevations and subsequently excavations.

1.05 EXAMINATION OF SITE

- A. Parties intending to bid for this work are advised to visit the site and make their own estimates of facilities and difficulties pertaining to the execution of work; actual site and soil conditions; severity, exposure and uncertainty of weather; space restrictions and all other issues associated with the work.
- B. The Contractor shall study the drawings and compare the same with the information gathered during his examination of the sites, as no extra compensation will be authorized for extra work caused by his unfamiliarity with the sites(s) and/or drawings or the conditions particular to this job.

1.06 WORK SCHEDULE

- A. Immediately upon award of contract, the Contractor shall submit a schedule of work to the Engineer on forms provided for that purpose. All entries contained in unit price schedule will be entered on form. Each entry will show an intended start and completion date using a horizontal bar graph method. No work will commence until this schedule has been reviewed and approved by the Engineer or Owner.
- B. Should the Contractor find that they cannot maintain schedule as originally intended, the Contractor shall immediately submit a revised schedule without being requested to do so by the Engineer.

1.07 LAYOUT OF WORK

- A. Contractor shall lay out work on ground to satisfaction of the Engineer using base and datum information shown on Drawings or as requested by the Engineer.

1.08 SITE OPERATIONS

- A. Arrange for sufficient space adjacent to project site for conducting operations and storage of materials. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day to day operations adjacent to site. All arrangements for space and access will be made by the Contractor as approved by the Engineer or Owner.
- B. The Contractor shall clean-up and restore all disturbed areas each week and every week throughout the duration of the project.
- C. Materials and/or equipment stockpiled on site shall be done so in a manner to protect existing pavement, grassed areas, and site improvements. Contractor shall coordinate location of material staging area and protection measures with the Engineer prior to commencing the work.
- D. At completion of each phase, restore area to its original condition. Damage to ground and property will be repaired by the Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to the Engineer.
- E. Work Hours shall be limited to local ordinances to avoid disturbance to local residents and businesses.
- F. The Westerly end of the site (**Phase I**) shall be fully operational on or prior to **May 1<sup>st</sup>, 2025** and the Easterly end of the site (**Phase II**) shall be fully operational on or prior to **May 1<sup>st</sup>, 2026**

1.09 PROJECT MEETINGS

- A. Engineer will arrange all project meetings.
- B. All project meetings will take place on site of work unless so directed by the Engineer.
- C. Contractor will have a responsible member of their firm present at all project meetings.

1.10 PROTECTION

- A. The area designated for storage of materials and equipment shall be approved by the Engineer and Owner during the Pre-Construction Meeting.
- B. Take necessary precautions to prevent damage by any means to all materials and equipment to be incorporated into work that are stored on site.
- C. Repair or replace all materials or equipment damaged in transit or storage to the satisfaction of and at no cost to the Engineer or Owner.

1.11 EXISTING SERVICES

- A. Before commencing work, establish locations and extent of any service lines in area of work and notify Engineer of findings.



- B. Submit schedule to and obtain approval from Engineer for any shutdown or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- C. Where unknown services are encountered, immediately advise Engineer, and confirm findings in writing.
- D. Record locations of maintained, re-routed and abandoned service lines.

1.12 DOCUMENT REQUIRED AND PHOTOGRAPHS

- A. Maintain at job site, one copy each of following:
  - 1. Contract drawings
  - 2. Specifications
  - 3. Addenda
  - 4. Reviewed shop drawings
  - 5. Change orders
  - 6. Other modifications to Contract
  - 7. Field test reports
  - 8. Copy of approved work schedule.
- B. Photographs
  - 1. The Contractor shall, at its own expense, furnish the Engineer with suitable electronic digital color photographs of the project.
  - 2. A minimum of twenty-four (24) views will be required and shall be taken as follows:
    - a. Before the project has started.
    - b. Every week of construction activity.
    - c. After the project has been completed.

1.13 TAXES AND PERMITS

- A. Contractor shall pay applicable federal, state, and municipal taxes.
- B. If required, Contractor shall pay for applicable permits.

1.14 REGULATORY REQUIREMENTS

- A. Contractor shall be responsible for performing all work in accordance with regulatory approval requirements. The Orders of Conditions shall be provided when received.
- B. The Contractor shall provide and maintain an erosion and sediment control system, secured around the work area to prevent debris from entering the water.

1.15 CONSTRUCTION SCHEDULES AND SUBMITTALS

- A. Unless otherwise specified, within ten (10) calendar days from the notice to proceed the Contractor shall submit to the Engineer a schedule of work tasks. In addition, the Contractor shall submit a complete breakdown of all items that shall be paid for under this Contract in a lump sum manner. This breakdown shall show all relative costs to the item as bid, such as the cost of material, labor, mobilization and demobilization, survey and all incidentals to the item.

- B. A construction schedule shall be maintained on the project for review during site meetings. If a major change is made to the schedule, an updated schedule shall be submitted to the Engineer immediately.
- C. Claims for scheduling delays caused by adverse weather conditions will not be considered.
- D. Shop Drawings shall be submitted to the Engineer for review as required by the Specifications.
- E. At completion of work, deliver completed record documents to the Owner. Final payment for project will not be made until the Owner reviews and approves these documents.

1.16 CONSTRUCTION FACILITIES

- A. Provide and maintain temporary sanitary facilities. Existing facilities shall not be used unless permitted prior to the start of work.

1.17 MEASUREMENT AND PAYMENT

- A. Coordination work herein shall be included under Contract Item 01001 – MOB/DEMOB.

1.18 ATTACHMENTS

- A. See Appendices

**END OF SECTION**

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**SECTION 01001**

**MOBILIZATION AND DEMOBILIZATION**

**PART 1 - GENERAL**

1.01 WORK INCLUDED

- A. This item shall consist of all administrative and overhead cost; preparatory work; operations; and testing; including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site, for the establishment of Contractor's field facilities, signage, buildings, and other facilities and accessories (job lighting and power, firefighting provisions, etc.), environmental requirements consistent with the permits necessary for work on the project, and all other work and operations which must be performed or for costs which must be incurred prior to beginning work. All services and materials specified in 01000 GENERAL INSTRUCTIONS shall also be included for payment under this Item.

1.02 SUBMITTALS

- A. Submittals for work items shall be in accordance with Section 01000 – General Instructions.

**PART 2 - PRODUCTS**

1.03 GENERAL

- A. Products shall be as required and as specified in other sections.

**PART 3 - EXECUTION**

1.04 SITE PREPARATION AND RESTORATION

- A. Contractor shall provide site access as required for the transport of materials, personnel and equipment to the project site.
- B. Contractor shall remove all materials used for access and restore all areas to their pre-construction condition.
- C. Contractor shall provide measures to prevent demolition materials from entering the ocean.
- D. Excess material shall be removed from the site and become the property of the Contractor.

**PART 4 - MEASUREMENT AND PAYMENT**

1.05 MEASUREMENT

- A. MOB/DEMOB (MOBILIZATION AND DEMOBILIZATION) shall be measured as a lump sum with the percentage of MOB/DEMOB complete measured by the Engineer. Total payment under this item shall be less than 10 percent of the total contract amount bid.
- B. Following mobilization of equipment on site and approval of shop drawings, the Contractor can invoice for 20 percent of this item. Following completion of 50 percent of the work under the Contract, the Contractor may invoice 60 percent (40 percent more) of this item. Following

remobilization (if necessary for phased elements), the contractor may invoice up to 80 percent (20 percent more) of this item. Following the completion of all work under this item, the Contractor can invoice the remaining 20 percent of this item.

**END OF SECTION**

**SECTION 01019**

**CONTRACT CONSIDERATIONS**

**PART 1 - GENERAL**

1.01 RELATED SECTIONS

- A. Owner-Contractor Agreement: Contract sum/price including allowances. Bonds and Insurance Requirements.
- B. Section 01700 - Contract Close Out.

1.02 INSPECTION AND TESTING

- A. The Contractor shall be responsible for engaging an inspection or testing firm(s), execution of inspection or tests, and reporting results as per Section 01400.
- C. The Contractor will cooperate with the Owner and provide the Owner's agents with the facilities necessary to sample and inspect during each phase of construction at no cost to the Owner. The Contractor shall be responsible for all costs associated with retesting areas that have previously failed.

1.03 APPLICATIONS FOR PAYMENT

- A. Submit four (4) copies of each application on AIA Form G.703.
- B. For each item, provide a column for listing: Item Number; Description of Work; Scheduled Value, Previous Applications; Work in Place and Stored Materials under this Application; Authorized Change Orders; Total Completed and Stored to Date of Applications; Percentage of Completion; Balance to Finish; and Retainage.
- C. Present required information in typewritten form.
- D. Execute certification by signature of authorized officer.
- E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
- F. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.
- G. Prepare Application for Final Payment as specified in Section 01700 - Contract Closeout.

1.04 CHANGE PROCEDURES

- A. The Engineer/Owner will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by the Engineer/Owner, by issuing written supplemental instructions.
- B. The Engineer/Owner may issue a Notice of Change which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. The Contractor will prepare and submit an estimate within 7 days.

- C. The Contractor may propose a change by submitting a request for change to the Engineer/Owner, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01340. No change will be allowed except under written approval and Notice of Change from the Engineer/Owner, verbal orders are not binding.
- D. Stipulated Sum/Price Change Order: Based on Notice of Change and Contractor's estimated price quotation.
- E. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- F. Work Directive Change: The Engineer/Owner may issue a directive, on EJCDC C-940 Work Directive Change signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.
- G. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. The Engineer/Owner will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.
- H. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- I. Change Order Forms: EJCDC C-941 Change Order.
- J. Execution of Change Orders: The Engineer/Owner will issue Change Orders for signature of parties as provided in the Conditions of the Contract.

1.05 SUBSTANTIAL COMPLETION

- A. For the purposes of this project, substantial completion shall be considered after a point when all site work is completed and the contractor is prepared to demobilize from the site. Work to be completed subsequent to substantial completion shall be limited to site cleaning, a post construction survey, and project closeout requirements.

**PART 2 - PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01025**

**MEASUREMENT AND PAYMENT**

**PART 1 - GENERAL**

1.01 ADMINISTRATIVE SUBMITTALS

- A. Application for Payment: In accordance with the General Conditions and as specified herein.
- B. Final Application for Payment: As specified herein.

1.02 APPLICATION FOR PAYMENT

- A. Reference the General Conditions.
- B. Use separate, detailed Application for Payment Form suitable to Owner for each pay application.
- C. Preparation:
  - 1. List each Change Order and Written Amendment executed prior to date of submission as separate line item.
  - 2. Submit three (3) copies of Application for Payment Form, and such supporting data as may be requested by Owner.

1.03 MEASUREMENT - GENERAL

- A. Reference the General Conditions for additional requirements on Unit Price Work.
- B. All unit prices which are specified for measurement by the linear foot (LF) shall be measured from the beginning to the termination point of the unit being measured.
- C. Measurement and payment for all bid items shall include furnishing all equipment, material, plant, and personnel required for completion of the work in accordance with the contract documents unless otherwise noted.
- D. Units of measure shown on the Bid Form shall be as follows unless specified otherwise.

<u>Item</u>	<u>Method of Measurement</u>
CY	Cubic Yard – Field Measure by Engineer using the Average-End -Area Method to Calculate Volume
EA	Each-Field Count by Owner/Owner’s Representative
TON	Ton-Certified Truck Scale
LF	Linear Foot-Field Measure by Engineer
LS	Lump Sum-Unit is one; no measurement will be made.
SF	Square Foot-Field Measured by Engineer
SY	Square Yard-Field Measured by Engineer

1.04 PAYMENT

- A. General: Progress payment requests shall be submitted monthly as specified in the General Conditions.

- B. Payment for Lump Sum Work covers all personnel, equipment, materials, and incidentals required to furnish, install and/or complete the Work as specified, indicated, and directed as indicated in the Construction Documents for the following items.
  
- C. Payment for unit price items covers all personnel, equipment, materials, and incidentals required to furnish, install and/or complete the Work as specified, indicated, and directed as indicated in the Construction Documents for the following items.

Bid Item No.	Unit	Title/Description
1	LS	Contract Bonds: Furnish all material, labor, and equipment to furnish; Performance Bonds, Labor Bonds, Materials Bonds and any other bonds required within the contract documents.
2	LS	General Requirements: Furnish all material, labor, and equipment to furnish, work plans, schedules, meetings, submittals, temporary construction facilities, permits, QC/QA, materials testing, closeout documentation, closeout survey, and Record Contract Documents as stated within the Contract Documents.
3	LS	Mobilization & Demobilization: Furnish all material, labor, and equipment and stage on-site: personnel, equipment, and materials to complete all work items stated in the Contract documents; install site signage, RIDEM file number signs, and warning signs; install temporary security fencing to secure work areas; prepare the site for construction; establish and maintain access roads; protect site utilities and other facilities to remain; move out personnel, equipment, and unused material; restore and clean portions of the site disturbed by construction and entrances; remove and dispose of signs and security fencing; and remove all debris and rubbish. This item is inclusive of site restoration and loam and seeding for areas disturbed by construction.
4	LS	Erosion and Sediment Controls: Furnish all material, labor, and equipment to install, and maintain straw bales, silt fence; and to remove erosion and sediment controls in their entirety at project completion.
5	LS	Control of Water: Furnish all material, labor, and equipment to design, install, and maintain dewatering pumps to maintain dry working areas; design and install temporary dewatering systems, dewatering basins, diversions, and other water control structures to complete the work.
6A	LS	Demolition and Removal of Structures: Furnish all material, labor, and equipment to demolish and dispose of concrete stairs, wood fence, and sheetpile. Timber ramps and stairs are to be removed and stockpiled for relocation off site for Parks Department.
6B	LS	Demolish and Remove Bituminous Pavement: Furnish all material, labor, and equipment to sawcut pavement and demolish and dispose of existing pavement beneath the proposed structures, stairs/ramps, and concrete walkways, or as indicated on the contract drawings.
7A	EA	16-inch Diameter Precast Concrete Piles: Furnish all material, labor, and equipment to install 12-inch diameter prestressed concrete piles. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.
7B	EA	12-inch Diameter Precast Concrete Piles: Furnish all material, labor, and equipment to install 16-inch diameter prestressed concrete piles. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.
7C	LF	Cast in Place Concrete Beams – Form, Reinforce, Pour, Cure & Finish Concrete: Furnish all materials, labor, and equipment to form, reinforce, place, finish, and cure concrete associated with the concrete beams. Installation of control joints, construction joints, and water stops is considered incidental in this bid item. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.



7D	LF	Concrete Retaining Wall – Form, Reinforce, Pour, Cure & Finish Concrete: Furnish all materials, labor, and equipment to form, reinforce, place, finish, and cure concrete associated with the concrete retaining wall. Installation of control joints, construction joints, and water stops as well as excavation and backfill to facilitate concrete formwork is considered incidental to this bid item. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.
7E	SF	Precast Concrete Boardwalk: Furnish all materials, labor, and equipment to install precast concrete beams and precast concrete deck panels associated with the concrete boardwalk, bump outs (viewing platforms and shade structures), transition pieces, timber lattice, steel connections. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.
7F	EA	Precast Concrete Ramps: Furnish all materials, labor, and equipment to install precast concrete ramps and beams. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.
7G	EA	Precast Concrete Stairs: Furnish all materials, labor, and equipment to install precast concrete stairs and stringers. Include design calculations and drawings stamped by a Professional Engineer in the State of Rhode Island.
8	LF	Aluminum Rail: Furnish all materials, labor, and equipment to fabricate/construct and install the aluminum handrailing and timber posts as shown on the contract documents. ADA handrailing along ramps and stairs are an incidental to this item.
9A	EA	Timber Shade Structures: Furnish all labor, materials, equipment, and tools; preparation; and all other incidental work necessary to complete the erection of timber shade structure, appurtenances, and other work under this item as shown on the Drawings, as specified herein, and as approved by the Engineer.
9B	EA	Concrete Benches: Furnish all materials, labor, and equipment to construct and install concrete benches as shown on the contract documents.
10A	SF	Concrete Sidewalk: Furnish all labor, materials, and equipment and for all other incidentals required to finish the work, complete and accepted by the Engineer. The work shall also include all necessary excavation, furnishing and installing required backfill, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. The work shall include the installation of detectable warnings where shown or as required.
10B	LF	Concrete Curb: The price so-stated constitutes full and complete compensation for all labor, materials, and equipment and for all other incidentals required to finish the installation of the new concrete curb, complete and accepted by the Engineer. This work shall also include the installation of concrete curb locks. The work shall also include all necessary excavation, furnishing and installing required backfill, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil.
11	EA	Footwashing Station & Spigots: Furnish all material, labor, and equipment to install new footwashing stations as indicated on the drawings and specifications.
12A	LF	12" PVC C909 Water Main: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of new C909 PVC water main piping of various sizes, including ductile iron fittings, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, furnishing and installation of the water pipe and fittings, furnishing and installing required bedding material, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, furnishing and installing insulation material as required by the Engineer or as shown on the Drawings, furnishing and installing ductile iron fittings, tracer wire with roadway access points, restrained joints as required by the Engineer and as shown on the Drawings, making connections between new and existing water mains where shown on the

		Drawings including furnishing and installing solid sleeve & transitional couplings, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. Required disinfection and testing of the water main shall also be included for payment under this item, including furnishing backflow prevention device. Hydrant laterals are not included in this item and are to be paid for under other bid items.
12B	LF	10" PVC C909 Water Main: Furnish all labor, materials, and equipment and for all other incidentals required to finish the connection of the new 12" C909 PVC water main to the existing 10" C909 PVC water main, including piping of various sizes, ductile iron fittings, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, furnishing and installation of the water pipe and fittings, furnishing and installing required bedding material, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, furnishing and installing insulation material as required by the Engineer or as shown on the Drawings, furnishing and installing ductile iron fittings, tracer wire with roadway access points, restrained joints as required by the Engineer and as shown on the Drawings, making connections between new and existing water mains where shown on the Drawings including furnishing and installing solid sleeve & transitional couplings, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. Required disinfection and testing of the water main shall also be included for payment under this item, including furnishing backflow prevention device. Hydrant laterals are not included in this item and are to be paid for under other bid items.
12C	EA	Gate Valves and Boxes: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of new gate valves and boxes of all sizes, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, furnishing and installing the gate valve and valve box with aligner, furnishing gate valve operating wrench, furnishing and installing required bedding material, removal & disposal of existing gate valves and boxes, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, furnishing and installing required leveling blocks, furnish and installing insulation material as required by the Engineer, making connections between new and existing water mains where shown on the Drawings and as necessary, furnishing and installing thrust blocks where required by the Engineer, furnishing and installing tie rods where required by the Engineer, pavement/concrete saw cutting, removing and disposing of pavement/concrete and removing excess soil. Required testing of the water main shall be paid for under other bid items. Gate valves and valve boxes associated with hydrant laterals shall be paid for under a separate bid item. Traffic control, pavement/concrete saw cutting, removal and disposal of pavement/concrete, and removal of excess soil is included.
12D	EA	Fire Hydrant Assemblies: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of new fire hydrant assemblies, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, furnishing and installing associated anchor tee, furnishing and installing associated 6-inch gate valve and valve box, furnishing and installing the hydrant, furnishing and installing MEGALUG restraining system on all mechanical joints, furnishing and installing PVC C909 pipe from the gate valve to the hydrant, furnishing and installing FIELD-LOC gaskets at any bell and spigot joint between the anchor tee and hydrant, furnishing and installing required bedding material, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, furnishing and installing insulation material as required by the Engineer, furnishing and installing thrust blocks where

		required by the Engineer, placing drain stone, furnishing and installing hydrant extension kit if required, furnishing and installing bollards, furnishing and installing tie rods where required by the Engineer, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. Required testing of the water main shall be paid for under other bid items. Traffic control, pavement/concrete saw cutting, removal and disposal of pavement/concrete, and removal of excess soil is included. Payment shall include furnishing spare parts as specified
12E	LF	2" Polyethylene (PE) Services: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of new polyethylene services of various sizes, including service piping, corporation taps (including shop-installed), and curbstops and boxes, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, furnishing and installation of the water pipe and fittings, furnishing and installing required bedding material, furnishing and installing corporations, fittings, saddles, curb stops and boxes, making connections between new and existing water mains/services where shown on the Drawings, removing and disposing of existing water piping and appurtenances as necessary and where called for on the Drawings, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. Required disinfection and testing of the water services shall also be included for payment under this item.
12F	LF	4" Polyethylene (PE) Services: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of new polyethylene services of various sizes, including service piping, corporation taps (including shop-installed), and curbstops and boxes, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, furnishing and installation of the water pipe and fittings, furnishing and installing required bedding material, furnishing and installing corporations, fittings, saddles, curb stops and boxes, making connections between new and existing water mains/services where shown on the Drawings, removing and disposing of existing water piping and appurtenances as necessary and where called for on the Drawings, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. Required disinfection and testing of the water services shall also be included for payment under this item.
12G	LF	Polyethylene (PE) Tubing: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of new aboveground CTS polyethylene tubing to feed the footwashing stations and water spigots, complete and accepted by the Engineer. The work shall also include all necessary work for the furnishing and installation of the water pipe, fittings, blowoffs, and ball valves, making connections between new and existing water mains/services where shown on the Drawings, furnishing and installing connections to the footwashing stations and water spigots, furnishing and installing a PVC encasement to match the existing aboveground water, and furnishing and installing all required suspensions. Required disinfection and testing of the water service shall also be included for payment under this item.
12H	LF	Cellular Concrete Pipe Abandonment: Furnish all labor, materials, and equipment and for all other incidentals required to finish the abandonment of pipe using cellular concrete, complete and accepted by the Engineer. The work shall also include all necessary trench work, dewatering, support of excavations, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil.

12I	LF	Remove and Dispose Asbestos Cement Pipe: Furnish all labor, materials, and equipment and for all other incidentals required to finish the proper removal, transportation, and disposal of asbestos cement pipe, where specified on the Drawings, complete and accepted by the Engineer. The work shall include all necessary trench work, dewatering, support of excavations, backfilling with suitable common borrow, furnishing and installing backfill material where adequate common borrow does not exist, providing traffic control, pavement/concrete saw cutting, removing and disposing of pavement/concrete, and removing excess soil. The work shall also include all third-party licensed asbestos abatement contractors, air monitoring, and decontamination facilities, if necessary.
12J	CY	Test Pits: Furnish all labor, materials, and equipment and for all other incidentals required to finish test pits related to the water main installation, complete and accepted by the Engineer. The work shall also include, but is not necessarily limited to, traffic control, saw cutting, removal and disposal of concrete/bituminous pavement and excess soil, excavation to depths required by the Engineer, de-watering, shoring, providing points of egress for the Engineer to safely access the test pit, furnishing and installing bedding material for utilities or structures encountered in the test pit, and furnishing, installing, and properly compacting backfill.
12K	CY	Rock Removal: Furnish all labor, materials, and equipment and for all other incidentals required to finish the removal of rock greater than one (1) cubic yard, complete and accepted by the Engineer. The work shall also include excavation, drilling, blasting or otherwise breaking (mechanical removal) and hauling of rock off site and legal disposal in accordance with the requirements of Section 02220, backfilling and providing screened gravel, for any deficiency of trench backfill and all work incidental thereto, for which payment is not provided under other items. Traffic control, pavement/concrete saw cutting, removal and disposal of pavement/concrete, and removal of excess soil is included.
12L	TONS	Temporary Trench Pavement: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of temporary trench pavement, complete and accepted by the Engineer. The work shall also include furnishing and installing gravel borrow subbase, pavement/concrete saw cutting, removal and disposal of pavement/concrete, and removal of excess soil.
12M	TONS	Full-Depth Trench Pavement: Furnish all labor, materials, and equipment and for all other incidentals required to finish the installation of full-depth trench pavement, complete and accepted by the Engineer. The work shall also include furnishing and installing gravel borrow subbase, pavement/concrete saw cutting, removal and disposal of pavement/concrete, and removal of excess soil.
13	LS	Pavement Markings: Furnish all material, labor, and equipment to install new pavement markings and the painting over of existing striping and pain new striping/ markings as indicated on the drawings.

- D. Payment for equipment, materials and labor for items not included on the Bid or described in Article PAYMENT, herein, shall be considered incidental and no separate payment will be made.

1.05 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for following:
  1. Loading, hauling, and disposing of rejected material.
  2. Quantities of material wasted or disposed of in manner not called for under the Contract Documents.

3. Rejected loads of material, including material rejected after it has been placed by Contractor.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by the Engineer.
6. Material remaining on hand after completion of Work.

1.06 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Final Payment: Will be made only for materials incorporated into the Work in the Contract; no partial payments shall be made for equipment or materials delivered to the site but not used.

1.07 FINAL APPLICATION FOR PAYMENT

- A. Reference the General Conditions, and as may otherwise be required in the Contract Documents.
- B. Prior to submitting final application, make acceptable delivery of required documents.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## SECTION 01070

### ABBREVIATIONS, SYMBOLS, AND DEFINITIONS

#### PART 1 - GENERAL

##### 1.01 STANDARD SPECIFICATIONS:

- A. Wherever a reference is made to any standard specifications, it shall mean the most recent specification, code, standard or tentative specification of the organization referred to, and these standard specifications shall be considered a part of these Contract Documents to the extent indicated. Abbreviations which may be used refer to the following organizations:

1. AA Aluminum Association
2. AAMA Architectural Aluminum Manufacturers Association
3. AASHTO American Association of State Highway and Transportation Officials
4. ACI American Concrete Institute
5. ACOE Army Corps of Engineers
6. AISC American Institute of Steel Construction
7. AISI American Iron and Steel Institute
8. ANSI American National Standards Institute
9. ASTM American Society for Testing and Materials
10. AWS American Welding Society
11. RIDEM Rhode Island Department of Environmental Management
12. CRMC Rhode Island Coastal Resources Management Council
13. NFPA National Fire Protection Association
14. OSHA Occupational Safety and Health Administration
15. PTI Post-tensioning Institute
16. UL Underwriter's Laboratory

##### 1.02 DEFINITIONS

- A. General: A substantial amount of specification language consists of definitions of terms found in other Contract Documents, including the Drawings. Certain terms used in Contract Documents are defined in this article. Definitions and explanations contained in this section are not necessarily either complete or exclusive but are general for the Work to the extent that they are not stated more explicitly in another element of the Contract Documents.
1. Construction Documents: Refers to the contract documents inclusive of the Contractors Bid, the Contract, General Conditions, Supplementary Conditions, Technical Specifications, Permits, and Construction Drawings
- B. Owner of the Property: The Rhode Island Department of Environmental Management (RIDEM) is the current owner of the property and is referred to as Owner in the Contract Documents.
- C. Engineer: Refers to the engineer on record, Pare Corporation (Pare) of Foxboro, MA and Lincoln, RI, and its Representatives.
- D. Regulatory Agencies: Refers to the following agencies having jurisdiction over all or part of the work:
1. Rhode Island Department of Environmental Management

2. Rhode Island Coastal Resources Management Council
  3. Army Corps of Engineers
- E. Work: Refers to all construction activities associated with the Roger Wheeler State Beach Boardwalk project as specified in the Contract Documents and specified herein.
- F. Overburden Soils: Refers to unclassified soils, fills, and debris located between the existing surface grades and the underlying bedrock.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01200**

**PROJECT MEETINGS**

**PART 1 - GENERAL**

1.01 REQUIREMENTS INCLUDED

- A. The Owner or Owner's Representative shall schedule and administer the preconstruction conference. The Owner or Owner's Representative shall:
  - 1. Prepare the agenda for the meeting.
  - 2. Notify all parties required to attend meeting.
  - 3. Make physical arrangements for meeting.
  - 4. Preside at meeting.
  - 5. Record the minutes, including significant proceedings and decisions.
  - 6. Reproduce and distribute copies of minutes within three (3) calendar days after the meeting to participants in the meeting and other parties affected by decisions made at the meeting.
- B. The Owner or Owner's Representative shall schedule and administer periodic progress meetings, and specially called meetings throughout the progress of the Work. The Owner or Owner's Representative shall:
  - 1. Prepare agenda for meetings.
  - 2. Make physical arrangements for meetings.
  - 3. Preside at meetings.
  - 4. Record the minutes, including significant proceedings and decisions.
  - 5. Reproduce and distribute copies of minutes within three (3) calendar days after each meeting to participants in the meeting and other parties affected by decisions made at the meeting.
- C. Representatives of Contractors, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 PRE-CONSTRUCTION CONFERENCE

- A. Attendance:
  - 1. Owner and/or Representative.
  - 2. Resident project Representative.
  - 3. Contractor's superintendent.
  - 4. Major Subcontractors.
  - 5. Major suppliers.
  - 6. Others as appropriate.
- B. Suggested Agenda:
  - 1. Distribution and discussion of
    - a. List of major Subcontractors and suppliers.
    - b. Projected construction schedules.
  - 2. Critical work sequencing.



3. Major equipment deliveries and priorities.
4. Project coordination.
  - a. Designation of responsible personnel.
5. Procedures and processing of:
  - a. Field decisions.
  - b. Proposal requests.
  - c. Submittals.
  - d. Change orders.
  - e. Applications for payment.
6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining record documents.
8. Use of premises:
  - a. Office, work and storage areas.
  - b. Owner's requirements.
9. Construction facilities, controls, and construction aids.
10. Traffic Maintenance Plan.
11. Temporary utilities.
12. Safety and first-aid procedures.
13. Security procedures.
14. Housekeeping procedures.
15. Place, date, and time for regular progress meetings.

#### 1.03 PROGRESS MEETINGS

- A. Conduct, at most, scheduled weekly progress meetings (meeting schedule may be adjusted at the Owner's discretion) at a place and time agreed upon at Pre-Construction Conference.
- B. Conduct additional meetings as progress of the Work dictates.
- C. Attendance:
  1. Engineer and his/her professional consultants as needed.
  2. Owner or Representative, when required.
  3. Contractor's superintendent.
  4. Subcontractors as appropriate to the agenda.
  5. Suppliers as appropriate to the agenda.
  6. Others.
- D. Suggested Agenda:
  1. Review approval of minutes of previous meeting.
  2. Review of work progress since previous meeting.
  3. Field observations, problems, and conflicts.
  4. Problems which impede construction schedule.
  5. Review of off-site fabrication and delivery schedules.
  6. Corrective measures and procedures to regain projected schedule.
  7. Revisions to construction schedule.
  8. Progress schedule during succeeding work period.
  9. Maintenance of quality standards.
  10. Pending changes and substitutions.
  11. Coordination of schedules.
  12. Review submittal schedules; expedite as required.
  13. Review proposed changes for:

- a. Effect on construction schedule and on completion date.
  - b. Effect on subcontracts of the project.
14. Other business.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01310**

**CONSTRUCTION SCHEDULES**

**PART 1 - GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. At least three (3) calendar days before the scheduled Pre-Construction Conference, prepare and submit to Owner or Owner's Representative the initial construction schedule for the Work, with sub schedules, if required, of related activities that are essential to its progress.
- B. Submit revised progress schedules with the submission of each payment request.

**1.02 FORM OF SCHEDULES**

- A. Prepare schedules using Microsoft Project (V.4.0 or later) in the form of a horizontal bar chart.
- B. Provide a separate horizontal bar for each item of work that matches verbatim the breakdown of the contract price toward which partial payments will be made to the Contractor.
- C. Horizontal Time Scale: Identify the first workday of each week.
- D. Scale and Spacing: To allow space for notations and future revisions.
- E. Minimum Sheet Size: 8-1/2" by 11".

**1.03 CONTENT OF SCHEDULES**

- A. Construction Progress Schedule: Include the following:
  - 1. The name of the project and name and address of the Contractor.
  - 2. The name and address of the Owner.
  - 3. Date indicating the end of the construction period being reported.
  - 4. Legend showing a solid line representing estimated construction and a dotted line representing actual construction.
  - 5. Columns showing the percentage of the total contract of each item, the percentage of completion to date of each item and the weighted percentage of completion of each item to the project as a whole.
  - 6. Starting and completion dates of the contract.
  - 7. Projected percentage of completion for each item, as of the first day of each month.
- B. Submittals Schedule for Shop Drawings, Product Data and Samples: Show the following:
  - 1. The dates for Contractor's submittals.
  - 2. The dates reviewed submittals will be required from the Engineer/Owner.

**1.04 MONTHLY PROGRESS REPORTS**

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:

1. Major changes in scope.
2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other prime Contractors.

1.05 SUBMISSIONS

A. Submit initial schedule at least three (3) calendar days before the scheduled Pre-Construction Conference.

1. Owner will review schedule prior to the scheduled Pre-Construction Conference.
2. If required, resubmit within three (3) calendar days after return of review copy.

B. Submit revised progress schedules with each application for payment.

C. Submit initial schedule and schedule updates in accordance with Section 01340 Submittals.

1.06 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. Job site file.
2. Subcontractors.
3. Other concerned parties.

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01340**

**SUBMITTALS**

**PART 1.00 GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings, General Provisions of Contract, and Division-1 Specification Sections, apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS

- A. General: This section specifies procedural requirements for non-administrative submittals including shop drawings, product data, samples and other miscellaneous work-related submittals. Shop drawings, product data, samples and other work-related submittals are required to amplify, expand and coordinate the information contained in the Contract Documents.
1. Refer to other Division-1 sections and other Contract Documents for specifications on administrative, non-work-related submittals. Such submittals include, but are not limited to the following items:
    - a. Permits.
    - b. Written consents.
    - c. Manifests
    - d. Payment applications.
    - e. Performance and payment bonds.
    - f. Insurance certificates.
    - g. Inspection and test reports.
    - h. Progress reports.
    - i. Listing of Subcontractors.
    - j. Construction schedules.
- B. Shop drawings are technical drawings and data that have been specially prepared for this project, including but not limited to the following items:
1. Fabrication and installation drawings.
  2. Coordination drawings (for use on-site).
  3. Schedules.
  4. Design mix formulas.
  5. Where verification of existing conditions is required to fabricate/construct an element; the Contractor shall provide a letter along with the submittal stating that the conditions have been verified.
- C. Product data includes standard printed information on manufactured products that has not been specially-prepared for this project, including but not limited to the following items:
1. Manufacturer's product specifications and installation instructions.
  2. Catalog cuts.
  3. Roughing-in diagram and templates.
  4. Standard wiring diagrams.
  5. Printed performance curves.

6. Operational range diagrams.
- D. Samples are physical examples of work, including but not limited to the following items:
1. Partial sections of manufactured or fabricated work.
  2. Small cuts or containers of materials.
  3. Complete units of repetitively-used materials.
- E. Miscellaneous submittals are work-related, non-administrative submittals that do not fit in the three previous categories, including, but not limited to the following:
1. Specially-prepared and standard printed warranties.
  2. Project photographs.
  3. Testing and certification reports.
  4. Record drawings.
  5. Field measurement data.
  6. Keys and other security protection devices.

### 1.03 SUBMITTAL PROCEDURES

- A. General: Refer to the General Conditions for basic procedures for submittal handling.
- B. Coordination: Coordinate the preparation and processing of submittals with the performance of the work. Coordinate each separate submittal with other submittals and related activities such as testing, purchasing, fabrication, delivery and similar activities that require sequential activity.
1. Coordinate the submittal of different units of interrelated work so that one submittal will not be delayed by the Engineer/Owner/Owner's Representative need to review a related submittal. The Engineer/Owner/Owner's Representative reserves the right to withhold action on any submittal requiring coordination with other submittals until related submittals are forthcoming.
- C. Scheduling: In each appropriate administrative submittal, such as the progress schedule, show the principal work-related submittals and time requirements for coordination of submittal activity with related work.
- D. Coordination of Submittal Times: Prepare and transmit each submittal to the Engineer/Owner sufficiently in advance of the scheduled performance of related work and other applicable activities. Transmit different kinds of submittals for the same unit of work so that processing will not be delayed by the Engineer/Owner's need to review submittals concurrently for coordination.
- E. Review Time: Allow sufficient time so that the installation will not be delayed as a result of the time required to properly process submittals, including time for resubmittal, if necessary. Advise the Engineer/Owner on each submittal, as to whether processing time is critical to the progress of the work, and if the work would be expedited if processing time could be shortened.
1. Allow seven (7) calendar days for the Engineer/Owner's initial processing of each submittal. Allow a longer time period where processing must be delayed for coordination with subsequent submittals. The Engineer/Owner will advise the Contractor promptly when it is determined that a submittal being processed must be delayed for coordination.
  2. Allow five (5) calendar days for reprocessing each submittal.

3. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Engineer/Owner sufficiently in advance of the work.
- F. Submittal Preparation: Mark each submittal with a permanent label for identification. Provide the following information on the label for proper processing and recording of action taken.
1. Project name.
  2. Date.
  3. Name and address of Owner.
  4. Name and address of Contractor.
  5. Name and address of supplier.
  6. Name of manufacturer.
  7. Number and title of appropriate specification section.
  8. Drawing number and detail references, as appropriate.
  9. Similar definitive information as necessary.
  10. Provide a space on the label for the Contractor's review and approval markings, and a space for the Engineer/Owner's "Action" marking.
  11. Submittals shall be titled "19131.00\_RogerWheelerBoardwalk\_SubmittalNo.XX-xxxxxxxxxxxxx".
    - a. Where "XX" is the designated submittal Number.
    - b. Where "xxxxxxxxxxxxx" is a short description of the submittal content.
- G. Electronic Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit one (1) copy, including a transmittal form to the Contractor's Folder on the Pare File Transfer Protocol site. Emailed submittals shall be sent to the Engineer in the same format. Prepare a separate transmittal form for each division of work and identify each submittal by specification section number on the transmittal form.
1. Record relevant information and requests for data on the transmittal form. On the transmittal form, or on a separate sheet attached to the form, record deviations from the requirements of the Contract Documents, if any, including minor variations and limitations.
  2. Include the Contractor's signed certification stating that information submitted complies with requirements of the Contract Documents.
  3. Sequentially number the transmittal forms; resubmittals to have original number with an alphabetic suffix.
  4. Where appropriate, submittals shall be in Adobe PDF format. Where appropriate, File formats shall be compatible with Microsoft Office 2010.
  5. In the event of a discrepancy between the electronically transmitted submittal and the hardcopy, the hardcopy shall prevail.
  6. Contractor shall be responsible for notifying Engineer in writing when new submittals are posted to the FTP site.
  7. Emailed submittals shall be limited to one submittal per email.
  8. Emailed submittals shall be titled "19131.00\_RogerWheelerBoardwalk \_SubmittalNo.XX-xxxxxxxxxxxxx".
    - a. Where "XX" is the designated submittal Number.
    - b. Where "xxxxxxxxxxxxx" is a short description of the submittal content.
  9. Emailed submittals must be confirmed as received by the Engineer through either but not limited to a read receipt or confirmatory email.
- H. Contractor Review: Stamp of approval indicates to Owner and Engineer/Owner that all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data have been determined and verified, and that each submittal has been reviewed or coordinated with requirements of work and Contract Documents.

- I. No portion of Work requiring shop drawings shall be started or any materials be fabricated, delivered to site, or installed prior to approval of such items. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at Contractor's risk. Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- J. Project work, materials, fabrications, and installation shall conform to approved shop drawings.

#### 1.04 SPECIFIC SUBMITTAL REQUIREMENTS

##### A. Miscellaneous Submittals:

1. Inspection and Test Reports: Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.
2. Survey Data: Provide copies of all survey data collected for property surveys, field measurements, quantitative records of actual work, damage surveys and similar data required by the individual sections of these specifications. None of the specified copies will be returned.
3. Standards: Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Engineer/Owner's use. Where workmanship, whether at the project site or elsewhere, is governed by a standard, furnish additional copies of the standard to installers, Owner's field representative, and others involved in the performance of the work.
4. Closeout Submittals: Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information, materials, tools, and similar items.
  - a. Record Documents: Furnish set of original documents as maintained on the project site.
5. General Distribution: Provide additional distribution of submittals to Subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for the proper performance of the work. Include such additional copies of submittals in the transmittal to the Engineer/Owner where the submittals are required to receive "Action" marking before final distribution. Record distributions on transmittal forms.

- B. Verification of Existing Conditions: Where verification of existing conditions is required to fabricate/construct an element; the Contractor shall provide a letter along with the submittal stating that the conditions have been verified.

#### 1.05 ENGINEER/OWNER'S ACTION

- A. General: Except for submittals for the record and similar purposes, where action and return on submittals is required or requested, the Engineer/Owner will review each submittal, mark with appropriate "Action", and where possible return within seven (7) calendar days of receipt. Where the submittal must be held for coordination the Engineer/Owner will so advise the Contractor without delay.
- B. Action Stamp: The Engineer/Owner will stamp, sign and date each submittal copy to be returned to Contractor and indicate disposition of each submittal in accordance with the following grading requirements:



1. "No Exceptions Taken" indicates that Engineer/Owner notes no exception to the intent of the Contract Documents. Fabrication of item may commence.
2. "Furnish as Corrected" indicates that with minor corrections or additions, Engineer/Owner notes no exception to the intent of the Contract Documents. Item may be fabricated on basis of corrections noted. No further checking will be required.
3. "Revise and Resubmit". No fabrication may commence.
4. "Rejected" indicates nonconformance with the contract requirements, or that too many corrections would be necessary. The Engineer/Owner will state the reasons for rejections.
5. "Submit Specified Item" indicates missing portions of the submissions. Fabrication may commence upon submission and approval of specified item.
6. "Reviewed" indicates that the Engineer/Owner has received and processed the submittal. No determination of conformance was completed/necessary.

C. Engineer/Owner Review:

1. Engineer/Owner's review of submitted drawings and data will cover only general conformity to drawings and specification, external connections, and dimensions which affect layout.
2. Engineer/Owner's review does not indicate thorough review of all dimensions.
3. Engineer/Owner's review of submittals does not relieve Contractor's responsibility for errors, omissions, or deviations, nor responsibility for compliance with Contract Documents.

1.06 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Engineer/Owner and resubmit until they are denoted "No Exceptions Taken" or "Furnish as Corrected" by the Engineer/Owner. Resubmission requirements specified in individual specification sections, which differ from these requirements, will take precedence over these requirements.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those requested by the Engineer/Owner.

C. Samples: Submit new samples as required for initial submittal.

1.07 DISTRIBUTION

A. Distribute reproductions of shop drawings and copies of product data which carry the Engineer's stamp denoting "No Exceptions Taken" or "Furnish as Corrected" to:

1. Job site file.
2. Record documents file.
3. Subcontractors.
4. Supplier or fabricator.

B. Distribute samples which carry the Engineer/Owner's stamp denoting "No Exceptions Taken" or "Furnish as Corrected" as directed by the Engineer/Owner.

**PART 2.00 PRODUCTS**

Not Used

**PART 3.00 EXECUTION**

Not Used

END OF SECTION

**SECTION 01400**

**QUALITY CONTROL & QUALITY ASSURANCE**

**PART 1.00 GENERAL**

1.01 SECTION INCLUDES

- A. Quality Control that the Contractor will perform during the performance of this work.
- B. Quality Assurance that the Owner will perform during the performance of this work.

1.02 SUBMITTALS

- A. Submit Quality Control Plan to the Owner/Owner's Representative at least three (3) calendar days before starting work which includes the following information:
  - 1. Statement and description of Contractor's overall Quality Control (QC) program as described below. Each Sub-contractor shall submit a separate QC program applicable to their scope of work to the Contractor.
  - 2. Procedures to be used in obtaining field samples of materials except where required for submittal under other sections.
  - 3. Name, qualifications, and prior experience of inspection and testing laboratories that Contractor proposes for Owner/Owner's Representative's consideration.

1.03 QUALITY CONTROL (QC) PROGRAM

- A. Formulation, Submission, Details and Acceptance of Plan:
  - 1. Contractor shall develop a QC program appropriate to the scale of the project.
  - 2. The plan shall identify personnel, and establish procedures, instructions, records, and forms to be used.
  - 3. The Contractor's QC Plan shall include as a minimum, the following:
    - a. A description of the Contractor's QC organization, including a chart showing lines of authority, and acknowledgement that the Contractor's QC staff shall conduct inspections for all aspects of the work specified.
    - b. The name, qualifications, responsibilities, and authority of each person assigned to the Contractor's QC function.
    - c. Procedures for scheduling and managing submittals, including those of Subcontractor, fabricators, suppliers, and purchasing agents.
    - d. Control procedures to be promulgated.
    - e. Control testing procedures for each specific test, including field sampling.
    - f. Reporting procedures including proposed reporting formats.
  - 4. Acceptance of Plan: Acceptance of the Contractor's plan by the Owner/Owner's Representative is required prior to the start of construction. Acceptance is conditional, and its continuation will depend on satisfactory performance by the Contractor during construction. The Owner/Owner's Representative reserves the right to require the Contractor to make changes in the Contractor's QC Plan and operations as necessary to obtain the quality specified at no additional cost to the Owner.
  - 5. Notification of Changes: After acceptance of the Contractor's QC Plan, the Contractor shall notify the Owner/Owner's Representative in writing of any proposed change. The proposed changes will be subject to acceptance by the Owner/Owner's Representative.

- B. Implementation of QC Plan:
1. General:
    - a. Comply with the highest industry standards except when specified requirements indicate more rigid standards, or more precise workmanship is required.
    - b. Provide personnel to produce work of specified quality.
    - c. Secure, protect, and maintain products and Work completed or in progress from damage during the progress of remaining Work.
  2. Preparatory Inspection: This shall be performed prior to beginning any segment of Work. It shall include a review of Contract requirements; a check to assure that all materials and or equipment are on hand, and have been tested, samples submitted and approved; a check to assure that provisions have been made to do required control testing; examination of the work that has been completed; and a physical examination of materials, equipment and sample work to assure that they conform to approved shop drawings or submittal data. Contractor shall instruct each Subcontractor contributing work as to the acceptable level of workmanship required in the Contractor's QC Plan in order to meet Specifications.
  3. Initial Inspection: This shall be performed as soon as a representative portion of a particular segment of Work has been accomplished, and shall include examination of the quality of workmanship and materials, a review of control testing for compliance with Contract requirements, and inspection for omissions and dimensional requirements.
  4. Follow-up Inspections: These shall be performed regularly to assure continuing compliance with Contract requirements, including control testing, until Completion. Final follow-up inspections shall be conducted and deficiencies corrected prior to final acceptance of segments of Work.
  5. Tests: A list of QC tests, and the frequency of their performance, which the Contractor understands he is to perform, and on which he is to submit reports shall satisfy the requirements described under 3.03(B) of this section.
  6. Prompt turn-around is required for all analyses, so as not to jeopardize the project schedule. Verbal turn-around time on soil samples is not to exceed 48 hours and written turn-around time is not to exceed 72 hours.
  7. The Contractor shall submit the list of tests, and the frequency of their performance, as a part of the Contractor's QC Plan, to the Owner/Owner's Representative. The list shall give the test name, Specification Paragraph containing the test requirements, and the personnel and laboratory responsible for each type of test. The Contractor shall perform the following activities:
    - a. Verify that testing procedures comply with Contract requirements.
    - b. Verify that facilities and testing equipment are available and comply with testing standards.
    - c. Check test instrument calibration data against certified standards.
    - d. Verify that recording forms, including all of the test documentation requirements, have been prepared.
  8. Testing for Laboratory Capability:
    - a. Capability Check: Owner/Owner's Representative shall have the right to check laboratory equipment in proposed laboratories for compliance with testing procedures.
    - b. Capability Rechecks: If the selected laboratory(ies) fails the capability check the Contractor shall be assessed actual costs to reimburse the Owner/Owner's Representative for each succeeding recheck of the laboratory or the checking of a subsequently-selected laboratory.
  9. Documentation:
    - a. The Contractor shall maintain records of QC operations, activities and tests performed including the work of suppliers and Subcontractors. These records shall be on an acceptable form and shall include a description of the trades working on the project, the number of personnel working, weather conditions encountered, and delays encountered, and acknowledgement of deficiencies noted along with corrective actions taken on current or previous deficiencies. Additionally these records shall include

evidence that required activities or tests have been performed, including but not limited to the following:

- i. Type and number of control activities and tests performed.
  - ii. Results of control activities or tests, including nature of any defects, causes for rejection, and other information related to deficient features.
  - iii. Proposed remedies and accomplished corrections.
- b. These records shall cover both conforming and defective features, and shall include a statement that supplies and materials incorporated in the Work comply with the Contract requirements. Legible copies of these records shall be submitted to the Owner/Owner's Representative.
  - c. Notification of Noncompliance: Owner/Owner's Representative will notify the Contractor or his designated representative of any observed noncompliance with requirements of this Section. If the Contractor fails or refuses to comply promptly, the Owner/Owner's Representative may issue an order stopping all or part of the Work until satisfactory corrective action has been taken.

#### 1.04 QUALITY ASSURANCE (QA) PROGRAM

- A. The Contractor shall provide for all costs associated with implementing a QA testing program within the bid price for General Requirements.
- B. In general, QA testing will be performed at a frequency equal to about 10 percent of the QC testing frequency or as directed by the Owner/Owner's Representative.

#### 1.05 WEIGHTS AND MEASURES

- A. The Contractor shall weigh and measure its own materials.
- B. Give one copy of each delivery's weight or measurement to Owner/Owner's Representative prior to stockpiling or storage.

#### 1.06 REFERENCE STANDARDS

- A. Where reference to an industry standard does not include a date of issue, conform to issue current as of date of Contract Documents.
- B. Where reference to an industry standard includes a date of issue, conform to issue current as of the date specified.

#### 1.07 INSPECTION AND TESTING LABORATORIES

- A. Independent testing laboratories shall perform inspections, tests, and other services specified in individual specification sections, the Contractor's Quality Control Plan, and as required for QA by the Owner/Owner's Representative.
- B. Reports and test results shall be submitted by the independent testing laboratory directly to the Owner, indicating observations and results of tests and indicating compliance or noncompliance with the requirements of the specifications.
- C. Contractor shall provide access to the work and fully cooperate with laboratory firms. Notify Owner at least 48 hours prior to expected time when work is ready for inspection, sampling, or testing, if not otherwise specified for the particular work to be tested.

- D. Retesting required due to nonconformance to specified requirements shall be performed by the same independent testing laboratories on instructions from the Owner/Owner's Representative. Retesting costs shall be borne by the Contractor and will not be applied to any unit price items.

**PART 2.00 PRODUCTS**

2.01 MATERIALS

- A. See applicable Specification Sections for types of material and equipment used on this project.

**PART 3.00 EXECUTION**

3.01 PRECONSTRUCTION TESTING

- A. Prior to construction, identify sources for soil, rock, and bituminous materials and test samples of each material from each source to determine whether they meet the required material specifications.
- B. Document all tests. Soil, rock, and bituminous materials shall be accepted or rejected according to the test results. Some or all of the following tests shall be performed in the evaluation of the material properties for construction purposes:
  - 1. ASTM D422 – Particle Size Analysis
  - 2. ASTM D1557 – Moisture/Density Relationship
  - 3. ASTM D2216 – Moisture Content
  - 4. ASTM D2488 – Unified Soils Classification
  - 5. ASTM D854 – Specific Gravity
- C. All material evaluation tests shall be performed by the independent testing laboratory retained by the Contractor and approved for use by the Owner/Owner's Representative.

3.02 CONSTRUCTION TESTING

- A. Document all tests. Some or all of the following tests shall be performed in the evaluation of the in place properties of soil and rock materials.
  - 1. ASTM C31 – Making and Curing Test Specimens in the Field
  - 2. ASTM C39 – Compressive Strength of Cylindrical Concrete Specimens
  - 3. ASTM C143 – Concrete Slump Test
  - 4. ASTM D422 – Particle Size Analysis
  - 5. ASTM D1557 – Moisture/Density Relationship
  - 6. ASTM D2216 – Moisture Content
  - 7. ASTM D1556 – Density of Soil in Place by Sand-Cone Method
  - 8. ASTM D2216 – Laboratory Determination of Water Content
  - 9. ASTM D2922 – Density of Soil in Place by Nuclear Methods
  - 10. ASTM D3017 – Water Content of Soil in Place by Nuclear Methods
- B. Further material testing may be necessary if alternative sources of material are required during construction or, if based on visual inspection during delivery to the site, it appears that a material

change (color, grain size, plasticity) has occurred. Additional source testing due to change of material shall be borne by the Contractor and will not be applied to any unit price items.

- C. Questions concerning the accuracy of any single test shall be addressed by retesting.

3.03 QC TESTING FREQUENCY

- A. All QC testing shall be conducted in accordance with the Contractor’s QC Plan. Documentation and reporting of test results shall be the responsibility of the Contractor.
- B. Testing frequencies for material/product evaluation and construction quality evaluation are presented in the following table.

Material / Product	RESPONSIBLE PARTY	SITUATION	Test	Minimum Frequency
Gravel Borrow/Regrading	Contractor	Source	Grain Size through 0.002 mm	1 per source
		Investigation	Moisture Density Relationship	1 per source
			Soil Permeability	3 per source
Fill	Contractor	During Placement	Grain Size through 0.002 mm	1 per 100 tons
			Moisture Density Relationship	1 per 100 tons
	Contractor	As-Placed	Dry Density and As-Placed Moisture	2 per lift per location and no less than 1 every 1000 sf
Concrete	Contractor	As-Placed	Strength, Slump, Air Entrainment, Temperature	See Section 03300
Hydrant	Contractor	After Installation	Leak Test	Once

- C. Sampling locations shall be approved by the Owner/Owner’s Representative.
- D. A special testing frequency shall be used at the discretion of the Owner/Owner’s Representative when visual observations of construction performance indicate a potential problem. Additional testing for suspected areas shall be considered when:
  1. Materials appear substantially different from those specified
  2. Directed by the Owner/Owner’s Representative
- E. During construction, the frequency of testing may also be increased in the following situations:
  1. Adverse weather conditions
  2. Breakdown of equipment
  3. Material fails to meet specification

3.04 QA TESTING FREQUENCY

- A. In general, QA testing will be performed at a frequency equal to about 10 percent of the QC testing frequency or as directed by the Owner/Owner’s Representative.

3.05 DEFICIENCIES

- A. If a defect is discovered, the Contractor shall immediately determine the extent and nature of the defect.

1. If the defect is indicated by unsatisfactory test results, the Contractor shall determine the extent of the deficient area by additional tests, observations, a review of records, or other means that the Contractor deems appropriate. Costs for additional testing shall be borne by the Contractor and not applied to any unit price items.
  2. If the defect is related to adverse site conditions, such as overly wet soils or surface desiccation, the Contractor shall define the limits and nature of the defect.
- B. After determining the extent and nature of a defect, the Contractor shall notify the Owner/Owner's Representative and schedule for defect repair and retesting.
- C. The Contractor shall correct the deficiency to the satisfaction of the Owner/Owner's Representative. If the project specification criteria cannot be met, or if unusual weather conditions hinder work, then the Contractor shall develop and present to the Owner/Owner's Representative suggested solutions for his approval.
- D. All retests by the Contractor must verify that the defect has been corrected before any additional work is performed by the Contractor in the area of the deficiency. The Contractor shall also verify that all installation requirements are met and that all required submittals are provided.

**END OF SECTION**



**SECTION 01500**

**TEMPORARY FACILITIES AND CONTROL**

**PART 1.00 GENERAL**

1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Instructions which is hereby made a part of this Section of the Specifications.

1.02 REQUIREMENTS INCLUDED

- A. Temporary Facilities and Controls including the following:

1. Temporary Water.
2. Weather Protection.
3. Temporary Power.
4. Hoisting Equipment and Machinery.
5. Staging.
6. Maintenance of Access.
7. Dust Control.
8. Noise Control.
9. Enclosures.
10. Cleaning During Construction.
11. Field Offices.
12. Sanitary Facilities.
13. Construction Barriers.
14. Parking.
15. Debris Control and Removal.
16. Safety Protection.
17. Vehicle and Equipment Protection.
18. Shoring.
19. Construction Fence.
20. Project Identification Sign.

1.03 TEMPORARY WATER

- A. Water, if required, shall be furnished by the Contractor.
- B. Temporary hoses and temporary pipe lines used for transporting water shall not be run unattended or unprotected across streets, parking areas, parking area entrances, walkways, plazas, or steps.
- C. The Contractor shall provide an adequate supply of drinking water from approved sources of acceptable quality, satisfactorily cooled, for his employees and those of his Subcontractors.

1.04 WEATHER PROTECTION

- A. It is the intent of these Specifications to require that the Contractor shall provide temporary enclosures and heat to permit construction work to be carried on during the winter months. Under no circumstances shall the Contractor suspend any work during the months of this time because of their reluctance to provide and pay for temporary weather protection. These

Specifications are not to be construed as requiring enclosures or heat for operations that are not economically feasible to protect in the judgment of the Engineer. Included in the preceding category, without limitation, are such items as site work, excavation, timber erection, roofing, and similar operations.

- B. "WEATHER PROTECTION" shall mean the temporary protection of that work adversely affected by moisture, wind, and cold, by covering, enclosing and/or heating. This protection shall provide adequate working areas during winter months as determined by the Engineer and consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations. The Contractor shall furnish and install all "weather protection" material and be responsible for all costs, including heating required to maintain a minimum temperature of 50 degrees Fahrenheit at the working surface. This provision does not supersede any specific requirements for methods of construction, curing of materials or the applicable general conditions set forth in the Contract with added regard to performance obligations of the Contractor.
- C. The cost of providing and installing weather protection is the responsibility of the Contractor. Additional work or time spent installing the weather protection shall not be eligible for additional payment.
- D. Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate ventilation and fire protection devices. Heating devices which may cause damage to finish surfaces shall not be used.

#### 1.05 TEMPORARY POWER

- A. The utility company may provide electrical energy required for temporary light and power. If requested by the Contractor and approved by the Owner/Town, the Contractor may provide temporary feeders of sufficient capacity from the local utility company, or from power lines, for the electric light and power requirements of the project while under construction. It is not the intent of the above statement to relieve the Contractor of the responsibility of payment for energy consumed during construction, but rather to afford him use of permanent feeder, etc. for electric distribution during construction. Payment for energy consumed during construction shall be the responsibility of the Contractor.
- B. The Contractor shall pay for the cost of electric energy consumed by himself and by all of his Subcontractors. Any temporary wiring of a special nature shall be paid for by the Contractor requiring it, such as:
  - 1. Special circuits required by electric welders, elevators, lifts or other special equipment requiring high-amperage and/or special voltage service, etc.
  - 2. Exterior lighting circuits for protection against vandalism, public warning lights, lights for advertising, and similar items.
- C. The Contractor and all Subcontractors, individually, shall furnish all extension cords, sockets, motors, and accessories required for their work. They shall also pay for all temporary wiring of construction offices and buildings used by them. The Contractor shall pay for the offices of the Contractor and the Engineer.
- D. All temporary wiring installed by the Electrical Subcontractor shall be removed after it has served its purpose. Use copper wire only.

- E. All relocations of temporary service to meet construction and/or phasing requirements shall be performed at no additional cost to the Owner.

1.06 HOISTING EQUIPMENT AND MACHINERY

- A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work shall be furnished, installed, operated and maintained in safe condition by the individual Subcontractors and is so stated in each appropriately related Section of the Specifications. All costs for hoisting operating services shall be borne by the Subcontractors unless specifically excepted in the Contract Documents.
  - 1. A licensed equipment manufacturer's representative shall be present at all times, to witness the erection and dismantling of all hoisting equipment and machinery, whenever such equipment is being erected or dismantled. No such work will be performed without the presence of such representative.
  - 2. Hoisting equipment and machinery erection and dismantling shall be performed only by trained, certified, and experienced riggers qualified to perform such work.
  - 3. Copies of such licenses and/or certifications, clearly indicating qualifications, shall be provided to the Engineer prior to commencement of such erecting and dismantling work.
- B. Review Drawings for hoisting requirements and openness of traffic access routes to installed destinations of specified equipment and furnishings.

1.07 STAGING

- A. All staging, planking and scaffolding, exterior and interior, required for the proper execution of the work and over eight feet in height, shall be furnished, installed, and maintained by the Contractor.
  - 1. Erection and dismantling of staging shall be performed only by trained, certified, and experienced staging personnel qualified to perform such work.
  - 2. Copies of such certifications, clearly indicating qualifications, shall be provided to the Engineer prior to commencement of such erecting and dismantling work.
- B. All staging up to eight feet in height shall be provided by the individual Subcontractors as applicable to their work.

1.08 MAINTENANCE OF ACCESS

- A. The Contractor shall provide and maintain for the duration of the Contract, a means of access to, around and within the site, as indicated on the Drawings, for vehicular traffic and authorized personnel. This means of access shall be construed to sustain the weight of equipment customarily engaged for use in construction projects of this type and magnitude. The Contractor shall, without additional compensation from the Owner, furnish labor and materials as may be required from time to time to maintain this means of access in an acceptable condition as determined by the Engineer.
- B. Pedestrian access shall provide adequate protection against falling debris, slippage, adequate lighting, warning and directional signs, and protection against construction activities.

1.09 DUST CONTROL

- A. The Contractor shall have all Subcontractors provide adequate means for the purpose of preventing dust caused by construction operations from creating a hazard, nuisance, and from entering adjacent occupied areas throughout the period of the construction contract.
- B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions set forth in the Contract with added regard to performance obligations of the Contractor.

1.10 NOISE CONTROL

- A. Comply with requirements of authorities having jurisdiction. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.
- B. Execute construction work by methods and by use of equipment which will reduce excess noise.
  - 1. Equip air compressors with silencers, and power equipment with mufflers.
  - 2. Manage vehicular traffic and scheduling to reduce noise.
  - 3. No heavy equipment may be started or idled before 7A.M.

1.11 ENCLOSURES

- A. Provide temporary, insulated, weather tight closures of openings in exterior surfaces for providing acceptable working conditions and protection for materials, allowing for heating during construction, and preventing entry of unauthorized persons. Provide doors with self-closing hardware and locks.
- B. All utilities including electric ducts, conduits, telephone lines, sprinklers, and other utilities shall be protected against damage from construction activity. The Contractor shall be responsible for all damage to the utilities from construction and shall repair all such damage at no additional cost to the Owner.

1.12 CLEANING DURING CONSTRUCTION

- A. Unless otherwise specified under the various Sections of the Specifications, the Contractor shall perform clean-up operations during construction as herein specified.
- B. Control accumulation of waste materials and rubbish; periodically dispose of off-site in a legal manner. The Contractor shall bear all costs, including fees resulting from such disposal.
- C. Clean interior areas prior to start of finish work and maintain areas free of dust and other contaminants during finish operations.
- D. Maintain project in accordance with all local, state, and Federal Regulatory Requirements.
- E. Store volatile wastes in covered metal containers, and remove from premises.
- F. Prevent accumulation of wastes which create hazardous conditions.
- G. Provide adequate ventilation during use of volatile or noxious substances.

- H. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
    - 1. Do not burn or bury rubbish and waste materials on site.
    - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
    - 3. Do not dispose of wastes into streams or waterways.
    - 4. Identify potential sources of cleaning water runoff and propose abatement procedures.
  - I. Use only those materials which will not create hazards to health or property and which will not damage surfaces.
  - J. Use only those cleaning materials and methods recommended by manufacturer of surface materials to be cleaned.
  - K. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and windblown debris, resulting from construction operations.
  - L. Provide on-site containers for collection of waste materials, debris, and rubbish.
  - M. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal dump site.
  - N. Handle material in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.
  - O. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.
- 1.13 FIELD OFFICES
- A. The Contractor shall provide and maintain temporary field offices on site for its own use and space shall be provided for the Engineer. The location shall be at the discretion of the Owner.
- 1.14 SANITARY FACILITIES
- A. The Contractor shall provide suitable toilet facilities for its staff, the Engineer and the Owner, and additional facilities for the workmen on the job, including personnel of Subcontractors.
  - B. Provide chemical toilets where work is in progress and in quantity required by OSHA Code.
  - C. Chemical toilets and their maintenance shall meet requirements of state and local health regulations and ordinances, and shall be subject to approval of the Engineer and Owner.
- 1.15 CONSTRUCTION BARRIERS
- A. Proper construction barriers shall be provided around the contract work areas as defined by the Contract Drawings or as directed by the Engineer.
  - B. Construction barriers shall consist of traffic cones, ribbons, tapes, secure fencing, trench covers, wood barriers, warning signs, directional signs, and other traffic materials to keep traffic and people from area of construction and maintain ongoing operations.

- C. Barriers shall be erected at such approved locations as are necessary, sufficiently cross-braced and supported adequately from floors and ceilings as required.

1.16 PARKING

- A. Only during Contract working hours and to the extent available, existing parking facilities located at the construction area will be available for use by the Contractor, Subcontractors and their employees.
- B. The Owner shall not be responsible for cars, trucks, etc. or their contents, and the Contractor, Subcontractors, and material suppliers will use the designated area with this understanding.

1.17 DEBRIS CONTROL AND REMOVAL

- A. Debris shall not be permitted to accumulate or migrate and the work shall at all times be kept satisfactorily clean. A dumpster shall be provided by the Contractor for removal of debris for all Subcontractors.
- B. Remove debris from the work site on a daily basis and dispose of at any (private or public) approved dump that the Contractor may choose providing that the Contractor shall make all arrangements and obtain all approvals and permits necessary from the Owner or officials in charge of such dumps. Proposed dump site shall be submitted to be approved by the Engineer prior to start of demolition. During disposal process, copies of daily receipts from dumpsite shall be submitted on a regular basis.

1.18 SAFETY PROTECTION

- A. At no time shall the work be left unattended without proper safety protection, and shall not be left unprotected to the weather or accessible to the public. It is the responsibility of the Contractor to maintain proper safety protection for the public while work is in progress or unattended.

1.19 VEHICLE AND EQUIPMENT PROTECTION

- A. All construction activities shall be performed in such a manner so as not to dust, stain or damage any building elements, equipment, vehicles, etc. within general vicinity of the construction work area. Any damage to these items shall be cleaned and repaired at the expense of the Contractor.
  - 1. All construction vehicles and equipment on site shall be effectively disabled and secured when not in use.

1.20 SHORING

- A. The Subcontractors shall provide all temporary shoring and bracing as required for the proposed work. Comply with all applicable codes and standards.
- B. The Contractor is responsible for protecting the existing infrastructure during excavation activities.
- C. All shoring and bracing shall be designed by a registered professional engineer in the State of Rhode Island.

1.21 CONSTRUCTION FENCE

- A. A construction fence shall be provided along the entire perimeter of the contract limit lines, and shall be kept in good repair at all times, and shall be arranged to maintain ongoing operation's access and egress.
- B. Construction fences shall be six feet high and of chain link, or approved equal, erected in a substantial manner, straight, plumb and true as approved by the Engineer.
- C. Gates shall be built into fence at such approved locations as are necessary, well cross-braced, and hung on heavy strap hinges with proper post and hook for double gates. Provide heavy hasps and padlocks for each gate. Provide a set of three keys for each lock to the Owner and Engineer to facilitate emergency access.
- D. Fencing shall be removed by the Contractor at no cost to the Owner at such time before final completion as approved by the Engineer. Restore site to acceptable condition after removing fence.

1.22 PROJECT IDENTIFICATION

- A. Request sketch of sign language and graphics from the Owner in sufficient time that sign can be fabricated and erected at start of construction.
- B. The Contractor shall provide one 4 foot high by 8 foot wide project sign indicating the project title, contract number, and CRMC permit number.
- C. Sign shall be lettered by a professional sign painter, in accordance with the general layouts attached. Lettering shall be gloss vinyl, size, and color as indicated as attached at the end of this Section. Surfaces and edges of sign shall receive two coats of exterior primer and two coats of exterior gloss enamel.
- D. Submit a shop drawing indicating sign construction and lettering for approval by the Engineer and Owner. The official project title and an electronic file in AutoCAD drawing format can be provided to the Contractor by the Owner and Engineer upon request.
- E. Locate and install the sign at location as specified by the Owner or Engineer. At the completion of the Project, remove the sign and supports completely and restore surface to original condition.

**PART 2.00 - PRODUCTS**

Not Used

**PART 3.00 - EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01510**

**TEMPORARY UTILITIES**

**PART 1.00 GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings, General Provisions of Contract, and Division 1 Specification Sections, apply to work of this section.

1.02 REQUIREMENTS INCLUDED

- A. Furnishing, installing, and maintaining temporary utilities to support construction **as required by the Contractor's means and methods**, and remove at completion of work. This specification does not require that such facilities be provided; however, any facilities installed shall meet the minimum requirements specified herein.

- 1. Electric and Lighting
- 2. Heating and Ventilation
- 3. Water

- B. Furnishing, installing, and maintaining sanitary facilities to support construction.

1.03 TEMPORARY ELECTRICITY AND LIGHTING

- A. Arrange with utility company to provide all power for heating, lighting, operation of equipment, or for any other required use.

- 1. Pay costs for service and for power used.

- B. Install circuit and branch wiring, with area distribution boxes located so that power and lighting is available throughout construction by use of construction-type power cords.

- C. Provide artificial lighting for areas of work when natural light is not adequate for work, and for areas accessible to public.

- D. Furnish all extension cords, sockets, lamps, motors and accessories for work. Ground all outlets.

- E. All temporary wiring, service equipment and accessories thereto installed shall be removed at expense of Contractor after serving its purpose.

1.04 TEMPORARY HEATING AND VENTILATION

- A. Provide temporary heating when temperature falls below 50 deg. F and as otherwise required to:

- 1. Maintain working conditions acceptable to Engineer.
- 2. Protect all work, materials, and equipment against damage from dampness or cold.
- 3. Dry out structures.
- 4. Maintain proper conditions for installation and curing of materials.

- B. Heating equipment and fuels shall be compatible for their particular purpose and shall include safety devices in accordance with industry standards.



- C. Do not use combustion type heaters without proper venting nor in areas where such equipment might introduce a hazard.
- D. Ensure that all enclosed areas are ventilated (using forced-draft equipment when necessary) as required to maintain proper conditions for personnel and work, and to avoid any accumulation of hazardous dust or fumes.
- E. Pay costs associated with furnishing, installing, maintaining, operating, and removing of heating and ventilation equipment.

1.05 TEMPORARY WATER

- A. Furnish all water required for and in connection with work to be done under this Contract.
- B. Water shall not be pumped directly from surrounding water bodies without the express written consent of the RIDEM.
- C. Pay costs associated with furnishing, cleaning, installing, maintaining, operating, and removing of water-related equipment.

1.06 TEMPORARY SANITARY FACILITIES

- A. Furnish temporary sanitary facilities at site for needs of all construction workers and others performing work or furnishing services on project.
- B. Ensure that sanitary facilities are:
  - 1. Of a capacity acceptable to Engineer.
  - 2. Maintained throughout construction period.
  - 3. Obscured from public view to greatest extent possible and secured to prevent vandalism.
  - 4. Located such that leakage from the sanitary facility can in no way enter surrounding water bodies or drainage areas.
- C. Furnish at least one toilet for each 10 workers if toilets of chemically treated type are used.
- D. Service, clean, and maintain facilities and enclosures.
- E. Enforce use of such sanitary facilities by all personnel at site.
- F. Pay costs associated with furnishing, installing, maintaining, operating and removing sanitary facilities.

**PART 2.00 PRODUCTS**

Not Used

**PART 3.00 EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01560**

**TEMPORARY CONTROLS**

**PART 1.00 GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings, General Provisions of contract, and Division 1 Specification Sections, apply to work of this section.

1.02 REQUIREMENTS INCLUDED

- A. Controlling and protecting the Contractor's operations and work.
- B. Furnishing, installing and operating temporary controls during construction for:
  - 1. Dewatering
  - 2. Noise
  - 3. Dust
  - 4. Surface Water
  - 5. Pollution
  - 6. Debris and Clean Up
  - 7. Air Pollution
  - 8. Public Safety

1.03 ROGER WHEELER STATE BEACH WATERS

- A. The Contractor is made aware that the lands and waters within the Roger Wheeler State Beach drainage area are a critical environmental resource for the State of Rhode Island. Protection of the integrity of the water resource should be held in importance second only to worker/personnel safety.
- B. Water from the Roger Wheeler State Beach may be accessed by the Contractor on-site only after coordinating with the RIDEM and acquiring written permission.
- C. Water from the Town of Narragansett water supply infrastructure may be accessed by the Contractor on-site only after coordinating with the Town of Narragansett and acquiring written permission.
- D. Any permits or fees associated with the use of public/private waters are to be completed and paid for by the Contractor at no additional cost to the Owner. Coordination and negotiation of fees are to be completed by the Contractor at no additional cost to the Owner.

1.04 PRIVATE LAND

- A. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the property owner. Furnish Owner copies of all agreements the Contractor has with property owners to enter or occupy private lands.

1.05 CARE AND PROTECTION OF PROPERTY

- A. The Contractor shall install temporary security fencing to prevent access to the site by unauthorized personnel during periods of construction.
- B. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Engineer.
- C. Along the location of this work, all fences, pathways, bushes, trees, shrubbery and other physical features shall be protected and restored in a thoroughly workmanlike manner. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be regraded and seeded as necessary, subject to the approval of the Engineer.
- D. Trees close to the work and not marked for removal shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are likely to be damaged because of his operations, but in no case shall any tree be cut or removed without prior notification of the Engineer. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by dressing, cutting and painting according to approved methods, using only approved tools and materials, subject to the approval of the Owner.
- E. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the proposal.

1.06 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities below grade, utilities on overhead lines, gas pipes, water pipes, hydrants, sewers, drains, electric and telephone cables, and cesspools adjacent to trench excavations, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by the Contractor at their expense, to the damaged items original condition.
- B. The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water, gas, electric and telephone services, drain lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.
- C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the work under the contract and all costs in connection therewith shall be included in the unit prices established in the proposal.
- D. Contractor shall note and protect buried utilities and pipes with the limits of work and anticipated staging areas.

1.07 PROTECTION OF WORK

- A. The Contractor shall at all times protect excavations, trenches, new construction, old construction, all job materials, apparatus and fixtures from rain, wind, snow, ice, dust, dirt, mud, groundwater, back-up or leakage of sewers, drains, or other piping, and from water of any other origin, and shall remove promptly any accumulation of the above. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end at no additional cost to Owner.
- B. Thoroughly protect all completed work and all stored materials.
- C. Provide boards, cloths, planks, waterproof paper, canvas or other approved protection and use as necessary to prevent any damage.
- D. Provide protective measures to prevent damage to lawns, trees and shrubs to remain after project is complete.
- E. Protect, at end of each day's work, such work that may be liable to damage by the elements.  
  
Replace or rectify work or materials damaged by workmen, by the elements or by any other cause, to the satisfaction of the Engineer and at no additional expense to the Owner.
- F. Repair streets, curbs, sidewalks, poles, grass, shrubs, trees, or other existing site features, if disturbed by construction operations, in a manner satisfactory to the Owner/Engineer at no additional cost to the Owner. Structures disturbed as part of construction activity shall be restored, at a minimum, to their preconstruction condition.
- G. Do not allow workmen, including those of any Subcontractor or supplier, to mark finish surfaces with marking pens or other such devices which are not readily erasable.
- H. Contractor shall be responsible for any and all damage to the Owner provided materials once delivered to the site. All materials shall be handled, stored, and installed in accordance with the manufacturer's recommendations.

1.08 SECURITY

- A. The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner or Contractor, whether or not forming part of the work, located within the limits of work. The Contractor shall have full responsibility for the security of such property located in such areas and shall reimburse the Owner for any such loss, damage, or injury, except such as may be directly caused by agents or employees of the Owner.

**PART 2.00 MATERIALS**

Not Used

**PART 3.00 EXECUTION**

3.01 INTERFERENCE WITH EXISTING STRUCTURES

- A. Whenever it may be necessary to cross or interfere with existing culverts, drains, water pipes, water fixtures, guardrails, fences, sewers, or other structures needing special care, due notice shall be given to the Owner and to the various public and private agencies or individuals responsible for the utility or structure that is interfered with. Whenever required, all objects shall be strengthened to meet any additional stress that the work herein specified may impose upon it, and any damage caused shall be thoroughly repaired. The entire work shall be the responsibility of the Contractor and the work shall be performed at no additional expense to the Owner. All damaged items of work or items required to be removed and replaced due to construction shall be replaced or repaired by the Contractor to the complete satisfaction of the property Owners and/or the Engineer at no additional expense to the Owner.

3.02 REMOVAL OF WATER AND PROTECTION FROM FLOODING

- A. The Contractor shall construct and maintain, at no additional expense to the Owner, all pumps, drains, well points or any other facility for the control and collection of groundwater and/or surface water and provide all pumps and piping for the removal of water from the trenches and excavations so that all trenches and excavations may be kept at all times free from water and so that all construction work may be performed in the dry.
- B. Any damage resulting from the failure of the dewatering operations of the Contractor and any damage resulting from the failure of the Contractor to maintain the areas of all work in a suitable dry condition shall be repaired by the Contractor as directed by the Engineer or Owner at no additional expense to the Owner.
- C. The Contractor's pumping and dewatering operations shall be carried out in accordance with RIDEM regulations and in such a manner as to prevent damage to existing structures, utilities, and the contract work; and so that no loss of ground will result from these operations.
- D. Precautions shall be taken to protect new and existing work from flooding during storms or from other causes. Pumping shall be continuous where directed by the Engineer to protect the work and/or to maintain satisfactory progress.
- E. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.
- F. Water from the trenches, excavations and drainage operations shall be pumped to a dewatering basin in such a manner as will neither cause public nuisance, nor cause injury to public health nor to public or private property nor to the work completed nor to the work in progress.
- G. No extra payment will be made for the removal of water, protection from flooding, drainage work, diversion of existing water courses and such other work. Compensation therefore shall be considered as having been included in the prices stipulated for the appropriate items of work as listed in the bid.

3.03 NOISE CONTROL

- A. The Contractor shall employ all reasonable measures to avoid unnecessary noise and ensure that noise is appropriate for normal ambient sound levels in the work area during working hours. Where required by agencies having jurisdiction, certain noise - producing work may have to be performed during specified periods only. Noise control measures during normal work hours shall include but not be limited to:

1. Operate machinery in a manner to cause least noise consistent with efficient performance of work.
  2. Equip all construction machinery and vehicles with sound-muffling devices.
  3. During construction adjacent to occupied buildings, erect screens or barriers to reduce noise in building to limits in accordance with applicable codes. Conduct operations in such a manner as to avoid unnecessary noise which might interfere with activities of building occupants.
- B. When the Contractor's work extends beyond normal working hours the Contractor shall incorporate to the complete satisfaction of the Owner and Engineer, adequate noise prevention measures to insure minimum noise impact on the surrounding areas. Noise prevention measures shall include, but not be limited to:
1. Insulated enclosures.
  2. Hospital grade silencers or mufflers.
  3. Equipment modification.
  4. Special equipment, as necessary to meet City noise guidelines.
  5. Any other noise prevention measures.
- C. Should at any time the Owner and/or Engineer determine that noise prevention measures are inadequate, the Contractor shall suspend all such work in question until acceptable measures are incorporated. Suspension of work due to inadequate noise prevention shall not be a cause for additional cost to the Owner.
- D. Prior to the start of any work outside normal work hours, the Contractor shall submit a Noise Control plan to the Owner and Engineer for review. Noise Control plans shall be submitted for:
1. Night work.
  2. All Pumping operations and work which extend beyond normal work day.
  3. Any other work as determined by the Engineer which warrants special noise prevention measures.
- E. All costs associated with noise control measures shall be considered part of the bid price for the appropriate work being completed.

### 3.04 DUST CONTROL

- A. At no additional cost to the Owner take measures to prevent unnecessary dust.
1. Keep earth surfaces subject to dusting moist with water only.
  2. Cover dusty materials in piles or in transit to prevent blowing.
- B. Protect buildings or operating facilities which may be affected adversely by dust.
- C. Protect existing or new machinery, motors, instrument panels, or similar equipment with dust screens.
1. Include proper ventilation with dust screens.
- D. The Contractor shall act quickly to address any concerns or complaints from CMRC or the Owner if dust is to blow onto Sand Hill Cove Road as a result of work within the project area.

3.05 SURFACE WATER CONTROL

- A. Provide for drainage of storm water and such water as may be applied or discharged on site in performance of work.
- B. Ensure that drainage facilities are adequate to prevent damage to work, site, and adjacent property.
  - 1. Clean, enlarge, or supplement existing drainage channels to carry all increased runoff attributable to operation.
  - 2. Construct dikes to:
    - a. Divert increased runoff from entering Roger Wheeler State Beach (except from waters that fall and contact natural channels).
    - b. Protect the work.
    - c. Direct water to drainage channels or conduits downstream of the dam.

3.06 POLLUTION CONTROL

- A. Prevent pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities.
  - 1. In order to protect the Roger Wheeler State Beach and surrounding wetlands from hazardous materials releases by the construction equipment involved in this project, fueling shall take place within staged fueling areas in the presence of a spill kit, equipment must be in good condition and inspected for leaks; spill control and cleanup equipment shall be stored on site; and the Contractor shall be responsible for all cleanup and remediation of hazardous materials releases.
  - 2. Do not allow sanitary wastes to enter any drain or watercourse other than sanitary sewers.
  - 3. Do not allow sediment, debris, or other substance to enter sanitary sewers and take measures to prevent such materials from entering any drain or watercourse.
  - 4. All concrete repair work requiring cleaning and removal of debris is to be contained so as not to contaminate the surrounding environment.

3.07 SPILL PREVENTION / CLEANUP

- A. In the event of a spill of hydraulic oil, fuel, slurry, or other construction chemical into Roger Wheeler State Beach, all work shall immediately be brought to a safe stoppage, and all efforts shall be diverted to preventing further release of the substance into the impoundment.
- B. The Contractor will be responsible for all time, materials, and costs associated with clean-up, environmental testing, and remedial action required from a release or spill of chemical into the impoundment at no additional cost to the Owner.
- C. RIDEM Office of Emergency Response must be notified immediately in the event of a spill.

James Ball – Emergency Response Coordinator. 235 Promenade Street, Providence RI 02908.  
Contact Number - (401) 537-4533

3.08 DEBRIS AND CLEANUP

- A. Keep all premises free at all times from accumulation of waste materials and rubbish.
  - 1. Immediately after unpacking, remove and dispose of all packing materials, case lumber, excelsior, wrapping, or other rubbish from site.

- B. Provide trash receptacles about site, and empty containers daily.
- C. Neatly stack construction materials, such as concrete forms and scaffolding, when not in use.
- D. Promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solution from surfaces to prevent marring or other damage to satisfaction of Engineer and/or Owner.
- E. Ensure that wastes are not buried or burned on site or disposed into storm drains, sanitary sewers, streams, or waterways.
  - 1. Remove all wastes from site and dispose in a manner complying with local ordinances and antipollution laws.
  - 2. Store volatile wastes in covered metal containers and remove daily.
- F. Cleanup as determined by Engineer will be a condition for recommendation of progress payment application.
  - 1. Contractor shall have full responsibility for cleaning up during and immediately upon completion of work. Remove all rubbish, waste, tools, equipment, and appurtenances caused by and used in execution of work, leaving site clean, free of debris and in condition acceptable to Owner.
  - 2. Equipment or material shall not be left within any work area after acceptance of Contract without written permission of Owner. Do not abandon any material at or near site regardless of its value.

### 3.09 PUBLIC SAFETY

- A. Prior to the start of the Work, Owner will post signage indicating to the public that the Roger Wheeler State Beach within the limits of construction will be closed for construction for the duration of the project.
- B. At all times until final acceptance of Work by Owner, the Contractor shall protect Work and shall take all precautions of preventing injuries to persons or damage to property on or about site.
- C. Contractor shall comply with all applicable laws, ordinances, rules, and regulations regarding safety of persons or property or with regard to protecting them from damage, injury, or loss and shall not load or permit any part of work to be placed so as to endanger safety of work.
- D. If Contractor constructs temporary bridges or provides temporary crossing of streams, Contractor's responsibility for accidents shall include roadway and sidewalk approaches as well as structure of such crossings.
- E. Conduct work such that abutters shall have reasonable access to their property. Contractor shall be responsible for providing such reasonable safe means of access to public way as Engineer deems essential. When it is necessary to leave materials and equipment upon highway or city or town way, place them so as to cause least possible obstruction to drainage, pedestrian, and other travel.

### 3.10 REMOVAL OF TEMPORARY CONTROLS

- A. Completely remove temporary materials and equipment when their use is no longer required.



- B. Upon completion of work of all trades and before final acceptance of entire project, each trade shall remove, at it's own expense, all wiring, appurtenances and accessories used in performance of its respective work
- C. Temporary sheds, utilities, barricades, signs, and other appurtenances related to prosecution of the work and not incorporated in the permanent construction shall be completely removed from the site prior to acceptance of work by Owner.

**END OF SECTION**

**SECTION 01600**

**MATERIALS AND EQUIPMENT**

**PART 1.00 GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. Material and Equipment Incorporated into the Work:
  - 1. Conform to applicable specifications and standards.
  - 2. Comply with size, make, type and quality specified, or as specifically reviewed by the Engineer.
- B. Manufactured and Fabricated Products:
  - 1. Design, fabricate and assemble in accordance with the best engineering and shop practices.
  - 2. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
  - 3. Two or more items of the same kind shall be identical, by the same manufacturer.
  - 4. Products shall be suitable for service conditions.
- C. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically reviewed by Engineer.
- D. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

**1.02 MANUFACTURER'S INSTRUCTIONS**

- A. When the Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, as specified in Section 01340, SUBMITTALS.
- B. Maintain one set of complete instructions at the job site during installation and until completion.
- C. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.
- D. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
- E. Do not proceed with work without clear instructions.
- F. Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by the Contract Documents.

**1.03 TRANSPORTATION AND HANDLING**

- A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site and also when two or more trades, Contractors, or suppliers are involved.
- B. Transport all materials and equipment on legally approved conveyances as required or recommended by the respective manufacturer or supplier.

- C. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
- D. Receive and handle all materials and equipment, at the project site, by conveyances or methods as recommended by the respective manufacturer or supplier to prevent damage to products.
- E. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and reviewed submittals, and that products are properly protected and undamaged.
- F. Remove from the site any material or item of equipment damaged during the transportation or handling process, and immediately replace at no additional cost to the Owner.

1.04 STORAGE AND PROTECTION

- A. Store products in accordance with the manufacturer's instructions, with seals and labels intact and legible.
- B. Store products subject to damage by the elements in weather tight enclosures.
- C. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- D. Maintain all storage areas in a clean and orderly condition at all times.
- E. Store calibrated products in such a manner as to not alter the calibrated settings.

1.05 EXTERIOR STORAGE

- A. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products, which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
- B. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.
- D. Replace any material or item of equipment damaged, due to inadequate storage protection, and immediately replace it at no additional cost to the Owner.

1.06 PROTECTION AFTER INSTALLATION

- A. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.07 CERTIFICATES OF CONFORMANCE AND MANUFACTURE

- A. In addition to other requirements specified herein, the Contractor shall furnish to the Engineer, as specified in Section 01340, SUBMITTALS, notarized certificates of conformance and manufacture that all materials and/or equipment to be furnished under this contract meet the specification requirements. When directed, each shipment of material shall be accompanied by the manufacturer's notarized certificates of conformance and manufacture. Unless otherwise

specifically specified, all testing of materials shall be provided by the Contractor at no additional expense to the Owner.

- B. Each manufacturer's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer will be the material incorporated in the work.

**PART 2.00 PRODUCTS**

Not Used

**PART 3.00 EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01700**

**CONTRACT CLOSEOUT**

**PART 1.00 GENERAL**

1.01 REQUIREMENTS INCLUDED

- A. Comply with requirements stated in the conditions of the contract and in specifications for administrative procedure in closing out the work.

1.02 SUBSTANTIAL COMPLETION

- A. When Contractor considers the work is substantially complete, he shall submit to Owner.
  - 1. A written notice that the work, or designated portion thereof, is substantially complete.
  - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, Owner will review the work to determine the status of completion.
- C. Should Owner determine that the work is not substantially complete:
  - 1. Owner will promptly notify the Contractor in writing, giving the reasons therefore.
  - 2. Contractor shall remedy the deficiencies in the work, and send out another written notice of substantial completion to the Owner.
  - 3. Owner will again review the work.
- D. When Owner concurs that the work is substantially complete, he will:
  - 1. Prepare a certificate of substantial completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Owner.
  - 2. Submit the certificate to Contractor and manufacturer for their written acceptance of the responsibilities assigned to them in the certificate.

1.03 FINAL REVIEW

- A. When Contractor considers the work is complete, he shall submit written certification that:
  - 1. Contract documents have been reviewed.
  - 2. Work has been inspected for compliance with Contract Documents.
  - 3. Work has been completed in accordance with Contract Documents.
  - 4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
  - 5. Work is completed and ready for final review.
- B. Owner will make final review to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should Owner consider that the work is incomplete or defective:

1. Owner will promptly notify the Contractor in writing, listing the incomplete or defective work.
  2. Contractor shall take immediate steps to remedy the stated deficiencies, and send out another written certification to Owner that the Work is complete.
  3. Owner will again review the Work.
- D. When the Owner finds that the Work is acceptable under the Contract Documents and that all punch list items have been accomplished to his satisfaction, he shall request the Contractor to make closeout submittals.

1.04 FEES FOR ADDITIONAL REVIEWS

- A. Should Owner or Owner's Representative perform additional reviews due to failure of the Work to comply with the claims of status of completion made by the Contractor:
1. Owner or Owner's Representative will be compensated for such additional services.
  2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER

- A. Operating and Maintenance Data:
1. Instruct the Owner's personnel with regard to equipment, systems and operating specialties which are installed as part of this project.
  2. Submit brochures indicating operating instructions and maintenance schedules for all equipment, systems, operating devices and specialties, as specified in Section 01340, SUBMITTALS.
  3. Submit detailed maintenance methods and schedules for all materials and equipment provided in this project, as specified in Section 01340, SUBMITTALS.
- B. Warranties, Guarantees, and Bonds:
1. In addition to the Warranty and Guarantee Requirements of the General Conditions, provide all other guarantees, bonds, affidavits and certifications required throughout the specifications.
- C. Spare parts and maintenance materials for Owner.
- D. Contractor's affidavit of payment of debts and claims.
- E. Contractor's affidavit of release of liens.
- F. Consent of surety to final payment.
- G. Certificate of insurance for products and completed operations.
- H. Project Record Drawings – (see Section 01720)
1. Inclusive of red-lined markups and surveyed as-builts of final grades and site features.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to Owner.
- B. Statement shall reflect all adjustments to the contract sum:
  - 1. The original contract sum.
  - 2. Additions and deductions resulting from:
    - a. Previous change orders.
    - b. Allowances.
    - c. Unit prices.
    - d. Deductions for uncorrected work.
    - e. Deductions for liquidated damages.
    - f. Deductions for re-inspection payments.
    - g. Other adjustments.
  - 3. Total contract sum, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.
- C. Owner will prepare a final change order reflecting approved adjustments to the contract sum which were not previously made by change orders.

1.07 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final application for payment in accordance with procedures and requirements stated in the General Conditions.

**PART 2.00 PRODUCTS**

Not Used

**PART 3.00 EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01720**

**PROJECT RECORD DOCUMENTS**

**PART 1.00 GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. Maintain at the site for the Owner one record copy of
  - 1. Drawings
  - 2. Specifications
  - 3. Addenda
  - 4. Change orders and other modifications to the contract
  - 5. Engineer field orders or written instructions
  - 6. Reviewed shop drawings, product data and samples
  - 7. Field test records
- B. The Contractor will be required to furnish, at no additional expense to the Owner, the services of a surveyor and/or Engineer registered in the state where the project is located and under whose direction shall be obtained and recorded all surveys, measurements and such other data required for the determination of the as-built records of the construction of all site work.

**1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
- B. Provide locked file cabinet for storage of documents.
- C. Provide locked cabinet space for storage of samples.
- D. File documents and samples in accordance with CSI/CSC format.
- E. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- F. Make documents and samples available at all times for inspection by Engineer and Owner.

**1.03 MARKING DEVICES**

- A. Provide felt tip marking pens for recording information in the color code designated by Engineer.

**1.04 RECORDING**

- A. Label each document "Project Record" in neat large printed letters.
- B. Record information concurrently with construction progress.
- C. Do not conceal any work until required information is recorded.



- D. Drawings: Principal dimensions, elevations and other data, as required, shall be recorded for all work, such as:
  - 1. Deviations of any nature made during construction.
  - 2. Location of underground utilities.
  - 3. Field changes of dimension and detail.
  - 4. Changes made by field order or by change order.
  - 5. Details not on original contract drawings.
- E. The marked-up prints shall be inspected weekly by the Engineer and shall be corrected immediately if found either inaccurate or incomplete.
- F. Specifications and Addenda: Legibly mark each section to record:
  - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - 2. Changes made by field order or by change order shall reference the appropriate order on the drawings.

1.05 FINAL MEASUREMENTS

- A. The Contractor shall provide qualified personnel and equipment for taking final measurements for quantities and record documents.
- B. During and at the completion of the project the Contractor shall complete as-built surveys to accurately and precisely document the completed work within the project LOD:
  - 1. Elevations of inverts of structures, gates, walls, pipes, and instrumentation shall be measured to within 0.01 foot.
  - 2. Ground surfaces shall be surveyed to create a grade map with 1-foot contours with intermittent spot grades.

1.06 RECORD DRAWINGS

- A. At the completion of the project, the record prints shall be submitted to the Engineer for final review and comment.
- B. The Contractor shall correct, amplify and do all other work as may be required by the Engineer to complete the drawings in a manner satisfactory to the Engineer and at no additional cost to the Owner.
- C. Upon approval, the Contractor shall provide two (2) full size copies of the final record drawing set and one (1) in PDF or electronic format to the Engineer. The final record set shall be submitted to the Owner by the Engineer.

1.07 SUBMITTAL

- A. Close out submittal shall consist of the following:
  - 1. A cover sheet indicating:
    - a. Project Title
    - b. Owner's name and address
    - c. Contractor's name and address

- d. Date of substantial completion
  - e. Date of final completion
  - f. Contents of submittal package
  2. Final project submittals (submittals marked “rejected” or “revise and resubmit” need not be included)
  3. Project RFI’s
  4. Project record documents (redlined drawings)
  5. Electronic copy of close-out survey data
- B. At contract close-out, deliver record documents to Engineer for the Owner.
- C. Accompany submittal with transmittal letter in duplicate, containing:
1. Date
  2. Project title and number
  3. Contractor's name and address
  4. Title and number of each record document
  5. Signature of Contractor or his authorized representative

**PART 2.00 PRODUCTS**

Not Used

**PART 3.00 EXECUTION**

Not Used

**END OF SECTION**

**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**DIVISION 2  
SITE WORK**

## SECTION 02050

### DEMOLITION AND REMOVAL

#### PART 1.00 - GENERAL

##### 1.01 WORK INCLUDED

- A. This section covers the work associated with but not limited to:
1. The removal and offsite disposal of trees, stumps, and vegetation within removal areas.
  2. The removal and offsite disposal of the existing concrete structures.
  3. The removal and offsite disposal of miscellaneous concrete debris.
  4. The removal and offsite disposal of unsuitable excavation spoils.
  5. The removal and offsite disposal of all unsuitable material encountered during excavation operations.
  6. The removal and stockpiling of all suitable materials encountered during excavation operations.

The work shall be executed to the lines and grades shown on the Contract Documents and described in the specifications.

##### 1.02 SUBMITTALS

- A. The Contractor shall submit to the Owner and Engineer a schedule of removal and disposal.
- B. Contractor shall submit disposal site certification and haul roads for all disposal.

#### PART 2.00 - PRODUCTS

##### 2.01 GENERAL

- A. The Contractor shall provide all materials and equipment in suitable and adequate quantity as required to accomplish the Work shown and specified.

#### PART 3.00 - EXECUTION

##### 3.01 GENERAL

- A. Demolition approaches shall employ low vibration methodologies that limits disturbance to adjacent structure(s) to remain. Vibrations are not to exceed 2 in/sec.
- B. No blasting will be permitted.

##### 3.02 EXISTING TREES, STUMPS, AND VEGETATION

- A. See Section 02110.

##### 3.03 CONCRETE STRUCTURES MARKED FOR DEMOLITION

- A. Provide saw cut transitions where concrete structures designated to remain contact the limits of removal.
- B. Sections of the stone masonry or concrete walls damaged by the Contractor that are not scheduled for abandonment or removal shall be replaced by the Contractor at no additional cost. This includes

excavation and dewatering required to remove or replace damaged sections.

3.04 CONCRETE, MASONRY, AND STONE DEBRIS

- A. Remove and dispose of miscellaneous stone material removed to facilitate grubbing and other work items requiring masonry demolition.
- B. Stone removed should be stockpiled for reuse elsewhere on-site prior to be removed from the site, including in reconstruction of stone walls partially demolished during construction and for facing of the void filling within the downstream wall left of the primary spillway.

3.05 REMOVE AND STOCKPILE LOAM BORROW

- A. Remove and stockpile loam borrow for later reuse.
- B. Material stockpiled for reuse is subject to testing in accordance with Section 01400.

3.06 REMOVE AND DISPOSAL OF UNSUITABLE EXCAVATION SPOILS

- A. Where deemed possible by the Engineer, excavated soils shall be reused on-site prior to offsite disposal.
- B. Unsuitable excavation spoils shall be disposed of in accordance with all Local, State, and Federal Laws.

3.07 REMOVE AND DISPOSE UNSUITABLE ON-SITE MATERIALS

- A. Remove and dispose of off-site, on-site earthen fill, loam, and stone materials deemed unacceptable for reuse.

3.08 REMOVE AND STOCKPILE ON-SITE MATERIALS

- A. Remove and stockpile on-site earthen fill from the right embankment for later reuse.
- B. Materials shall be segregated by material type so as to not be mixed or require further segregation.
- C. The suitability of the existing material for later reuse shall be determined by the Engineer or Owner. No material shall be disposed of offsite without the approval of the Engineer or Owner. Suitable soil material shall be used for backfilling or regrading operations or any other use as determined by the Engineer or Owner. All suitable soil material that is temporarily stockpiled on-site shall be protected from adverse weather conditions until the time of installation.

3.09 DISPOSAL

- A. No burning of combustible materials will be permitted. Remove all demolition materials from the work site and dispose of in accordance with all Federal, State, and local codes, regulations, and ordinances.

3.10 PROTECTION OF EXISTING UTILITIES

- A. Protect existing site improvements from damage during construction.
- B. Restore damaged improvements to their original condition, as acceptable to the Engineer.
- C. All areas disturbed through the removal and disposal of existing utilities and site improvements outside the limits of final grading shall be loamed and seeded or paved to match or exceed existing conditions.

- D. The Contractor shall protect existing utility poles, guy wires, overhead wires, and other electrical or communications elements within and adjacent to the property that may be affected by construction activities.
- E. Any damage to these utilities or structures resulting from the construction operation shall be repaired to meet or exceed the existing condition at the Contractor's expense.
- F. Any losses to the property or any other utility company resulting from the interruption of service from construction, both directly or indirectly, shall be the responsibility of the Contractor, and shall result in no additional cost to the Owner.
- G. The Contractor shall make every effort to protect existing utilities including electrical and communications conduits and structures during construction. Any damage to utilities designated to remain shall be repaired immediately at the Contractor's expense.

**END OF SECTION**

**SECTION 02110**

**CLEARING, GRUBBING, AND STRIPPING**

**PART 1.00 GENERAL**

1.01 WORK INCLUDED

- A. This section covers the work necessary to cut and clear and clear and grub the work area and other areas as specified; to the limits indicated on the drawings; and strip the topsoil and/or organic material from all areas to be filled or graded as shown on the Drawings, including areas of woody and brush growth within riprap areas, or otherwise designated in the Specifications.
- B. This work shall also include the preservation from injury or defacement of all vegetation, and existing objects designated to remain, as shown, specified herein, or beyond the limits of work indicated.
- C. The Contractor shall stake the limits of clearing, grubbing, and stripping. The Engineer shall review the location, limits, and methods to be used prior to commencing the work under this section.

**PART 2.00 PRODUCTS**

2.01 GENERAL

- A. The Contractor shall provide all materials and equipment in suitable and adequate quantity as required to accomplish the work shown, specified herein, and as required to complete the project.

**PART 3.00 EXECUTION**

3.01 CLEARING

- A. Definition: Clearing shall consist of cutting, removing, and disposing of trees, snags, stumps, shrubs, brush, limbs, and other vegetative growth, and shall be performed in such a manner as to remove all evidence of their presence from the surface and shall be inclusive of sticks and branches greater than 0.5 inches in diameter or thickness. Clearing shall also include the removal and disposal of trash piles, rubbish, and fencing; and the preservation of trees, shrubs, and vegetative growth, which are designated to remain.
- B. Cutting Timber: In the cutting of timber growth, cuts shall be made such that all trees are felled into the area to be cleared. Exercise care when clearing near the clearing limits so as not to damage existing trees, vegetation, structures, or utilities which are outside of the clearing limits. Flush cut all stumps not designated for grubbing by cutting to within 3 inches of the ground surface.

3.02 PRESERVATION OF TREES, SHRUBS, AND OTHER VEGETATION

- A. Protect trees, shrubbery, and other vegetation not designated for removal from damage resulting from the Work. Cut and remove tree branches only where such cutting is necessary to

allow for construction operation as approved by the Engineer and/or Owner. Remove branches other than those required to complete the Work to provide a balanced appearance of any tree, as approved prior to removal. All pruning performed shall be in accordance with the latest version of the International Society of Arboriculture standards.

3.03 GRUBBING

- A. Definition: Grubbing shall consist of the removal and disposal of wood or root matter below the ground surface remaining after clearing and shall include stumps, trunks, roots, or root systems greater than 1/2 inch in diameter or thickness.
- B. Pulling on trunks or branches to remove root systems is not an acceptable means of grubbing as it creates a loose pocket of material of which the extents are unknown. Grubbing of root systems shall consist of excavation of root systems. Followed by backfilling with compacted lifts of the excavated materials after organic matter has been removed.
- C. Areas requiring clearing and grubbing are shown on the Drawings and specified herein.

3.04 CLEARING AND GRUBBING FOR TRENCHING

- A. Complete clearing and grubbing prior to the start of trenching. Get Engineer's approval before beginning trenching. Do not permit excavated trench materials to cover brush or trees prior to their removal and disposal.

3.05 DISPOSAL OF CLEARING AND GRUBBING DEBRIS

- A. Material shall be promptly removed from the site and disposed of in accordance with all local laws, codes, and ordinances. The Contractor shall bear full responsibility for lawful and safe disposal of all cleared and grubbed material.

3.06 STRIPPING

- A. Definition: Stripping shall include the removal of all organic sod, loam borrow, grass and grass roots, remaining after clearing and grubbing.
- B. Disposal of Stripping: Loam borrow from stripping operations which meets the requirements specified in Section 02200 EARTHWORK shall be stockpiled and protected for later use. All other material will be disposed of offsite at the Contractor's expense.
- C. Stockpiled loam shall be approved by the Engineer and/or Owner prior to reuse, including an agreed upon quantity for reuse.

**END OF SECTION**



**SECTION 02130**

**CELLULAR CONCRETE**

**PART 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. The work under this section includes providing and installing lightweight cellular concrete as required to completely fill the water mains noted to be abandoned.

**1.02 REFERENCES**

- A. ACI 523.1, Guide for Cast-in-Place Low Density Cellular Concrete
- B. ASTM C495, Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
- C. ASTM C869, Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete
- D. ASTM C796, Standard Test Method for Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam
- E. ASTM C989 Standard Specification for Slag Cement for Use in Concrete and Mortars
- F. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

**1.03 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 02626 – C909 PVC Water Mains
- B. Section 02630 – Asbestos Cement Pipe Removal

**1.04 QUALITY ASSURANCE**

- A. The approved Geofill LD installer producing and placing Geofill LD shall have a record of experience in excess of 20 similar applications with compressive strength reports that prove the quality of work has been achieved in these applications. The installer must be capable of developing a mix design, batching, mixing, handling, and placing pervious and non-pervious cellular concrete. The installer shall be certified by the manufacturer of the foaming agent and regularly engaged in the production and placement of cellular concrete. The installer shall have produced a minimum of 15,000 cubic yards of cellular concrete within the last calendar year. The installer shall have produced a minimum of 75,000 cubic yards of cellular concrete within the last five calendar years in similar cellular concrete applications. The installer shall have fully qualified workers who are thoroughly trained and experienced in the production, placement and quality control of cellular concrete. Documentation verifying cellular concrete installer qualifications and training will be required as part of the submittal for approval. A letter from the foam manufacturer certifying and qualifying cellular concrete installer shall be submitted with the bid.

**1.05 CONFORMANCE**

- A. Cellular concrete supplier must be able to provide independent, third-party testing from a similar

mix design as that proposed for the project, confirming the proposed cellular concrete meets the following:

1. ASTM C495 as modified by ASTM C796, Standard Test Method for Compressive Strength of Lightweight Insulating Concrete – Minimum compressive strength testing at 28 days.

#### 1.06 QUALITY CONTROL AND REPORTING

- A. The cellular concrete supplier must have documented quality control (QC) procedures that include processes for training and certification of QC personnel. The cellular concrete supplier must provide a dedicated onsite QC representative that is certified according to the above-noted process.
- B. Within 60 days of project completion, test results shall be provided to the project engineer. These shall include the measured cast densities of cylinders, cast dates, location of samples, compressive strengths at 28 days or 56 days, respectively.

#### 1.07 SUBMITTALS

- A. Qualifications of the proposed subcontractor.
- B. Cellular Concrete Mix Design and equipment proposed.
- C. Layout of venting points along the water main to be filled and abandoned.
- D. Refer to Section 01340 - Submittals.

### **PART 2.00 PRODUCTS**

#### 2.01 EQUIPMENT

- A. The specialized batching, mixing, and placing equipment shall be automated and certified for the purpose by the manufacturer of the cellular concrete material.
- B. Dry-mix equipment must be able to receive bulk cement installed with a dust suppression system. The dry-mix unit must be capable of producing over 100 cubic yards per hour on-site, continuously, from one piece of equipment, and pump through hoses or pipes up to a flat lineal distance of at least 500 feet. Bulk cement weight measurements shall be determined by onboard instrumentation that operates within a tolerance of one and one-half percent (1.5%) per batch.
- C. Wet-mix production units manufacture cellular concrete utilizing slurry supplied from a ready-mix plant that has the required dust suppression system to create the slurry. Wet-mix equipment must be able to receive slurry on-site into the equipment and process it continuously during ready-mix supply, and pump through hoses or pipes up to a flat lineal distance of 200 feet. Each unit must be capable of producing a minimum of 50 cubic yards per hour.
- D. Cellular concrete must be pumped by a positive displacement pump or a progressive cavity pump only. A foam generator shall be used to continuously produce pre-formed foam, which shall be injected and mixed with the cementitious slurry downstream of the positive displacement slurry pump. The equipment shall be calibrated to produce a precise and predictable volumetric rate of foam with stable uniform microbubbles. Volumetric mixers may only be utilized if approved by the cellular concrete installer, the manufacturer of the foaming agent, and the engineer.
- E. Mixing the material utilizing bagged cement is not permitted unless approved by engineer.

2.02 MATERIALS AND TESTING

- A. A slurry of Portland Cement, supplementary cementing materials, and water is introduced with a foaming agent and air to create closed-cell cellular concrete with minimal shrinkage.
- B. Cellular concrete shall be GEOFILL LD or PROVOTON or CF-1 lightweight engineered fill with a minimum unconfined compressive strength at 28 days of 100 psi and wet cast density of 36 pcf maximum.
- C. Compressive strength shall be suitable for use within the RIDOT roadway.
- D. Cellular concrete supplier must be capable of incorporating supplementary cementing materials into their mix designs. Blast furnace slag, if utilized, shall conform to ASTM C989. Fly ash, if utilized, must conform to ASTM C618. If fly ash is utilized in the mix, it shall have a minimum unconfined compressive strength at 56 days of 100 psi and wet cast density of 36 pcf maximum.
- E. Portland cement shall be Type I/II for normal placement. Type III cement may be utilized for cold weather placement. Type IV or V may be utilized for specialty applications. Consult with the Geofill installer for specialty applications.
- F. Mixing water shall be potable. Water of questionable quality shall not be used unless proven to produce specimens whose 28-day compressive strength is at least 90 % of those made with known acceptable water and an identical material mix.

**GEOFILL PROPERTIES:**

<b>TABLE A - GEOFILL PROPERTIES</b>						
<b>PROPERTY</b>	<b>CLASS I</b>	<b>CLASS II</b>	<b>CLASS III</b>	<b>CLASS IV</b>	<b>CLASS V</b>	<b>CLASS VI</b>
<b>CAST DENSITY</b>	24 pcf	30 pcf	36	42	55	75
<b>(MAXIMUM)</b>	(384 kg/m3)	(481 kg/m3)	(577 kg/m3)	(673 kg/m3)	(881 kg/m3)	(1201 kg/m3)
<b>RANGE</b>	18 - 24 PCF	24 - 30 PCF	30 - 36 PCF	36 - 42 PCF	42 - 55 PCF	55 - 75 PCF
<b>COMPRESSIVE STRENGTH</b>	20 psi	40 psi	100 psi	160 psi	200 psi	300 psi
<b>(MINIMUM AT 28 DAYS)</b>	(0.14 mPa)	(0.28 mPa)	(0.69 mPa)	(1.10 mPa)	(1.38 mPa)	(2.07 mPa)

- G. Foaming agents shall conform to the requirements of ASTM C 869 when tested in accordance with the provisions of ASTM C 796. Only GEOFILL LD, PROVOTON or CF-1 approved foaming agents shall be used. The Cellular Concrete installer shall be pre-qualified and approved in writing by the foaming agent manufacturer, referencing this Project.
  - I. Foaming Agents/Manufacturers may be:
    - a. Geofill LD – <http://www.geofill.com>  
Contact – 708-514-6284 – Stephen Rachford
    - b. Provoton - <http://www.provoton.com/>  
Contact – 630-917-2376– Steve Lavallee
    - c. CF-1  
Contact – 403-312-7505 - Doug Lavis
- H. The fresh cellular concrete density shall be measured and recorded once per production run, or once for every 300 cubic yards, or once per every four hours, whichever is more frequent. The

density shall be maintained within +/- 3 pcf of the design density.

- I. Cellular concrete samples must be captured, cured, and tested to verify the compressive strength requirement is satisfied. One sample is comprised of one set of four cellular concrete cylinders. One sample should be taken for each placement, or every 300cy, whichever is more frequent. Cylinders are cast in 3 inch by 6 inch cylindrical plastic molds or Styrofoam molds. The sample plastic mold must be lined with "freezer paper" with the paper side against the cellular concrete. Cellular concrete cylinders shall be cured and tested as per ASTM C495, modified to represent the field curing conditions for geotechnical applications.

### **PART 3.00 EXECUTION**

#### **3.01 PREPARATION**

- A. For pipeline abandonment and annular space fill applications, injection and vent tubes may be utilized. Down holes or vertical casings may also be used for injection and vent points. These pipelines and annuli must be dewatered before introducing cellular concrete into the void space. If water is still present during installation, a volume variance may occur.
- B. Injection points and vent points shall be located outside of pavement which is not expected to be disturbed during this project.

#### **3.02 INSTALLATION**

- A. Where required, formwork should be designed and installed to withhold cellular concrete and may require lining with poly sheeting or similar impermeable membrane to prevent leakage.
- B. Cellular concrete may be placed during freezing conditions, provided measures are taken to prevent damage to the cellular concrete until sufficient strength has been attained. Care should be taken to avoid freezing before initial set. Cellular concrete must not be placed during heavy or prolonged precipitation.
- C. Once mixed, the cellular concrete shall be conveyed promptly to the location of placement without excessive handling.
- D. The concrete shall be installed so as to produce no voids within the pipe.

**END OF SECTION**

**SECTION 02200**

**EARTHWORK**

**PART 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. This section covers the work necessary for:
  - 1. Excavation to subgrade, preparation of the subgrade, and backfilling for site improvements.
  - 2. Compaction requirements for backfilling.
  - 3. Material requirements for soils.
  - 4. Ancillary activities requiring excavation and backfilling.
- B. All excavation is unclassified.

**1.02 DEFINITIONS**

- A. Boulder: A stone particle with a minimum dimension of 36 inches.
- B. Completed Course: A course or layer that is ready for the next layer or next phase of the work.
- C. Excavation: Removal of material encountered above elevations and to lines and dimensions indicated on the drawings.
  - 1. Additional Excavation: Excavation below subgrade elevations or beyond the indicated lines and dimensions as directed by the Engineer or Owner.
  - 2. Bulk Excavation: Excavation more than 6 feet in width and more than 10 feet in length.
  - 3. Trench Excavation: Excavation 6 feet in width or less for the installation of utilities and footings.
  - 4. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.
  - 5. Unclassified Excavation: The nature of materials to be encountered has not been identified or described herein.
- D. Fill: Soil materials used to raise existing grades.
- E. Frost Zone: The area within 4 feet of finished grade.
- F. Influence Area: The area within planes sloped downward and outward at an angle of 60 degrees from the horizontal from (a) 1 foot outside the outermost edge at the base of foundations or slabs; or (b) 1 foot outside the outermost edge at the surface of roadways or shoulder; or (c) 0.5 foot outside the exterior edge at the spring line of pipes and culverts.
- G. Imported Material: Material obtained by the Contractor from sources off the site.
- H. "In-the-dry": In-situ soil moisture content of no more than two percentage points above the optimum moisture content for that soil.
- I. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density for relative compaction.

- J. Prepared Ground Surface: The ground surface after clearing, grubbing, stripping, excavation, and scarification and/or compaction.
- K. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D1557 (i.e. the Modified Proctor Test). Corrections for oversize material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Engineer.
- L. Relative Density: As defined by ASTM D4253 or D4254.
- M. Soils Representative: The Geotechnical Engineer or a delegate of the Geotechnical Engineer that observes and records the construction of the subgrade, backfill, slabs, footings, utilities, pavements, and related items within the Contract Documents.
- N. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- O. Subbase Course: Course placed between the subgrade and base course for asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or asphalt walk.
- P. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- Q. Suitable Soil: Soil that has been approved by the Engineer for use in a designated area.
- R. Unsuitable Soils: Existing soils that, in the opinion of the Engineer and Owner's Representative, are unsuitable to remain in their existing location that are deposited outside the excavation limits such as mulch, peat, organic silt, topsoil, sod, ash, deleterious material, roots greater than ¼-inch in diameter, and/or particles greater than four inches in diameter, that are not satisfactory for use as determined by the Engineer or Owner.
  - 1. Anticipated unsuitable soils: Unsuitable soils identified in the drawings, specifications, test pit logs, or boring logs provided.
  - 2. Unanticipated unsuitable soils: Unsuitable soils not identified in either the geotechnical report, test pits, or boring logs provided as part of the project manual.
- S. Utilities: On-site underground pipes, conduits, ducts, and cables or overhead wires, as well as underground services within buildings.
- T. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

1.03 SITE INFORMATION

- A. Information regarding the location of surrounding structures, utilities, and the as-built configuration and condition of the existing site, structures, and adjacent areas is furnished solely for the convenience of the contractor and shall be field verified. The contractor shall conduct their own independent examination of site conditions for the purpose of bidding, fabrication,

and construction associated with the project. Any reliance upon information made available by RIDEM and/or the engineer shall be at the contractor's risk.

1.04 EXISTING UTILITIES

- A. Call, Call Before You Dig **1-800-922-4455** 72 hours before commencing with any excavation or drilling, in order that all pertinent utility companies become informed of such work.
- B. If active utilities existing on the site are encountered they shall be carefully protected from damage. When an active utility line is exposed during construction, its location and elevation shall be documented and both the Engineer and the utility Owner notified in writing.
- C. Active utility lines damaged in the course of construction operations shall be repaired or replaced as determined by the Engineer, without additional cost to the Owner.

1.05 USE OF EXPLOSIVES

- A. Use of explosives is prohibited.

1.06 SUBMITTALS

- A. Provide the following submittals:
  - 1. Certification, test results, source, and samples for all imported earth materials as outlined in Section 01400. Submit bag samples (40lbs minimum) of each type of fill material to be used for backfilling to the Engineer at least 10 working days in advance of its required use. Representative samples of excavated fill material which will be used for backfill shall also be submitted for testing.
  - 2. Support of excavation submittals
    - a. Details identifying the design, layout, and method of construction of any required support of excavation system, stamped by a Professional Engineer licensed by the State of Rhode Island.
    - b. Design calculations identifying each support of excavation system's ability to withstand all loads during all stages of the excavation and backfilling process.
    - c. Documentation certifying that each excavation support system that is constructed in the field remains, throughout its use, to be in compliance with the design of that specific system.
  - 3. Catalog and manufacturer's data sheets for compaction equipment.
  - 4. Copies of permits obtained for excavation that are required by state and local governing authorities.

1.07 IMPORTED MATERIAL ACCEPTANCE

- A. All imported earth materials specified in this section are subject to the following requirements:
  - 1. All tests necessary for the Contractor to locate acceptable sources of imported material shall be made by the Contractor. Certification that the material conforms to the Specification requirements along with copies of the test results from a qualified commercial testing laboratory shall be submitted to the Engineer for approval at least 21 calendar days before the material is required for use. All material samples shall be a minimum of 40 pounds and

furnished by the Contractor at the Contractor's sole expense. Samples shall be representative and be clearly marked to show the source of the material and the intended use on the project. Sampling of the material source shall be done by the Contractor in accordance with ASTM D75. Tentative acceptance of the material shall be based on an inspection of the source by the Engineer and/or the certified test results submitted by the Contractor to the Engineer at the Engineer's discretion. No imported materials shall be delivered to the site until the proposed source and materials tests have been tentatively accepted in writing by the Engineer. Final acceptance will be based on Quality Control and Quality Assurance tests made on samples of material taken from the completed and compacted course.

2. Gradation tests by the Contractor shall be made on samples taken at the place of production prior to shipment. Samples of the finished product for gradation testing shall be taken as specified in Section 01400, QUALITY CONTROL, or more often as directed by the Engineer if variation in gradation is occurring, or if the material appears to depart from the Specifications. Test results shall be forwarded to the Engineer within 48 hours of testing.
3. If tests conducted by the Contractor or the Engineer indicate that the material does not meet Specification requirements, material placement will be terminated until corrective measures are taken. Material that does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense. Retesting of material that does not meet specification requirements shall be performed at the Contractor's sole expense.

#### 1.08 SLOPING

- A. The Contractor shall design, furnish, install, and maintain sloping necessary to support the sides of excavations, maintain a stable excavation bottom, control groundwater, and to prevent any movement which may damage adjacent pavements, utilities, or structures, damage or delay the work, or endanger life and health. Furnish, install, and maintain excavating sloping as required by OSHA and other applicable governmental regulations and agencies. See Section 02250 for additional information about these systems.

#### 1.09 EXCAVATION SAFETY

- A. The Contractor shall be solely responsible for making all excavations in a safe manner. Provide appropriate measures to attain a stable base, retain excavation sideslopes and prevent earth slides to ensure that persons working in or near the excavation are protected.

#### 1.10 CODES, ORDINANCES, AND STATUS

- A. The Contractor shall familiarize itself with, and comply with, all applicable codes, ordinances, statues, and bear sole responsibility for the penalties imposed for noncompliance.

#### 1.11 TOLERANCES

- A. All material limits shall be constructed within a vertical tolerance of 0.1 foot and a horizontal tolerance of 1 foot except where dimensions or grades are shown or specified as minimum/maximum. All grading shall be performed to maintain slopes and drainage as shown. No reverse slopes will be permitted.



**PART 2.00 PRODUCTS**

**2.01 MATERIALS**

- A. Fill materials shall consist of hard, durable, sand and gravel and shall be free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter.
  - 1. Common Fill for use as buttressing material or general fill outside of the retaining wall bearing area shall be imported or reused material conforming to Type "1a" of Section M1.09.0 of the RIDOT Standard Specifications for Road and Bridge Construction. Common Fill for use as backfill below and against utilities shall be imported or reused material conforming to Type "1b" of Section M1.09.0 of the RIDOT Standard Specifications for Road and Bridge Construction. Common Fill shall be used as specified.
  - 2. Crushed gravel for bearing surface under retaining wall, drainage swale subgrades, and construction entrance/exit mats shall conform to Type II crushed gravel of Section M1.09.0 of the RI DOT Standard Specifications for Road and Bridge Construction.
  - 3. On-site materials may be used as specified products provided:
    - a. They meet the gradations of the specified material(s).
    - b. They shall be excavated on-site material free of roots, sod, rubbish or other deleterious or organic matter.
    - c. A geotechnical engineer is on-site to observe the excavation and stockpiling of the material.
    - d. The QA/QC rates are increased to two times as often as indicated in Section 01400.
    - e. The Owner/Owner's representative reserves the right to require additional testing of on-site materials prior to determination of suitability for reuse.
- B. Water for compaction shall be furnished by the Contractor. Water for compaction from sources other than potable sources shall be as approved by the Engineer.
  - 1. Prior to pumping water from the impoundment, the Contractor shall receive written permission from the Owner stating maximum allowable pumping rates and dates where usage of impounded waters are acceptable.
  - 2. Pumping of reservoir waters shall follow the requirements set forth in Section 02400.
- C. Geotextiles shall be nonwoven, needle punched pervious sheets of polyester, polyethylene, nylon, or polypropylene filaments formed into a uniform pattern. The geotextiles shall have the following minimum properties when measured in accordance with the referenced standards.

Test	Method	Type I
Grab Tensile Strength (lbs)	ASTM D4632	150-200
Elongation at Required Strength (%)	ASTM D4642	50
Trapezoidal Tear Strength (lbs)	ASTM D4533	50-60
CBR Puncture Strength (lbs)	ASTM D6241	>300
UV Resistance (after 500hrs)	ASTM D4355	70%

Test	Method	Type I
Apparent Opening Size (US Standard Sieve)	ASTM D4751	60-80
Permittivity (sec-1)	ASTM D4491	1.7
Flow Rate (2) (gal/min/sf)	ASTM D4491	120-140

**PART 3.00 EXECUTION**

**3.01 GENERAL**

- A. All Loam Borrow and unsuitable or excess materials shall be stripped from areas of new construction or regrading. Materials suitable for reuse shall be stored in approved locations that will not interfere with construction operations. Loam Borrow shall be stripped and stored before any underlying excavating is begun. Stripped Loam Borrow to be reused shall be free from clay, large stones and debris. All excess and unsuitable materials shall be legally disposed of off-site by the Contractor.
- B. Earth excavation is unclassified and shall include the excavation, removal and satisfactory disposal or reuse of all materials of whatever nature encountered from within the limits indicated or specified (other than rock ledge) or as directed in writing. It shall include, but not be limited to, earth materials such as peats, organic or inorganic silts, clay, sand and gravel, cobbles and boulders less than 3 cubic yards in volume, soft or disintegrated rock which, in the opinion of the Engineer, can be removed without hammering or drilling, pavement, and all obstructions not specifically included in another section.
- C. All excavations shall be backfilled as specified. All compacted fill shall be placed in layers. Each layer shall be systematically compacted by approved compaction equipment to the density specified herein.
- D. Compaction equipment in open areas shall consist of a vibratory drum roller with a minimum static weight of 10,000 lbs.
- E. Compaction equipment in confined area (in trenches and adjacent to walls) shall be accomplished by hand-operated vibratory compaction equipment.
- F. Material that is allowed to become saturated may be difficult to traverse, place, and compact. Care shall be taken to maintain the appropriate moisture content and prevent ground water, surface water, or precipitation from saturating stockpiled or placed material.
  - 1. Elastic-type deformation (pumping or weaving) may indicate there is excess moisture in the soil without adequate drainage time as the load is applied. Notify the Engineer of this condition.
  - 2. The contractor, at no cost to the Owner, may decide to stay off the area until the excess pore water pressure is dissipated naturally, or the material can be removed and replaced with dryer approved material.

3.02 WORK IN FREEZING WEATHER

- A. Protect excavation bottoms and sides against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.
- B. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment. Once compacted material should be protected from freezing. Material that freezes after compaction is subject to rejection, removal, and replacement at the discretion of the Owner/Engineer at no additional cost.
- C. The Contractor shall not place a layer of fill on top of snow, ice, or soil that was permitted to freeze.
  - 1. Removal of these unsatisfactory materials will be required as determined by the Owner/Engineer.
  - 2. Fill to be incorporated into the work shall not be permitted to freeze. "Breaking up" frozen soil will not be considered suitable for making frozen soils suitable for reuse.

3.03 STOCKPILE OPERATION

- A. Keep stockpiles and areas around them graded to drain and take all necessary precautions to minimize erosion including but not limited to the installation of baled hay. Maintain access roads as necessary at the Contractor's expense. Excavation at the stockpiles shall be limited to that depth which will permit the completed area to slope to drain to the surrounding area after completion of all work.
  - 1. The Contractor shall be responsible for protecting stockpiles of suitable material.
  - 2. Protect the stockpile so that the stockpiled material remains in a condition suitable for use in the project.
  - 3. Cover or otherwise protect the stockpiles to prevent saturation of the material from precipitation and to protect the material from the development of frost.
  - 4. Material lost through erosion or deemed unacceptable for reuse due to improper stockpiling shall be replaced by the Contractor at no additional cost to the Owner.
- B. Remove all stockpiles at the completion of the project. Grade the surrounding area at completion and finish the area as specified in Section 02220 EXCAVATION, BACKFILLING, and COMPACTION.

3.04 BACKFILL

- A. The Contractor shall inform the Engineer in writing a minimum of 48 hours prior to starting any backfill operation. The information shall include the location to be filled, the amount of fill to be placed, and the material to be placed.
- B. Prior to placing any backfill, remove all trash, debris, and/or any other unsuitable material from areas where backfill is to be placed. Do not place frozen backfill. Do not place backfill on frozen ground or in areas where standing water is present.
- C. Do not operate earth-moving or other heavy equipment within a distance that will cause damage to new or existing structures.

3.05 COMMON FILL

- A. Place and grade to match adjacent grades, using imported or reused Common Fill. Place material in 12-inch maximum loose lifts and compact each lift to not less than 95 percent relative compaction. Make proper allowances for Bedding for Riprap, Riprap, Loam Borrow, Filter Sand, and Common Fill. It is the contractor's responsibility, at no cost to the owner, to provide the means to maintain a stable subgrade prior to the placement of subsequent lifts or concrete.
- B. Common Fill shall be compacted to not less than 95 percent relative compaction.

3.06 GENERAL EXCAVATION

- A. All excavations shall progress under good practice and shall abide to all State and Federal regulations.
- B. The contractor shall provide the means necessary to dewater excavations so as to achieve a firm and stable subgrade upon reaching the bottom of the excavation.

3.07 TRENCH EXCAVATION

- A. Excavation: All obstructions, such as tree roots, stumps, and other material of any type shall be removed.
- B. Trench Width: Minimum width of unsheeted trenches or the minimum clear width of Sheeted trenches in which pipe is to be laid shall be 24 inches. Sheeting requirements shall be independent of trench width. The maximum clear width at the top of the pipe or above the pipe will not be limited, except in cases where excess width of excavation would cause damage to adjacent structures.
- C. After completion of excavation, and prior to backfill placement, compact the excavation surface with a heavy vibratory roller or other suitable equipment to detect soft or loose zones. Notify the Engineer prior to commencement of compacting. If soft or loose zones are found excavate the soft or loose material to a depth accepted by the Engineer, then fill with Common Fill as specified for such fill. The cost of such excavation shall be paid for under the appropriate unit price bid item.
- D. Trench excavations shall be backfilled utilizing material specified within the Construction Drawings.

3.08 MOISTURE CONTROL

- A. During the compacting operations, the moisture content of the material shall be within the range necessary to obtain the specified compaction, as determined by laboratory testing.
- B. Maintain moisture content throughout the lift. Insofar as practicable, add water to the material at the site of excavation. Supplement, if required, by sprinkling the material.
- C. Do not compact material that contains excessive moisture. Aerate material by blading, discing, harrowing, or as approved, to hasten the drying process.
- D. Stockpiled soils which are left uncovered on the site may become saturated due to rainfall or other precipitation events. The Contractor shall protect stockpiled material from becoming too

wet to achieve adequate compaction. Any soil which becomes too wet shall be dried or replaced by the Contractor at no additional cost to the Owner.

3.09 COMPACTION

- A. Place material in 12-inch maximum loose lifts and compact each lift to not less than 95 percent of the maximum dry density as determined by the Modified Proctor Test. Make proper allowances for Bedding for common fill.
- B. The Contractor shall make all necessary excavations and preparations for testing by the Owner. Excavations for density tests shall be backfilled with material similar to that excavated and compacted to the specified density by the Contractor. Failure of the backfill material to achieve the specified density will be just cause for rejection of any or all portions of the excavation section tested. The Contractor will not be granted an extension of time or additional compensation for testing or repair of backfill ordered by the Engineer.

3.10 PROOF COMPACTION

- A. Areas requiring excavation shall be excavated to subgrade and then proof rolled, this is inclusive of slopes requiring additional fill after stripping of loam and topsoil. Areas requiring filling shall be proof rolled in their existing condition prior to any filling.
- B. Proof rolling on horizontal surfaces shall be accomplished at least six passes with vibratory compaction equipment of the total area, three in each direction. Procedure for proof rolling of sloped surfaces shall be discussed with the Engineer prior to execution.
- C. If any unstable areas or areas indicating problem soils are discovered, these areas shall be removed and replaced with compacted granular fill.
- D. Proof rolling operations shall be completed in the presence of the Engineer.

**END OF SECTION**

**SECTION 02220**

**EXCAVATION, BACKFILL AND COMPACTION**

**PART 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. The Contractor shall provide all labor, equipment, materials, tools and accessories to complete the work in this section. This work includes, but is not necessarily limited to:
  - 1. Excavation and disposal
  - 2. Site filling and backfilling
  - 3. Reused or imported fill materials
  - 4. Compaction requirements

**1.02 SUBMITTALS**

- A. Submit 40 lb. sample of each type of fill to the Engineer, in air-tight containers, to establish reference densities.
- B. Submit shop drawings or product data for all materials and equipment required under this Section.

**1.03 REFERENCES**

- A. Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction (latest edition) - Division II, Section 100, 200, 300 and 700, Division III. Please visit <http://www.dot.ri.gov/business/bluebook.php> for the latest edition of the specifications.
- B. ANSI/ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates.
- C. ANSI/ASTM D1556 - Density of Soil in Place by the Sand Cone Method.
- D. ANSI/ASTM D1557 - Moisture-Density Relations of Soils and Soil-Aggregate Mixture Using 10 lb. (4.54 kg) Rammer and 18 inch (457 mm) Drop.

**1.04 UTILITIES AND PROTECTION**

- A. The Contractor shall locate and mark active underground utility lines before commencing work. Utility services to remain shall be protected from damage and shall be plotted on the Record Plans by the Contractor. Utilities which are not active shall be protected or properly removed as directed by the Engineer and the Owner. Existing utilities shall not be interrupted except when authorized in writing both by the Engineer and by authorities having jurisdiction.
- B. The location and size of the existing sewers, drains, culverts, water mains, gas mains, cables, service pipes, and other utilities shown on the Contract Drawings, were obtained from the results of surveys and existing records and are shown as approximate only, to guide the Contractor in the preparation of his bid. The drawings do not show the exact location and depth of all utilities, nor do they show all utilities or the number of lines for each utility that may encountered.

- C. All utilities interfered with or damaged shall be properly restored immediately, by the Contractor. The Contractor shall carefully bed, tamp and fully consolidate refill material around and under all existing utilities encountered or crossed unless otherwise shown on the Contract Drawings.
- D. Excavated areas shall be kept free from water, snow and ice during construction. Pumping operations shall be performed should surface rain, groundwater or tide be encountered during construction. Sheeting, shoring and trench boxes shall be of proper strength and shall be placed where necessary to prevent caving, erosion or gulying of excavation sites.
- E. The Contractor shall ensure that no excavation is left open, unguarded, or water filled during any period of time when work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations, and temporary surfacing within an area be accomplished expeditiously before proceeding to other work areas.

1.05 SHORING, SHEETING, BRACING, AND SLOPING

- A. The Contractor shall furnish, install, and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of excavations, maintain a stable excavation bottom, and to keep and to prevent any movement which may damage adjacent pavements, utilities, or structures, damage or delay the work, or endanger life and health. Furnish, install, and maintain shoring, sheeting, bracing, and sloping as required by OSHA and other applicable governmental regulations and agencies.

1.06 EXCAVATION SAFETY

- A. The Contractor shall be solely responsible for making all excavations in a safe manner. Provide appropriate measures to attain a stable base, retain excavation side slopes, and prevent earth slides to ensure that persons working in or near the excavation are protected.

1.07 CODES, ORDINANCES, AND STATUS

- A. The Contractor shall familiarize itself with, and comply with, all applicable codes, ordinances, statues, and bear sole responsibility for the penalties imposed for noncompliance.

**PART 2.00 PRODUCTS**

2.01 FILL MATERIALS

- A. Gravel backfill shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. Gradation requirements shall conform to the following:

(RI DOT Standard Specifications for Road and Bridge Construction 304.02, Coarse and Fine Aggregate Mix)

<u>U.S. Sieve No.</u>	<u>Percent Passing by Weight</u>
1 ½"	100
1"	70 - 100
¾"	50 - 85
⅜"	40 - 75
#4	30-55

#50	0-25
#200	0-8

Maximum size of stone shall be two inches (2") largest dimension.

- B. Crushed stone where shown on the plans shall consist of inert material that is hard, durable stone, free from loam, clay, surface coatings, and other deleterious materials. Gradation requirements shall conform to the following:

(RI DOT Standard Specifications for Road and Bridge Construction M.01.09, Crushed Stone)

<u>U.S. Sieve No.</u>	<u>Percent Passing by Weight</u>
2 1/4"	100
2"	90 - 100
1 1/2"	30 - 55
1 1/4"	0 - 25
1"	0 - 5

Maximum size of stone shall be three inches (3") largest dimension.

- C. Granular backfill shall be well graded, natural inorganic soil, approved by the Engineer and meeting the following requirements:
1. It shall be free of organic or other weak or compressible materials, of frozen materials, and of stones larger than three inches (3") maximum dimension.
    - a. It shall be of such nature and character that it can be compacted to the specified densities in a reasonable length of time.
    - b. It shall be free from highly plastic clays, from all materials subject to decay, decomposition, or dissolution and from cinders or other materials which will corrode piping or other metal.
    - c. It shall have a maximum dry density of not less than 95%.
    - d. Material from excavation on the site may be used as ordinary fill if it meets the above requirements and is approved by the Engineer.
    - e. This material shall have the physical characteristics of soils designated as group A-1 or A-3, under AASHTO M145. It shall have properties such that it may be readily spread and compacted.
- D. It is understood that the majority of existing fill, if suitable, will be re-used as granular backfill as approved by the Engineer, with minimal imported fill required. The Engineer and the Owner reserve the right to require additional testing of the excavated on-site material to determine suitability for reuse.

2.02 GEOTEXTILE FABRIC

- A. Geotextile fabric shall be non-woven Mirafi 140N or approved equal.
- B. Overlap fabric at least 24 inches.



**PART 3.00 EXECUTION**

**3.01 EXCAVATION**

- A. The Contractor shall excavate the existing soils or fill to the dimensions and elevations shown on the Contract Drawings, or as necessary to install the various components of the work.
- B. The Contractor shall separate excavated materials as suitable and unsuitable for backfill, as approved by the Engineer. It is understood that the majority of existing fill will be re-used as backfill, with minimal imported fill required. Unsuitable material shall be immediately removed from the site. All material removed from the site shall be disposed of legally. Suitable material taken from excavations shall be stockpiled for future backfilling within the staging areas as indicated on the Drawings or as specified by the Engineer.
- C. The Contractor shall maintain project benchmarks for horizontal and vertical control of excavations and backfilling.
- D. Suitable material for backfilling shall meet the requirements of the fill materials specified in these Contract Documents. Soils with significant fines content, organic material, miscellaneous fill or other objectionable material will not be allowed as backfill.
- E. Excavation for footings shall be made to the design elevation leaving a bottom of undisturbed earth, smooth, and free of loose materials.
- F. Excavated material shall not be deposited or piled so as to cause excessive settlement or endanger portions of any new or existing structures.
- G. Unsuitable soil or materials found during excavation shall be removed, as determined in the field by the Engineer. The Engineer shall be present during excavation of unsuitable soil or materials to verify the volume of material removed. Grades will be restored with approved fill as directed by the Engineer.
- H. The Contractor shall take appropriate measures to shore the walls of the excavation when necessary, particularly when made below water level. Excavations shall be in accordance with current OSHA standards.

**3.02 INSPECTION**

- A. The Contractor shall verify that stockpiled on-site material to be reused has been approved by the Engineer.
- B. Before backfilling, the Contractor shall verify that drainage and utility installation has been inspected.
- C. Prior to backfilling, the Contractor shall verify that areas to be backfilled are free of debris, snow, ice, or water, and that ground surfaces are not frozen.

**3.03 PREPARATION**

- A. When necessary, compact subgrade surfaces to density requirements for fill or backfill material.

- B. Cut out soft areas not readily capable of in situ compaction. Backfill with suitable on-site material or imported fill as required, and compact to density equal to requirements for subsequent backfill material.

#### 3.04 FILLING AND BACKFILLING

- A. Fill or backfill areas to the contours and elevations as shown on the Contract Drawings. Use unfrozen materials.
- B. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- C. Compact all materials by mechanical means. Employ a placement method so not to disturb or damage drainage pipes or utilities.
- D. Maximum thickness of loose lift to be twelve 12-inches unless approved by the Engineer.
- E. Maintain optimum moisture content (+/- 2%) of backfill materials to attain required compaction density.
- F. Backfill against headwalls simultaneously on each side to limit lateral loading. Hand operated equipment shall be required next to wall and footings.
- G. Make changes in grade gradual. Blend slopes into level areas.
- H. Place surplus backfill materials as approved by the Engineer. Leave stockpile areas completely free of excess fill materials.
- I. Do not place, spread, or roll any fill material during unfavorable weather conditions. Do not resume operations until moisture content and fill density are satisfactory to the Engineer.
- J. Where soil has been softened or eroded by flooding or placement during unfavorable weather, remove all damaged areas and recompact as specified for fill and compaction below, at no additional cost to the Owner.

#### 3.05 TOLERANCES

- A. Top Surface of Backfilling: Plus or minus one (1) inch.

#### 3.06 FIELD QUALITY CONTROL

- A. Compaction testing shall be performed in accordance with ANSI/ASTM D1557 and ANSI/ASTM D1556.
- B. Suitable on-site material or imported fill shall be compacted to 95% (minimum) of the Modified Proctor Test, ASTM D1557.

#### 3.07 CLEANUP

- A. At the end of all filling and grading operations and before acceptance of the work, the Contractor shall remove all debris, materials, rubbish, etc., from the site, disposing of them in a manner satisfactory to the Engineer. The premises shall be maintained clean, presentable and satisfactory.

3.08 WORK IN FREEZING WEATHER

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.
- B. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.
- C. The Contractor shall not place a layer of compacted fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Owner.

**END OF SECTION**

**SECTION 02250**

**EXCAVATION SUPPORT**

**PART 1.00 GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings, General Provisions of Contract, and Division 1 Specification Sections, apply to work of this section.

1.02 WORK INCLUDED

- A. The work covered in this section includes the design, installation, maintenance, and removal of engineered slopes, as necessary for the following:
  - 1. To comply with all applicable federal, state and local codes and regulations;
  - 2. To permit the proper installation and construction of the work;
  - 3. To prevent injury to persons or damage to pavements, utilities or structures;
  - 4. To prevent injurious caving or erosion, or loss of ground; or, where shown on the Drawings, necessary for unforeseen reasons, or where requested by the Engineer, all in accordance with the Drawings and Specifications and as directed.
  - 5. Control of water.
- B. The work covered in this section also covers pre-construction inspections and monitoring to compare the conditions of existing infrastructure before and after excavations.

1.03 RESPONSIBILITY

- A. Sloped excavations shall conform to all Local, State, and Federal regulations.
- B. The Contractor shall, at all times, be entirely responsible for the adequacy of sloped excavations used to permit the satisfactory and safe installation and construction of the work.
- C. The Contractor shall, at all times, provide adequate protection against damage to all existing utilities, structures and completed portions of the work, and shall prevent injury to persons.
- D. The Contractor shall determine the limits and final elevations to support construction and comply with the requirements within the Project Documents.

1.04 LIMITATIONS

- A. Timber shoring shall not be allowed where removal and proper compaction cannot be attained.

1.05 SUBMITTALS

- A. Pre-Construction Inspection
  - 1. In the event sloped excavations is needed the Contractor shall provide a pre-construction survey, inclusive of photos, videos, and descriptions of existing deficiencies sealed by a registered Professional Engineer licensed to practice in the State of Rhode Island when:

- a. At other times deemed appropriate by the Owner or Engineer.
  2. Results from additional monitoring requirements (in accordance with Part 3.04 of this Section) shall be submitted within 2 days of acquiring the results.
- B. Drawings:
1. At least fourteen (14) calendar days prior to the start of work under this section, submit for review by the Engineer:
    - a. Drawings
    - b. Sections
    - c. Details and other pertinent information regarding sloped excavations.
  2. The data shown shall include:
    - a. An overall time schedule for construction.
    - b. A description of the anticipated sequence of construction.
    - c. Complete details of the methods, equipment and materials proposed to be used at each work location.
    - d. Any other pertinent data required for review by the Engineer.
- C. Design Computations:
1. The Contractor shall also submit complete computations. The design shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics. It shall include the effects of all surcharge loads which may be reasonably anticipated.
  2. The minimum factor of safety for each proposed system shall be at least 1.50.
  3. All computations shall be made or sealed by a registered Professional Engineer licensed to practice in the State of Rhode Island. Computations shall bear the stamp of the Engineer.
- D. Submittal Review by Engineer:
1. The design and layout will be reviewed by the Engineer as to type and suitability, providing that the arrangements presented by the Contractor are satisfactory, but such review will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as a guarantee that the Contractor's proposed equipment, materials, and methods will be adequate for the work required at the locations of and for the work required by this contract.

**PART 2.00 PRODUCTS**

2.01 SUPPORTS

- A. Bracing and other supports whether of steel, timber, or other materials shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects, which might impair this strength.

2.02 OTHER SYSTEMS

- A. The sizes, shapes and configurations of other systems are at the Contractor's option and shall be of sufficient configuration necessary to withstand the loads to which it will be subjected.

2.03 MONITORING EQUIPMENT

- A. Monitoring equipment is not anticipated to be necessary for sloped excavations. If the Contractor will use other methods and material for excavation support (steel sheet piles, soldier pile and lagging, etc...), monitoring equipment will be necessary to monitor the condition of the existing beach pavilion during excavation operations.

**PART 3.00 EXECUTION**

3.01 GENERAL

- A. The Contractor shall take all precautions necessary to prevent lateral or inward movement of material along the sides or the bottoms of excavations.
  - 1. It is expressly understood and agreed that whenever sloped excavations are used, it shall not relieve the Contractor of the sole responsibility for any damages or injury due to the installation or failure of the sloped excavations, or the settlement of adjacent ground, structures, utilities or other work.

3.02 INSTALLATION

- A. Where sloped excavations are used they shall be installed ahead of other work activities.
  - 1. Install to maintain sufficient restraint of the adjacent soil and to prevent movement, excessive inflow of water, and intrusion of soils into or instability of the bottom of the excavations.

3.03 INSPECTION

- A. The Contractor shall provide inspection prior to and during its operations of all existing utilities, structures and other facilities, which might be disturbed by construction.
  - 1. The Contractor shall monitor and control its construction operations to prevent damage to the existing adjacent utilities, structures and completed portions of the work.
  - 2. The Contractor shall provide photographic and video documentation of the condition of adjacent structures.

3.04 REMOVAL

- A. As the concrete retaining wall is completed, the sloped excavations can be backfilled with in situ beach sand that was removed initially to create the sloped excavation. Removal of the sloped excavation shall be conducted in such a manner so as to avoid any damage to the permanent structure.

**END OF SECTION**

## SECTION 02270

### EROSION AND SEDIMENT CONTROL

#### PART 1.00 GENERAL

##### 1.01 WORK INCLUDED

- A. Work covered under this Section shall include all work for erosion and sediment control.
- B. All work shall conform to the requirements stated herein and to the requirements of the regulatory agencies having jurisdiction over the areas of work.

##### 1.02 SUBMITTALS

- A. Provide the following submittals:
  - 1. Manufacturer's Data Sheet for Compost Filter Sock;
  - 2. Manufacturer's Data Sheet for Plastic Sheeting used in Concrete Washout Station.

##### 1.03 COMPLIANCE

- A. All work shall be done in compliance with the provisions of all local, state and federal regulatory agencies. Failure to comply with these provisions shall constitute grounds for the Owner ordering work to cease until such provisions are met.
- B. If required, the Contractor shall meet with regulatory agencies with purview for clarification regarding requirements of the execution of, and compliance with, environmental protection programs. The Contractor shall familiarize itself with the nature of the work to be performed. The Contractor shall be responsible for scheduling its submittals and/or meetings, if required, with the regulatory agencies.

#### PART 2.00 PRODUCTS

##### 2.01 STRAWBALES

- A. Bales of straw fastened with wire and have a minimum size of 1 foot by 1.5 feet by 3 feet and conform to the applicable portions of Rhode Island Standard Specifications for Road and Bridge Construction, latest edition. Bales shall be made of straw with forty pounds minimum weight and one hundred and twenty pounds maximum weight. They should be either wire or nylon bound.
- B. Hay bales are prohibited on this project.

##### 2.02 SILTATION FENCE

- A. Filter fabric siltation fencing shall be a woven filter fabric having a permittivity of not less than 0.05 sec-1, a water flow rate of a minimum 12 gallons per minute per square foot, and a grab tensile strength of a minimum of 100 lbs. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics.

- B. Silt fences or sedimentation barriers shall consist of wood posts with industrial support netting and sediment control filter fabric attached.
- C. Wood post shall be standard 2"x2"x4.5' long hardwood stakes commonly used to support filter fabric. Silt fence shall be furnished standard with filter fabric attached to hardwood posts and spaced at a maximum distance of 8 feet.
- D. Provide suitable heavy nylon cord for securing abutting silt fence posts.
- E. The filter fabric material shall be needle punched non-woven polypropylene geotextile conforming to the following criteria:

Fabric Properties	Minimum Acceptance Value	Test Method
Grab Tensile Strength (1bs)	124	ASTM D4632
Elongation of Failure (%)	15	ASTM D4632
Mullen Burst Strength (PSI)	300	ASTM D3786
Puncture Strength (1bs)	100	ASTM D4833
Flow Rate (gal/min/sf)	10	ASTM D4491
Apparent Opening Size (sieve)	30	ASTM D4751
Ultraviolet Radiation (% strength retained)	70	ASTM D4355
Unit Weight	5	ASTM D3776
Thickness	80	ASTM D1777
Trapezoidal Tear Strength	50	ASTM D4533
Permittivity	.01	ASTM D4491

- F. Acceptable filter fabric materials include "Mirafi Envirofence", "Propex Silt Stop" by Amoco Fabrics Co or equal approved by the Designer.
- G. The control fabric shall be at least 3 feet wide.

2.03 EROSION CONTROL MATS

- A. Erosion control mats shall consist of temporary degradable rolled erosion control product composed of processed natural or polymer fibers mechanically, structurally or chemically bound together to form a continuous matrix to provide erosion control and facilitate vegetation establishment

2.04 FILTER SOCKS

- A. Filter Socks are biodegradable sediment-trapping devices. Manufacturers include SiltSoxx, Corr Logs, Straw Wattles, or equal.

2.05 WOODEN STAKES

- A. Stakes: Oak wood, minimum 2-inch by 2-inch, by minimum 54 inches long.

2.06 WATER

- A. Water used for dust control and equipment washes shall be clean and free of salt, oil, and other injurious materials. Water is available on-site; however the Contractor shall coordinate with the RIDEM for access to the water. The Contractor will be responsible for any costs associated with using Town water; otherwise the Contractor shall provide all necessary water.



2.07 CONSTRUCTION ENTRANCE/EXIT MATS

- A. Geotextile: A non-woven geotextile fabric that meets the requirements of Section M 288 of AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing.
- B. The surface course of the first 50 feet of the access road off of any paved roadway shall consist of crushed stone that conforms to Type II crushed gravel of Section M1.09.0 of the RI DOT Standard Specifications for Road and Bridge Construction. Beyond 50-feet, the roadway can consist of Engineered Fill, Common Fill or existing materials.

**PART 3.00 EXECUTION**

- A. If necessary, the Contractor shall furnish, install, and remove dewatering basins in accordance the Contract Documents.
- B. The Contractor shall maintain baled straw, filter socks, and siltation fence in good condition, rotating bales and replacing fencing periodically to maximize their effectiveness as sediment traps. The Contractor shall remove accumulated sediment periodically as directed by the Engineer. Remove baled straw, filter socks, and siltation fence in its entirety upon completion of the Work.
- C. The Contractor is advised that impoundment flows and water levels of resource areas may vary substantially due to climatic and seasonal conditions and Contractor shall be responsible for controlling and handling ground and or surface water regardless of the volume of water and regardless of whether this flow is due to flood waters from storms.
- D. The Contractor shall take every precaution to minimize and control erosion and turbidity within the contract area. These precautions shall be subject to approval by the Engineer and shall include, but not necessarily be limited to, the following:
  - 1. Straw bale erosion barriers and sedimentation control fencing shall be staked in place down gradient from all exposed materials storage areas in order to reduce the amount of suspended solids in runoff water. The Contractor shall promptly remove any sedimentation buildup over 6 inches in depth that accumulates behind the erosion barriers. Barriers shall be checked after every storm and at regular weekly intervals.
- E. Removal and clean up: All temporary erosion control facilities and accumulated sediments shall be removed and legally disposed in a neat and workmanlike manner when all disturbed areas have been satisfactorily stabilized.
- F. Provide approved jute mesh or erosion control mats installed in accordance with manufacturer's recommendations on slopes steeper than 3H:1V or as otherwise required or as requested by the Owner's representative.

**END OF SECTION**

## SECTION 02400

### DEWATERING, CONTROL, AND DIVERSION OF WATER

#### PART 1.00 GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings, General Provisions of Contract, and Division 1 Specification Sections, apply to work of this section.

##### 1.02 REQUIREMENTS INCLUDED

- A. Furnishing, installing, and maintaining temporary utilities to support construction **as required by the Contractor's means and methods**, and remove at completion of work. This specification does not require that such facilities be provided; however, any facilities installed shall meet the minimum requirements specified herein.

- 1. Electric and Lighting
- 2. Heating and Ventilation

##### 1.03 WORK INCLUDED

- A. Work covered under this section consists of the dewatering, control, and diversion of water as required to perform the Work.
- B. The Contractor shall have a diversion system capable of accommodating flows associated with the 10-year storm event as defined in Section 01070 without damaging the work area.

##### 1.04 WATER LEVELS

- A. Not Applicable for this project; however, the contractor should protect work against predicted storm events.

##### 1.05 SUBMITTALS

- A. At least ten (10) calendar days prior to the start of dewatering, submit the following for review by the Engineer.
  - 1. Drawings
  - 2. Sections
  - 3. Details and other pertinent information.
  - 4. Material providers shall provide written confirmation that their product(s) are new and/or are rated to withstand the forces expected for the duration expected. If limitations are present those limitations shall be stated.
  - 5. The data shown shall include:
    - a. An overall schedule for dewatering, control, and diversion of water.
    - b. A description of the anticipated sequence of construction.
    - c. Complete details of methods, equipment, and materials proposed to be used.
    - d. Any other pertinent data required for review by the Engineer.
    - e. The Contractor shall coordinate this submittal with submittal requirements specified in Section 02270-EROSION AND SEDIMENT CONTROL and Section 02250-EXCAVATION SUPPORT.

- B. Design Computations:
  - 1. The Contractor shall also submit complete computations for the design of the dewatering system.
  - 2. All computations shall be made by a registered Professional Engineer licensed to practice in the State of Rhode Island. Computations shall bear the stamp of the Engineer.

**PART 2.00 PRODUCTS**

- A. The Contractor shall provide all materials and equipment including, but not limited to, sandbags, barriers, pipe, fittings, valves, pumps, tools, frac tanks, dewatering basins, fuel and other appurtenances in suitable and adequate quantities as required to control water.

**PART 3.00 EXECUTION**

3.01 SURFACE DRAINAGE

- A. The Contractor shall intercept and divert surface drainage away from the work sites by the use of dikes, curb walls, ditches, sumps or other means. The Contractor shall design surface drainage systems so that they do not cause erosion on or off the site. Surface runoff shall be controlled to prevent entry of water into excavations. The Contractor shall remove drainage systems when no longer needed.

3.02 WATER CONTROL IN EXCAVATIONS

- A. The Contractor shall use water control methods, which are appropriate to the ground conditions, the construction operations, and the requirements of these Contract Documents. The methods will involve removal of water within the excavation and may involve removal of water outside the excavation or construction of facilities to control water movement into the excavation. Water control measures shall minimize adverse effects of elevated or reduced water pressure on the work, the surrounding ground and adjacent facilities and structures. The water control measures shall be designed and operated so as to prevent removal of in-situ materials, or loosening or softening of in-situ materials within the excavation. The Contractor shall control groundwater and surface water such that the construction of open cut pipelines, and other structures will be performed without adverse effects of water, and to prevent hydrostatic uplift pressures until construction has been completed. Water shall be controlled such that work can be completed "in the dry" during periods when concrete (except tremie concrete) is being placed, when pipe is being laid, when soils are being placed and compacted, when drainage structures are being installed, and at such other times as is necessary for the safe execution of the work.
- B. If the Contractor encounters large amounts of water entering the excavation, immediate action shall be taken to control the water inflow. A large amount of inflow requiring control shall be defined as that which causes piping or boiling of the soil, adversely affects the performance of the work, or has the potential of causing loss or damage to adjacent property or structures.

3.03 PROPERTY LOSSES FROM REMOVAL OR DISTURBANCE OF GROUNDWATER

- A. Any structure, including but not limited to walls, structures, and utilities that become unstable or vulnerable to settlement due to removal or disturbance of groundwater will be supported immediately by the Contractor. Support shall include but not be limited to bracing, underpinning, or compaction grouting.

- B. All loss or damage arising from removal or disturbance of groundwater, including but not limited to claims for subsidence and the loss of structure support, that may occur in the progression of the Work shall be sustained and borne by the Contractor. If the Contractor needs to correct the damage resulting from his operations, the Owner may, 30 days after notifying the Contractor in writing, proceed to repair, rebuild or otherwise restore such damaged property as may be deemed necessary, and the cost thereof shall be deducted from compensation which may be or become due to the Contractor under this Contract.

**END OF SECTION**

**SECTION 02455**

**DRIVEN PILES**

**Part 1.00 GENERAL**

1.01 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK

- A. General
  - 1. The work covered by this Section, without limiting the generality thereof, consists of furnishing all labor, equipment, and materials, and performing all operations in connection with the furnishing and installing at the locations and to the lines and grades shown on the Drawings, including installation in the sequence required by this specification:
  - 2. Precast-prestressed concrete (PPC) friction piles driven to 35 ft below bottom of pile cap. The PPC piles have been designed to have a vertical compressive capacity of 27 kips and a lateral capacity of 55 psf, applied at the top of the pile.
  - 3. A single or double acting steam, diesel, or air hammer with a minimum of 15,000 ft-lbs of energy delivered to the top of the pile, shall be utilized to continuously drive the pile, using fixed leads.
  - 4. Conducting computer wave equation analyses by WEAP (Wave Equation Analyses for Piles) as required herein prior to mobilization to determine end bearing driving criteria for each type of pile and their ultimate capacities and to demonstrate that the compressive and tensile stresses experienced in the piles with the proposed hammer-pile-soil systems will not exceed the maximum allowable values in the pile during driving.
  - 5. The Contractor shall submit for approval the proposed final driving criteria and methods and equipment for installing production piles.
  - 6. Provide reinforcing steel or other connection as shown on the Drawings to connect piles to cast-in-place concrete beams and pile caps.
  - 7. Pile splices shall not be allowed.
  - 8. The Contractor may elect to perform near surface pre-excavation and/or probing or spudding through the entire fill thickness at pile locations.
  - 9. The Contractor shall manage any soil, fill, drilling fluids or muds in accordance with Section
  - 10. Provide and maintain survey control for layout of design pile locations, pile heave measurement, preparation of as-built sketches, and related survey control work.
  - 11. Perform and sequence work, and maintain equipment in good condition to minimize noise and vibration caused by pile installation activities.

B. Related Sections

1. Section 02 61 00 - Excavated Soil and Material Management Plan
2. Section 02220 - Excavation, Backfill and Compaction
3. Section 03399 – Precast Concrete Structures

1.03 DEFINITIONS AND REFERENCE STANDARDS

- A. Owner: Rhode Island Department of Environmental Management, RIDEM.
- B. Engineer: The Engineer is Pare Corporation, also referred to as the Designer.
- C. Contractor: The Contractor is the person or organization identified in the Agreement as being responsible for the work under this Section. The term Contractor shall also refer to an authorized representative of the Contractor.
- D. ASTM: Specifications of the American Society for Testing and Materials.
- E. AWS: Standard Code for Welding in Building Construction, of the American Welding Society.
- F. AISC: Specification of the American Institute of Steel Construction.
- G. Code: Rhode Island State Building Code.

1.04 QUALITY ASSURANCE

- A. Comply with all rules, regulations, laws and ordinances of the Rhode Island Department of Public Safety, Town of Narragansett, State, Federal, and all other authorities having jurisdiction over the project site. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided by the Contractor without additional cost to the Owner.
- B. Field Monitoring and Testing
  1. Full-time monitoring of pile driving operations will be provided by the Owner. No piles shall be driven except in the presence of an authorized representative of the Engineer.
  2. Certification of quality of pile materials to be used in the work shall be furnished, in a form acceptable to the Engineer, at the time of delivery of materials to the site. Pile materials shall also be subject to on-site observation for conformance with specifications.
  3. Approvals given by the Engineer or by testing agencies shall not relieve the Contractor of his responsibility for performing the work in accordance with the Contract Documents.

1.05 SUBMITTALS

- A. General:
  1. The Contractor shall conform to all submittal requirements of the Contract including submitting the information specified herein to the Engineer for review. All submittals shall be stamped by a Professional Engineer registered in the state of Rhode Island.
  2. The Contractor shall adhere to the Submittal Schedule described in the Contract General Conditions and herein. The Contractor shall make every effort for timely submissions,

leaving adequate time for the Owner's Representative to review, evaluate and respond to the Contractor. The Contractor is responsible for scheduling specified submittals and re-submittals so as to prevent delays in the Work.

3. The Contractor shall submit a driving plan and schedule for installation of the piles.
4. Unless otherwise noted, the Contractor shall forward submittals to the Owner's Representative a minimum of two weeks prior to any planned Work related to the Contractor's submittals. No Work shall be started until the necessary review and approvals have been given.

B. Shop Drawings:

1. Shop drawings showing sizes, tip or stinger details, pick up points and other items pertinent to pile manufacturing, design and handling. Drawings shall be stamped by a Registered Professional Engineer.
2. A scaled drawing indicating design pile locations relative to boardwalk column lines, with each pile labeled with a sequential designation proposed by the Contractor, scale 1 in. = 20 ft.

C. Pile Driving Equipment:

1. Manufacturer's literature, including technical and performance literature for pile driving hammer, cushions, and other equipment for piles.
2. Details of equipment and procedures for preaugering, pre-excavation or spudding.

D. Wave Equation Analyses

1. Qualifications and experience of Contractor's Engineer performing the wave equation analyses
2. Prior to pile driving, the Contractor shall propose a final driving criteria (blow count) as the minimum number of hammer blows per each inch of penetration for the final six (6) inches of pile penetration in the bearing stratum to achieve the ultimate capacity. The proposed criteria shall be submitted to the Engineer for review and acceptance. Piles shall not be installed prior to acceptance of the criteria by the Engineer.
3. Results of wave equation analyses, performed and stamped by a Registered Professional Engineer in the State of Rhode Island, which demonstrate that the equipment and cushions are capable of obtaining the required pile load capacity in accordance with the Code without damage to the particular pile type due to driving stresses. A minimum of two wave equation analyses for each pile driving system proposed by the Contractor shall be submitted to the Engineer. The wave equation analyses shall model bearing conditions in soil as appropriate, and anticipated pile lengths across the site.

E. Pile Design:

1. Pre-stressed PPC:
  - a. The concrete mix design including cement type and source, and any additives.
  - b. With each delivery of PPC piles, results of concrete strength tests conducted by a certified laboratory on samples cured in the same environment as the piles. No piles will be accepted unless accompanied with delivery by concrete strength data.

F. Estimated Pile Lengths:

1. A tabular summary of anticipated pile lengths at each column location or other point of structure support.
  2. Pile designation plan showing piles numbered sequentially (i.e., 1,2,3).
- G. As-Driven Pile Location Data:
1. Submit sketch and tabular documentation of actual pile location in relation to the design location within one working day after each individual pile or pile cluster is completed.
  2. Within seven days after the completion of all pile driving, submit to the Owner a final as-driven pile location drawing (1 in. = 20 ft), certified by a Registered Land Surveyor or Registered Professional Engineer.
  3. All drawings and sketches shall include the following:
    - a. Column lines, north arrow and graphical scale.
    - b. Each pile identified by a separate number, designated by the Contractor and submitted prior to pile driving.
    - c. Elevation of each top of pile prior to and after cutting, to nearest one-tenth (0.1) foot.
    - d. Deviation in inches, to the nearest one-fourth (0.25) inch, from plan design location at cutoff elevation.

#### 1.06 JOB CONDITIONS

##### A. Site and Subsurface Conditions

1. Subsurface information representing surficial geology can be found in Appendix C of the Specifications dated January 2020. Prior to submitting his bid, the Contractor shall review and understand the information. The information is made available to the Contractor for information on factual data only and shall not be interpreted as a warranty of subsurface conditions whether interpreted from written text, boring logs, or other data.
2. The boring information is considered to represent the conditions at the locations of the test borings and at the time the test borings were made. Variations from the conditions disclosed by the borings should be anticipated by the Contractor in planning and estimating the work.
3. The Contractor shall protect adjacent property, utilities, tunnels, buildings and structures, and completed work from damage associated with the pile driving operation. Damage due to pile driving shall be repaired by the Contractor at his own expense.

#### 1.07 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall deliver piles at times and in sequence to assure continuity of pile driving.
- B. Piles shall be handled, transported, stacked and protected to prevent damage.
- C. Lifting points shall be clearly marked on the piles by the manufacturer, and all handling and storage shall be undertaken with consideration for required support.
- D. Piles shall be picked up into fixed leads at the top of the boom and to the crane at the bottom. No swinging leads are to be permitted.
- E. Piles shall be clearly marked with the length of the pile prior to delivery.



1.08 LINES AND GRADES

- A. The Contractor shall stake the pile locations and establish all elevations required. The Contractor shall be responsible for the maintenance and protection of the control point and benchmark, and all pile location stakes.
- B. The Contractor shall employ a licensed Registered Land Surveyor or a Registered Civil Engineer, familiar with pile installation, who shall establish lines and levels. The Contractor shall be responsible for the correct location of piles, as well as keeping up-to-date records of the amount of uplift of individual piles, and establishing actual pile locations. Locations of the centers of as-driven piles shall be shown on a drawing in relation to the design location and submitted to the Engineer within 2 days after the individual pile or pile group is completed. Drawings shall include the following:
  - 1. Column lines and north arrow.
  - 2. Each pile identified by a separate number.
  - 3. Elevation referenced to North American Vertical Datum of 1988 (NAVD 88) of each top of pile prior to cutting, to nearest 0.1 ft.
  - 4. Deviation in inches, to the nearest ¼ in., from plan location at cutoff elevation.
- C. Within 2 weeks after the completion of all pile driving, the Contractor shall provide for the Engineer a plan, certified by said Surveyor or Engineer, showing the as-driven location of all piles.

**Part 2.00 PRODUCTS**

2.01 GENERAL

- A. Pile types and minimum dimensions shall be sufficient for static design capacity indicated on the Drawings and in accordance with the requirements herein and the Code. Whereas the allowable pile load capacity would equal the static design capacity.
- B. Pile materials shall be new and of uniform quality. Manufactured or assembled pile materials shall be of sufficient strength and rigidity to withstand all handling and driving stresses.
- C. Piles shall be furnished in sufficient lengths to meet specified driving and all other requirements.

2.02 PRECAST-PRESTRESSED CONCRETE PILES

- A. Piles shall be precast-prestressed concrete piles with 12 or 16-inch diameter dimensions. All precast concrete piles shall be designed, reinforced, and manufactured in accordance with current standards of the Joint Committee of AASHTO and PCI. Hollow core piles will not be accepted.
- B. Concrete for precast piles shall have minimum compressive strength of 5,000 psi at 28 days. The maximum water/cement ratio shall not exceed 0.40. The minimum cement content shall be 7 bags per cubic yard. No precast concrete piles shall be delivered to site before concrete has attained a compressive strength of 5,000 psi, based on tests of cylinders cast from same batches and cured under same conditions as pile concrete. Provide the Owner's Representative with each delivery, documentation in acceptable form indicating that concrete used in piles had attained minimum compressive strength of 5,000 psi, prior to

delivery of piles to site, and that the piles conform to PCI and AASHTO requirements. Pile materials shall also be subject to on-site inspection for conformance with specifications. Regardless of concrete strength data, no piles shall be delivered to site until they are at least 48 hours old.

- C. If, for any reason, a pile is damaged or reinforcing steel is exposed, its use shall not be allowed. The minimum concrete cover of the reinforcing steel shall be 3 inches.
- D. Lateral reinforcing at both ends of pile shall be spaced sufficiently close to resist impact stresses due to driving and in no case more than three inches on center. Lateral reinforcing for piles shall also conform to the requirements of the Rhode Island State Building Code. Top of pile must be perpendicular to longitudinal axis of pile, and ends of any prestressing or reinforcing steel shall be cut flush with top of pile to prevent direct impact on steel during driving.
- E. Length of piles to be ordered shall be determined by the Contractor. Ordering and delivery of piles shall be planned in such a manner that changes in length of piles for piles not yet manufactured may be made if driving experience, as Work progresses, indicates need for such changes.
- F. Precast piles shall be cast with a steel bottom plate. The plate shall have a minimum thickness of 1-1/2 inches, have the same lateral dimensions as the pile, and shall be attached to the pile with dowels as indicated in the AASHTO-PCI standards. Dowels shall extend into the pile a minimum distance of 3 feet.
- G. Concrete for precast piles shall contain a maximum tricalcium aluminate (C3A) content of eight (8) percent and a minimum of seven bags of cement per cu. yd. Upon delivery of the piles to the site, provide the Engineer with certificates indicating that the tricalcium aluminate content conforms to this requirement.
- H. Install dowels in the tops of the piles or expose pile reinforcement strands as indicated on the Drawings.
- I. Prestressing steel shall be 7-wire low relaxation strand conforming to the requirements of ASTM A416, Grade 270. Piles shall have an effective prestress of 700 psi.
  - 1. Special Requirements for Pile Cap Seismic Connection: The Contractor shall consider these special requirements when estimating anticipated pile lengths at each column location or other point of structure support to ensure the minimum required length of reinforcement in the upper two feet of pile is achieved. Reinforcing steel for precast-prestressed concrete piles shall conform to the Rhode Island State Building Code.

### **Part 3.00 EXECUTION**

#### **3.01 SEQUENCE OF OPERATIONS AND EQUIPMENT REQUIREMENTS**

- A. The Contractor shall provide at least one fully equipped pile-driving rig in full-time operation at the site during the work, and shall mobilize additional equipment, if necessary, to complete the work on schedule.
- B. The Contractor shall coordinate his pile driving operations with other work on the project.

3.02 EQUIPMENT

- A. Piles shall be driven to final driving resistance with a single or double acting steam, diesel, or air hammer with a minimum energy of 15,000 ft-lbs. When the determination of the final driving resistance is being made, the hammer shall be operated at its rated speed and capacity.
- B. An aluminum micarta cushion block, or other cushion material approved by the Engineer, shall be used in the hammer for driving piles. The cushion shall be replaced when burned or otherwise worn.
- C. Hammers used to drive permanent piles shall be of the same type and have the same rated energy as the hammer used to drive test piles for the pile load test program.
- D. The use of followers will not be permitted.

3.03 INSTALLATION

A. Obstruction Removal

- 1. It shall be the Contractor's responsibility to overcome obstructions.
- 2. Where obstructions make it impossible to install certain piles to the required depth, the Contractor shall remove or clear the obstruction by spudding or other technique selected by the Contractor and at their own expense. Obstructions are the responsibility of the Contractor.
- 3. Piles abandoned because of obstructions encountered shall be pulled out and the hole filled with sand.

B. Driving

- 1. As part of preparation for driving, each pile shall be marked at 1-ft intervals along the entire pile length. In addition, the footage shall be marked and designated at 5-ft intervals, starting from the tip of the pile.
- 2. All piles shall be driven at the locations and orientations shown on the Drawings. Pile location and orientation shall be checked during driving and appropriate measures taken, as necessary, to maintain the correct pile position.
- 3. If the hammer energy is significantly greater than the required minimum, or if a lower driving resistance is indicated by an acceptable wave equation analysis the required final driving resistance may be reduced by the Engineer.
- 4. Immediately after a pile is driven, the Contractor shall establish a reference point and its elevation on the pile for the purpose of checking uplift of the pile tip.
- 5. After all piles within the radius of uplift have been driven, the Contractor shall determine the elevation of the reference points on each of the piles in the group. If uplift of 0.04 ft or more has occurred, the pile shall be redriven to its original elevation, and deeper if necessary, to the specified final driving resistance. After redriving each pile, the Contractor shall re-establish the elevation of the reference point. Redriving shall be repeated as often as necessary until the measured uplift on any pile is less than 0.04 ft.
- 6. The radius of uplift is defined as the maximum distance between piles such that pile driving causes uplift of 0.04 ft or more in the affected pile. Survey instruments used to establish the reference elevations shall be carefully checked and adjusted as necessary to insure accurate readings. Uplift measurements shall be submitted to the Engineer.

C. Cutting Off Piles

1. Pile tops shall be cut off square within 1 in. of the elevations shown on the drawings. The pile cutoffs shall become the property of the Contractor and shall be removed from the site.

3.04 TOLERANCES AND CRITERIA FOR ACCEPTANCE

- A. A maximum lateral deviation from the correct location at cutoff elevation permitted will be 3 in., as measured at the cutoff elevation. A maximum deviation from design cutoff elevation equal to 1 in. will be permitted.
- B. The plumbness of a driven pile, as measured on the projection of the pile above ground, shall not deviate by greater than 5 percent from the design alignment.
- C. Piles that are damaged below cutoff elevation during driving will be rejected. Upon comparing pile performance during driving with that of other driven piles, and based on their knowledge of subsurface conditions, the Engineer determines that a pile has been unacceptably damaged, they may reject the pile.
- D. Piles indicating sudden or peculiar decrease in penetration resistance during driving will be assumed to be broken and will be rejected unless Engineer's review of available data indicates that sudden decrease in driving resistance is due to natural, subsurface conditions and continued acceptable driving behavior is observed.
- E. Piles that are rejected because of damage, mislocation or misalignment, or failure to meet the driving criteria, shall be cut off below the limits of the structure and abandoned, and additional piles shall be driven as directed by the Engineer.
- F. When otherwise acceptable, installed piles exceed the specified tolerances, the Contractor shall provide an accurate survey to the Engineer, as specified. The Engineer will then analytically determine the total loads on individual piles, based on this survey. If the load on any pile exceeds 110 percent of the specified load capacity, corrections shall be made in accordance with a design provided by the Engineer.
- G. The installation of replacement piles and other corrective measures shall in all cases be in accordance with designs provided by the Engineer.

**END OF SECTION**

**SECTION 02513**

**BITUMINOUS CONCRETE PAVEMENT**

**PART 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. Work under this section includes placement of temporary pavement in roadways and providing new bituminous concrete pavement as shown on the Drawings and specified in the Bid Form, or as directed. All existing pavement, curbing and street fixtures damaged or displaced as a result of the construction operations shall be restored in accordance with the requirements of this section.
- B. Related Work Specified Elsewhere  
  
Section 02220 – Excavation, Backfill and Compaction

**1.02 QUALITY CONTROL**

- A. Qualifications of Workmen:
  - 1. Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described within this section, who shall be present at all times during progress of the work of this section, and who shall direct all work performed under this section.
  - 2. For actual finishing of bituminous concrete surfaces and operation of the required equipment, use only personnel who are thoroughly trained and experienced in the skills required and whose prime occupation is this type of work.
  - 3. All work shall conform to State Standards.
- B. Submittals:
  - 1. Contractor shall submit to the Engineer, data showing gradation and composition of materials proposed.
  - 2. Submittals shall be made in accordance with Section 01340 – Submittals.

**1.03 REFERENCE STANDARDS**

- A. All work specified in this section shall conform to "Standard Specifications for Road and Bridge Construction" of the Rhode Island Department of Transportation, including latest revisions, hereinafter referred to as "State Standards".

**1.04 GUARANTEE**

- A. All permanent pavement shall be warranted by the Contractor for a period of five (5) years from the date of substantial completion. During this period all areas which have settled or are unsatisfactory for traffic shall be removed and replaced at no cost to the Owner, including the cost of Traffic Police. Settlement in excess of one (1) inch shall be considered significant and shall be repaired.

**PART 2.00 PRODUCTS**

2.01 GRAVEL BORROW SUBBASE

- A. Gravel borrow subbase shall conform to Section 02220 – Excavation, Backfill and Compaction.

2.02 BITUMINOUS CONCRETE SURFACE COURSE

- A. Bituminous concrete surface course shall be Class 12.5 HMA, as directed, and shall conform to State Standards subsection 401.02 and Section M03.

2.03 MODIFIED BITUMINOUS CONCRETE BASE COURSE

- A. Modified bituminous concrete base course shall conform to State Standards subsection 401.02 and Section M03.

2.04 CALCIUM CHLORIDE

- A. Calcium chloride shall conform to AASHTO M144, Type 1 or Type 2.

2.05 TACK COAT

- A. Tack coat shall conform to State Standards Section 403.

**PART 3.00 EXECUTION**

3.01 GENERAL REQUIREMENTS

- A. Contractor Requirements:
  1. The Contractor shall perform and complete the construction work within the limits indicated in a continuous manner so that the pavement placement work may proceed without delay.
  2. The Contractor shall, at all times, prior to acceptance of the work by Engineer, maintain the completed work in a safe and satisfactory condition. All maintenance and repairs to the completed work shall be subject to the approval of the Engineer, Owner, and the controlling municipal and/or State authorities. All maintenance and repairs of the completed work shall be provided by the Contractor at no additional cost to the Owner.
  3. Equipment used in the work will be subject to approval by Engineer and shall be maintained in a satisfactory condition at all times. Unless otherwise permitted, compaction shall be performed by use of suitable power rollers. Finished surfaces of new asphaltic surface courses shall finish even with adjacent existing pavement surfaces and be free from surface irregularities.
  4. It shall be the responsibility of the Contractor to obtain from the controlling municipal and/or State authorities all required permits for cutting roadway pavements and to perform the work in accordance with all customs and requirements of the controlling authorities, in addition to those specified herein, and at no additional expense to Owner.
  5. Existing pavements outside of the indicated work limits which are damaged as a result of the Contractor's operations, including base courses, bituminous tack coats, and surface courses, shall be replaced by the Contractor in accordance with the requirements specified herein for the respective type of pavement; in a satisfactory manner and at no additional cost to Owner.
  6. In case of settlement or other defects in new or replaced pavements, the Contractor shall cut out, replace, restore, or repair the damaged pavements at no additional expense to Owner. This requirement shall remain in effect for five (5) years after the acceptance of the work by Engineer. The pavement area to be replaced, repaired, or restored, shall extend from edge of

pavement to edge of pavement, a minimum of 20 feet on either side of the defect; final pavement course shall be feathered to provide a smooth finish detail.

7. This contract shall not be considered complete until the replacement, restoration, and repair of pavements has been provided in a manner satisfactory to Owner and Engineer, and in accordance with the requirements specified herein.

### 3.02 SUBGRADE PREPARATION

- A. Prepare subgrade and the top 12 inches of trenches by shaping and compacting to proper grade. Remove all soft and yielding material from the subgrade and replace with suitable material. Compact thoroughly using approved types of rollers or tampers. Ensure that all areas are stable and dry.
- B. Cut back edges of existing pavement of State and Town roads to be matched along even lines to obtain undisturbed, clean and sound vertical edges of original pavement.
- C. Do not store or stockpile materials on the subgrade.

### 3.03 GRAVEL BORROW SUBBASE PLACEMENT

- A. Place approved subbase material in successive 6-inch maximum compacted layers for the full width of the disturbed cross-section. Do not place fill on muddy or frozen sub-grade or until subgrade is approved by the Engineer.
- B. During placing and/or compacting operations, the moisture content of material in the layers being compacted shall be near optimum, as determined in accordance with ASTM D-1557, and shall be as nearly uniform as practicable throughout the layer.
- C. All compaction shall be performed with approved equipment well suited to location and material being compacted. Use heavy vibratory rollers where heavy equipment is authorized.
- D. Do not operate heavy equipment closer to foundations than a horizontal distance equal to height of backfill above bottom of foundation. Compact remaining area with hand tampers suitable for material being compacted. Place and compact backfill around pipes with care to avoid damage.
- E. Compact fill materials to 95 percent dry maximum density in accordance with ASTM D-1557, Method D.

### 3.04 TEMPORARY PAVEMENT PLACEMENT

- A. In all areas an initial layer of temporary pavement shall be placed daily wherever existing pavement has been removed or disturbed.
- B. On the approved gravel borrow sub base, place temporary pavement surface course of 2" minimum plant-mixed bituminous concrete (hot mix) Class 12.5 (i.e., type I-1 or I-2 old designation), on street, sidewalks and such other places as field conditions require, as directed, to the compacted thickness and layers specified and/or detailed on the Drawings. Finish flush with the top of adjacent undisturbed pavement and conform to the cross-section of the existing pavement or as directed. Maintain temporary pavement flush with adjacent undisturbed pavement as settlement of trench backfill occurs and until permanent surface is placed. Temporary pavement shall be maintained in place for a period of no longer than 4 months from the date of placement.

- C. In highly traveled roadways, temporary pavement shall be placed on all backfilled trenches within 24 hours of backfilling. No backfilled trenches shall be left unpaved over weekends and/or holiday periods. At any one time during the construction work on any particular roadway, the length of an unpaved backfilled continuous trench shall not exceed 500 linear feet.
- D. Upon approval by the Owner, cold patch may be temporarily substituted for the hot-mix bituminous concrete required for temporary pavement. No payment shall be made for the installation of cold patch. All areas that have been patched with cold-mix shall be repaved with temporary hot-mix bituminous concrete within one week after the work. When patching the trench with hot-mix bituminous concrete, all of the cold-mix bituminous materials shall be first removed, and the gravel sub base shall be regraded and additional gravel sub base added and compacted as necessary.
- E. Cold-laid plant mixes shall be of the Precoated Macadam Aggregate Type of the Macadam aggregate type conforming with Asphalt Institute Specifications CL-1 and CL-2 respectively. Rapid curing (RC-3 and RC-4) and medium curing (MC-4 and MC-5) cut back asphaltic primers shall be used mixed with an asphalt cement of 85-100 penetration and hydrated lime. Aggregate gradation shall be between the limits of 1-inch and No. 8 sieve with high percent passing 3/8-inch sieve. The mixture shall consist of from 90.0 to 93.0 percent of mineral aggregate for CL-1 and 94.5 to 96.5 percent for CL-2. Cold-laid emulsified asphalt plant-mix may also be used subject to approval of samples by the Owner. The surface of the base course shall be clean, dry and free from frost when paving operations are to start and shall be maintained in that condition. The surface of the temporary pavement shall conform to the existing pavement.

### 3.05 REMOVAL OF TEMPORARY PAVEMENT

- A. Remove all temporary pavement material in its entirety and the partial thickness of sub base specified and/or detailed on the Drawings. Dispose of all removed materials to an approved dumping site and maintain the adjacent pavement areas clear and clean. Use care in removing materials so as not to damage sub base or the adjoining pavement. Maintain base course in an approved condition for placing of the permanent pavement. Saw cut back edges of existing pavement as necessary to obtain undisturbed, clean, and sound vertical edges for application of permanent pavement.

### 3.06 MODIFIED BITUMINOUS CONCRETE BASE COURSE

- A. Provide a modified bituminous concrete base course on the approved gravel foundation in compacted thickness as shown on the Drawings. The bituminous concrete base course shall be provided in accordance with the applicable requirements of the State Standards, Section 401, subsection 401.02 and Section M.03 for materials; and Subsection 401.03 for construction methods.

### 3.07 TACK COAT

- A. An approved tack coat consisting of an approved asphalt emulsion shall be applied to the bituminous base course prior to placement of the bituminous surface course.
- B. The tack coat shall be applied on a clean surface free of dust and loose material, such that a very thin but uniform coating of asphalt is left on the surface when the emulsion is broken. Application rates shall conform to section 403.03 of the State Standards. No more tack coat should be applied to an area than can be covered by the same day's operation. Traffic shall be kept off the tacked area. Tack coats shall not be applied during periods of cold or wet weather.



- C. Tack coat shall not be required between freshly laid courses (laid within 48 hours of each other), providing the base course is a clean surface which has not been turned over to traffic.

### 3.08 BITUMINOUS CONCRETE SURFACE COURSE

- A. Place bituminous concrete Class 12.5 HMA on an approved base course to a compacted thickness as shown on the Drawings. The finished surface shall conform to the existing cross-sections of the roadway or as directed and shall be flush with all existing surfaces unless otherwise indicated.
- B. The permanent bituminous concrete surface courses shall be provided in accordance with the Drawings and the applicable requirements of the State Standards, Section 401, subsection 401.02, and Section M03 for materials, and subsection 401.03 for construction methods.

### 3.09 MILL AND OVERLAY

- A. Remove bituminous concrete by cold planing prior to placement of overlay, where applicable. A 2-inch cut to predetermined grade or any specified lesser depth may be required in one pass. The minimum width of pavement planed in one pass shall be 6 feet, except in areas to be trimmed and edged. The Contractor shall be permitted to augment large cold planing equipment with more maneuverable machines in areas inaccessible to the 6-foot machine.
- B. The planed surface shall conform generally to the grade and cross section required. The surface shall not be torn, gouged, shoved, broken, or excessively grooved. It shall be free of imperfections in workmanship that prevent resurfacing after the cold plane operation. Surface texture shall be as required by the Engineer and excess material shall be removed so that the surface is acceptable to traffic if required. Asphalt cuttings shall be removed and legally disposed of by the Contractor. The planed surface shall be swept clean and its condition accepted by the Engineer prior to installation of bituminous surface course.
- C. Permanent surface paving shall commence within 72 hours of the cold planning operation. Contractor shall completely remove all temporary tapers and ramps, including all loose materials from the underlying surface prior to installing permanent surface paving.

### 3.10 COMPACTION

- A. The Contractor shall conform to all State Standards for operations, including compaction (State Standards 401.03.6), as well as compaction requirements specified in Section 02200 – Earthwork.
- B. Immediately after the bituminous mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The surface shall be rolled when the mixture is in the proper condition and when rolling does not cause undue displacement, cracking, and shoving.
- C. The number, weight, and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. The sequence of rolling operations and the selection of measurements shall be performed by a nuclear density gauge. Rolling shall be continued until all roller marks are eliminated and the minimum densities have been obtained based upon 95 percent of laboratory Marshall Densities made in the proportions of the job-mix formula, AASHTO T-245.
- D. Steel-Tired, Static Weight Rollers: The maximum roller speeds for steel-tired static-weight rollers for various operations shall not exceed three miles per hour. The wheels of steel-wheel rollers

shall be kept moist and clean to prevent adhesion of the fresh material, but an excess of water will not be permitted.

- E. Vibratory Rollers: The maximum roller speed for vibratory rollers shall be that to provide impact spacing less than the compacted lift thickness. When vibratory rollers are used in the static mode, roller speed shall not exceed three miles per hour.
  - 1. When an approved vibratory roller is used for breakdown rolling in a vibratory mode, intermediate rolling will not be required. When the vibratory roller is used for finish rolling it shall be used in the static mode. Rolling shall progress continuously until the specified density of the corresponding daily plant Marshall Density, AASHTO T-245 has been attained. Finish rolling shall continue until all roller marks are eliminated.
- F. Unless otherwise directed, rolling shall start longitudinally at the sides and gradually progress toward the center of the pavement except on super-elevated curves where the rolling shall begin on the low side and progress to the high side, overlapping on successive trips by at least one-half the width of tandem rollers and uniformly lapping each preceding track.
- G. The motion of the rollers shall be slow enough at all times to avoid displacement of the hot mixture. Any displacement resulting from reversing the direction of the rollers or from any other cause shall be satisfactorily corrected.
- H. When the base course, binder course, or wearing course fails to comply with the density requirements herein specified, additional compaction may be applied when permitted and as directed, to attain the required density. If satisfactory density cannot be attained the Contractor shall be required to remove and replace, at his own expense, any affected area, which is proven to be structurally inadequate and/or incapable of maintaining material integrity.
- I. Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective, shall be removed and replaced with fresh hot mixture, which shall be compacted to conform to the surrounding area. Any area showing an excess or deficiency of bituminous material shall be removed and replaced.
- J. In the event of dispute as to the creditability of the results, density shall be determined from cores taken from the pavement.

### 3.13 FIELD QUALITY CONTROL

- A. Conform to testing methods outlined in Section 02200 – Earthwork.
- B. In general, compaction testing shall be performed at a minimum frequency of once every 200 linear feet or less of roadway at locations and depths directed by the Owner. Excavate to depths directed to accommodate testing and backfill test holes. Restore roadway to original condition.

**END OF SECTION**

**SECTION 02626**

**POLYVINYL CHLORIDE PRESSURE PIPE (AWWA C909)**

**PART 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. Furnish and install molecularly oriented polyvinyl chloride (PVCO), complete and in place. It shall include:
  - 1. C909 PVCO Water Pipe;
  - 2. Connections to other work;
  - 3. Jointing and jointing materials;
  - 4. All testing and disinfecting; and
  - 5. All other related and appurtenant work.
- B. The pipe shall be installed to the lines and grades, and at the locations, shown on the Drawings.
- C. Related Work Described Elsewhere:
  - Section 02220 – Excavation, Backfill, and Compaction
  - Section 02640 – Valves, Tapping Sleeves, and Appurtenances
  - Section 02704 – Pipeline Pressure, Leakage, and Disinfection

**1.02 REFERENCES**

- A. American Water Works Association (AWWA):
  - 1. AWWA C104: Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  - 2. AWWA C110: Standard for Ductile-Iron and Gray-Iron Fittings for Water.
  - 3. AWWA C111: Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - 4. AWWA C153: Standard for Ductile-Iron Compact Fittings for Water Service.
  - 5. AWWA C605: Standard for Underground Installation of PVC and PVCO Pressure Pipe and Fittings.
  - 6. AWWA C651: Standard for Disinfecting Water Mains.
  - 7. AWWA C909: Standard for Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe for Water.
  - 8. Appendix B: Materials List and Requirements for Suez Water RI

**1.03 QUALITY CONTROL**

- A. Manufacturers' Recommendations:

The Contractor shall submit for approval, one (1) copy of the manufacturer's printed recommendations for the storage, protection, and handling and installation of the C909 PVCO pipe, pipe fittings, valves, and appurtenances which shall be strictly adhered to by the Contractor.
- B. Certificate of Compliance:

Each shipment of pipe, fittings, valves, and appurtenances shall be accompanied by the manufacturer's notarized certificate certifying conformance with all requirements of these specifications.

- C. Pipe shall be homogeneous throughout; free from voids, cracks, inclusions, and other defects; and as uniform as commercially practical in color, density, and other physical properties. Pipe surfaces shall be free from nicks and significant scratches. The joining surfaces of pipe spigots and of integral-bell and sleeve-reinforced bell sockets shall be free of imperfections that might cause leakage at joints.

#### 1.04 SUBMITTALS

- A. Submittals shall be provided in accordance with the requirements specified in Section 01340 – Submittals.

#### 1.05 MARKING

- A. Marking of all pipes shall conform to the requirements of AWWA C909, latest revision. Marking of all fittings shall conform to the requirements of AWWA C909, latest revision.
- B. Pipe shall bear identification markings that will remain legible during normal handling, storage, and installation. The markings shall be applied in a manner that will not reduce the strength of any product described by this standard.
- C. Marking on the pipe shall include the following and shall be applied at intervals of not more than 5 ft:
  - 1. Nominal size in inches and OD base (for example, 4 CI).
  - 2. PVC0.
  - 3. AWWA pressure class (for example, PC 235).
  - 4. Test pressure for hydrotested pipe (for example, T330).
  - 5. AWWA designation number for this standard (ANSI/AWWA C909).
  - 6. Manufacturer's name or trademark and production run record or lot code, to include date of starting stock extrusion and the date the finished pipe is expanded.
  - 7. Seal (mark) of the testing agency that verified the suitability of the pipe material for potable water service.
  - 8. The words "Do Not Use Solvent Cement."

#### 1.06 MANUFACTURER'S REPRESENTATIVE

- A. The Contractor shall furnish, at no additional expense to the Owner, the services of pipe manufacturer's representatives for instruction of the Contractor's personnel who will be installing the pipe. The instruction shall include proper handling, installation, and jointing and other construction areas, and shall be for such lengths of time required to fully familiarize the Contractor's personnel with the proper techniques.

### **PART 2.00 PRODUCTS**

#### 2.01 GENERAL

- A. All products as specified herein shall be new, unused, and purchased specifically for this contract. All pipe shall be made in the United States of America and shall be provided with documentation indicating the place of origin, unless otherwise approved.

- B. All materials included in this section that are to come into contact with potable water shall be either NSF 61 or NSF 60 approved as applicable.
  - C. All hardware for joint restraints and fittings shall be Type 316 stainless steel for corrosion resistance.
- 2.02 C909 PVCO PIPE
- A. C909 PVCO pipe shall be Pressure Class 235 with cast iron pipe equivalent outside diameter, and shall conform to AWWA specifications C909, latest revision, and shall have integral elastomeric-gasket bell and spigot ends meeting the requirements of ASTM D2122.
  - B. One gasket shall be furnished with each bell end of every pipe. Elastomeric gaskets shall meet the requirements of ASTM F477 for high-head (50 ft of head or higher) applications.
- 2.03 FITTINGS
- A. All Fittings and plugs for use with the C909 PVCO pipe shall be ductile iron, conforming to Specification Section 02640.
- 2.04 JOINTS
- A. Integral bell joints shall conform to C909, latest revision. Gasket material for all jointing requirements shall be styrene butadiene (SBR). All water pipe lubricants shall be ANSI/NSF certified for potable water use.
- 2.05 TRACER WIRE
- A. Tracer wire shall be continuous AWG no. 12 gauge solid copper tracer wire with 30 mil thick blue HDPE insulation.
  - B. The tracer wire shall be terminated at each end with a SnakePit Roadway Access point with a blue two-terminal switchable lid as manufactured by Copperhead Industries or approved equal.
- 2.06 STORAGE OF MATERIALS
- A. Pipe and related materials shall be stored in locations and in a manner approved by the Engineer. The locations and manner of storage shall be as to minimize handling of the materials.
  - B. The Contractor shall, at all times, be solely responsible for the safe storage of all materials.
  - C. The ends of all pipe stored for this project shall have their ends covered with plastic sheeting firmly secured in-place.
- 2.07 TESTING
- A. Manufacturer Testing:
    - 1. Testing of C909 PVCO pipe shall be done in accordance with AWWA C909, latest revision.
    - 2. Testing of ductile iron fittings shall be done in accordance with AWWA C153, latest revision.

3. Testing of jointing material shall be done in accordance with AWWA C111, latest revision.
4. The Owner and Engineer shall be notified at least ten (10) days in advance of the date and location of the testing in order to witness the tests.
5. The Contractor shall furnish to the Owner and Engineer notarized test reports by an independent testing laboratory, which show compliance of all materials furnished to the requirements specified herein. The test reports shall indicate results and methods employed.

B. Field Testing:

1. Field testing of C909 PVC0 watermain shall be performed according to the requirements as specified in Section 02704 - Pipeline Pressure, Leakage, and Disinfection.

2.08 JOINT RESTRAINT

- A. Restraining devices shall be utilized on all mechanical joints.
- B. Mechanical joint restraints used for PVC0 pipe shall have a gland body, wedge inserts, break-off top actuating bolts and machine-serrated clamping ring manufactured of high strength ductile iron in accordance with ASTM A536, Grade 65-45-12. Side clamping bolts and hex nuts shall be manufactured of high strength steel in accordance with ASTM A449 and zinc-plated to B663, Type III Sec.1 for corrosion resistance. Restraints shall be Series 19MJ00 as manufactured by EBAA Iron Inc. or approved equal.
- C. Where required, bell joints shall be restrained using a bell joint restraint harness suitable for PVC0 pipe.
- D. Where directed or as otherwise designated on the Drawings, concrete thrust blocks shall be designed to withstand the force imparted by the main with a minimum 1½ times the anticipated working pressure but not less than 200 psi. Maximum lateral bearing capacity shall be 1500 lb/sf. Sizing guidelines (minimum bearing area) for thrust blocks are provided on the project Drawings.
- E. Thrust restraint utilizing tie-rods shall not be utilized unless approved by the Owner or specifically indicated. Tie-rod diameters shall be 2 times the diameter required to restrain the main. All rods shall be protected from corrosion with two coats of bituminous paint or epoxy. The Contractor shall supply the Engineer and Owner with calculations stamped by a registered professional engineer in the State of Rhode Island that shows the ability of the tie rod restraint to restrain thrust imparted by 1 ½ times the anticipated working pressure, but not less than 200 psi.

2.09 PIPE IDENTIFICATION

- A. Provide 3" blue metalized detection tape with white printing reading "CAUTION BURIED WATER LINE BELOW" for water pipes, as manufactured by Seton.

**PART 3.00 EXECUTION**

3.01 PIPE INSTALLATION

- A. General:
  1. All pipes shall be installed in accordance with AWWA C605, latest revision, and

- manufacturer requirements.
2. All pipe and accessories shall be carefully inspected by the Contractor for defects before installation and all defective, unsound, or damaged materials shall be rejected.
  3. The Owner and/or Engineer will make such additional inspections as deemed necessary and the Contractor shall furnish all necessary assistance for such inspection.
  4. The Contractor shall provide proper implements, tools, and facilities satisfactory to the Owner for the proper and satisfactory execution of the work.
- B. Pipes, accessories, and appurtenances shall be new, unused, purchased specifically for this work, and shall be of the types and materials specified, as indicated or as directed.
- C. The interior of pipe and fittings shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations.
- D. Pipelines shall be constructed in dry trenches and shall not be laid when the conditions of the trench or the weather is unsuitable for such work.
- E. The trench bottom and gravel bedding shall be shaped and compacted to give substantially uniform unyielding circumferential support to the lower fourth of the full length of each pipe.
- F. Holes for the bells shall be excavated so that after placement the pipe and coupling receives uniform bearing pressure from the trench bottom.
- G. Each pipe shall be laid to the line and grade and in such a manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line.
- H. As the work progresses, the interior and exterior of the pipes and couplings shall be cleaned of all dirt and superfluous material of every description.
- I. To keep interior of pipe clean, a suitable drag shall be kept in the pipe and pulled forward past each joint immediately after the jointing has been completed.
- J. At times when work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipe or fitting.
- K. Any pipe that has been disturbed after laying shall be taken up and re-laid.
- L. All materials found to be defective during the progress of the work will be rejected by the Owner and the Contractor shall promptly remove such defective material from the site of the work and replace with new material at no additional expense to the Owner.
- M. The Contractor shall be responsible for the safe storage and proper handling of all materials.
- N. No shims or mounds of earth shall be used to raise the pipe to grade.
- O. All pipe shall be maintained accurately to the required line and grade.
- P. No pipe shall be covered until the Owner or Engineer has inspected the joints.
- Q. The pipeline shall not be used to convey trench drainage during construction.
- R. Pipes shall be protected at all times during construction against flotation. They shall be thoroughly secured, properly supported and bedded to prevent settlement or disturbance.

Compaction of bedding and backfill material shall be in strict accordance with Section 02200 – Earthwork.

- S. Bends, crosses, tees, caps, plugs, and other appurtenances shall be strapped and clamped where indicated and/or as directed. Steel bars, rods and plates shall be of structural steel. Straps, bridle rods, clamps, anchors and such other parts shall be provided to the details as directed and as approved. After installation, all parts of the strapping and clamping devices shall be given two (2) heavy coats of an approved coal tar base protective coating.

### 3.02 JOINTING

- A. No pipes shall be jointed until couplings and ends of pipe have been inspected to determine that the joint surfaces are free from any defects in materials or workmanship, and free from dirt or other foreign matter.
- B. Pipe, pipe fittings and accessories shall be stored, installed, joined and protected by the Contractor in strict accordance with the printed recommendations of the manufacturer of the piping material, and as approved.
- C. Field assembled joints shall be checked with a suitable gauge as recommended by the manufacturer to ensure that the rubber rings are properly located.
- C. All water pipe lubricants shall be ANSI/NSF 60/61 certified for potable water use.
- E. If inspection indicates that the rings are improperly located, the Contractor shall disassemble and properly reinstall the pipe.
- F. Pipe stoppers shall be installed, sealed, and blocked in such a manner as to prevent any leakage and so as to withstand an internal hydrostatic pressure of not less than 5 psi.
  - 1. Timber blocking shall be of adequate size and arrangement to prevent the stopper from being blown off the line.
  - 2. Timber bracing shall extend back to the undisturbed end of the trench.

### 3.03 TESTING AND DISINFECTION

- A. After installation but before putting any new water main in service, the water main shall be pressure tested in accordance with Specification Section 02704 - Pipeline Pressure, Leakage, and Disinfection.
- B. After installation, but before putting the new water main in service, the water main shall be disinfected in accordance with Section 02704 - Pipeline Pressure, Leakage, and Disinfection.
- C. Contractor shall perform a continuity test on all tracer wire in the presence of the Engineer. Should the tracer wire continuity test fail, Contractor shall repair or replace the failed segment of tracer wire at their own expense.

### 3.04 IDENTIFICATION MARKERS

- A. The line markers shall be installed along the centerline of the pipe two feet below the ground surface.

**END OF SECTION**



**SECTION 02630**

**ASBESTOS CEMENT PIPE REMOVAL & DISPOSAL**

**PART 1.00 GENERAL**

1.01 SCOPE

A. Section Includes:

1. This specification provides the requirements for the proper removal & disposal of existing Asbestos Cement (AC) pipe where required by the contract documents.
2. Removal shall meet the requirements of the current publication entitled "AWWA Work Practices for Asbestos-Cement Pipe" or subsequent revisions and in accordance with the requirements provided in the current standard entitled "OSHA Asbestos Construction Standards" or subsequent revisions for the removal, disposal, or abandonment of all asbestos-cement pipes as shown on the plans and/or encountered in the field during construction and any other applicable federal, state or local regulation.

1.02 WORK INCLUDED

- A. The Contractor shall, unless specified otherwise, furnish all labor, materials, equipment, tools, and all other associated appurtenances necessary to do the work required under the contract, including removal & disposal of pipe, spill/emergency clean-up, transportation, temporary storage, containment and housekeeping activities on the site where construction activities are performed.
- B. The Contractor shall be responsible for the satisfactory coordination of the pipe removal, disposal, alteration or modification of pipe with other construction and activities in the area. Delays in work resulting from lack of such harmony shall not in any way be a cause for extra compensation by any of the parties.

**PART 2.00 PRODUCTS (NOT USED)**

**PART 3.00 EXECUTION**

- A. Asbestos Cement Pipe Removal and Disposal: Removal and disposal of asbestos cement pipe, all types and sizes, shall be performed in the following manner:
  1. Asbestos cement pipe shall be removed and disposed of at landfill sites approved for such purpose by both the United States Environmental Protection Agency, and the Rhode Island Department of Environmental Management.
  2. Any disposal site chosen by the Contractor must have a license from the appropriate State and Federal agency to accept this material.
  3. A copy of the license or approval must be given to the Engineer. Said license must be valid at the time of disposal in the selected landfill.
  4. The Contractor shall coordinate with the authorities in charge of the landfill for specific details on acceptability of the disposal of the asbestos-cement material.
  5. The qualifications of personnel required for the removal and disposal operation must be approved by the Engineer.

6. Any required materials or equipment, such as; overalls, gloves, air respirator and etc. for persons involved in the handling of the AC material must meet the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1926.
7. The Contractor will excavate the trench to the necessary width on either side and to the depth which will not exceed the bottom of the pipe while maintaining a safe angle of repose. The pipe should not be disturbed in any way during excavation. The AC material may have to be wetted with water prior to breaking/cutting, depending on the requirements set forth by the selected landfill.
8. The asbestos landfill sites may have different restrictions on the length of the AC pipe which they accept for disposal. If the Contractor chooses to break or cut the AC pipe to meet the length requirement of the accepted landfill, it shall be done inside the trench area before the pipe is removed.
9. The AC pipe shall be completely covered with a minimum 6-mil polyethylene sheet and/or bag fastened with high strength duct tape. The free ends of the sheeting or the end of the bag shall be folded outside and over the pipe/duct bank and be sealed transversely with the duct tape.
10. The polyethylene sealed asbestos cement pipe shall be lifted intact without additional breaking and placed in a transport vehicle (box type trailer) which completely contains the wrapped and sealed portion of pipe/duct bank on all sides. A box trailer with tarpaulin top is not acceptable.
11. Any remaining portions of AC material (i.e., pieces, fragments, collars, rubber gaskets, etc.) in the trench, overburden or work area, will be carefully collected and placed in a 6-mil polyethylene bag or sheeting. The bags or sheeted materials will be then placed in the manner of transport mentioned above. If the polyethylene bag or sheet is torn or punctured, the Contractor must repeat the above process to assure a sealed mode of handling at no additional cost to the Owner.
12. All of the removal and placement of the AC material into the transport truck shall be accomplished with the Owner's designated representative present at the site.
13. The Contractor shall notify Owner and Engineer one week prior to the implementation of removal, disposal, and transport operations.
14. No dumping of AC material will be permitted under any circumstances at any site except the approved asbestos landfill.
15. The Contractor shall also monitor the air quality based on the requirement as set forth by the U.S. Department of Labor, OSHA 29 CFR 1926.58(f).

**END OF SECTION**

**SECTION 02640**

**VALVES, TAPPING SLEEVES AND APPURTENANCES**

**PART 1.00 GENERAL**

1.01 DESCRIPTION

A. Work Included:

The work under this Section includes the furnishing, installation and testing of all valves, tapping sleeves, transition couplings, hydrants, and appurtenances as indicated on the Drawings or as may be required by the Owner or the Engineer.

B. All materials to come into contact with potable water in this section shall be NSF 61 certified.

C. Related Work Described Elsewhere:

1. 02220 – Excavation, Backfill and Compaction
2. 02626 – PVC C909 Water Main

D. Reference: See appendices.

1.02 QUALITY ASSURANCE

A. Manufacturer's Recommendations:

The Contractor shall submit for approval the manufacturer's printed recommendations for the storage, protection, handling and installation of the valves, tapping sleeves, hydrants and appurtenances, which shall be strictly adhered to by the Contractor.

B. Certificate of Compliance:

Each shipment of valves, tapping sleeves, transition couplings, hydrants and appurtenances shall be accompanied with the manufacturer's notarized certificate certifying conformance with all requirements of the Specifications.

1.03 MARKING

A. Marking of all tapping sleeves shall conform to the requirements of AWWA 110 latest revision, marking of all valves shall conform to the requirements of AWWA C-509 latest revision, and marking of all hydrants shall conform to the requirements of AWWA 502 latest revision.

1.04 MANUFACTURER'S REPRESENTATIVE

A. The Contractor shall furnish at no additional expense to the Owner, the services of the manufacturer's representative for instruction of the Contractor personnel who will be installing the tapping sleeves, transition couplings, valves and hydrants. The instruction shall include proper handling, installation and jointing, and other construction areas and shall be for such lengths of time required to fully familiarize the Contractor's personnel with proper techniques. This information shall be bound and indexed for each type of unit as herein specified.

**PART 2.00 PRODUCTS**

2.01 GENERAL

- A. All materials to be incorporated into the work shall be new, purchased specifically for this Contract. All material shall be made in the United States of America and shall be provided with documentation indicating the location of the foundry and/or place of origin, unless otherwise approved.
- B. All coatings and/or protective oils used on materials that will eventually be in contact with potable water must be ANSI/NSF approved.

2.02 TAPPING SLEEVES AND TAPPING VALVES

- A. All tapping sleeves shall comply in all respects to AWWA Standard C-110 and the following design standards:
  - 1. Tapping sleeve shall be installed at the locations shown on the plans and details.
  - 2. The tapping sleeve shall be a mechanical type joint to provide pressure - tight installation and be suitable for use with the existing pressurized pipe material. Outlet flange shall be Class 125C, ANSI B16.1.
  - 3. Mechanical joint tapping sleeves shall have totally confined end gaskets and be designed to withstand a minimum of 200 psi working pressure.
  - 4. Mechanical tapping sleeves to be manufactured by Ford stainless steel tapping sleeve, with stainless steel bolts and flange Model No. FAST, or by Cascade Water Works Manufacturer stainless steel tapping sleeve, with stainless steel bolts and Flange Model No. CSTO-1. Nuts and bolts shall be Type 304 stainless steel.
  - 5. Tapping valves shall comply with Section 2.3 - Gate Valves except one end shall be flanged and the other mechanical.
  - 6. Tapping valves shall be provided with an oversized opening to allow the use of full size cutters.

2.03 GATE VALVES

- A. Resilient seated gate valves shall meet AWWA C509 and be UL listed and FM approved. This valve shall be ductile iron-body, bronze mounted, non-rising stem, 3-inch through 12-inch in diameter as shown on plans. All valves shall OPEN RIGHT. All valves shall be mechanical joint.
- B. Sizes 3-inch through 12-inch shall be suitable for 250 psig maximum working pressure and 400 psig test pressure.
- C. Valve shall have a minimum of two O-ring stem seals.
- D. Bonnet and gland bolts and nuts shall be stainless steel for corrosion resistance.
- E. The interior and exterior of valves shall be fully epoxy coated 8 mils thick. Epoxy shall be certified NSF approved for use in potable water systems. Field touch-up of the bonded epoxy within the body of the valve will be allowed; however, touch-up kit must be provided by the manufacturer of the valve and must meet the same NSF approval as the original bonded epoxy.

2.04 STRAIGHT AND TRANSITION PIPE COUPLINGS

- A. The center sleeve and end rings of couplings shall be made of ductile iron, meeting or exceeding ASTM A536. The coupling shall accommodate the entire O.D. range in the specified size by use of interchangeable color-coded end rings and gaskets.
- B. The coupling gasket shall be made of virgin rubber compound for water use. The SBR shall meet or exceed ASTM D2000-3-BA715. The gasket shall have raised lettering and sizing and state the proper color code for the appropriate end ring.
- C. The coupling shall be equipped with stainless steel bolts, washers, and nuts and conform to the latest edition of the AWWA specification designation C-111.
- D. Straight couplings shall be as manufactured by Smith Blair Model 441 or approved equal.
- E. Transitional couplings shall be as manufactured by Smith Blair Model 441, or approved equal.

2.05 VALVE BOXES AND COVERS

- A. Cast iron valve boxes shall be two-piece adjustable style, slip type, as manufactured by Clow, Mueller, Tyler, Bailey, or equal. Barrel inside diameter shall be 5-1/4 inches with 26-inch top section and 48-inch bottom section lengths adjusted to finish grade.
- B. Covers shall be cast iron, 5/8 inch, with the word "WATER" and a direction to open arrow imprinted thereon. The boxes and covers shall be compatible with the valves to which they attach.
- C. An approved operating Key shall be provided.

2.06 THRUST RESTRAINTS

- A. Restraining devices shall be utilized on all mains under the following conditions:
  - 1. Pipeline direction changes (tees, bends)
  - 2. Dead end lines (caps or plugs)
  - 3. Transition pieces (reducers)
- B. Thrust blocks shall be designed to withstand the force imparted by the main with a minimum 1½ times the anticipated working pressure but not less than 150 p.s.i. Maximum lateral bearing capacity shall be 1,500 lb/sf. Sizing guidelines for thrust blocks are detailed on the project Drawings.
- C. Thrust restraint shall also be provided via restrained joint, ductile iron pipe meeting AWWA C151 and AWWA C111. Restrained joint pipe lengths (restrained length) shall be sufficient to restrain thrust imparted by 1½ times the anticipated working pressure but not less than 150 psi. Pipe restrained joints shall be manufactured by EBAA Iron Sales, Inc. Series 1100 Megalug restraining system, or approved equivalent.
- D. Thrust restraint utilizing tie-rods shall not be utilized unless approved by the Engineer or specifically indicated. Tie-rod diameters shall be 2 times the diameter required to restrain the main. All rods shall be protected from corrosion with two coats of bituminous paint or epoxy.

2.07 HYDRANTS

- A. All fire hydrants shall comply in all respects to AWWA C-502 and the following design standards:
1. Fire hydrants shall be of the compression type, closing with the line pressure. The connecting line or hydrant lateral shall be 6 inches in diameter, as per AWWA Standard M17.
  2. The depths of bury shall be 5 feet minimum to top flange of hydrant boot. Hydrant extensions, which may be required, shall be manufactured by the same manufacturer of the hydrants being installed.
  3. Hydrant shall be furnished with a sealed reservoir located in the bonnet so that all threaded and bearing surfaces are lubricated each time the hydrant is operated.
  4. Hydrant shall be equipped with "O" ring packing. Each nozzle cap shall be provided with a Buna-N rubble washer.
  5. A bronze or rustproof steel nut and check nut shall be provided to hold the main hydrant valve on its stem.
  6. Hydrant shall be equipped with 5-¼ inch main valve opening.
  7. Hydrants shall have a 150 PSI working pressure. Each hydrant shall be able to deliver 500 gallons per minute through its two hose nozzles when opened together with a loss of not more than 2 psi through hydrant.
  8. Hydrant shall have at least two (2) bronze or copper lined drain outlets. The shoe of the hydrant shall be 6-inch mechanical joint D-150, suitable for use either with centrifugally cast pipe or Class D Pit Cast Pipe. Lugs will be case on either side shoe, securely anchoring the hydrant. Hydrants shall be furnished with a breakable feature that will break cleanly upon impact. This shall consist of a 2-part breakable safety flange with a breakable stem coupling. Hydrant nozzles must be able to be rotated to any position without disassembly of ground-line flange.
  9. Hydrants shall open to the RIGHT (clockwise) and shall have a direction-to open arrow with the word "OPEN" imprinted on the hydrant.
  10. The above grade stem shall be factory-coated (2 coats) with yellow enamel.
  11. Hydrants shall be so arranged that the direction of outlets may be turned 90 degrees without interference with the drip mechanism or obstructing the discharge from any outlet.
  12. Hydrants shall be furnished with caps, double galvanized steel hose cap chain, galvanized steel pumper hose cap chain, a galvanized steel chain holder and any other hooks and/or appurtenances required for proper use.
  13. All hydrants shall be equipped with a 6" gate valve in accordance with Section 2.03 above and be fully restrained as shown on the drawings. Restrained joints shall be by Megalug Thrust Restraint Wedge manufactured and sold by EBAA Iron Sales Inc., or approved equivalent.
  14. Hydrants shall be Mueller 3-way Centurion Model A-423 or approved equivalent.
  15. For every 4 hydrants installed the following shall be provided to the Owner or the Engineer (If less than 4 hydrants are installed, at least one completed set of the following shall be provided):
    - a. One (1)-traffic repair kit,
    - b. One (1) full set of "O" - rings and gaskets,
    - c. One (1) set of drain valve facings,
    - d. One (1) hydrant valve removal wrench, and
    - e. One (1) hydrant-operating wrench

All parts shall be properly labeled and housed in a carton with part numbers clearly indicated.

16. Hydrants shall be installed with sufficient height that when installed a 15-inch hydrant wrench will not contact the ground when making a full 360-degree turn on any nozzle cap.

17. A drainage pit with a volume of 10 cubic feet shall be provided at the base of the fire hydrant barrel. The pit shall be filled with gravel or crushed stone to a depth of 6 inches above the hydrant drain opening and covered with filter fabric prior to backfilling. The gravel or crushed stone aggregate shall provide void space greater than the volume of the hydrant barrel.

2.08 INSERTION VALVE

- A. Insertion valves shall conform to AWWA Standard C509 or C515 for material specifications and shall be Insta-Valve 250 Patriot as manufactured by Hydra-Stop, Inc., or approved equal.

2.09 TEMPORARY LINE STOP

- A. Temporary line stops shall conform to AWWA Standard C509 or C515 for material specifications and shall be HSF 250 Patriot as manufactured by Hydra-Stop, Inc., or approved equal.

**PART 3.00 EXECUTION**

3.01 INSTALLATION

- A. General:
  1. All tapping sleeves, valves, hydrants, and accessories shall be carefully inspected by the Contractor for defects before installation and all defective, unsound or damaged materials shall be rejected.
  2. The Owner or the Engineer will make such additional inspections as he deems necessary, and the Contractor shall furnish all necessary assistance for such inspection.
  3. Proper implements, tools and facilities satisfactory to the Owner or the Engineer shall be provided by the Contractor for the proper and satisfactory execution of the work.
- B. Tapping sleeves, valves, couplings and appurtenances shall be new and unused and shall be of the types and materials specified as indicated or as directed.
- C. The interior of tapping sleeves, valves, and fittings shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operation.
- D. Tapping sleeves, valves, and fittings shall be constructed in dry trenches and shall not be laid when the conditions of the trench or the weather are unsuitable for such work.
- E. Tapping sleeves, valves, and couplings shall be laid to the line and grade in such a manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line.
- F. At times when work is not in progress, open ends of tapping sleeves, valves and fittings shall be securely closed so that no trench water, earth or other substances will enter.
- G. Any tapping sleeves, valves or fittings that have been disturbed after laying shall be taken up and re-laid.
- H. All materials found to be defective during the progress of the work will be rejected by the Engineer and the Contractor shall promptly remove such defective material from the site of the work and replace with new material at no additional expense to the Owner.

- I. The Contractor shall be responsible for the safe storage and proper handling of all materials.
- J. No shims or mounds of earth shall be used to raise the equipment to grade.
- K. No tapping sleeve, valve, or appurtenance shall be covered until the joints have been inspected.
- L. Installed materials shall be protected at all times during construction against flotation; they shall be thoroughly secured, properly supported and bedded to prevent settlement or disturbance. Compaction of bedding and backfill material shall be in accordance with Section 02220 – Excavation, Backfill and Compaction
- M. Tapping sleeves shall be installed where indicated or as directed by the Owner or the Engineer and shall be installed according to the manufacturer's recommended procedures.
- N. Valves and joint restraints shall be installed where indicated or as directed by the Owner or the Engineer and shall be installed according to the manufacturer's recommended procedures.

3.02 SETTING VALVES AND VALVE BOXES

- A. Valves shall be set in the pipelines as directed. Blocking or supports of a permanent nature shall be placed under each valve to ensure against settlement.
- B. Each valve shall be tightly closed before being placed in the line and shall remain so until the joints on each side are completely tightened.
- C. Valve boxes shall be set for all valves and shall be locking type. They shall be carefully fitted together and to the valve and securely held during backfilling. They shall be centered over the valve-operating nut. The bedding material around them shall be thoroughly tamped in place and the box cover set to the finished grade.

3.03 TESTING

- A. All materials shall be tested for tightness as soon after installation as possible in accordance with Section 02704, Pipeline Pressure, Leakage, and Disinfection.
- B. All materials found to be defective during testing shall be replaced with new and approved material at no additional expense to the Owner.

3.04 TEST REPORTS AND CERTIFICATES

- A. In addition to other requirements specified herein, the Contractor shall furnish to the Engineer notarized test reports and methods of test by an approved independent testing laboratory to show compliance of all materials furnished under this section of the Specifications with all the requirements herein.
- B. Each shipment of tapping sleeves, valves, and other appurtenances shall be accompanied by the manufacturer's notarized certificate of conformance certifying that materials to be furnished under these items meet all requirements herein.
- C. All testing of materials furnished under this section of the Specifications shall be provided by the Contractor at no additional expense to the Owner.

**END OF SECTION**



**SECTION 02643**

**WATER SERVICE LINES**

**PART 1.00 GENERAL**

1.01 DESCRIPTION

- A. Work under this section includes furnishing, installing, testing, and disinfection of all new water service, or water service branch connections, of the size and location shown on the plans and/or as may be required by the Owner.

1.02 QUALITY ASSURANCE

- A. Shop Drawings: Contractor shall submit for approval six (6) copies of shop drawings for all material to be used for this item of work.

1.03 MANUFACTURER'S INFORMATION

- A. Contractor shall furnish, at no additional expense to the Owner, detailed parts information, as well as operating, maintenance and installation procedures, as recommended by the manufacturer, for all units used for this specification. This information shall be submitted in duplicate to the Engineer, bound and indexed for each type of unit as herein specified.

**PART 2.00 PRODUCTS**

2.01 GENERAL

- A. All materials required to be incorporated into the work shall be new, purchased specifically for this contract.

2.02 CORPORATION STOPS AND FITTINGS

- A. Corporation Stops:
  - 1. The inlet thread shall be AWWA taper "cc" threads and conform to AWWA 800. The outlet thread shall conform to CTS and accessories required for a compression type connection. Design to withstand a minimum of 200-psi pressure.
  - 2. Corporation stops shall be Mueller Style No. H-15008, or Ford Style No. FB1000, for ¾ inch and 1-inch sizes; and Mueller style H-15013 for 1-1/2 inch and 2-inch sizes or approved equal.
- B. Fittings - Brass:
  - 1. Compression Fitting: Materials shall meet standard AWWA C-800 for brass fittings. Fitting design to withstand a minimum of 200-psi pressure and shall be as manufactured by Mueller, Ford, or approved equal.

2.03 CURB STOPS

- A. Curb stops to meet the following requirements:
  - 1. Valve to open right.

2. T-head which aligns with the port that provides a quick identification of valve position.
3. Valves shall be of bronze, meeting AWWA C-800.
4. Design of valve shall be for a minimum hydrostatic test pressure of 200-psi pressure.
5. Curb stop shall be non-draining type.
6. Curb stops shall be Mueller Style No. H15209, or approved equal.

#### 2.04 CURB BOXES

- A. Curb boxes shall be 2½-inch "Buffalo" type. The construction shall provide adjustment for varying grade levels and provide allowance for settlement or frost heave. Extension range shall be 40" to 60". The boxes shall completely cover the curb stop. "Water" shall be clearly cast on the cover and have a brass pentagonal bolt.
- B. The box and cover shall be coated inside and out with a tar base enamel.
- C. Provide a standard valve box cover in lieu of a curb box cover if placed in a paved area.

#### 2.05 WATER SERVICE PIPING (TUBING)

- A. Polyethylene Tubing
  1. Polyethylene tubing shall be copper-tube sized (CTS), 200-psi working pressure, 600 psi burst pressure, continuous tubing meeting or exceeding the standards of ASTM D2239.
  2. Each water service shall consist of one (1) continuous run of polyethylene tubing. Splices, couplings, or other methods of joining separate sections of tubing shall not be allowed without the approval of the Engineer.

### PART 3.00 EXECUTION

#### 3.01 INSTALLATION OF WATER SERVICE LINES

- A. Water service lines or branches shall be installed in accordance with the Drawings.
- B. For service branch installations the Contractor will use the conventional open-trench cut method, no other method will be used unless previously agreed to by the Owner.
- C. Corporation stops shall be directly tapped into the water main and the service piping (tubing) of the size specified shall run directly from the corporation stop to the curb stop. The run shall be perpendicular to the water main, in the event the Contractor does not run the tubing perpendicular to the water main, and the new alignment was not approved by the Owner, the Contractor shall not be entitled to additional monies resulting from additional work and materials.
- D. Corporation stops shall be installed as near the horizontal diameter as possible. The length of travel of the tap should be so established that when the stop is inserted and tightened with a 14-inch wrench, not more than one to three threads will be exposed on the outside. When a wet tapping machine is used, the corporation cock shall be inserted with the machine while it is still in place. Stops shall be tightened only sufficiently to give watertightness and care must be constantly exercised not to overtighten them.
- E. The Contractor shall install straight couplings to existing water mains of the sizes required in the locations designated by the Engineer in the field. The Contractor shall utilize the manufacturer's recommended installation procedures while performing the work. Care shall be taken to ensure a watertight connection.

- F. Curb stops will, in most cases, be installed near the property line. The Contractor shall install the curb stops and boxes in a workmanlike manner as described herein and as directed by the Engineer and shall place clean compacted sand around and below the curb stop.
- G. When applicable, curb stops installed for future use shall be furnished with a tailpiece and end plug, which will be removed during future connection to the service stop.
- H. The boxes shall be set in a true vertical position and if they are within the limits of the roadway or within limits where the plowing of snow will take place in the winter, the tops of the boxes shall be set about 1/2 inch below the top of the finished grade. In locations where these boxes are not likely to be disturbed, the tops shall be set flush with the adjoining ground.
- I. Care shall be exercised in the placing and laying of service tubing to be sure that the pipe (tubing) does not have kinks or sharp bends and to assure against it being in contact with sharp stones or ledge which would cause damage to the pipe. At least 12-inches of clean compacted sand shall be placed adjacent to, below and above the water service tubing and no stone shall be placed over the pipe until the depth of backfill above the latter is in excess of one foot.
- J. All new water services shall have a minimum cover of four and one-half feet, as measured from finished grade; throughout the installation from the water main to the curb stop. New water services shall also have a maximum cover of eight feet measured from finished grade; throughout the installation from the water main to the curb stop. In the event that this minimum or maximum cover cannot be attained, the Contractor shall propose an alternative alignment for approval by the Engineer and Owner. In no event shall the Contractor install any service not meeting the above requirements without prior approval by the Owner and Engineer.

**END OF SECTION**

**SECTION 02704**

**PIPELINE PRESSURE, LEAKAGE, AND DISINFECTION**

**PART 1.00 GENERAL**

**1.01 SCOPE**

- A. This section specifies requirements for the testing and disinfection of underground potable water and fire service pipelines. The work covered under this section includes, but is not necessarily limited to:

1. Leakage tests
2. Disinfection

NOTE: Testing will be performed prior to connecting new pipeline sections to any existing potable water system piping. No physical connections (temporary or permanent) between new pipe and existing pipe will be allowed during the test without the use of a tested and approved backflow prevention device.

**1.02 REFERENCES**

- A. American Water Works Association (AWWA):
1. AWWA B300: Standard for Hypochlorites
  2. AWWA B301: Standard for Liquid Chlorine
  3. AWWA C600: Standard for Installation of Ductile Iron Water Mains and Their Appurtenances
  4. AWWA C605: Standard for Installation of Polyvinyl Chloride Water Mains and Their Appurtenances
  5. AWWA C651: Standard for Disinfecting Water Mains

**1.03 SUBMITTALS**

- A. Submittals shall be provided in accordance with the requirements of Section 01340 – Submittals.
- B. Bacteriologic Test: Certified reports of the required bacteriologic test from an approved qualified independent testing laboratory.
- C. Shop drawing of temporary connection backflow preventer.
- D. Detail of temporary connection between existing and new water pipelines.

**1.04 QUALITY CONTROL**

- A. Sampling for laboratory analysis following disinfection shall be conducted by qualified personnel familiar with sampling procedures and protocols.
- B. Reference Standards: Except as modified or supplemented herein, the testing of the pipeline system shall meet the requirements of the following standard specifications:
1. AWWA C600, Latest Revision - Pressure and Leakage Tests; and C651, Latest Revision - Disinfecting Water Mains.

2. NSF/ANSI 60: National Sanitation Foundation Standard for Drinking Water Treatment Chemicals
3. NSF/ANSI 61: National Sanitation Foundation Standard for Drinking Water System Components

**PART 2.00 PRODUCTS**

2.01 LIQUID CHLORINE

- A. Liquid chlorine shall conform to AWWA Standard B301, current edition.

2.02 HYPOCHLORITE

- A. Hypochlorite shall conform to AWWA Standard B300, current edition.

2.03 BACKFLOW PREVENTER

- A. Backflow prevention device for any connection between the existing water system and new water pipes prior to acceptance of pressure test, disinfections, and flushing, shall be of the appropriate size as required, testable, and shall be double check-reduced pressure type as manufactured by Watts, Febco, Hersey, or approved equivalent.

**PART 3.00 EXECUTION**

3.01 PREPARATION

- A. Cleaning and Inspection: The interior of all pipe, fittings, valves, and appurtenances shall be thoroughly cleaned of all foreign material and inspected for cracks, flaws, or other defects before installation, and shall be kept clean until the work is accepted.

3.02 FIELD QUALITY CONTROL

- A. Alignment Tests: Each section of pipe will be checked by the Engineer in order to determine whether any displacement of the pipe has occurred. The Contractor shall provide suitable assistance to the Engineer. The Contractor shall repair any poor alignment, displaced pipe, or other defects discovered, as directed by the Engineer.
- B. Hydrostatic Tests: After the pipe has been laid and the trench has been backfilled, all newly laid pipe or any valve section thereof, shall be subjected to a pressure and leakage test in accordance with AWWA C600 or C605, latest edition, and as approved by the Engineer. The Contractor shall provide all pumps, pipe, connections, gauges, measuring devices, and all other apparatus necessary for the test and shall conduct the test in the presence of and to the satisfaction of the Owner and Engineer. The Owner will supply water to the Contractor for testing purposes at no expense to the Contractor.
  1. Test Pressure - The required minimum test pressure shall be 1-½ times the working pressure measured at the point of lowest elevation of the pipeline and corrected to the elevation of the test gauge but shall not be less than 150 psi. Test pressures shall not vary by more than plus or minus 5 psi for the duration of the test.
  2. Duration of Test - two (2) hours minimum.
  3. Length of main to be tested in no event shall be greater than 1,000 linear feet measure along the centerline of the trench.
  4. Air Removal - Prior to performance of the test, the pipeline shall be completely filled with water for a period of 72 hours. Expel air by means of air relief valves, hydrants, or other means as required. If permanent air vents or taps are not located at all high points, the Contractor shall

install corporation stops at such points so air can be expelled. After the tests are completed, plug all temporary taps.

5. Allowable Leakage:
  - a. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valve section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
  - b. No pipe installation will be accepted if the leakage is greater than that determined by the following formula in which "L" is the allowable leakage in gallons per hour; "S" is the length of pipe tested in feet; "P" is the average test pressure during the leakage test in pounds per square inch (gauge); and "D" is the nominal diameter of the pipe in inches.

$$L = \frac{SD\sqrt{P}}{133,200}$$

6. Repair of Leaks - If the test discloses leakage greater than the allowable leakage, the Contractor shall, at his own expense, locate and repair the defective joints until leakage is within the specified allowable. The Contractor shall repair any specific leaks regardless of the test results if, in the opinion of the Owner or Engineer, they are serious enough to endanger the future serviceability of the pipeline.

### 3.03 DISINFECTIONS OF POTABLE WATER LINES & PUMP SYSTEMS

#### A. General:

1. Flushing and disinfection of potable water lines and pump systems shall be done in accordance with the procedure set forth in AWWA C651 - Disinfecting Water Mains, latest edition, and shall be witnessed by the Engineer unless otherwise approved. Furthermore, any chlorine used in the disinfection of the potable water systems shall be NSF 60 certified. The Contractor shall provide all temporary blowoffs, pumps, chlorination equipment, chlorine, and all other necessary apparatus required.
2. All new valves shall be operated during the disinfection procedure in order to ensure complete disinfection.
3. The form of chlorine proposed by the Contractor for disinfection shall be approved by the Owner.
4. The Contractor shall take adequate measures to prevent backflow of flushing water and chlorinated water into the existing water distribution system.
5. Contractor shall not make physical connection to the existing water system prior to satisfactory results of chlorination. An approved backflow prevention device shall be utilized to transfer water from the existing system to the new piping network. **A closed gate valve shall not constitute a separation from the existing system and new work.**

#### B. Pipe Cleaning:

1. If the pipe contains dirt or heavy encrusted matter that, in the opinion of the Engineer, will not be removed during the flushing operation, the Contractor shall clean and swab the interior of the pipe with a one (1) percent hypochlorite disinfecting solution.
2. The pipeline shall be flushed to remove all remaining foreign material prior to disinfection, except when the tablet method is used. The flushing operation shall develop a minimum velocity of 3.0 ft/s. It will be the Contractor's responsibility to properly size and locate corporations within test sections to adequately flush all piping at least 2 times its volume at the desired velocity. The Contractor must coordinate all flushing operations with the Owner. If in

the Owner's opinion flushing of the new main will cause a significant disruption to the existing system, the Owner may require the Contractor to perform flushing at times designated by the Owner or in a manner that the Owner views as suitable. The Contractor shall not be entitled to additional monies as a result of the Owners requirements for flushing. It may be necessary for the Contractor to utilize a pump to achieve the minimum required velocity for flushing. If a pump is necessary, the Contractor shall utilize a pump at no additional cost to the Owner.

C. Chlorine Application:

1. In general, chlorine shall be applied using the continuous feed method, as specified in AWWA C651, latest edition. Chlorine used for disinfection shall be NSF 60 certified for potable water use.
2. Introduce water into the line at a constant rate while adding chlorine to the water at a constant rate, such that the water will have not less than 25 mg/L free chlorine. Maintain the chlorinated water in the pipeline for a minimum of 24 hours, after which period the treated water shall have a free chlorine residual of not less than 10 mg/L throughout the entire length. Repeat the above procedure if the residual, at the end of the 24 hours, fails to meet the minimum concentration. Chlorinated water above the normal system prevailing concentration shall not be allowed to remain in the pipeline for a period longer than 5 days.

D. Final Flushing:

1. After the required retention period, flush all heavily chlorinated water from the main until the chlorine concentration is no higher than that prevailing in the system or is acceptable for domestic use. The Contractor shall be responsible for satisfactory disposal of all flushing water and chlorinated water at no additional expense to the Owner.
2. Prior to discharging, a reducing agent shall be applied to the water to be wasted, to neutralize thoroughly the chlorine residual remaining in the water. Where necessary, Federal, State and local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

E. Bacteriologic Tests:

1. After completion of the final flushing and prior to connecting pipeline to distribution system and placing it into service, collect two (2) consecutive sets of samples from the end of the line at least 16 hours apart and test for coliform organisms (i.e., total coliform) and heterotrophic plate count (HPC) or collect two sets of samples 15 minutes apart after at least a 16-hr rest period. Testing shall be performed in accordance with Standard Methods for the Examination of Water and Wastewater. The results shall be submitted to the Rhode Island Department of Health (HEALTH) on RI Department of Health – Office of Drinking Water Quality official reporting forms for review and approval prior to placing the pipeline into service. Contractor shall coordinate with the Engineer/Owner for sampling. Engineer and/or Owner shall have the option of collecting independent samples at time of sampling.
2. Sample sets will be required for each isolated section of pipe tested.
3. Collect samples in sterile bottles, treated with sodium thiosulfate, from a standard corporation stop with gooseneck assembly installed in the main. Do not collect samples using a hose or fire hydrant.

F. Repetition of Procedure - If the original disinfections fails to produce satisfactory bacteriological samples, repeat the disinfections procedure until satisfactory results are obtained at no additional expense to the Owner.

**END OF SECTION**

**SECTION 02745**

**PAVEMENT MARKINGS**

**PART 1.00 GENERAL**

1.01 WORK INCLUDED

- A. Work under this section includes placement of new pavement marking paint as shown on the Drawings and specified in the Bid Form, or as directed.

1.02 SUBMITTALS

- A. Product Data: For each type of product indicated include technical data and composition of materials proposed.
- B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- C. Shop Drawings: Indicate pavement markings, lane separations, bike lanes, railroad crossings, crosswalks to match existing conditions. Provide shop drawings prior to removal of pavement.
- D. Qualification Data: For manufacturer.
- E. Material Test Reports: For each paving material.
- F. Conformance Certificates: For each paving material, signed by manufacturers.

1.03 REFERENCE STANDARDS

- A. All work specified in this section shall conform to "Standard Specifications for Road and Bridge Construction" of the Rhode Island Department of Transportation, including latest revisions, hereinafter referred to as "State Standards".

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with the State Standards.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.06 PROJECT CONDITIONS

- A. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.



**PART 2.00 PRODUCTS**

2.01 PAVEMENT MARKINGS

- A. Pavement markings shall be composed of epoxy resin conforming to the State Standards.
- B. Pavement markings shall be “yellow” or “white” in color as specified on the Drawings.
- C. Pavement marking stripes shall measure 4 inches in width or as specified on the Drawings.
- D. Waterborne pavement markings are not acceptable.

**PART 3.00 EXECUTION**

3.01 PAVEMENT MARKINGS

- A. Epoxy Resin Pavement Markings shall be installed in accordance with Section T.20 of the State Standards.

**END OF SECTION**

**SECTION 02751**

**CEMENT CONCRETE PAVEMENT**

**PART 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. The work of this Section includes the following:
  - 1. Cement Concrete Sidewalks
  - 2. Cement Concrete Curbs
  
- B. Related Work Specified Elsewhere
  - 1. Section 02200 – Earthwork
  - 2. Section 02220 - Excavation, Backfill and Compaction
  - 3. Section 03200 - Reinforcing Steel

**1.02 REFERENCE STANDARDS**

- A. All work specified in this section shall conform to the latest edition of ACI 318 – “Building Code Requirements for Structural Concrete” and "Standard Specifications for Road and Bridge Construction" of the Rhode Island Department of Transportation, including latest revisions, hereinafter referred to as "State Standards".

**1.03 SUMMARY**

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

**1.04 SUBMITTALS**

- A. Product Data: For each type of manufactured material and product indicated. Indicate name, source, and description of each material and product.
  
- B. Design Mixtures:
  - 1. Submit prior to start of Work written reports of each proposed mix for each class of concrete. Do not begin concrete production until mixes have been approved by the Engineer.
  - 2. For each concrete pavement mixture, include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  
- C. Qualification Data: For testing agency.
  
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the aggregates and concrete mix with requirements indicated.

- E. Batch Ticket Information: Provide concrete delivery tickets showing job name and location, date and time of delivery, quantity of concrete, quality and type of concrete, admixtures, amount of water added, and all other relevant information as described in ASTM C-94. Submit original batch tickets and 2 copies at the end of each week.
- F. Field quality-control test reports.
- G. Sample of Detectable Warning Paver for review by Owner.
- H. Submittal depicting proposed locations for expansion and control joints on all cement concrete pavement surfaces.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program
- C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- D. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- E. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.
  - 1. Notify Owner's Representative a minimum of seven days in advance of dates and times when mockups will be constructed.
  - 2. Obtain Owner's Representative's approval of mockups before starting construction.
  - 3. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
  - 4. Demolish and remove approved mockups from the site when directed by Owner's Representative.
  - 5. Approved mockups may become part of the completed Work if approved by the Owner's Representative.

1.06 DESIGN REQUIREMENTS

- A. Design formwork to support vertical loads and lateral pressures resulting from placement and vibration of concrete in accordance with the requirements of ACI 301 and ACI 347, and as specified herein.
- B. Camber the formwork to compensate for anticipated deflections due to the weight and pressure of the fresh concrete and due to construction loads.

- C. Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations. Use wedges or jacks, individually or in combination for adjustment.
- D. Design forms and falsework to include assumed values of live loads, dead load, weight of moving equipment operated on formwork, concrete mix, height of drop, vibrator frequency, ambient temperature, lateral stability, and other factors pertinent to the safety of the structure during construction.
- E. Provide and design forms to conform with expansion and construction joint locations.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Order concrete from batching plant so that trucks arrive at discharge locations when concrete is required. Avoid excessive mixing of concrete or delays in placing successive layers of concrete in forms.
- C. Deliver concrete to discharge locations in watertight agitator or mixer trucks without altering the water-cement ratio, slump, air entrainment, temperature and homogeneity.
- D. Concrete not conforming to specification, unsuitable for placement, exceeding the time or temperature limitations or not having a complete delivery batch ticket will be rejected.

1.08 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Weather: Protect concrete from damage and reduced strength or performance due to weather extremes during mixing, placing and curing.
- C. Cold Weather: Unless special precautions are taken to protect concrete, do not Work when temperatures are below 40°F or when temperatures are expected to fall below 40°F within 72 hours after placing concrete.
  - 1. Comply with ACI 306 in cold weather.
  - 2. Maintain concrete temperature of at least 60°F. Reinforcement, forms and ground in contact with concrete, shall be free of frost.
  - 3. Keep concrete and formwork at least 50°F for at least 96 hours after placing concrete.
  - 4. The use of calcium chloride in any form is not permitted. Non-chloride accelerator shall be used when ambient temperature is below 50°F.
  - 5. Admixture manufacturer shall provide technical assistance at no additional cost. A manufacturer's representative shall be available for consultation by phone or on site upon 72-hour notice.
- D. Hot Weather: Concrete, when deposited, shall be less than 85°F. Cool the mix in a manner acceptable to the Engineer if the concrete temperature is higher.
  - 1. Comply with ACI 305 in hot weather.
  - 2. Retarder shall be used when ambient temperature exceeds 80°F.

**PART 2.00 PRODUCTS**

2.01 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
  - 1. Use flexible or curved forms for curves with a radius 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, nor adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Forms for Exposed Finish Concrete: Construct formwork for exposed concrete surfaces with smooth faced undamaged plywood or metal, metal-framed plywood faced or other acceptable panel-type facing materials approved by Owner's Representative, to provide continuous, straight, smooth as-cast surfaces, and produce a uniform and consistent texture and pattern on the surfaces. Metal patches on forms for these surfaces will not be permitted. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on the drawings.
  - 1. Use overlaid plywood complying with U.S. Product PS-1 "A-C or B-B High Density Overlaid Concrete Form", Class I.
  - 2. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- D. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- E. Form Ties:
  - 1. Form Ties: For concrete structures, which will not be in view or buried below finish grade, use carbon steel factory-fabricated, removable or stay in place snap-off type form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units, which will leave no metal closer than 1-1/2" to surface. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface. Patch all holes with non-shrink grout.
  - 2. Form ties and spreaders for walls in areas exposed to view shall be Stainless Steel Cone-Tight Tyscru by Richmond Screw Anchor Co.; Dayton Sure-Grip and Shore Co.; or substitute approved by Engineer with Plastic cone-tight type cones having a 1" setback and a taper from 1" to 1-1/4". Tycone holes shall be sealed with plastic set back plugs, color as selected by Engineer from manufacturer's standard color selection or filled with non-shrink grout. Tyscru ties shall be sized to satisfy loading requirements.
  - 3. In lieu of form ties specified above, fiberglass form tie systems shall be used. Fiberglass form ties shall be standard gray color. The concrete structure shall be finished by grinding the fiberglass form tie flush with the finish surface of the concrete structure.
    - a. If tapered architectural holes are required, dummy tapered cones having a 1" setback and a taper from 1" to 1-1/4 shall be fastened to the interior of the formwork to achieve the specified pattern on the finish structure.
- F. Chamfer Strips: Provide 3/4-inch triangular fillets to form all exposed concrete corners. Material shall be rubber or polyvinyl chloride type, or smooth clear, sealed softwood.

- G. Sleeves: Sleeves for wall and floor penetrations shall be pre-engineered Century-Line sleeves as manufactured by Thunderline Corporation or Engineer approved substitute. Sleeves shall be constructed of high impact thermoplastic with waterstop collar, reinforcing ribs and nailer end caps for positioning forms. Sleeve shall be designed to work with modular mechanical seal for through wall penetrations. Size of sleeves shall be selected according to manufacturer's recommendations for pipe sizes indicated on drawings.
- H. Seals: Sleeve/pipe seals shall be Link-Seal modular mechanical seals as manufactured by Thunderline Corporation or approved equivalent. The seal shall be modular, mechanical; type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening. The elastomeric element shall be sized and selected per manufacturer's recommendations and have the following properties as designated by ASTM:
  - 1. For standard service applications: (-40°F to 250°F) EPDM – ASTM D2000 M3 BA 510.
  - 2. For hydrocarbon service applications: (-40°F to 210°F) Nitrile – ASTM D2000 M1BF510.
  - 3. For high temperature or fire seal applications: (-60°F to 400°F) Silicone – ASTM D2000 M1GE505.

## 2.02 STEEL REINFORCEMENT

- A. Steel reinforcement required for the construction of sidewalks, walkways, and concrete apron shall conform to the requirements of the State Standards.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- D. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 deformed bars.
- E. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.
- F. Epoxy-Coated Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain steel bars.

## 2.03 CONCRETE MATERIALS

- A. The Contractor shall insure that the final appearance of the sidewalks is consistent throughout the whole project. Any difference in color, texture, or finish will not be accepted by the Engineer.
  - 1. Any portion of sidewalk or walkway that does not match the color, texture, or finish of previously constructed sidewalks will be removed and replaced with a sidewalk that matches the recently poured sidewalks at the expense of the Contractor.
- B. Cementitious Materials conforming to the State Standards shall be provided for the construction of the proposed sidewalks.
  - 1. The cement factor shall be between 658 lbs/cy and 799 lbs/cy.
  - 2. The maximum water/cementitious ratio is 0.42.
  - 3. The slump shall be between 1 and 3 inches.

4. The minimum compressive strength after 7 days shall be 2,400 lbs with a 28-day compressive strength of 4,000 lbs.
- C. Aggregate shall conform to the requirements and gradations specified in the State Standards.
  - D. Water: ASTM C 94/C 94M.
  - E. Air-Entraining Admixture: ASTM C 260.
  - F. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
    1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
    2. Retarding Admixture: ASTM C 494/C 494M, Type B.
    3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
    4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
    5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
    6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- 2.04 CURING MATERIALS
- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
  - B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
  - C. Water: Potable.
- 2.05 CONCRETE MIXTURES
- A. Prepare design mixtures, proportioned according to the State Standards, for each type and strength of normal-weight concrete required.
- 2.06 CONCRETE MIXING
- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.
    1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
  - B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
    1. For concrete mixes of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
    2. For concrete mixes larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

2.07 PREMOLDED JOINT FILLER

- A. Provide premolded–joint filler conforming to ASTM D1752, Type I or Type II.
- B. Provide Type III self-expanding cork where specifically indicated.
- C. Provide joint filler of same thickness as expansion joint width indicated.
- D. Provide maximum length filler manufactured to minimize field splicing.

2.08 JOINT COMPOUNDS

- A. Provide joint compound for expansion joints in horizontal surfaces and surfaces inclined less than 30 degrees from the horizontal conforming to ASTM C920, Type S or M, Grade P, Class 25. Use type T in pedestrian and vehicular traffic areas and use type NT in non-vehicular areas.
- B. Provide joint compound for expansion joints in walls and surfaces inclined greater than 30 degrees from the horizontal conforming to ASTM C920, Type S or M, Grade NS, Class 25.
- C. Provide compatible joint compounds as recommended by manufacturer when they abut each other.
- D. Provide compound intended for continuous submergence in liquid containing structures.

2.09 BOND BREAKER FOR JOINT COMPOUNDS

- A. Provide polyethylene tape, coated tape or metal foil.

2.10 BACK-UP MATERIAL FOR JOINT COMPOUNDS

- A. Provide polyethylene foam or polychloroprene foam rubber.
- B. Do not use material impregnated with oil, bitumen, or similar substances.
- C. Provide back-up material as recommended by joint compound manufacturer that is compatible with the joint compound and has the same expansion/contraction capability as joint compound.

2.11 DETECTABLE WARNING PAVERS

- A. Provide precast concrete unit pavers with detectable warning surface that comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
  1. Pavers shall be ‘Detectable Warning Pavers’ as manufactured by Hanover Architectural Products, Hanover Pennsylvania, or approved equivalent.
- B. Detectable warning pavers shall be manufactured and installed to the sizes and dimensions indicated on the Contract Documents and approved Submittals.



- C. Concrete pavers shall conform to ASTM C936-82, Standard Specifications for Solid Concrete Interlocking Paving Units. The minimum compressive strength shall not be less than 7,200 pounds per square inch with the average compressive strength not less than 8,000 pounds per square inch Maximum absorption shall be 5 percent or less at 50 cycles of freeze-thaw testing per section ASTM C67. Submit paver tests for freeze thaw and abrasion resistance to be approved by the engineer.
1. Paver size shall be 11- $\frac{3}{4}$  inch square with beveled top edges.
  2. Paver thickness shall be 2 inches.
  3. Width and thickness shall not vary by greater than 1/16 inch.
  4. The finish shall be non-slip texture.
  5. Paver color shall be 'Charcoal' from manufacturer's standard color range which provides a 60% color contrast from the abutting ramp pavement color, as required by the Americans with Disabilities Act.
- D. Mortar for Detectable Warning Pavers
1. Mortar for grouted joints between pavers shall be a cement mortar composed of one part Portland cement and two parts sand, by volume with sufficient water to form a workable, stiff mixture.
  2. Setting bed mortar shall conform to ASTM C 270, Type S, except that latex polymer additive shall be mixed with the cementitious materials and aggregate in lieu of water.
  3. Cement: Shall be an American portland cement conforming to ASTM C150, Type I or II, except Type III may be used for cold-weather construction and shall exhibit no efflorescence when cast into 2 inch x 7 inch x  $\frac{1}{2}$  inch (50 mm x 178 mm x 13 mm) slabs comprising the mortar under test.
  4. Water: clean, fresh and potable, from public water system.
  5. Sand: clean, washed, uniformly well-graded, conforming to ASTM C144 with 100 percent passing No. 8 sieve (2.37 mm), and not more than 35 percent passing No. 50 sieve (300um), with a fineness modulus maintained at 2.25 plus or minus 0.10.
  6. Hydrated Lime: provide plastic hydrate, conforming to ASTM C207, Type "S" as approved by the Owner's Representative.

## **PART 3.00 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
  2. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Section 02200 Earthwork.
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.
- D. Remove loose material from compacted subbase surface immediately before placing concrete.

3.02 EDGE FORMS AND SCREENED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.
- C. General:
  - 1. Construct forms as designed and in accordance with Contractor's approved working drawings conforming to ACI 347, to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, level, and plumb work in finished structures.
  - 2. Provide for openings, offsets, keyways, recesses, moldings, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features required. Use selected materials to obtain required finishes.
  - 3. Forms for concrete which accommodate work of other trades, fabricated before the opportunity exists to verify the measurements of adjacent construction, shall be accurately sized and located as dimensioned on the Drawings. In the event that deviation from the Drawing dimensions results in problems in the field, the Contractor shall be responsible for resolution of the conditions as approved by the Engineer, at no cost to the Owner.
- D. Fabrication:
  - 1. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage concrete surfaces.
  - 2. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Brace temporary closures and set tightly to temporary openings on forms in as many inconspicuous locations as possible, commensurate with design requirements. Form intersecting planes to provide true, clean cut corners.
- E. Falsework:
  - 1. Erect falsework and support, brace, and maintain it to safely support vertical, lateral, and asymmetrical loads applied until complete structure has attained design strength. Construct falsework so that adjustments can be made for take-up and settlement, and access is provided for inspection.
  - 2. Provide wedges, jacks or chamfer strips to facilitate vertical adjustments. Carefully inspect falsework and formwork during and after concrete placement operations to determine abnormal deflection or signs of failure; make necessary adjustments to product work of required dimensions.
- F. Forms for Exposed Concrete:
  - 1. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes
  - 2. Provide sharp clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or grits to maintain true, square intersections.

3. Use extra studs, walers, and bracing to prevent bowing of forms between studs and to avoid bowed appearance in concrete. Do not use narrow strips of form material, which will produce bow.
- G. Corner Treatment:
1. Unless shown otherwise, form chamfers with  $\frac{3}{4}$ -inch by  $\frac{3}{4}$ -inch strips, accurately formed and surfaced to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to required limit and miter chamfer strips at changes in direction.
- H. Control Joints: Locate as indicated on the Drawings.
- I. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Verify size and location of openings, recesses and sleeves with the trade requiring such items. Accurately place and securely support items to be built into forms.
- J. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove encrusted mortar and grout, chips, wood, sawdust, dirt, and other debris just before concrete is placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

### 3.03 REMOVAL OF FORMS

- A. Formwork not supporting concrete, such as sides of walls, columns, and similar parts of the Work, may be removed after cumulatively curing at not less than 50 degrees F for 72 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operation, and provided that curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as elevated beams, joists, slabs and other structural elements may not be removed until concrete has attained 70% of its design minimum 28-day compressive strength and has cumulatively cured for no less than 7 days. Concrete shall have sufficient strength to safely support its own weight and construction live loads and lateral pressures. Determine potential compressive strength of in-place concrete testing field-cured specimens representative of the concrete location or members in accordance with State Standards.
- C. Form facing material may be removed one day after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.
- D. Form ties: The concrete structure shall be finished by grinding the fiberglass form ties flush with the finish surface of the concrete structure.

### 3.04 REUSE OF FORMS

- A. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. When forms are reused for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Apply new form releasing agent to all form areas that will be in contact with concrete.

- B. Do not reuse forms if there is any evidence of surface wear and tear, splits, fraying, delamination or other damage which would impair the quality of the concrete surface or prevent obtaining the specified concrete finish.

3.05 STEEL AND WELDED WIRE FABRIC REINFORCEMENT

- A. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- B. Place steel or welded wire fabric in conformance with the construction methods specified within the State Standards.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.06 CONSTRUCTION JOINTS

- A. Locate and install construction joints as indicated or, if not indicated, locate so as not to impair the strength and appearance of the structure. Submit proposed construction joint locations for approval.
- B. The Contractor shall score the concrete sidewalks in conformance with the scoring pattern shown on the Drawings where specified.
- C. Where the scoring pattern is not specified, the Contractor shall score the concrete sidewalk in conformance with the State Standards.
- D. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.
- E. Key groove all construction joints unless otherwise indicated. Wall horizontal joints need not be keyed except where specifically indicated.
- F. Key grooves shall be one-third the thickness of the thinner member and 1-1/2-in. deep unless otherwise indicated.
- G. Use tapered key groove forms to permit form removal without damage to the groove. Taper not to exceed 2 inches per foot.
- H. Center waterstops in construction joints unless otherwise indicated. Secure waterstops in position by tie wire to adjacent reinforcing every 12 inches.
- I. Consolidate concrete during placement in the vicinity of key groove without damaging or dislodging waterstop.
- J. Remove all key groove forms.
- K. Clean key groove of laitance, curing compound, foreign materials and protrusions of hardened concrete. Roughen by bush hammer or lightly sandblast to expose coarse aggregate. Blow out debris and dust with oil-free compressed air.

- L. Protect exposed key groove and waterstop from damage.

### 3.07 EXPANSION JOINTS

- A. Install expansion joints in accordance with the manufacturers printed instructions and as indicated.
- B. Center waterstops in expansion joints unless otherwise indicated. Secure waterstops in position by tie wire to adjacent reinforcing every 12 inches.
- C. Consolidate concrete during placement in vicinity of expansion joint without damaging premolded joint filler and waterstop.

### 3.08 PREMOLDED JOINT FILLER

- A. Treat cut surface of premolded joint filler in conformance with manufacturer's printed instructions.
- B. Prevent disturbance of or damage to premolded joint filler.
- C. Fill expansion joint completely with premolded joint filler, except as specified below.
- D. Secure wood strips to expansion joint surfaces, which are to receive joint compound.
- E. Use tapered wood strips with the smaller width being the same width as the expansion joint and of depth necessary to install the joint compound and back-up materials.
- F. Use materials to secure the premolded joint filler and wood strips that will not harm concrete or affect the joint compound bond to concrete.
- G. Do not remove wood strips until forms are removed.
- H. Clean groove of laitance, curing compound, foreign materials and protrusions of hardened concrete. Blow out debris and dust with oil-free compressed air.

### 3.09 JOINT COMPOUND

- A. Seal the dry clean concrete in expansion joints in conformance with manufacturer's printed instruction.
- B. Install back-up and bond breaker materials.
- C. Prime concrete, fill flush with joint compound or required thickness, tool to concave shape and seal in conformance with manufacturer's printed instructions and ASTM C1193.
- D. Prevent spilling joint compound over adjoining surfaces. Use tape adjacent to joint as required. Remove all tape completely from concrete surface after installing joint.
- E. Do not prime concrete or install joint compound when compound, air or concrete temperature is less than 40 deg. F. or as required by manufacturer.

3.10 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site.
- F. Do not add water to fresh concrete after testing.
- G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
  - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
  - 1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer or use bonding agent if approved by Architect.
- J. Screed pavement surfaces with a straightedge and strike off.
- K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- L. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.
  - 1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.
- M. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

- N. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
  - 2. Do not use frozen materials or materials containing ice or snow.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
  
- O. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
  - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
  - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

### 3.11 FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
  
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
  
- C. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
  
- D. Coordinate special finishes with Landscape Drawings.

### 3.12 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
  
- B. Comply with ACI 306.1 for cold-weather protection.
  
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
  
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
  2. Water.
  3. Continuous water-fog spray.
  4. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inchlap over adjacent absorptive covers.
  5. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  6. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

### 3.13 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
1. Elevation: 1/4 inch.
  2. Thickness: Plus 3/8 inch, minus 1/4 inch.
  3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
  4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
  5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
  6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
  7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
  8. Joint Spacing: 3 inches.
  9. Contraction Joint Depth: Plus 1/4 inch, no minus.
  10. Joint Width: Plus 1/8 inch, no minus.

### 3.14 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least 1 composite sample for each 5000 sq. ft. or fraction thereof of each concrete mix placed each day.
  2. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
  4. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.



5. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
6. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
7. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
  - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.15 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section at no expense to the Owner.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

3.16 DETECTABLE WARNING PAVERS

- A. No pavers shall be laid in inclement weather or when the temperature is 36 degrees Fahrenheit, and dropping, nor shall any work be done on rising temperatures until the temperature reaches 32 degrees Fahrenheit. Frozen mortar materials shall not be used.
- B. Concrete detectable warning pavers shall be set on a mortar setting bed over a prepared concrete base slab. All setting shall be done by competent workmen under adequate supervision. Do any cleaning necessary to cement concrete base to provide a clean base surface, free from dust, oil, grease, other impurities, or loose or friable particles.
- C. Damp the surface immediately before placing the mortar setting bed, but do not allow free water to remain on the surface.
- D. Latex modified mortar setting bed shall be spread evenly over moistened concrete base. Mortar setting bed shall be 3/4--inch thick, minimum. Back butter pavers with latex modified mortar to ensure a full bond between pavers and setting bed.
- E. Before setting, the back of each piece of concrete paver shall be dampened. Each piece shall be carefully bedded into a wet, sticky mortar mixture and tapped home to a full and solid bearing. Particular care shall be exercised to equalize bed and joint openings and eliminate the need for redressing of exposed surfaces.
- F. Exposed surfaces of pavers shall be kept free from bed mortar at all times. Any bed mortar smears shall be immediately removed with a clean sponge and clean water before latex modified mortar can set.
- G. Pavers shall be set true to the required lines and grades in the pattern detailed on the Contract Documents.
- H. Joints between pavers shall be filled with mortar to prevent water intrusion.

**END OF SECTION**

**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**DIVISION 3  
CONCRETE**

**SECTION 03100**

**CONCRETE FORMWORK**

**PART 1.00 GENERAL**

1.01 DESCRIPTION

- A. This section specifies requirements for concrete formwork to produce cast-in-place concrete structures as shown on the Drawings and as specified herein. The work shall consist of designing, furnishing, constructing and removing formwork for all cast-in-place concrete structures.
- B. Use forms, wherever necessary, to confine the concrete and shape it to the required lines, and to provide the specified finish. Construct forms with sufficient strength to structurally support the work, and withstand the pressure resulting from placement and vibration of the concrete, and maintain forms rigidly in position. Construct forms sufficiently tight to prevent loss of mortar from the concrete.

1.02 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 117: Standard Specification for Tolerances for Concrete Construction and Materials.
  - 2. ACI 301: Standard Specification for Structural Concrete.
  - 3. ACI 347: Guide to Formwork for Concrete.
- B. Rhode Island State Building Code

1.03 QUALITY CONTROL

- A. Provide in accordance with the requirements as specified.
- B. Tolerances:
  - 1. Permissible surface irregularities for the various classes of concrete surface finish as specified in Section 03300, Cast-in-Place Concrete, are defined as “finishes”, and are to be distinguished from tolerances as specified herein. Deviations from the established lines, grades, and dimensions will be permitted to the extent set forth herein.
  - 2. The tolerance limits specified in this Section and the surface finish irregularities permitted in Section 03300, Cast-in-Place Concrete, are not the limits to which forms may be built or by which damaged from sheathing may be used. These limits are provided only for the occasional slight misalignment or irregularity of surface that may occur despite a serious effort to build and maintain the forms accurately and securely with an even surface. These limits will be allowed only for inadvertent or relatively infrequent irregularities of the degree mentioned, but practices and form materials will be prohibited which without doubt will result in the creation of additional irregularities, even though these would be within the limits specified.
  - 3. Where specific tolerances are not stated herein or shown on the Drawings for a structure, portion of a structure, or other feature of the work, permissible deviations will be interpreted conforming to the tolerances stated herein for similar construction. Specific maximum or minimum tolerances as shown on the Drawings in connection with any dimension shall be considered as supplemental to the tolerances specified herein and shall govern. Concrete forms shall be set and maintained within the tolerance limits necessary to

ensure that the completed work will be within the tolerances specified. Concrete construction that exceeds the tolerance limits specified or as shown on the Drawings shall be remedied or removed and replaced by the Contractor at no cost to the Owner.

4. Tolerances shall be as specified in ACI 117, Standard Specifications for Tolerances for Concrete and Materials.

#### 1.04 DESIGN REQUIREMENTS

- A. Design formwork to support vertical loads and lateral pressures resulting from placement and vibration of concrete in accordance with the requirements of ACI 301 and ACI 347, and as specified herein.
- B. Camber the formwork to compensate for anticipated deflections due to the weight and pressure of the fresh concrete and due to construction loads.
- C. Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations. Use wedges or jacks, individually or in combination for adjustment.
- D. Design forms and falsework to include assumed values of live loads, dead load, weight of moving equipment operated on formwork, concrete mix, height of drop, vibrator frequency, ambient temperature, lateral stability, and other factors pertinent to the safety of the structure during construction.
- E. Provide and design forms to conform with expansion and construction joint locations.
- F. Provide box-outs to accommodate the installation of the spillway gate frames. Box-outs shall be installed such that when removed the exposed concrete is plumb without protrusions or bulges.

#### 1.05 SUBMITTALS

- A. Submittals for the following items shall be made in accordance with the requirements as specified.
- B. Submit the following at least 30 days before the first concrete placement:
  1. Manufacturer's data and installation instructions for proprietary form accessories, form coatings, pipe sleeves and seals, form ties and manufactured form systems if used.
  2. Certification that form coatings comply with the requirements of this Section.

### **PART 2.00 PRODUCTS**

#### 2.01 MATERIALS

- A. Forms for Exposed Finish Concrete: Construct formwork for exposed concrete surfaces with smooth faced undamaged plywood or metal, metal-framed plywood faced or other acceptable panel-type facing materials approved by Engineer, to provide continuous, straight, smooth as-cast surfaces, and produce a uniform and consistent texture and pattern on the surfaces. Metal patches on forms for these surfaces will not be permitted. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on the drawings.

1. Use overlaid plywood complying with U.S. Product PS-1 "A-C or B-B High Density Overlaid Concrete Form", Class I.
  2. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Tubular Fiber Forms:
1. Provide forms with spirally constructed laminated plies of fiber.
  2. Provide forms with wall thickness as recommended by the manufacturer to meet load requirements of the various uses and sizes.
  3. Provide forms with wax coated outside surfaces for moisture resistance.
  4. Provide forms with inside surface coated with bond-breaker compound.
- D. Form Ties:
1. Form Ties: For concrete structures, which will not be in view or buried below finish grade, use carbon steel factory-fabricated, removable or stay in place snap-off type form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units, which will leave no metal closer than 1-1/2" to surface.
    - a. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.
    - b. Patch all holes with non-shrink grout.
  2. Form ties and spreaders for walls in areas exposed to view shall be Stainless Steel Cone-Tight Tyscru by Richmond Screw Anchor Co.; Dayton Sure-Grip and Shore Co.; or substitute approved by Engineer with Plastic cone-tight type cones having a 1" setback and a taper from 1" to 1-1/4". Tycone holes shall be sealed with plastic set back plugs, color as selected by Engineer from manufacturer's standard color selection or filled with non-shrink grout. Tyscru ties shall be sized to satisfy loading requirements.
  3. In lieu of form ties specified above, fiberglass form tie systems shall be used. Fiberglass form ties shall be standard gray color. The concrete structure shall be finished by grinding the fiberglass form tie flush with the finish surface of the concrete structure.
- E. Form Releasing Agents: Provide commercial formulation form-releasing agents that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds. Volatile organic compound emissions of form coating agent shall not exceed 2.09 pounds per gallon (250 grams per liter).
- F. Chamfer Strips: Provide 3/4-inch triangular fillets to form all exposed concrete corners. Material shall be rubber or polyvinyl chloride type, or smooth clear, sealed softwood.
- G. Sleeves: Sleeves for wall and floor penetrations shall be pre-engineered Century-Line sleeves as manufactured by Thunderline Corporation or Engineer approved substitute. Sleeves shall be constructed of high impact thermoplastic with waterstop collar, reinforcing ribs and nailer end caps for positioning forms. Sleeve shall be designed to work with modular mechanical seal for through wall penetrations. Size of sleeves shall be selected according to manufacturer's recommendations for pipe sizes indicated on drawings.
- H. Seals: Sleeve/pipe seals shall be Link-Seal modular mechanical seals as manufactured by Thunderline Corporation or Engineer approved substitute. The seal shall be modular,

mechanical; type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening. The elastomeric element shall be sized and selected per manufacturer's recommendations and have the following properties as designated by ASTM:

1. For standard service applications: (-40°F to 250°F) EPDM – ASTM D2000 M3 BA 510.
2. For hydrocarbon service applications: (-40°F to 210°F) Nitrile – ASTM D2000 M1BF510.
3. For high temperature or fire seal applications: (-60°F to 400°F) Silicone – ASTM D2000 M1GE505.

## **PART 3.00 EXECUTION**

### **3.01 INSPECTION**

- A. Examine the substrate and conditions under which work of this Section is to be performed, and correct unsatisfactory conditions, which would prevent proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

### **3.02 FORM CONSTRUCTION**

#### **A. General:**

1. Construct forms as designed and in accordance with Contractor's approved working drawings conforming to ACI 347, to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, level, and plumb work in finished structures.
2. Provide for openings, offsets, keyways, recesses, moldings, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features required. Use selected materials to obtain required finishes.
3. Forms for concrete which accommodate work of other trades, fabricated before the opportunity exists to verify the measurements of adjacent construction, shall be accurately sized and located as dimensioned on the Drawings. In the event that deviation from the Drawing dimensions results in problems in the field, the Contractor shall be responsible for resolution of the conditions as approved by the Engineer, at no cost to the Owner.

#### **B. Fabrication:**

1. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage concrete surfaces.
2. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Brace temporary closures and set tightly to temporary openings on forms in as many inconspicuous locations as possible, commensurate with design requirements. Form intersecting planes to provide true, clean cut corners.

#### **C. Falsework:**

1. Erect falsework and support, brace, and maintain it to safely support vertical, lateral, and asymmetrical loads applied until complete structure has attained design strength. Construct falsework so that adjustments can be made for take-up and settlement, and access is provided for inspection.
2. Provide wedges, jacks or chamfer strips to facilitate vertical adjustments. Carefully inspect falsework and formwork during and after concrete placement operations to determine

abnormal deflection or signs of failure; make necessary adjustments to product work of required dimensions.

D. Forms for Exposed Concrete:

1. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes.
2. Provide sharp clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.
3. Use extra studs, walers, and bracing to prevent bowing of forms between studs and to avoid bowed appearance in concrete. Do not use narrow strips of form material, which will produce bow.

E. Corner Treatment:

1. Unless shown otherwise, form chamfers with  $\frac{3}{4}$ -inch by  $\frac{3}{4}$ -inch strips, accurately formed and surfaced to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to require limit and miter chamfer strips at changes in direction.

F. Control Joints: Locate as indicated on the Drawings.

G. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Verify size and location of openings, recesses and sleeves with the trade requiring such items. Accurately place and securely support items to be built into forms.

H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove encrusted mortar and grout, chips, wood, sawdust, dirt, and other debris just before concrete is placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

### 3.03 FORM COATINGS

- A. Coat form contact surfaces with form-releasing agent before reinforcement is placed. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces that will be bonded to fresh concrete. Apply in strict compliance with manufacturer's instructions.
- B. Remove surplus coating on form surfaces before placing concrete.

### 3.04 INSTALLATION OF EMBEDDED ITEMS

- A. Set and build into the forms, anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.
- B. Set edge forms or bulkheads and intermediate screed strips for slabs, to obtain required elevation and contours in the finished slab surface. Provide and secure units to support types of screeds required.

### 3.05 REMOVAL OF FORMS

- A. Formwork not supporting concrete, such as sides of walls, columns, and similar parts of the Work, may be removed after cumulatively curing at not less than 50 degrees F for 72 hours after



placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operation, and provided that curing and protection operations are maintained.

- B. Formwork supporting weight of concrete, such as elevated beams, joists, slabs and other structural elements may not be removed until concrete has attained 70% of its design minimum 28-day compressive strength, and has cumulatively cured for no less than 7 days. Concrete shall have sufficient strength to safely support its own weight and construction live loads and lateral pressures. Determine potential compressive strength of in-place concrete testing field-cured specimens representative of the concrete location or members, as specified in Section 03300, Cast-in-Place Concrete.
- C. Form facing material may be removed one day after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.
- D. Form ties: The concrete structure shall be finished by grinding the fiberglass form ties flush with the finish surface of the concrete structure or filling in voids left by the removal of steel form ties with a non-shrink grout.

### 3.06 REUSE OF FORMS

- A. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. When forms are reused for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Apply new form releasing agent to all form areas that will be in contact with concrete.
- B. Do not reuse forms if there is any evidence of surface wear and tear, splits, fraying, delamination or other damage which would impair the quality of the concrete surface or prevent obtaining the specified concrete finish.

**END OF SECTION**

**SECTION 03200**

**REINFORCING STEEL**

**PART 1.00 GENERAL**

1.01 DESCRIPTION

A. Work included:

1. Furnish and install all reinforcement and associated items required and/or indicated on the Drawings for all cast-in-place concrete.

1.02 REFERENCES

A. The latest editions of the following American Concrete Institute (ACI) publications shall be used as reference standards:

1. ACI SP-66 ACI Detailing Manual
2. ACI 301 Specifications for Structural Concrete for Buildings
3. ACI 315 Details and Detailing of Concrete Reinforcement

B. The latest editions of the following American Society for Testing and Materials (ASTM) publications shall be used as reference standards:

1. A185: Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
2. A615: Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. A767: Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
4. A706: Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
5. A1094: Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement.

C. The latest edition of the Rhode Island State Building Code.

1.03 SUBMITTALS:

A. Submit the following:

1. Mill test reports for each shipment of reinforcement. Identify reports with specific lots in shipments and submit prior to use of reinforcement in work.
2. Chemical composition of reinforcing steel. Ladle analysis to identify percentage of carbon, phosphorous, manganese and sulfur present in steel.
3. Welder's certification in accordance with AWS D1.4 prior to welding, when welding is indicated or specified.
4. Shop and placement drawings to the Engineer for review prior to fabrication, which show:
  - a. All construction and expansion joints.
  - b. Reinforcement detailed in conformance with ACI SP-66.
  - c. Support bars and details of bar supports including type, size and spacing.
  - d. Marking for each reinforcement item.

1.04 QUALITY ASSURANCE:

A. Provide in accordance with the requirements of the Quality Control section and as specified.

- B. Do not fabricate reinforcement until shop and placement drawings have been approved by the Engineer.
- C. Tolerances: Tolerances shall be as specified in ACI 315R.

1.05 PRODUCT HANDLING:

- A. Protection:
  - 1. Use all means necessary to protect reinforcing steel before, during, and after installation and to protect the installed work and materials of all other trades.
  - 2. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.
  - 3. Use all necessary precautions to maintain identification after the bundles are broken.
- B. Replacements:
  - 1. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

**PART 2.00 PRODUCTS**

2.01 REINFORCING MATERIALS

- A. All reinforcing steel shall be newly rolled deformed bars, free from rust, and comply with ASTM A-615 or A706, grade 60.
  - 1. Reinforcement bars shall be ASTM A767, Class 1, zinc coated or coated as per ASTM A1094 after fabrication and bending.
  - 2. Bars to be welded shall conform to ASTM A706 deformed, Grade 60.
  - 3. Provide mill bent reinforcing bars, bent cold to the dimensions indicated and conforming to the requirements of ACI SP-66.
- B. Welded wire fabric shall conform to ASTM A 185, with a minimum ultimate tensile strength of 70,000 psi. Provide in sizes indicated. Provide support bars and reinforcing bar supports as specified to obtain the concrete cover. Galvanized welded wire fabric shall meet ASTM A185, plain, fabricated from galvanized-steel wire into flat sheets.
- C. Bar support and accessories shall be galvanized or plastic coated and shall conform to ACI 315. Provide minimum size number 5 support bars.
- D. Wire for tying uncoated reinforcement in place shall be No. 16 AWG or heavier black soft-annealed wire. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

2.02 OTHER MATERIALS:

- A. All other materials, not specifically described but required for a complete and proper installation of reinforcing steel, shall be as selected by the Contractor subject to the approval of the Engineer.

2.03 FABRICATION:

- A. Fabricate reinforcement only after shop drawings have been returned by the Engineer marked "Approved".
- B. Provide reinforcing bars that have been cut and bent before shipment. If bars must be bent on site, bend reinforcing steel cold, and do not straighten or rebend in a manner, which will damage the material. Bend in conformance with requirements of ACI SP-66 or with ASTM A767 when reinforcement is to be galvanized.
- C. Splices:
  - 1. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying for the full length of the splice. All lap splices shall be ACI 318, Class B, unless indicated otherwise on the Drawings.
  - 2. Adjacent splices shall be staggered whenever possible.

**PART 3.00 EXECUTION**

3.01 SURFACE CONDITIONS:

- A. Inspection:
  - 1. Prior to installation of the work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
  - 2. Verify that reinforcing steel may be installed in strict accordance with all pertinent codes and regulations, the approved Shop Drawings, and the original design.
- B. Discrepancies:
  - 1. In the event of discrepancy, immediately notify the Engineer.
  - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 BENDING:

- A. General:
  - 1. Fabricate all reinforcement in strict accordance with the approved Shop Drawings.
  - 2. Do not use bars with kinks or bends not shown on the Drawings or on the approved Shop Drawings.
  - 3. Do not bend or straighten steel in a manner that will damage the material.
- B. Design:
  - 1. All bends shall be in accordance with ACI 318. Bend all bars cold.

3.03 PLACING:

- A. General:

Before the start of concrete placement, accurately place all reinforcing steel, positively securing and supporting by concrete blocks, metal chairs or spacers, or by metal hangers.

B. Splicing:

1. Horizontal Bars:

- a. Place bars in horizontal members with minimum laps at splices sufficient to develop the strength of the bars in accordance with ACI 318.
- b. Bars may be wired together at laps except at points of support of the member, at which points preserve the clear space described above.
- c. Wherever possible, stagger the splices of adjacent bars.

2. Other Splices:

Make only those other splices that are indicated on the approved Shop Drawings or specifically approved by the Engineer.

3. Dowels:

Place all required steel dowels and securely anchor them into position before the concrete is placed. Dowels placed into existing concrete shall be securely anchored with high strength epoxy as indicated on the Drawings.

4. Obstructions:

In the event conduits, piping, inserts, sleeves, or any other items interfere with placing reinforcement as indicated on the Drawings or as otherwise required, immediately consult the Engineer and obtain approval of new procedure before placing concrete.

5. Use precast concrete bar support blocks for foundation mats. Blocks shall be made of 4,000 psi (un-reinforced) concrete.

3.03 MINIMUM COVER

A. Unless otherwise shown, provide the following minimum cover:

Formed Concrete Exposed to Earth or Water	3" Minimum Cover
Cast Concrete Exposed to Earth	4" Minimum Cover

3.04 CLEANING AND TOUCH-UP OF REINFORCEMENT:

A. Steel reinforcement, at the time concrete is placed around it, shall be free from rust scale, loose mill scale, oil, paint, and all other coatings which will destroy or reduce the bond between steel and concrete.

B. After installation and prior to placing concrete or mortar, touch-up galvanized reinforcing with damaged or missing coatings. Galvanizing repair paint shall be SSPC-Paint 20; MIL-P-21035B; or engineer-approved equivalent with dry film containing a minimum of 94 percent zinc dust by weight.

**END OF SECTION**

**SECTION 03300**

**CAST-IN-PLACE CONCRETE**

**Part 1.00 GENERAL**

**1.01 WORK INCLUDED**

- A. The work covered under this Section includes, but is not limited to, the furnishing of all plant, labor, equipment, appliances and materials including all joint fillers and sealants, and performing all operations in connection with providing the construction of all Portland cement concrete in accordance with these specifications and in reasonably close conformity with the lines and grades shown.

**1.02 QUALITY CONTROL**

- A. As the work progresses, the Contractor will be required to perform tests and/or engage a testing laboratory in order to confirm that the quality of the concrete will be in conformance with these Specifications. Concrete shall be sampled in accordance with Section 01400, QUALITY CONTROL/QUALITY ASSURANCE.
  - 1. The independent testing laboratory onsite representative shall remain onsite throughout each concrete placement. Observing the contractors means and methods of concrete placement, including: transporting concrete (i.e. pumping or hopper methods), discharging, vibrating, and finishing.
- B. Slump tests shall be made according to ASTM C143. Slump test shall be performed for each day's pour of each type of concrete; perform additional tests when concrete consistency seems to have changed. Tests shall be taken at the point of discharge and prior to placement. If the concrete has been modified after testing has commenced, a new sample shall be taken of the modified mix and testing redone at no additional cost to the owner. No slump in excess of 4 inches shall be permitted without written consent of the Engineer.
- C. Air content of concrete made with normal-weight aggregates that have low absorption shall be tested according to either ASTM C231 or ASTM C173. Air content of concrete test shall be performed at a frequency of not less than one test per concrete truck of concrete placed. Tests shall be taken at the point of discharge and prior to placement. If the concrete has been modified after testing has commenced a new sample shall be taken of the modified mix and testing redone at no additional cost to the owner. No air content in excess of 6% +/-1% shall be permitted without written consent of the Engineer.
- D. Concrete Temperature: Test hourly when air temperature is below 40°F, when above 80°F, and each time a set of compression test specimens, slump test, or air entrainment test are required.
- E. Compression test specimens will be made by the Contractor and cured according to ASTM C31. Six specimens shall be collected for each 50 cubic yards of concrete placed or for each pour at a structure. Specimens shall be tested with one sample tested at 3 days, two samples tested at 7 days and two samples tested at 28 days and one specimen retained in reserve for a 56 day test if required. If both 28 day specimens achieve the required compression strength, the reserve specimen shall be broken at 28 days.
- F. Compressive test specimens shall be tested according to ASTM C39.

- G. If the concrete is found to be substandard as a result of the initial testing, then any additional work for replacement or removal of the substandard concrete or retesting shall be at the Contractor's expense.
- H. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
- I. Strength levels of concrete will be considered satisfactory if averages of sets of three consecutive strength cylinders meet or exceed required strength and no individual strength test results fall below specified compressive strength by more than 500 psi.
- J. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- K. Additional Tests: The Contractor's Independent testing service shall make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed by the Engineer.

#### 1.03 SUBMITTALS

- A. Submit the following:
  - 1. Batch plant details giving the location, layout, capacity, and type of batch plant and the method of transporting concrete from the batch plant to the work location. Contractor shall provide documentation that all requirements of local authorities and regulations have been met.
  - 2. Notification to the Engineer of concrete deliveries, a minimum of 24 hours in advance of the scheduled delivery. Include within this notification, class and quantity of concrete, frequency of trucks, and ordered slump.
  - 3. Description of methods for cold-weather and hot weather batching, mixing and delivery.
  - 4. Concrete Mix Designs:
    - a. Submit concrete mix designs to the Engineer within a minimum of 30 calendar days prior to placement. Include a complete list of materials including admixtures, applicable reference specifications, and copies of test reports showing the mix has been successfully tested to produce the properties specified.
    - b. For each design mix
      - i. Certifications by the concrete supplier that ingredients conform to the specified requirements.
      - ii. Certifications by the concrete supplier that design mix conforms to specified strength, unit weight, maximum size aggregate, air entrainment, slump and to be free of soluble chloride content.
      - iii. Coarse aggregate gradation, specific gravity, and dry rodded unit weight.
      - iv. Identify admixtures, and planned dosage rate.
  - 5. Compression test results.
    - a. Test results will be reported in writing to the Engineer within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name and location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7 day tests and 28 day tests.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Order concrete from batching plant so that trucks arrive at discharge locations when concrete is required. Avoid excessive mixing of concrete or delays in placing successive layers of concrete in forms.
- B. Deliver concrete to discharge locations in watertight agitator or mixer trucks without altering the water-cement ratio, slump, air entrainment, temperature and homogeneity. Addition of water will not be permitted once the concrete has left the batch plant, unless approved in writing by the Engineer on Record.
- C. Concrete not conforming to specification, unsuitable for placement, exceeding the time or temperature limitations or not having a complete delivery batch ticket will be rejected.

1.05 JOBSITE CONDITIONS

- A. Weather: Protect concrete from damage and reduced strength or performance due to weather extremes during mixing, placing and curing.
- B. Cold Weather: Unless special precautions are taken to protect concrete, do not work if temperatures are below 40°F or when temperatures are expected to fall below 40°F within 72 hours after placing concrete.
  - 1. Comply with ACI 306 in cold weather.
  - 2. Maintain concrete temperature of at least 60°F.
  - 3. Reinforcement, forms and ground in contact with concrete shall be free of frost.
  - 4. Maintain a temperature of at least 50°F, for reinforcement, forms and ground in contact with concrete prior to placement.
  - 5. Keep concrete and formwork at least 50°F for at least 96 hours after placing concrete.
  - 6. The use of calcium chloride in any form is not permitted. Non-chloride accelerator shall be used when ambient temperature is below 50°F.
  - 7. Admixture manufacturer shall provide technical assistance at no additional cost. A manufacturer's representative shall be available for consultation by phone of on-site upon 72-hour notice.
- C. Hot Weather: Concrete, when deposited, shall be less than 85°F. Cool the mix in a manner acceptable to the Engineer if the concrete temperature is higher.
  - 1. Comply with ACI 305 in hot weather.
  - 2. Retarder shall be used when ambient temperature exceeds 80°F.

**Part 2.00 PRODUCTS**

2.01 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II for all work unless otherwise specified. Use one brand of cement throughout project.
- B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Use ¾" maximum size for all concrete, unless otherwise directed or specified. Provide aggregates from a single source for exposed concrete.



- C. Water: Clean, potable and free from foreign materials in amounts harmful to concrete and embedded steel. Provide water which meets ACI/ASTM requirements for concrete mix water.
- D. Fly Ash: ASTM C618, Type F
1. Fly ash shall be used in concrete designated as "Mass Concrete" as a cementitious replacement for Portland cement at ratio of 1:1, up to 25% but no less than 15% by weight, unless noted otherwise.
  2. Fly ash type F shall be from one production source throughout the work and shall meet or exceed the requirement of ASTM C618, Type F, Tables No. 1 and No. 2. The source shall be in conformance with U.S. Army Corps of Engineers Pre-qualification requirements.
  3. The concrete supplier shall furnish a notarized certificate from the fly ash supplier at the time of submittal of concrete mix designs indicating conformance with these requirements specified. Also, a copy of the most recent chemical analysis shall be provided.
  4. Fly ash shall be considered as a part of the cementitious material when calculating water cement ratio.
- E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
1. Products: Subject to compliance with requirements, products, which may be incorporated in the work, include the following
    - a. "Air-Mix"; Euclid Chemical Co.
    - b. "Sika Aer"; Sika Corp.
    - c. "MB-VR or MB-AE"; Master Builders
    - d. "Darex AEA" or "Daravair"; W.R. Grace
    - e. Or equal.
- F. Water Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.1% chloride ions. Follow manufacturer's recommendations for amount of admixture to be added to the concrete. Admixture shall be compatible with air-entraining admixtures.
1. Products: Subject to compliance with requirements, products which may be incorporated in the work include the following
    - a. "WRDA Hycol"; W. R. Grace.
    - b. "Eucon WR-75"; Euclid Chemical Co.
    - c. "Pozzolith Normal" Master Builders.
    - d. "Plastocrete 160"; Sika Chemical Corp.
    - e. Or equal.
- G. High-Range Water Reducing Admixture (SuperPlasticizer): ASTM C 494, Type F or Type G and containing not more than 0.1% chloride ions. Follow manufacturer's recommendations.
1. Products: Subject to compliance with requirements, products which may be incorporated in the work include the following:
    - a. "WRDA 10" or "Daracem"; W. R. Grace.
    - b. "PSP"; Protex Industries Inc.
    - c. "Super P"; Anit-Hydro.
    - d. "Sikament"; Sika Chemical Corp.
    - e. "Rheobuild"; Master Builders.
    - f. Or equal.

- H. Water Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E or C, and containing not more than 0.1% chloride ions.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Accelguard 80"; Euclid Chemical Co.
    - b. "Pozzutec 20"; Master Builders, Inc.
    - c. "PolarSet"; Grace Construction Products.
    - d. Or equal.
- I. Water Reducing, Retarding Admixture: ASTM C 494 Type D, and containing not more than 0.1% chloride ions.
  - 1. Products: Subject to compliance with requirements, products that may be incorporated in the work include the following:
    - a. "Edoco 20006"; Edoco Technical Products.
    - b. "Pozzolith Retarder"; Master Builders.
    - c. "Eucon Retarder 75"; Euclid Chemical Co.
    - d. "Daratard"; W. R. Grace.
    - e. "Plastiment"; Sika Chemical Co.
    - f. Or equal.
- J. Prohibited Admixtures: Calcium chloride thycyanates or admixtures containing more than 0.1% chloride ions are not permitted.

## 2.02 RELATED MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. Per sq. yd., complying with AASHTO M 182, Class 2.
- B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
  - 1. Waterproof paper.
  - 2. Polyethylene film.
  - 3. Polyethylene-coated burlap.
- C. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
  - 1. Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
    - a. "Masterseal"; Master Builders.
    - b. "A-H 3 Way Sealer"; Anti-Hydro Waterproofing Co.
    - c. "Ecocure"; Euclid Chemical Co.
    - d. "Clear Seal"; A.C. Horn, Inc.
    - e. "Sealco 309"; Gifford-Hill/American Admixtures.
    - f. "J-20 Acrylic Cure"; Dayton Superior.
- D. Underlayment Compound: Free flowing, self-leveling, pumpable cementitious base compound.
  - 1. Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
    - a. "Ardex K-15"; Ardex Engineered Cements.

- b. "Silflo 200"; Silpro Masonry Systems.
  - c. "Ultra/IPlan"; Mapei.
- E. Bonding Compound: Polyvinyl acetate or acrylic base.
- 1. Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
    - a. Acrylic or Styrene Butadiene:
      - ii. "J-40 Bonding Agent"; Dayton Superior Corp.
      - iii. "Everbond"; L & M Construction Chemicals.
      - iv. "Hornweld"; A. C. Horn, Inc.
      - v. "Daraweld C"; W. R. Grace.

2.03 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to the Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.
- B. Submit written reports for review of design mix for specified strength of concrete within 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed.
- C. Strength: Provide concrete having the following minimum compressive strength at 28 days:
  - 1. Class 5000 psi -3/4": Use in all concrete, unless otherwise specified.
- D. The concrete quality, mixing and placing shall conform to ACI-318, Chapter 5.
- E. Design mixes to provide normal weight concrete with the following properties, as indicated:

Design Compressive Strength,	Minimum Strength fc 7 days	Laboratory Testing Age 28 day	Minimum ** Cement Lbs./cu.yd.	Maximum* W/C Ratio
5,000 psi	3,500 psi	5,000 psi	705	0.40

\*Maximum: Decrease if possible

\*\*Minimum: Increase as necessary to meet all other stated requirements.

- F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by the Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Engineer before using in work.
- G. Admixtures
  - 1. Use water-reducing admixture or high range water reducing admixture (super plasticizer) in all concrete in strict accordance with the manufacturer's printed instructions.
  - 2. Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6% with a tolerance of ±1%.

H. Consistency:

1. The consistency shall be uniformly maintained within the allowable range of slump for the job materials. Ordinarily the slump shall not be less than 1-1/2 nor more than 3 inches, unless in the opinion of the Engineer, job conditions warrant exceeding these limits. The consistency shall be determined by the AASHTO Method T-119. This range of slump is to be maintained for all concrete including pumped concrete.
2. Concrete containing HRWR admixture (super-plasticizer): Not more than 7" after addition of HRWR to site-verified 1-1/2" to 3" slump concrete.

2.04 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water after the concrete has been batched will not be permitted, unless approved in writing by the Engineer of Record.

1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required. When air temperature is between 85°F (30° C) and 90°F (32° C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes.
2. During cold weather heat water, sand and cement materials per recommendations of ACI 306.

**Part 3.00 EXECUTION**

3.01 FORMWORK

- A. All formwork shall be completed as provided for within Section 03100.
- B. Forms shall conform to shapes, lines and dimensions of the members as called for on the Drawings and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape.
- C. Forms shall be removed in such a manner as to ensure the complete safety of the structure. In no case shall supporting forms or shoring be removed until members have acquired sufficient strength to support their weight and imposed loads safely.

3.02 INSTALLATION

- A. Batch, mix and deliver Portland cement concrete in conformance with ASTM 94. Batch all constituents at central batching or mixing plant. Produce concrete in conformance with ACI 301 and as specified.
- B. Seasonal Conditions:
  1. Conform to ACI 305R and as specified for hot weather concreting. Do not add retarder admixture to any concrete.
  2. Conform to ACI 306R and as specified for cold weather concreting. Do not add accelerator admixture to any concrete.

3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Set and build into work, anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
- B. Clean embedded items of oil, ice, dirt and all other foreign items.
- C. For embedded pipes, complete all necessary testing requirements prior to placing concrete.

3.04 PLACING CONCRETE

- A. General:
  - 1. Prior to placing concrete against rock, the rock surface shall be cleared of loose rock and cleaned and washed of all loose soil, organic matter or other deleterious materials such that competent rock surface is exposed. The cleaned rock surface shall be inspected by the Engineer prior to the Contractor placing concrete against the rock. Backfill or concrete placed against the surface of rock without prior inspection by the Engineer shall be subject to removal and replacement at the discretion of the Engineer at no additional cost to the Owner.
  - 2. Concrete shall not be placed when the Engineer is not present.
  - 3. Do not place concrete until the depth, character and adequacy of forms, falsework, embedment, and the placing of the steel reinforcement have been approved by the Engineer. The method and manner of placing the concrete shall be such as to avoid segregation of aggregate and displacement of the reinforcement. Non-aluminum troughs, pipes and round bottom chutes may be used as aids in placing concrete when necessary. Dropping the concrete a distance of more than five feet, or depositing a large quantity at one point and moving concrete over an extended distance with mechanical vibrators, will not be permitted. Concrete shall be placed upon clean, damp surfaces, free from running water, or upon properly consolidated soil.
  - 4. Before placement, all equipment for mixing and transporting the concrete shall be cleaned, and all debris and ice shall be removed from the places to be occupied by the concrete. Forms shall be thoroughly wetted (except in freezing weather) or oiled. The reinforcement shall be thoroughly cleaned of ice, dirt, rust scale or other deleterious coatings.
  - 5. Retempering of concrete by adding water or any other material shall not be permitted.
  - 6. Concrete placement, finishing and curing, and all other pertinent construction practices shall be in accordance with ACI 117 and ACI 301. In addition to the requirements of ACI 117 and ACI 301, the following shall apply:
    - a. When placing is started, it shall be carried on as a continuous operation until placement is completed.
    - b. Concrete shall be placed so that a uniform appearance of surfaces will be obtained.
    - c. Concrete shall be placed and consolidated free of rock pockets, honeycombs, and voids.
    - d. Concrete shall be deposited as nearly as practicable in its final position, to avoid segregation due to rehandling or flowing, and shall not be subjected to any procedure that will cause segregation.
    - e. Concrete shall be placed and consolidated in walls in approximately 18-inch layers, proceeding at a uniform rate or per the form designer's recommendation.
    - f. Do not add water to concrete during delivery, at the Project site, or during placement, unless approved by the Engineer of Record in writing. Amount of water to be added (if permitted by Engineer of Record) at the project site shall be indicated on the mix design and batch tickets submitted by the contractor. Water shall be added prior to on-site testing of the concrete mix.



repaired satisfactorily, the entire section shall be removed and replaced at no cost to the Owner.

2. Other work considered to be defective includes, but is not limited to, the following:
  - a. Concrete in which defective or inadequate steel reinforcement has been placed.
  - b. Concrete incorrectly formed, or not conforming to details and dimensions on the Drawings or with the intent of these documents, or the concrete surfaces of which are out of plumb or level beyond specified tolerances.
  - c. Concrete below specified strength.
  - d. Concrete containing wood, cloth, or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the Drawings.

### 3.05 CONCRETE FINISHING

- A. In general, concrete exposed to view shall be surfaces shall be true, smooth, and free from open or rough spaces, depressions, projections, and burs, and have a rubbed finish. Tie holes and areas of honeycombing shall be filled with a non-shrink grout. Concrete permanently hidden from view shall have had burs removed and tie holes and honeycombs filled with a non-shrink grout. The concrete in horizontal plane surfaces shall be brought flush with the finished top surface at the proper elevation and shall be struck off with a straight-edge and floated. Mortar finishing will not be permitted, nor shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.
- B. The following requirements shall govern concrete finishes so indicated on the Drawings.
  1. Rubbed Finish: After forms have been removed, bug holes shall be filled with a low water-cement-ratio paste. Paste shall then be rubbed over the wall using a brush or sponge application to provide the desired finish.
  2. Float Finish: Force coarse aggregate away from surface; float to a smooth and even surface.
  3. Trowel Finish:
    - a. After floating, begin the first trowel finish operation using a power-driven trowel; begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.
    - b. Consolidate the concrete surface by the final hand troweling operation, free from trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8" in 10'-0" when tested with a 10'-0" straight-edge
  4. Broom Finish:
    - a. Apply nonslip broom finish to exterior concrete as specified, immediately after trowel finishing; roughen the concrete surface by brooming in the direction perpendicular to the main traffic route.
      - i. Use a fiber bristle broom.
      - ii. Frequently clean broom to avoid deep brooming.
  4. As-Cast Finish:
    - b. Rough form finish: tie holes and defects shall be patched.
      - i. Fins exceeding 1/4 Inch in height shall be chipped off or rubbed off.
      - ii. Otherwise, surfaces shall be left with the texture imparted by the forms.
    - c. Smooth form finish: the form facing material shall produce a smooth, hard, uniform texture on concrete.
      - i. The arrangement of the facing material shall be orderly and symmetrical, and the number of seams kept to the practical minimum.
      - ii. Forms shall be supported by studs or other backing capable of preventing excessive deflection.

- iii. Form-facing material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used.

### 3.06 CURING AND PROTECTION

- A. Initial Curing: All concrete shall be properly cured and protected in accordance with ACI 308. Maintain concrete above 50 degrees Fahrenheit during first seven days after placing. The work shall be protected from the elements, flowing water, and from defacement of any nature, during construction. The concrete shall be cured as soon as it has sufficiently hardened, by covering with an approved material. Water-absorptive coverings shall be thoroughly saturated when placed and kept saturated for a period of at least seven days. Curing mats or blankets shall be sufficiently weighted or tied down to keep the concrete surface covered and to prevent the surface from being exposed to air currents. Where wooden forms are used, they shall be kept wet at all times until removed, to prevent the opening of joints and drying out of the concrete. Membrane curing compounds shall be coordinated with the surface to be painted, covered with plaster, covered with sealer, and other surfaces which curing compound would adversely affect subsequent construction.
- B. Duration of Curing – Structural Concrete: The final curing shall continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50°F, has totaled 7 days beyond the initial curing period.
  1. Rapid drying at the end of the curing period shall be prevented.
- C. Duration of Curing – Non-Structural Concrete: The final curing shall continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50°F, has totaled 3 days beyond the initial curing period.
  1. Rapid drying at the end of the curing period shall be prevented.
  2. Covering of non-structural concrete shall not occur until a minimum of 3 days has elapsed from the time of the pour.
- D. Formed Surfaces: Steel forms heated by the sun and all wood forms in contact with the concrete during the curing period shall be kept wet.
  1. If forms are to be removed during the curing period, one of the specified curing materials or methods shall be employed immediately.
  2. Such curing shall be continued for the remainder of the curing period.

### 3.07 CONCRETE SURFACE REPAIRS

- A. General: Any defective work disclosed after removal of forms shall be immediately removed and replaced. If in the opinion of the Engineer, the surface of the concrete cannot be repaired satisfactorily, the entire section shall be removed and replaced at no additional expense to the Owner.
- B. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to the Engineer.



1. Cut out honeycomb, rock pockets, voids over 1" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case, to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
- C. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- D. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to the satisfaction of the Engineer. Surface defects, as such, include color and texture irregularities, bulges, uneven surfaces, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
- E. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- F. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
- G. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- H. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
- I. Perform structural repairs with prior approval of the Engineer for method and procedure, using specified epoxy adhesive and mortar.
- J. Repair methods not specified above may be used, subject to acceptance of the Engineer.

**END OF SECTION**

**SECTION 03399**

**PRECAST CONCRETE STRUCTURE**

**PART 1 - GENERAL**

**1.01 WORK INCLUDED**

- A. This section covers the work necessary to design, fabricate, furnish and install all precast concrete structures.

**1.02 DESIGN INFORMATION**

- A. The Contractor shall submit design computations for the all precast structures to the Engineer for review and approval. Design computations shall be stamped and sealed by a professional engineer registered in the State of Rhode Island. The computations shall be prepared in accordance with the latest AASHTO Standard Specifications for Highway Bridges, the latest RIDOT Standards using English units, and the Rhode Island Building Code, as appropriate. The design computations shall consider all loadings as appropriate for each stage of fabrication, shipment, construction, and upon completion, including the weight of any equipment to be supported by all precast structures. Where applicable, roadway structures (culverts), manholes, and catch basins shall be designed to meet HS20 live loading. Prior to fabrication, complete shop drawings showing, at a minimum, the following information shall be submitted to the Engineer for approval in accordance with Section 01000:

1. Plan layout of the structure;
2. Fabricating plant production schedule;
3. Description of the fabricating plant, including any backup concrete mixing facilities, original design mix and proposed method of placement. Modification or deviations from the original design mix at any time after the original approval shall be submitted to the Engineer for approval;
4. Proposed admixtures to be added to the concrete mix including brand and dosage rates;
5. Outline of the proposed concrete curing procedures for both the precast structures and test cylinders;
6. The name of the Manufacturer of all reinforcing steel;
7. Complete details of all precast units, including all dimensions and tolerances, locations and types of reinforcement, finish treatments and concrete strengths at lifting and at 28 days;
8. Joint dimensions and details including type and brand of joint sealing materials;
9. locations and methods of forming lifting holes, type and location of lifting devices and the method of handling and transporting all precast units to the job site;
10. Provisions for repair of minor non-structural defects;
11. Winter concreting procedures, if the need is anticipated and the Engineer hasn't previously approved such procedures.

- B. The precast concrete structure dimensions are provided on the Drawings.

- C. Placement of Reinforcement – The minimum clear cover of concrete over the reinforcement shall be 3-inches. Reinforcement shall be assembled utilizing any combination of single or multiple layers of welded-wire fabric or deformed billet-steel bars. The welded-wire fabric or deformed billet-steel bars shall meet the spacing requirements shown on the plans and as approved by the Engineer. Wire for tying uncoated reinforcement in place shall be No. 16 AWG or heavier black

soft-annealed wire. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

1.03 DEFINITIONS

- A. Manufacturer shall be the precast concrete structure manufacturer, who shall be responsible for the structures manufacture, handling and transport.
- B. Contractor shall be the site contractor who shall be responsible for placing and protecting the structure until accepted by the Owner.

1.04 SHOP DRAWINGS

- A. The shop drawings submitted by the Manufacturer shall show the setting plans, exact dimensions of the structure, openings required, all inserts and other items which are to be embedded in the units, including:
  - 1. Attachments, type, size and location of all reinforcing steel;
  - 2. Connection and anchoring methods.
  - 3. All other construction requirements necessary for the proper fitting of the contract work and for receiving the work of other trades;
  - 4. Details for joints between all precast concrete units and sections, to provide a watertight structure.
  - 5. A detailed listing of all material and installation techniques to be employed to assure watertight joints.
- B. A delivery schedule for the precast structures shall be provided by the Manufacturer to the Contractor within 48-hours of award.
- C. Concrete compression test results for the 28-day strength shall be submitted by the Manufacturer to the Contractor for forwarding to the Engineer.

1.05 TEST REPORTS AND CERTIFICATES OF CONFORMANCE

- A. In addition to other requirements specified herein, the Manufacturer shall furnish notarized test reports and methods of test to show compliance with all specification requirements.

1.06 SERVICES OF MANUFACTURERS' REPRESENTATIVES

- A. If required, the Manufacturer shall furnish at no additional expense to the Owner, the services of the respective manufacturers' representatives of the precast concrete structure, for such lengths of time as may be necessary to properly instruct the Contractor's personnel in the proper handling, installation, and jointing of the precast concrete slab in accordance with the printed recommendations of the manufacturer. This service will not be required if all installation of the precast concrete slab is performed by the manufacturer.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Cement shall be Portland cement conforming to the requirements of ACI 350, Chapter 3, Section 3.1.2 - Sulfate Resistant Cement.

- B. Aggregate shall conform to the requirements of ACI 350, Chapter 3, Section 3.4.1 - Aggregates for Watertight, Chemical Resistant Concrete.
- C. Water shall be clean and free of injurious and deleterious substances.
- D. Concrete shall have a minimum strength of 5,000 psi at 28 days and strength of 3,000 psi at time of form release.
  - 1. During the process of manufacturing of all precast structures, not less than two (2) test cylinders shall be tested at time of release of the form, and two (2) at age 28 days.
  - 2. All compression test cylinders shall be made, cured, and stored in accordance with ASTM C31. Cylinders shall be tested in accordance with ASTM C39.
  - 3. All concrete shall contain 5-7 percent air entrainment.
- E. Admixtures shall only be used after prior approval of the Engineer.
- F. All reinforcing bars shall conform to the requirements of ASTM A615, Grade 60. All reinforcing bars shall be galvanized and shall meet ASTM A767, Class 1, zinc coated after fabrication and bending.
- G. Welded wire fabric shall conform to the requirements of ASTM A185. Welded wire fabric shall be galvanized, plain, fabricated from galvanized-steel wire into flat sheets.
- H. All joint sealant shall be butyl rubber, per ASTM C-990 and ASSHTO M-198.
- I. All joint fillers shall be preformed non-expansive, non-extruding type and appropriate for the intended use.
- J. All concrete shall be coated with approved waterproofing at the place of manufacture.
- K. All anchors and lifting hooks engineered in concrete shall be stainless steel.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. All precast concrete units shall be stored, handled, protected and installed by the Manufacturer and/or Contractor in accordance with the printed recommendations of the manufacturer and in a manner to prevent overstressing, marring or damaging of all precast structures.
- B. The work shall be performed by workers experienced in this type of work.
- C. Installation by the Contractor shall be true to the lines and grades indicated on the drawings.
- D. In addition to all other requirements specified, all precast concrete shall be adequately designed and fabricated by the Manufacturer to:
  - 1. Safely withstand all handling stresses without damage
  - 2. Adequately and safely support all loads imposed by the work of other trades which might affect construction.
  - 3. Adequately and safely support all loads expected during the lifetime of the structure including but not limited to maintenance equipment.

3.02 INSTALLATION

A. Preparation:

1. All precast structures shall be installed true to line and grade, and in the proper sequence as outlined on the approved shop drawings.
2. To avoid damage and stress concentration, lifting devices shall be designed by the Manufacturer for 100 percent impact loading and shall be sufficiently ductile to insure obvious deformation before failure.

B. Installation:

1. All precast structures shall be set on clean and properly prepared bearing surfaces, free from any conditions that would interfere with the proper setting of each structure.
2. All anchoring and fastening devices shall be provided by the Manufacturer for the proper and satisfactory installation of each structure.
3. Anchoring and fastening devices to be embedded in other work shall be built-in as the work progresses.
4. No defects that might adversely affect the serviceability of each structure, shall be used in the work. Any precast structure found defective shall be removed from the site and shall be replaced by the Manufacturer with a new and sound structure at no additional expense to the Owner.

C. Installation Tolerances:

1. All connections shall be done in accordance with the shop drawings and shall be in accordance with the previously mentioned codes and accepted industry standards and best accepted practice.

3.03 PATCHING

A. Where patching is permitted by the Owner and Engineer, the patches shall be made using the same materials as used in the unit being patched and using a 2-part epoxy compound of a type to produce proper bonding of the patch to the units.

B. Patching of imperfections at the plant shall require the Owner's approval before the unit is shipped from the manufacturer's plant.

3.04 CURING

A. All precast concrete structures shall be cured by suitable heating, moisture or steam curing until the required strength for release or handling is obtained. During this time, no surface shall be exposed to direct sunlight or direct wind.

**END OF SECTION**

**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**DIVISION 5  
MISCELLANEOUS METALS**

**SECTION 05500**

**MISCELLANEOUS METALS**

**Part 1.00 GENERAL**

1.01 WORK DESCRIBED

- A. Fabrication of new steel members as shown on the Drawings, including, but not limited to, connection hardware, and other fabrications as specified herein, and as approved by the Engineer.

1.02 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal fabrications. This includes plans, elevations, sections, and details of metal fabrications and their connections and accessories.
- B. Submit product data and manufacturers' instructions to Engineer for approval.
- C. Delegated-Design Submittal: For installed products indicated to comply with the performance requirements and design criteria, including analysis data signed and sealed by a qualified professional engineer responsible for their preparation.
- D. Material Certificates: Provide copies of material certificates signed by material producer and/or subcontractor certifying that each material item complies with or exceeds specified requirements.
- E. Welding Certificates

1.03 REFERENCES

- A. The following standards (latest edition) shall apply to the work of this Section.
  - 1. American Society of Testing Materials (ASTM):
    - A36/A36M Carbon Structural Steel
    - A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
    - A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
    - A307 Low-Carbon Steel Externally and Internally Threaded Standard Fasteners
    - A563 Carbon and Alloy Steel Nuts
    - F3125 High Strength Structural Bolts
  - 2. American Welding Society (AWS)
    - D1.1/D1.1M Structural Welding Code

1.04 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel."

1.05 REGULATORY REQUIREMENTS

- A. All work performed shall conform to the Rhode Island State Building Code and AWS D1.1/D1.1M.

1.06 TESTS

- A. Tests of steel plates and threaded connections will be performed to ensure conformance with requirements stated herein under provisions of the General Conditions.
- B. AWS qualified inspector will perform weld tests in accordance with AWS D1.1.

**Part 2.00 PRODUCTS**

2.01 STEEL

- A. General:
  - 1. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated.
  - 2. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
  - 3. Steel Plates, Shapes, and Bars: ASTM A36/A36M
  - 4. Steel Bolts and Nuts: Regular hexagon-headed bolts, ASTM F3125, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
  - 5. Hurricane Straps: Galvanized Simpson Strong-Tie H2.5A Clip/Tie or approved equivalent.
  - 6. Welding Materials: AWS D1.1; type required for ferrous materials being welded.
  - 7. Timber Float Fasteners: Carbon Steel ASTM A307 and galvanized in accordance with ASTM A123 and A153 for exterior and treated wood locations, as shown on the Contract Drawings.
- B. Welding:
  - 1. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal allow welded.
  - 2. Weld corners and seams continuously to comply with the following:
    - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance to base metals.
    - b. Obtain fusion without undercut or overlap.
    - c. Remove welding flux immediately.

2.02 FABRICATION

- A. Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. The Contractor is responsible for verifying dimensions on site prior to submission of shop drawings.
- C. Assemblies shall conform to AISC Specification for the Design, Fabrication, and Erection of Structural Steel.
- D. Assemblies shall be fabricated to within + or – 1/8” of their dimensions.
- E. Fabricate items with joints tightly fitted and secured.



- F. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32" unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- G. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

2.03 FINISH

- A. The Contractor shall clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. The Contractor shall galvanize ferrous metal items to minimum 2.0 oz/sq ft zinc coating.

**Part 3.00 EXECUTION**

3.01 INSTALLATION

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
- C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- D. Perform field welding in accordance with AWS D1.1.
- E. Install items plumb and level, accurately fitted, free from distortion or defects.

3.02 DEFECTIVE WORK

- A. The following shall be ground for rejection and replaced at no additional cost to the Owner:
  - 1. Any damaged parts.
  - 2. Any parts improperly installed.
  - 3. Any items found not to have the proper connection.
  - 4. Otherwise not according to the Contract Documents.

**END OF SECTION**

**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**DIVISION 6**

**TIMBER**

**SECTION 06130**

**TIMBER FRAMING**

**Part 1.00 GENERAL**

1.01 WORK INCLUDED

- A. The work under this Section shall include the installation benches, shade structure components, railing posts, and other timber members associated with the construction of Roger Wheeler State Beach Boardwalk.
- B. Related Sections: Documents affecting the work in this section include, but are not necessarily limited to, the General Instructions and applicable portions of the following specifications:
  - 1. Section 05500 MISCELLANEOUS METALS

1.02 REFERENCES

- A. American Lumber Standards Committee (ALSC)
  - 1. Softwood Lumber Standards.
- B. American Society for Testing and Materials (ASTM).
  - 1. D245 – Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber
  - 2. D2555 – Standard Practice for Establishing Clear Wood Strength Values
  - 3. A123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - 4. A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 5. A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength
- C. American Wood Preservers Association (AWPA)
  - 1. U1 – User specification for Treated Wood
  - 2. T1- Processing and Treatment Standard
  - 3. M4 – Standard for the Handling, Storage, Field Fabrication and Field Treatment of Preservative Treated Wood Products
- D. American National Standards Institute/American Welding Society
  - 1. D1.1 - Structural Welding Code
- E. National Forest Products Association (NFPA)
  - 1. National Design Specification for Wood Construction
- F. American Wood Preservers Bureau (AWPB)

1. MLP - Standard for Softwood Lumber, Timber, and Plywood Pressure Treated for Marine (Saltwater) Exposure

G. American Institute of Timber Construction (AITC)

#### 1.03 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

B. Provide technical data on wood preservative materials and application instructions.

C. In lieu of grade stamping, submit manufacturer's certificate that products meet or exceed specified requirements.

### Part 2.00 PRODUCTS

#### 2.01 MATERIAL

A. Lumber Grading Rules: NFPA, RIS, SPIB, SFPA, WCLIB and WWPA.

B. Shade Structure columns and framing, benches, railing and other timber members: Southern Yellow Pine No. 1 Dense unless specified otherwise.

C. Preservative treatment of Southern pine shall be in accordance with AWPB U1-11, UC3B when not in contact with the ground, or UC4B for ground contact, permanent, or incidental. If a timber member does not bear the AWPB Quantity Mark indicating compliance, the treater shall provide certification of material used and retention rate.

D. All timber shall be supplied at a maximum moisture content of 19%.

E. Cut or drilled surfaces of all timbers shall be treated with a minimum of two saturating coats of copper naphthenate preservative (min. 2% metallic copper) in accordance with AWPB M4 and P8.

#### 2.02 ACCESSORIES

A. Connectors: Gusset Plates, Knife Plates, Hurricane Straps.

B. Bolts, Nuts, Washers, Lags, Screws, and Drift Pins: Medium carbon steel with galvanized coating. Size and type to suit application in conformance with ASTM A153.

C. Washers shall be round steel plate, 3" minimum O.D. and 1/4" minimum thickness, galvanized.

D. Galvanizing: All hardware and plates shall be hot-dipped galvanized after fabrication and threading of stock, in accordance with ASTM-A153.

#### 2.03 FABRICATION

A. Fabricate components in accordance with AITC. Joints shall be neatly fitted, welded, and ground smooth.

2.04 FINISHES

- A. Galvanize connectors in accordance with ANSI/ASTM A123 and A153.

2.05 STORAGE

- A. Wood products delivered at the site shall be carefully piled, off the ground, in such a manner as to assure proper drainage, ventilation, and protection from the weather.
  - 1. All lumber and timber shall be stored under dry conditions.
  - 2. Care of pressure treated wood products shall comply with AWWA Standard M4.
- B. Hardware and fasteners shall be stored in their original containers and under dry conditions until ready for use.

**Part 3.00 EXECUTION**

3.01 ERECTION

- A. Set structural members level and plumb, in correct position as indicated on the Drawings.
- B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Holes for machine bolts shall be bored with a bit 1/16" larger than the bolt diameter, and holes for drift bolts shall be 1/16" smaller than the bolt diameter as approved by the Engineer.
- D. Drilled holes shall be thoroughly flushed with preservative. Similarly, cut timber surfaces shall be given two brush coats of preservative before installation, in accordance with AWWA M4.
- E. All bolts shall bear on round plate washers under the nut and the head.
- F. After nuts have been tightened, there shall be at least ½-inch, but not more than 2-inches, of exposed thread beyond the nuts.
- G. After erection, touch-up galvanized surfaces with primer consistent with shop coat.
- H. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing structural timber to itself, or to in-place construction.
- I. Cutting, Fitting, and Placement: Perform cutting, drilling and fitting required for installation of structural timber. Provide temporary bracing as required. For items required to fit previously constructed spaces, take measurements at job and fabricate to fit actual spaces. Repair cut surface with preservative brushed on to dry surface as recommended by the manufacturer.
- J. Fit exposed connections accurately together to form tight joints. Cut exposed joints smooth and repair cut surfaces. Do not cut or abrade the surfaces of items which have been hot-dip galvanized.
- K. Fastening of one member to another shall be accomplished in such a manner that no cracking or splitting of timber members shall occur. Cracked or split members shall be replaced by the Contractor, to the approval of the Engineer, at no additional cost to the Owner.

3.02 DEMOLITION AND COORDINATION

- A. Demolition and legal disposal of existing and/or waste timber members and hardware shall be in accordance with Sections 02050 – DEMOLITION AND REMOVAL.
- B. Coordinate rails and column installation work so that no undue stresses are placed on individual members during pier installation.

**END OF SECTION**

Rhode Island Department of Environmental Management  
**ROGER WHEELER STATE BEACH BULKHEAD**

**APPENDIX A**  
**DRAWINGS**

(BOUND SEPARATELY)

**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**APPENDIX B  
PERMITS**



**SOIL EROSION AND SEDIMENT CONTROL PLAN**

**ROGER WHEELER STATE BEACH BOARDWALK  
NARRAGANSETT, RHODE ISLAND**

**Assessors Map J35;G175**

**Roger Wheeler State Beach  
Narragansett, Rhode Island**

**Prepared for:**

**Rhode Island Department of Environmental Management  
Division of Planning and Development  
235 Promenade Street  
Providence RI, 02908**

**Prepared by:**

**Pare Corporation  
10 Lincoln Road, Suite 210  
Foxboro, MA 02035**

**December 21, 2021**

# Soil Erosion and Sediment Control Plan

## For:

### **Roger Wheeler State Beach Boardwalk**

100 Sand Hill Cove Road

Narragansett, RI

J35;G175

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**Owner:**

RI Department of Environmental Management  
Project Manager: Jedd Andrew  
jedd.andrew@dem.ri.gov

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**Operator:**

*TO BE DETERMINED UPON  
CONTRACT AWARD*

Company Name  
Name  
Address  
City, State, Zip Code  
Telephone Number  
Email Address

---

**Estimated Project Dates:**

Start Date: September 2024  
Completion Date: May 2026

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**SESC Plan Prepared By:**

Pare Corporation  
Brian Dutra  
10 Lincoln Road; Suite 210  
Foxboro, MA 02035  
(508)543-1755  
bdutra@parecorp.com

---

**SESC Plan  
Preparation Date:**

12/21/21

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**SESC Plan Revision  
Date:**

---

## OPERATOR CERTIFICATION

*I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that it is the responsibility of the owner/operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.*

---

Operator Signature:

Date

Contractor Representative: Name

Contractor Title: Title

Contractor Company Name: Company Name (if applicable)

Address: Mailing Address

Phone Number: Phone Number

Email Address: Email

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Soil Erosion and Sediment Control Plan  
Roger Wheeler State Beach Boardwalk

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## INTRODUCTION

The purpose of erosion, runoff, and sedimentation control measures is to prevent pollutants from leaving the construction site and entering waterways or environmentally sensitive areas during and after construction. This SESC Plan has been prepared prior to the initiation of construction activities to address anticipated worksite conditions. The control measures depicted on the site plan and described in this narrative should be considered the minimum measures required to control erosion, sedimentation, and stormwater runoff at the site. Since construction is a dynamic process with changing site conditions, it is the operator's responsibility to manage the site during each construction phase so as to prevent pollutants from leaving the site. This may require the operator to revise and amend the SESC Plan during construction to address varying site and/or weather conditions, such as by adding or realigning erosion or sediment controls to ensure the SESC Plan remains compliant with the RIPDES Construction General Permit. Records of these changes must be added to the amendment log attached to the SESC Plan, and to the site plans as "red-lined" drawings. Please Note: **Even if practices are correctly installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site.**

It is the responsibility of the site owner and the site operator to maintain the SESC Plan at the site, including all attachments, amendments and inspection records, and to make all records available for inspection by RIDEM during and after construction. (RIPDES CGP - Part III.G)

The site owner, the site operator, and the designated site inspector are required to review the SESC Plan and sign the Party Certification pages (Section 8). The primary contractor (if different) and all subcontractors (if applicable) involved in earthwork or exterior construction activities are also required to review the SESC Plan and sign the certification pages before construction begins.

Any questions regarding the SESC Plan, control measures, inspection requirements, or any other facet of this document may be addressed to the RIDEM Office of Water Resources, at 401-222-4700 or via email: [water@dem.ri.gov](mailto:water@dem.ri.gov).

## SECTION 1: SITE DESCRIPTION

### 1.1 Project/Site Information

Project/Site Name:

- Roger Wheeler State Beach Boardwalk
- The proposed Roger Wheeler State Beach Boardwalk project includes encasing the existing bulkhead in concrete, constructing a new boardwalk atop the bulkhead, and providing minor miscellaneous site improvements. Project Street/Location:

The following are estimates of the construction site area:

- Total Project Area 5.71 acres
- Total Project Area to be Disturbed 0.92 acres

Yes  No The Limits of Disturbance have been marked in the field

### 1.3 Natural Heritage Area Information

RIPDES CGP - Part III.H

RIDEM Rhode Island Natural Heritage Program <mailto:plan@dem.ri.gov>

Are there any Natural Heritage Areas being disturbed by the construction activity or will discharges be directed to the Natural Heritage Area as a result of the construction activity?

Yes  No

If yes, describe or refer to documentation which determines the likelihood of an impact on this area and the steps that will be taken to address any impacts.

### 1.4 Historic Preservation/Cultural Resources

Are there any historic properties, historic cemeteries or cultural resources on or near the construction site?

Yes  No

Describe how this determination was made and summarize state or tribal review comments:

- RIHPHC and the Narragansett Tribe were provided project notification in pre-application processes. In their responses RIHPHC indicated that there will be no adverse effect on historic properties. The Narragansett Tribe is in support of the project, al

If yes, describe or refer to documentation which determines the likelihood of an impact on this historic property, historic cemetery or cultural resource and the steps taken to address that impact including any conditions or mitigation measures that were approved by other parties.

## SECTION 2: EROSION, RUNOFF, AND SEDIMENT CONTROL

RIPDES Construction General Permit – Part III.J.1 – Erosion, Runoff, and Sediment Controls

### 2.1 Avoid and Protect Sensitive Areas and Natural Features

Areas of existing and remaining vegetation and areas that are to be protected as identified in the Section 1.6 of the SESC Plan must be clearly identified on the SESC Site Plans for each Phase of Construction. Prior to any land disturbance activities commencing on the site, the Contractor shall physically mark limits of disturbance (LOD) on the site and any areas to be protected within the site, so that workers can clearly identify the areas to be protected.

Feature Requiring Protection	Construction Phase #	Method of Protection	Sheet #
Adjacent saltwater wetlands	1	Silt fence, straw bales, compost filter socks	2.1,2.2

### 2.2 Minimize Area of Disturbance

Will >5 acres be disturbed in order to complete this project?

Yes       No

Will <5 acres be disturbed or will disturbance activities be completed within a six (6) month window?

Yes       No

Based on the answers to the above questions will phasing be required for this project?

Yes       No

#### PHASING PLAN

The following are estimates of each phase of the construction project:

Phase No. or Identifier	1
Total Area of Phase	5.71 acres
Area to be Disturbed	0.92 acres

Description of Construction Sequencing for Phase 1

*Phase I will involve the contractor encasing the existing bulkhead in concrete, constructing a new boardwalk, and providing minor miscellaneous site improvements. The landward side of the boardwalk will be supported by concrete piles and seaward side will be supported by a concrete retaining wall. Below is*



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*the proposed construction sequence which is general in nature and intended to provide an overview of the major project elements. It is not to be construed to dictate the contractor's means and methods. Although arranged sequentially, some of the work items may be undertaken coincidentally.*

1. *Establish construction access, install erosion controls, security fence, and traffic control signage throughout project site.*
2. *Remove and dispose of existing pavement, stairs, fence, ramps, railings, on top of and connected to the existing boardwalk. Then demolish the existing boardwalk northwest and northeast of the pavilion.*
3. *Install concrete piles along the landward side of demolished boardwalk.*
4. *Construct a continuous retaining wall along the seaward side of the proposed boardwalk.*
5. *Construct a precast concrete deck for the new boardwalk supported by the retaining wall and piles. Then install electrical conduit underneath the boardwalk and handrails on both sides of the boardwalk.*
6. *Install landward and seaward concrete ramps and steps.*
7. *Install timber shade structures, patio with benches, and foot washing stations on the seaward side of the boardwalk.*
8. *Install concrete sidewalk with ramps and raised planters adjacent to the boardwalk on the landward side.*
9. *Return staging area to preconstruction condition.*
10. *Demobilize*

**2.3 Minimize the Disturbance of Steep Slopes**

Are steep slopes (>15%) present within the proposed project area?

Yes       No

**2.4 Preserve Topsoil**

Site owners and operators must preserve existing topsoil on the construction site to the maximum extent feasible and as necessary to support healthy vegetation, promote soil stabilization, and increase stormwater infiltration rates in the post-construction phase of the project.

Will existing topsoil be preserved at the site?

Yes       No

Beach sand in the proposed retaining wall area will be excavated, stockpiled, and then spread out over the length of the beach. Any unsuitable beach material will be used as backfill for the wall footing. See Sheet 3.1 of the Project Drawings.

Soil compaction must be minimized by maintaining limits of disturbance throughout construction. In instances where site soils are compacted the site owner and operator must restore infiltration capacity of the compacted soils by tilling or scarifying compacted soils and amending soils as necessary to ensure a minimum depth of topsoil is available in these areas. In areas where infiltrating stormwater treatment

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practices are located compacted soils must be amended such that they will comply the design infiltration rates.

Topsoil on site consists of beach sand. Beach sand will be spread out to meet the existing slope on Roger Wheeler State Beach.

## 2.5 Stabilize Soils

Upon completion and acceptance of site preparation and initial installation of erosion, runoff, and sediment controls and temporary pollution prevention measures, the operator shall initiate appropriate temporary or permanent stabilization practices during all phases of construction on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased.

Any disturbed areas that will not have active construction activity occurring within 14 days must be stabilized using the control measures depicted in the SESC Site Plans, in accordance with the *RI SESC Handbook*, and per manufacturer product specifications.

Only areas that can be reasonably expected to have active construction work being performed within 14 days of disturbance will be cleared/grubbed at any one time. It is NOT acceptable to clear and grub the entire construction site if portions will not be active within the 14-day time frame. Proper phasing of clearing and grubbing activities shall include temporary stabilization techniques for areas cleared and grubbed that will not be active within the 14-day time frame.

All disturbed soils exposed prior to October 15 of any calendar year shall be seeded by that date if vegetative measures are the intended soil stabilization method. Any such areas that do not have adequate vegetative stabilization, as determined by the site operator or designated inspector, by November 15, must be stabilized through the use of non-vegetative erosion control measures. If work continues within any of these areas during the period from October 15 through April 15, care must be taken to ensure that only the area required for that day's work is exposed, and all erodible soil must be restabilized within 5 working days. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed (i.e. construction of a motocross track).

*Describe controls (i.e., temporary seeding with native vegetation, hydroseeding, mulching, application of rolled erosion control products, etc.) including design specifications and details that will be implemented to stabilize exposed soils where construction activities have temporarily or permanently ceased.*

### Temporary Vegetative Control Measures

- N/A – No vegetation exists on site. The landward side of the site is covered by asphalt and the seaward side of the is comprised of beach sand.

### Temporary Non-Vegetative Control Measures

- Silt fences, straw bales, and compost filter soccks are proposed and were selected for their proven efficiency in trapping sediments, their ease of installation, and tehir low impact to the site

### Permanent Vegetative Control Measures

- N/A – No vegetation exists on site. The landward side of the site is covered by asphalt and the seaward side of the is comprised of beach sand.

### Permanent Non-Vegetative Control Measures

- A reinforced concrete wall will provide soil stabilization along the sand located on the seaward side of the existing bulkhead.

**2.6 Protect Storm Drain Outlets**

Temporary or permanent outlet protection must be used to prevent scour and erosion at discharge points through the protection of the soil surface, reduction in discharge velocities, and through the promotion of infiltration. Outlets often have high velocity, high volume flows, and require strong materials that will withstand the forces of stormwater. Storm drain outlet control measures also offer a last line of protection against sediment entering environmentally sensitive areas.

All stormwater outlets that may discharge sediment-laden stormwater flow from the construction site must be protected using the control practices depicted on the approved plan set and in accordance with the *RI SESC Handbook*.

Will temporary or permanent point source discharges be generated at the site as the result of construction of sediment traps or basins, diversions, and conveyance channels?

Yes       No

Insert textDue to the nature of the project, stormwater treatment practices are not proposed.

**2.7 Establish Temporary Controls for the Protection of Post-Construction Stormwater Treatment Practices**

Temporary measures shall be installed to protect permanent or long-term stormwater control and treatment measures as they are installed and throughout the construction phase of the project so that they will function properly when they are brought online.

Will long-term stormwater treatment practices be installed at the site?

Yes       No

Due to the nature of the project, stormwater treatment practices are not proposed.

**2.8 Divert or Manage Run-on from Up-gradient Areas**

Is stormwater from off-site areas anticipated to flow onto the project area or onto areas where soils will be disturbed?

Yes       No

Pre-Construction and Construction sub-watershed maps are included for each phase in this SESC Plan submittal.

Structural control measures will be used to limit stormwater flow from coming onto the project area, and to divert and slow on-site stormwater flow that is expected to impact exposed soils for the purpose of minimizing erosion, runoff, and the discharge of pollutants from the site.

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Control measures shall be installed as depicted on the approved plan set and in accordance with the <i>RI SESC Handbook</i> or the <i>RI Department of Transportation Standard Specifications for Road and Bridge Construction. Run-on and Run-off Management</i>				
Construction Phase #	On-site or Off-site Run-on?	Control measure	Identified on Sheet #	Detail(s) is/are on Sheet #

N/A – stormwater from off-site areas are not anticipated to flow onto the project area or onto areas where soils will be disturbed

**2.9 Retain Sediment Onsite through Structural and Non-Structural Practices**

**SEDIMENT BARRIERS** must be installed along the perimeter areas of the site that will receive stormwater from disturbed areas. This also may include the use of sediment barriers along the contour of disturbed slopes to maintain sheet flow and minimize rill and gully erosion during construction. Installation and maintenance of sediment barriers must be completed in accordance with the maintenance requirements specified by the product manufacturer or the *RI SESC Handbook*.

Will sediment barriers be utilized at the toe of slopes and other downgradient areas subject to stormwater impacts and erosion during construction?

Yes       No

Will sediment barriers be utilized along the contour of slopes to maintain sheet flow and minimize rill and gully erosion during construction?

Yes       No

Compost filter socks, silt fences, and straw bales are proposed

SEDIMENT BARRIERS			
Construction Phase #	Sediment Barrier Type	Sediment Barrier is Labeled on Sheet #	Detail is on Sheet #
1	On-Site	Silt Fence, Straw bales, compost filter sock	2.2

**INLET PROTECTION** will be utilized to prevent soil and debris from entering storm drain inlets. These measures are usually temporary and are implemented before a site is disturbed. ALL stormwater inlets &/or

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catch basins that are operational during construction and have the potential to receive sediment-laden stormwater flow from the construction site must be protected using control measures outlined in the *RI SESC Handbook*.

For more information on inlet protection refer to the *RI SESC Handbook*, Inlet Protection control measure.

**Maintenance**

The operator must clean, or remove and replace the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or as performance is compromised. Accumulated sediment adjacent to the inlet protection measures should be removed by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

Do inlets exist adjacent to or within the project area that require temporary protection?

Yes       No

The following lists the proposed storm drain inlet types selected from Section Six of the *RI SESC Handbook*. Each row is unique for each phase and inlet protection type.

INLET PROTECTION			
Construction Phase #	Inlet Protection Type	Inlet Protection is labeled on Sheet #	Detail(s) is/are on Sheet #
1	Temporary Inlet Protection (Siltsack)	2.1	2.2

Temporary Inlet protection silt sacks will be installed over the drainage catchbasins and shall be cleaned of silt and debris on a regular basis.

**CONSTRUCTION ENTRANCES** will be used in conjunction with the stabilization of construction roads to reduce the amount of sediment tracking off the project. This project has avoided placing construction entrances on poorly drained soils where possible. Where poorly drained soils could not be eliminated, the detail includes subsurface drainage.

Any construction site access point must employ the control measures on the approved SESC site plans and in accordance with the *RI SESC Handbook*. Construction entrances shall be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by construction vehicles. All construction access roads shall be constructed prior to any roadway accepting construction traffic.

The site owner and operator must:

1. Restrict vehicle use to properly designated exit points.
2. Use properly designed and constructed construction entrances at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit.
3. When and where necessary, use additional controls to remove sediment from vehicle tires prior to exit (i.e. wheel washing racks, rumble strips, and rattle plates).
4. Where sediment has been tracked out from the construction site onto the surface of off-site streets, other paved areas, and sidewalks, the deposited sediment must be removed by the end of the same work day in which the track out occurs. Track-out must be removed by

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sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal.

Will construction entrances be utilized at the proposed construction site?

Yes       No

CONSTRUCTION ENTRANCE			
Construction Phase #	Soil Type at the Entrance	Entrance is located on Sheet #	Detail is on Sheet #

*If No, discuss rationale.*

N/A – Construction vehicles can enter the site from the public entry and exit into the parking lot

**STOCKPILE CONTAINMENT** will be used onsite to minimize or eliminate the discharge of soil, topsoil, base material or rubble, from entering drainage systems or surface waters. All stockpiles must be located within the limit of disturbance, protected from run-on with the use of temporary sediment barriers and provided with cover or stabilization to avoid contact with precipitation and wind where and when practical.

Stock pile management consists of procedures and practices designed to minimize or eliminate the discharge of stockpiled material (soil, topsoil, base material, rubble) from entering drainage systems or surface waters.

For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

1. Locate piles within the designated limits of disturbance.
2. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.
3. Where practicable, provide cover or appropriate temporary vegetative or structural stabilization to avoid direct contact with precipitation or to minimize sediment discharge.
4. NEVER hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.
5. To the maximum extent practicable, contain and securely protect from wind.

STOCKPILE CONTAINMENT
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Construction Phase #	Run-on measures necessary? (yes/no)	Stabilization or Cover Type	Stockpile Containment Measure	Sheet #
1	No	Mulch, seed mix, or tarp	Geotextile and straw bales	6.2

**CONSTRUCTED SEDIMENT STRUCTURES**

**TEMPORARY SEDIMENT TRAPS** will be utilized onsite. There will be no disturbed drainage areas greater than one acre that will be exposed for longer than six months. Design and sizing calculations in accordance with the *RI SESC Handbook*, Section Six are found in Insert Text of this SESC Plan. A summary of the calculations are provided below:

Are temporary sediment traps required at the site?

Yes       No

SEDIMENT TRAPS				
Construction Phase #	Exposed Area (acres)	Trap #	Sheet #	Detail found on Sheet#

Trap #	Wet Storage Volume (cu.ft)	Dry Storage Volume (cu.ft.)	Cleanout Depth (ft)	Provide Reference to Location of Supporting Design and Sizing Calculations

All traps will be functional and installed prior to disturbance in the contributing drainage area. Access for sediment removal is provided on the plans with cleanout depth requirements. The removed sediment will be utilized onsite or disposed of properly off-site.

N/A – The site is relatively flat, and the nature of work is not expected to generate excess soil

**TEMPORARY SEDIMENT BASIN(S)** will be utilized onsite. Every effort must be made to prevent erosion and control it near the source.

Are temporary sediment basins required at the site?

Yes       No

Less than 1 acre of site will be disturbed at a time.

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There will be disturbed areas greater than 5 acres and/or disturbed areas greater than one acre but exposed for longer than six months. The basins have been located to intercept runoff only from disturbed areas and minimize interference with other construction activities and construction of utilities. They have been located outside of any natural buffers. The dam height is less than six feet and holds less than fifteen (15) acre-ft.

Modeling, Design and Sizing calculations in accordance with the *RI SESC Handbook*, Section Six are found in of this SESC Plan. The designs were also prepared to satisfy Section 3.3.7.13 of the Stormwater Manual and will control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows. A summary of the assumptions and calculations are provided below:

<b>TEMPORARY SEDIMENT BASINS</b>				
Construction Phase #	Exposed Area (acres)	Basin #	Sheet #	Detail found on Sheet#

<b>SEDIMENT BASIN #1</b>					
<b>Pre-Development</b>					
Pre-Construction Cover Type	Contributing Area (acres)	Soil Type	Curve Number	Tc (minutes)	10- Year Type III (cfs, at time t, acre feet)
<b>Total Pre-Construction Volume (cuft):</b>					
<b>During Construction</b>					
Construction Cover Type	Contributing Area	Erosion Rates	Curve Number	Tc (minutes)	10-Year Type III (cfs, at time t, acre feet)
<b>Total Runoff Volume During Construction (cuft):</b>					
<b>Basin #1</b>					
Pre-Construction Peak Discharge (cfs)	Wet Storage Volume (cuft)	Sediment Storage Volume (cuft)	Residence Storage Volume (cuft)	Outlet Max Discharge Rate (cfs)	Emergency Spillway Discharge Capacity (cfs)



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All sediment basins will be functional and installed prior to disturbance in the contributing drainage area. Access for sediment removal is provided on the plans with cleanout depth specifications. The removed sediment will be utilized onsite or properly disposed of off-site.

**2.10 Properly Design Constructed Stormwater Conveyance Channels**

Are temporary stormwater conveyance practices required in order to properly manage runoff within the proposed construction project?

Yes       No

The conveyance will be maintained as depicted on SESC Site Plans and in accordance with the *RI SESC Handbook* and if applicable.

**2.11 Erosion, Runoff, and Sediment Control Measure List**

It is expected that this table and corresponding Inspection Reports will be amended as needed throughout the construction project as control measures are added or modified.

Phase No. #1		
Location/Station	Control Measure Description/Reference	Maintenance Requirement
Perimeter (See Sheet 2.1, 2.2)	Straw bales, silt fence. Section Six, Sediment Control Measures – Straw Wattles, Compost Tubes and Fiber Rolls – <i>RI SESC Handbook</i> .	<p>Inspection should be made after each storm event and repair or replacement should be made promptly as needed. Straw bales must be replaced after 3 months in use.</p> <p>Cleanout of accumulated sediment behind the silt fence/straw bale if sediment accumulates to at least ½ of the original height of the barrier becomes filled with sediment.</p> <p>Straw bales should be inspected regularly, and sediment shall be cleared often to prevent buildup or damages.</p>
Entrances to the Site (See Sheet 2.1, 2.2)	Wash sediment of vehicle tires. Section Six: Sediment Control Measures – Construction Entrances – <i>RI SESC Handbook</i> .	<p>The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto pave surfaces.</p> <p>Roads adjacent to entrance shall be clean at the end of each day.</p> <p>If maintenance alone is not enough to prevent excessive track out, modify construction access road surface, or install washrack or mudrack.</p>
Stockpiles (See Sheet 2.2)	Stockpile Management. Section Three: Pollution Prevention and Good Housekeeping – Stockpile and Staging	Inspections should be made weekly during the rainy season and bi-monthly during the non-rainy season.

	Area Management – <i>RI SESC Handbook</i> .	
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## SECTION 3: CONSTRUCTION ACTIVITY POLLUTION PREVENTION

The purpose of construction activity pollution prevention is to prevent day to day construction activities from causing pollution.

This section describes the key pollution prevention measures that must be implemented to avoid and reduce the discharge of pollutants in stormwater. Example control measures include the proper management of waste, material handling and storage, and equipment/vehicle fueling/washing/maintenance operations.

Where applicable, include *RI SESC Handbook* or the *RI Department of Transportation Standard Specifications for Road and Bridge Construction* (as amended) specifications.

### 3.1 Existing Data of Known Discharges from Site

Are there known discharges from the project area?

Yes       No

Describe how this determination was made:

- Site Survey and field observation

If yes, list discharges and locations:

Is there existing data on the quality of the known discharges?

Yes       No

If yes, provide data:

### 3.2 Prohibited Discharges

The following discharges are prohibited at the construction site:

- Contaminated groundwater, unless specifically authorized by the DEM. These types of discharges may only be authorized under a separate DEM RIPDES permit.
- Wastewater from washout of concrete, unless the discharge is contained and managed by appropriate control measures.
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials.
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. Proper storage and spill prevention practices must be utilized at all construction sites.
- Soaps or solvents used in vehicle and equipment washing.
- Toxic or hazardous substances from a spill or other release.

All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations.

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Will any of the above listed prohibited discharges be generated at the site?

Yes       No

Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. Proper storage and spill prevention practices will be utilized at the construction site. See Section 3.4 in this SESC Report for specific measures

Concrete washout areas shall be utilized during construction. Proper storage and spill prevention practices shall be utilized to prevent discharges from construction vehicle operations.

### **3.3 Proper Waste Disposal**

Building materials and other construction site wastes must be properly managed and disposed of in a manner consistent with State Law and/or regulations.

- A waste collection area shall be designated on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody or storm drain.
- All waste containers shall be covered to avoid contact with wind and precipitation.
- Waste collection shall be scheduled frequently enough to prevent containers from overfilling.
- All construction site wastes shall be collected, removed, and disposed of in accordance with applicable regulatory requirements and only at authorized disposal sites.
- Equipment and containers shall be checked for leaks, corrosion, support or foundation failure, or other signs of deterioration. Those that are found to be defective shall be immediately repaired or replaced.

Is waste disposal a significant element of the proposed project?

Yes       No

Any earthwork materials to be disposed must be done at a permitted location. Construction dumpsters will provide a means of disposal for construction materials.

### **3.4 Spill Prevention and Control**

All chemicals and/or hazardous waste material must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. All areas where potential spills can occur and their accompanying drainage points must be described. The owner and operator must establish spill prevention and control measures to reduce the chance of spills, stop the source of spills, contain and clean-up spills, and dispose of materials contaminated by spills. The operator must establish and make highly visible location(s) for the storage of spill prevention and control equipment and provide training for personnel responsible for spill prevention and control on the construction site.

Are spill prevention and control measures required for this particular project?

Yes       No

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Spills related to construction vehicles and materials shall be prevented by the following procedures:

1. No vehicles shall be left unattended in project areas, which, in the event of a hazardous material spill, would flow into any portion of the drainage system.
2. Vehicles shall be fueled in areas and using procedures that will not lead to a discharge of fuel into Waters of the State.
3. In the event of a release of hazardous material, the equipment operator shall take all measures to stop and/or contain the leak and without exacerbating the release and attempt to remove equipment from areas likely to cause a discharge of hazardous materials into Water of the State. Further, site supervisors, and the Owner and his Representative shall be contacted and, should it be determined that the spill is of a reportable quantity, the RIDEM shall be notified. A licensed hazardous waste remediation contractor shall be engaged to remediate any such spills in accordance with RIDEM Regulations and procedures.

Any hazardous materials used for construction shall be stored away from the drainage system components and protected from precipitation. In the event of a release beyond the ability of construction staff to contain, emergency services of the Town of Narragansett, and the State of Rhode Island, and a licensed hazardous waste remediation contractor shall be contacted for assistance.

To prevent pollution of surface waters, the following construction procedures shall be prohibited:

1. Dumping of or discharging of spoil material or excessively turbid water into any drainage structures, stream corridor, any wetland, or any surface waters.
2. Indiscriminate, arbitrary or capricious operations of equipment in any drainage structures, stream corridors, any wetlands, or any surface waters.
3. Pumping of silt-laden water from trenches or other excavations into any drainage structures, surface waters, any stream corridors or any wetlands. All disposal of silt-laden water shall be carried out within the use of approved filter basins.
4. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.
5. Disposal of excess or unsuitable excavation material in wetlands or floodplain areas, even with permission of the property owner.
6. Open burning of project debris.
7. Location of storage stockpiles in environmentally sensitive areas.

### **3.5 Control of Allowable Non-Stormwater Discharges**

Are there allowable non-Stormwater discharges present on or near the project area?

Yes       No

List of allowable non-stormwater discharge(s) and the associated control measure(s):

Are there any known or proposed contaminated discharges, including anticipated contaminated dewatering operations, planned on or near the project area?

Yes       No

If yes, list the discharge types and the RIPDES individual permit number(s) or RIPDES Remediation General Permit Authorization number(s) associated with these discharges.

### 3.6 Control Dewatering Practices

Site owners and operators are prohibited from discharging groundwater or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate control measures.

Examples of appropriate control measures include, but are not limited to, temporary sediment basins or sediment traps, sediment socks, dewatering tanks and bags, or filtration systems (e.g. bag or sand filters) that are designed to remove sediment. Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control.

At a minimum the following discharge requirements must be met for dewatering activities:

1. Do not discharge visible floating solids or foam.
2. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area.
3. At all points where dewatering water is discharged, utilize velocity dissipation devices.
4. With filter backwash water, either haul it away for disposal or return it to the beginning of the treatment process.
5. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
6. Dewatering practices must involve the implementation of appropriate control measures as applicable (i.e. containment areas for dewatering earth materials, portable sediment tanks and bags, pumping settling basins, and pump intake protection.)

Is it at all likely that the site operator will need to implement construction dewatering in order to complete the proposed project?

Yes       No

- Dewatering activities may be necessary for installation of the concrete retaining wall on the seaward side of the boardwalk. Based upon soil boring information, dewatering may need to occur at the elevation where the footing is proposed. All proposed dewatering activities are to comply with the RI SESC Handbook.

### 3.7 Establish Proper Building Material Staging Areas

All construction materials that have the potential to contaminate stormwater must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. Designated areas shall be approved by the site owner/engineer. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in the discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

Materials stored on the site will be protected from exposure to precipitation through the use of tarps or other overhead cover. All construction debris shall be properly disposed of and/or covered at the end of each working day to avoid contact with precipitation.

### **3.8 Minimize Dust**

Dust control procedures and practices shall be used to suppress dust on a construction site during the construction process, as applicable. Precipitation, temperature, humidity, wind velocity and direction will determine amount and frequency of applications. However, the best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time. Dust Control measures outlined in the *RI SESC Handbook* shall be followed. Other dust control methods include watering, chemical application, surface roughening, wind barriers, walls, and covers.

Dust shall be controlled by watering or other approved methods as necessary or as directed by the owner or owner's representative.

### **3.9 Designate Washout Areas**

At no time shall any material (concrete, paint, chemicals) be washed into storm drains, open ditches, streets, streams, wetlands, or any environmentally sensitive area. The site operator must ensure that construction waste is properly disposed of, to avoid exposure to precipitation, at the end of each working day.

Will washout areas be required for the proposed project?

Yes       No

Washout shall remain within specified locations (i.e. concrete washout area) on site as shown on Sheet 2.1 and detailed on Sheet 2.2. Washout areas shall be constructed and maintained in accordance with the RI SESC Handbook. When temporary concrete washout facilities are no longer required for work, the hardened concrete, slurries, and liquids shall be removed and properly disposed of.

### **3.10 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices**

Vehicle fueling shall not take place within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Designated areas shall be depicted on the SESC Site Plans, or shall be approved by the site owner.

Vehicle maintenance and washing shall occur off-site, or in designated areas depicted on the SESC Site Plans or approved of by the site owner. Maintenance or washing areas shall not be within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Maintenance areas shall be clearly designated, and barriers shall be used around the perimeter of the maintenance area to prevent stormwater contamination.

Construction vehicles shall be inspected frequently for leaks. Repairs shall take place immediately. Disposal of all used oil, antifreeze, solvents and other automotive-related chemicals shall be according to applicable regulations; at no time shall any material be washed down the storm drain or in to any environmentally sensitive area.

See Section 3.4 of this report.

### **3.11 Chemical Treatment for Erosion and Sediment Control**

Chemical stabilizers, polymers, and flocculants are readily available on the market and can be easily applied to construction sites for the purposes of enhancing the control of erosion, runoff, and sedimentation. The following guidelines should be adhered to for construction sites that plan to use treatment chemicals as part of their overall erosion, runoff, and sedimentation control strategy.

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The U.S. Environmental Protection Agency has conducted research into the relative toxicity of chemicals commonly used for the treatment of construction stormwater discharges. The research conducted by the EPA focused on different formulations of chitosan, a cationic compound, and both cationic and anionic polyacrylamide (PAM). In summary, the studies found significant toxicity resulting from the use of chitosan and cationic PAM in laboratory conditions, and significantly less toxicity associated with using anionic PAM. EPA's research has led to the conclusion that the use of treatment chemicals for erosion, runoff, and sedimentation control requires proper operator training and appropriate usage to avoid risk to aquatic species. In the case of cationic treatment chemicals additional safeguards may be necessary.

**Application/Installation Minimum Requirements**

If a site operator plans to use polymers, flocculants, or other treatment chemicals during construction the SESC plan must address the following:

1. Treatment chemicals shall not be applied directly to or within 100 feet of any surface water body, wetland, or storm drain inlet.
2. Use conventional erosion, runoff, and sedimentation controls prior to and after the application of treatment chemicals. Use conventional erosion, runoff, and sedimentation controls prior to chemical addition to ensure effective treatment. Chemicals may only be applied where treated stormwater is directed to a sediment control (e.g. temporary sediment basin, temporary sediment trap or sediment barrier) prior to discharge.
3. Sites shall be stabilized as soon as possible using conventional measures to minimize the need to use chemical treatment.
4. Select appropriate treatment chemicals. Chemicals must be selected that are appropriately suited to the types of soils likely to be exposed during construction and to the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or treatment area. **Soil testing is essential. Using the wrong form of chemical treatment will result in some form of performance failure and unnecessary environmental risk.**
5. Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), or provide equivalent measures, designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means (e.g., storing chemicals in covered areas or having a spill kit available on site).
6. Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier. You must also use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the supplier of the applicable chemicals, or document specific departures from these practices or specifications and how they reflect good engineering practice.

Will chemical stabilizers, polymers, flocculants or other treatment chemicals be utilized on the proposed construction project?

Yes                       No

No, to the best of our knowledge

**Treatment Chemical SESC Plan Weekly Inspection Report Documentation Requirements**

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 Roger Wheeler State Beach Boardwalk

1. Document the type and quantity of treatment chemicals applied.
2. List the date, duration of discharge, and estimated discharge rate.
3. Provide an estimate of the volume of water treated.
4. Provide an estimate of the concentration of treatment chemicals in the discharge, with supporting calculations.

**3.12 Construction Activity Pollution Prevention Control Measure List**

It is expected that this table will be amended as needed throughout the construction project.

Phase No. #		
Location/Station	Control Measure Description/Reference	Maintenance Requirement
Concrete Washout Area (See Sheet 2.2)	Concrete washout area. Section Three: Pollution Prevention and Good Housekeeping, Concrete Washout, <i>RI SESC Handbook</i>	Verify that concrete washout container(s) are in place prior to pouring concrete. Inspect daily to verify continued proper conformance. Check remaining capacity during pour operations. Check for leaks periodically.
Street Sweeping	Street Sweeping. Section Three: Pollution Prevention and Good Housekeeping, Street Sweeping, <i>RI SESC Handbook</i> .	Public roads adjacent to the construction site shall be swept at the end of each day. Construction site shall be swept when sediment is visible.
Dust Control	Spill Prevention and Control. Section Three: Pollution Prevention and Good Housekeeping, Dust Control, <i>RI SESC Handbook</i> .	Exposed area shall be limited during construction. All exposed areas shall be inspected daily.
Waste Management	Waste Management. Section Three: Pollution Prevention and Good Housekeeping, Waste Management, <i>RI SESC Handbook</i> .	All loose trash and debris must be disposed of properly at the end of each working day.
Spill Prevention and Control	Spill Prevention and Control. Section Three: Pollution Prevention and Good Housekeeping, Spill Prevention and Control Plans, <i>RI SESC Handbook</i> .	All construction vehicles shall be regularly inspected for leaks and repaired as necessary. Spills shall be cleaned in accordance with <i>RI SESC Handbook</i> .



## SECTION 4: CONTROL MEASURE INSTALLATION, INSPECTION, and MAINTENANCE

### 4.1 Installation

Complete the installation of temporary erosion, runoff, sediment, and pollution prevention control measures by the time each phase of earth-disturbance has begun. All stormwater control measures must be installed in accordance with good judgment, including applicable design and manufacturer specifications. Installation techniques and maintenance requirements may be found in manufacturer specifications and/or the *RI SESC Handbook*.

Installation of requirements of temporary erosion, runoff, sediment, and pollution prevention control measures are shown in the plan Sheet 2.2 and are described in the project specifications.

### 4.2 Monitoring Weather Conditions

Anticipating Weather Events - Care will be taken to the best of the operator's ability to avoid disturbing large areas prior to anticipated precipitation events. Weather forecasts must be routinely checked, and in the case of an expected precipitation event of over 0.25-inches over a 24-hour period, it is highly recommended that all control measures should be evaluated and maintained as necessary, prior to the weather event. In the case of an extreme weather forecast (greater than one-inch of rain over a 24-hour period), additional erosion/sediment controls may need to be installed.

Storm Event Monitoring For Inspections - At a minimum, storm events must be monitored and tracked in order to determine when post-storm event inspections must be conducted. Inspections must be conducted and documented at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt.

The weather gauge station and website that will be utilized to monitor weather conditions on the construction site is as follows:

The closest weather gauge station located in Narragansett RI (Weather Station ID KRINARRA37) shall be used to monitor weather conditions and storm events at the site and can be found on [www.wunderground.com](http://www.wunderground.com)

### 4.3 Inspections

Minimum Frequency - Each of the following areas must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt:

- a. All areas that have been cleared, graded, or excavated and where permanent stabilization has not been achieved;
- b. All stormwater erosion, runoff, and sediment control measures (including pollution prevention control measures) installed at the site;
- c. Construction material, unstabilized soil stockpiles, waste, borrow, or equipment storage, and maintenance areas that are covered by this permit and are exposed to precipitation;

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- d. All areas where stormwater typically flows within the site, including temporary drainage ways designed to divert, convey, and/or treat stormwater;
- e. All points of discharge from the site;
- f. All locations where temporary soil stabilization measures have been implemented;
- g. All locations where vehicles enter or exit the site.

**Reductions in Inspection Frequency** - If earth disturbing activities are suspended due to frozen conditions, inspections may be reduced to a frequency of once per month. The owner and operator must document the beginning and ending dates of these periods in an inspection report.

**Qualified Personnel** – The site owner and operator are responsible for designating personnel to conduct inspections and for ensuring that the personnel who are responsible for conducting the inspections are “qualified” to do so. A “qualified person” is a person knowledgeable in the principles and practices of erosion, runoff, sediment, and pollution prevention controls, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of the permit.

**Recordkeeping Requirements** - All records of inspections, including records of maintenance and corrective actions must be maintained with the SESC Plan. Inspection records must include the date and time of the inspection, and the inspector’s name, signature, and contact information.

**General Notes**

- A separate inspection report will be prepared for each inspection.
- The Inspection Reference Number shall be a combination of the RIPDES Construction General Permit No - consecutively numbered inspections. ex/ Inspection reference number for the 4<sup>th</sup> inspection of a project would be: RIR10####-4
- Each report will be signed and dated by the Inspector and must be kept onsite.
- Each report will be signed and dated by the Site Operator.
- The corrective action log contained in each inspection report must be completed, signed, and dated by the site operator once all necessary repairs have been completed.
- It is the responsibility of the site operator to maintain a copy of the SESC Plan, copies of all completed inspection reports, and amendments as part of the SESC Plan documentation at the site during construction.

**Failure to make and provide documentation of inspections and corrective actions under this part constitutes a violation of your permit and enforcement actions under 46-12 of R.I. General Laws may result.**

**4.4 Maintenance**

Maintenance procedures for erosion and sedimentation controls and stormwater management structures/facilities are described on the SESC Site Plans and in the *RI SESC Handbook*.

Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls remain in effective operating condition and are protected from activities that would reduce their effectiveness. Erosion, runoff, sedimentation, and pollution prevention control measures must be maintained throughout the course of the project.

**Note: It is recommended that the site operator designates a full-time, on-site contact person responsible for working with the site owner to resolve SESC Plan-related issues.**

#### 4.5 Corrective Actions

*Per RI SESC Handbook – Part D:*

If, in the opinion of the designated site inspector, corrective action is required, the inspector shall note it on the inspection report and shall inform the site operator that corrective action is necessary. The site operator must make all necessary repairs whenever maintenance of any of the control measures instituted at the site is required.

In accordance with the *RI SESC Handbook*, the site operator shall initiate work to fix the problem immediately after its discovery, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

When installation of a new control or a significant repair is needed, site owners and operators must ensure that the new or modified control measure is installed and made operational by no later than seven (7) calendar days from the time of discovery where feasible. If it is infeasible to complete the installation or repair within seven (7) calendar days, the reasons why it is infeasible must be documented in the SESC Plan along with the schedule for installing the control measures and making it operational as soon as practicable after the 7-day timeframe. Such documentation of these maintenance procedures and timeframes should be described in the inspection report in which the issue was first documented. If these actions result in changes to any of the control measures outlined in the SESC Plan, site owners and operators must also modify the SESC Plan accordingly within seven (7) calendar days of completing this work.

## SECTION 5: AMENDMENTS

*Per RIPDES Construction General Permit – Part III.F:*

This SESC Plan is intended to be a working document. It is expected that amendments will be required throughout the active construction phase of the project. **Even if practices are installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site for the entire duration of the project.**

The SESC Plan shall be amended within seven (7) days whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SESC Plan proves to be ineffective in achieving its objectives (i.e. the selected control measures are not effective in controlling erosion or sedimentation).

In addition, the SESC Plan shall be amended to identify any new operator that will implement a component of the SESC Plan.

All revisions must be recorded in the Record of Amendments Log Sheet, which is contained in Attachment G of this SESC Plan, and dated red-lined drawings and/or a detailed written description must be appended

Soil Erosion and Sediment Control Plan  
Roger Wheeler State Beach Boardwalk

to the SESC Plan. Inspection Forms must be revised to reflect all amendments. Update the Revision Date and the Version # in the footer of the Report to reflect amendments made.

All SESC Plan Amendments, except minor non-technical revisions, must be approved by the site owner and operator. Any amendments to control measures that involve the practice of engineering must be reviewed, signed, and stamped by a Professional Engineer registered in the State of RI.

The amended SESC plan must be kept on file at the site while construction is ongoing and any modifications must be documented.

Attach a copy of the Amendment Log.

## SECTION 6: RECORDKEEPING

### RIPDES Construction General Permit – Parts III.D, III.G, III.J.3.b.iii, & V.O

It is the site owner and site operator's responsibility to have the following documents available at the construction site and immediately available for RIDEM review upon request:

- A copy of the fully signed and dated SESC Plan, which includes:
  - A copy of the General Location Map  
INCLUDED AS ATTACHMENT A
  - A copy of all SESC Site Plans  
INCLUDED AS ATTACHMENT B
  - A copy of the RIPDES Construction General Permit (*To save paper and file space, do not include in DEM/CRMC submittal, for operator copy only*)  
INCLUDED AS ATTACHMENT C
  - A copy of any regulatory permits (RIDEM Freshwater Wetlands Permit, CRMC Assent, RIDEM Water Quality Certification, RIDEM Groundwater Discharge Permit, RIDEM RIPDES Construction General Permit authorization letter, etc.) (*To be provided when received*)  
INCLUDED AS ATTACHMENT D
  - The signed and certified NOI form or permit application form (*if required as part of the application, see RIPDES Construction General Permit for applicability*)  
INCLUDED AS ATTACHMENT E
  - Completed Inspection Reports w/Completed Corrective Action Logs  
INCLUDED AS ATTACHMENT F
  - SESC Plan Amendment Log  
INCLUDED AS ATTACHMENT G

## SECTION 7: PARTY CERTIFICATIONS

### RIPDES Construction General Permit – Part V.G

All parties working at the project site are required to comply with the Soil Erosion and Sediment Control Plan (SESC Plan including SESC Site Plans) for any work that is performed on-site. The site owner, site operator, contractors and sub-contractors are encouraged to advise all employees working on this project of the requirements of the SESC Plan. A copy of the SESC Plan is available for your review at the following location: Onsite, or may be obtained by contacting the site owner or site operator.

The site owner and site operator and each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement.

***I acknowledge that I have read and understand the terms and conditions of the Soil Erosion and Sediment Control (SESC) Plan for the above designated project and agree to follow the control measures described in the SESC Plan and SESC Site Plans.***

Site Owner:

Rhode Island Department of Environmental Management  
Mr. David DeCost, Division of Planning and Development  
235 Promenade Street  
Providence, RI 02908  
401-222-2776 ext 2774316, 401-222-2991

\_\_\_\_\_  
signature/date

Site Operator:

Insert Company or Organization Name  
Insert Name & Title  
Insert Address  
Insert City, State, Zip Code  
Insert Telephone Number, Insert Fax/Email

\_\_\_\_\_  
signature/date

Designated Site Inspector:

Insert Company or Organization Name  
Insert Name & Title  
Insert Address  
Insert City, State, Zip Code  
Insert Telephone Number, Insert Fax/Email

\_\_\_\_\_  
signature/date

SubContractor SESC Plan Contact:

Insert Company or Organization Name  
Insert Name & Title  
Insert Address  
Insert City, State, Zip Code  
Insert Telephone Number, Insert Fax/Email

\_\_\_\_\_  
signature/date

*Insert more contact/signature lines as necessary*

## **LIST OF ATTACHMENTS**

**Attachment A - General Location Map**

**Attachment B - SESC Site Plans**

**Attachment C - Copy of RIPDES Construction General Permit and Authorization to Discharge** *(To save paper and file space, do not include in DEM/CRMC submittal, for operator copy only)*

**Attachment D - Copy of Other Regulatory Permits**

**Attachment E - Copy of RIPDES NOI** *(if required as part of application, see RIPDES Construction General Permit for applicability)*

**Attachment F - Inspection Reports w/ Corrective Action Log**

**Attachment G - SESC Plan Amendment Log**

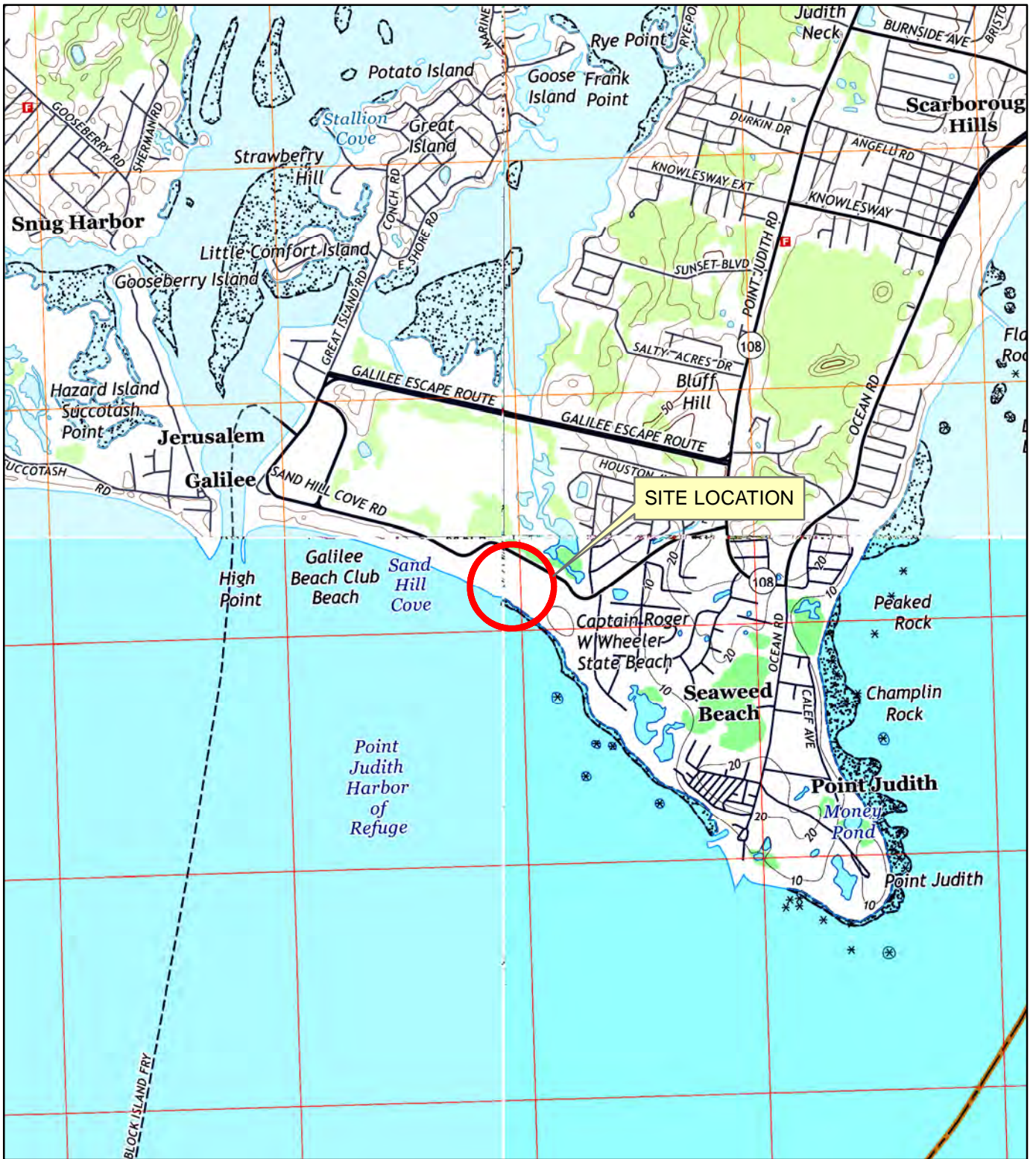
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**APPENDIX A**

General Location Map







**SITE LOCATION MAP**

SCALE: 1"=2,000'



8 BLACKSTONE VALLEY PLACE  
LINCOLN, RI 02865  
(401) 334-4100

10 LINCOLN ROAD, SUITE 210  
FOXBORO, MA 02035  
(508) 543-1755

PARE PROJECT No. 19131.00

OCTOBER 2021

**FIGURE 1**

**ROGER WHEELER STATE BEACH BOARDWALK  
NARRAGANSETT, RI**





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**APPENDIX B**

Soil Erosion and Sediment Control Site Plans





**GENERAL NOTES:**

- FOR THE PURPOSE OF THIS PROJECT
  - OWNER - DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
235 PROMENADE STREET, FL 3  
PROVIDENCE, RI 02908
  - ENGINEER - PARE CORPORATION  
10 LINCOLN ROAD, SUITE 210  
FOXBORO, MA 02035
  - CONTACT - J. MATTHEW BELLISLE, P.E., SENIOR VICE PRESIDENT  
BRIAN DUTRA, P.E., PROJECT ENGINEER
- ALL CONSTRUCTION INDICATED ON THESE PLANS SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE RHODE ISLAND STATE BUILDING CODE, ALL FEDERAL AND MUNICIPAL BUILDING CODES, AND THE SPECIFICATIONS INCLUDED IN THIS CONTRACT. THESE PLANS ARE INCOMPLETE UNLESS ACCOMPANIED BY THE SPECIFICATIONS INCLUDED IN THE CONTRACT DOCUMENTS.
- THE BASE PLAN WAS DEVELOPED BASED UPON PLAN ENTITLED "EXISTING CONDITIONS AND TOPOGRAPHY PLAN ROGER WHEELER STATE BEACH" PREPARED BY NARRAGANSETT ENGINEERING INC. OF PORTSMOUTH, RI DATED MARCH 2021. ANY DISCREPANCIES ON THESE PLANS WITH REGARD TO DIMENSIONS OR CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PORTION OF WORK.
- HORIZONTAL DATUM: RHODE ISLAND STATE PLANE - NAD83  
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AS ESTABLISHED BY NOS TIDAL BENCH MARK
- INFORMATION REGARDING THE LOCATION OF SURROUNDING STRUCTURES AND UTILITIES IS FURNISHED SOLELY FOR THE CONVENIENCE OF THE CONTRACTOR AND SHALL BE FIELD VERIFIED. THE CONTRACTOR SHALL CONDUCT ITS OWN INDEPENDENT EXAMINATION OF SITE CONDITIONS FOR THE PURPOSE OF BIDDING, FABRICATION, AND CONSTRUCTION ASSOCIATED WITH THE PROJECT. ANY RELIANCE UPON INFORMATION MADE AVAILABLE BY THE OWNER OR THE ENGINEER SHALL BE AT THE CONTRACTOR'S RISK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS. PLANS SHALL NOT BE SCALED FOR DIMENSIONS.
- CONSTRUCTION SHALL BE MADE FROM APPROVED SHOP DRAWINGS ONLY.
- NOTES, TYPICAL DETAILS, AND SCHEDULES APPLY TO ALL WORK UNLESS OTHERWISE NOTED. FOR CONDITIONS NOT SPECIFICALLY SHOWN, PROVIDE DETAILS OF SIMILAR NATURE. VERIFY APPLICABILITY BY SUBMITTING SHOP DRAWINGS FOR REVIEW.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL PROJECT DEMOLITION AND EXCESS MATERIAL IN ACCORDANCE WITH RHODE ISLAND, LOCAL, AND FEDERAL LAWS.
- THE CONTRACTOR SHALL PROTECT ALL ADJACENT STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ALL DAMAGE TO ADJACENT STRUCTURES AND UTILITIES AT NO ADDITIONAL COST TO THE OWNER.
- PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL VISIT THE SITE AND SHALL NOTIFY THE ENGINEER OF ANY ADDITIONAL UTILITIES, STRUCTURES, OR ANY OTHER ELEMENTS WHICH MAY IMPEDE WORK. UTILITY AND/OR STRUCTURE RELOCATIONS, IF NECESSARY, SHALL BE COORDINATED THROUGH THE OWNER'S ENGINEER.
- THE LOCATION AND DEPTH OF EXISTING UTILITIES ARE APPROXIMATE AND HAVE BEEN PLOTTED FROM THE LATEST AVAILABLE INFORMATION. THE UTILITY LOCATIONS ARE APPROXIMATE AND MAY NOT BE ALL INCLUSIVE. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "DIG SAFE" AT 1-888-DIG-SAFE TO ACCURATELY LOCATE ALL EXISTING UTILITIES, BOTH OVERHEAD AND UNDERGROUND, 72 HOURS PRIOR TO COMMENCING WORK. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. COSTS OF SUCH DAMAGE SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL COMMENCE UNTIL ALL INVOLVED UTILITY COMPANIES AND/OR TOWN WHOSE FACILITIES MIGHT BE AFFECTED BY ANY WORK TO BE PERFORMED BY THE CONTRACTOR ARE PROPERLY NOTIFIED.
- THE CONTRACTOR SHALL FOLLOW ALL OSHA, FEDERAL, STATE, AND LOCAL STANDARDS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL SITE SAFETY PROCEDURES AND PRACTICES REGARDLESS OF THE PRESENCE OF THE OWNER OR ENGINEER.
- ALL CONSTRUCTION ACTIVITIES SHALL BE CONFINED TO THE LIMITS OF WORK AND TEMPORARY EASEMENTS DEFINED HEREIN.
- THE CONTRACTOR WILL BE REQUIRED TO SUBMIT A CONSTRUCTION SCHEDULE TO THE OWNER WITHIN 5 DAYS OF THE NOTICE OF AWARD. THE CONTRACTOR SHALL UPDATE SCHEDULE AS NEEDED THROUGHOUT THE COURSE OF WORK.
- THE CONTRACTOR SHALL STAGE ALL EQUIPMENT IN THE DESIGNATED STAGING AREA. ALL GREASING AND REFUELING ACTIVITIES SHALL OCCUR IN THE STAGING AREA. ALL NECESSARY MEASURES SHALL BE TAKEN TO PREVENT BY ANY METHOD, OIL, CONSTRUCTION DEBRIS, STOCKPILED MATERIALS, AND OTHER MATERIALS ON THE SITE, FROM ENTERING THE WATERWAY. STAGING/LAYDOWN AREAS, AS APPROVED BY THE ENGINEER, SHALL BE RESTORED BY THE CONTRACTOR TO THE EXISTING CONDITION. IN ADDITION, THE CONTRACTOR SHALL REPLACE ALL DAMAGED MATERIALS AS A RESULT OF HIS OPERATIONS, TO THE SATISFACTION OF THE ENGINEER.
- THE CONTRACTOR SHALL MAINTAIN A SECURE SITE AND PROVIDE APPROPRIATE SAFETY MEASURES TO PREVENT ACCIDENTS. THE SAFETY MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO SIGNAGE, BARRICADES, FENCES, FLASHING WARNING LIGHTS, AND POLICING IF NECESSARY.
- IN CASE OF CONTRADICTION BETWEEN THE DRAWINGS, THE SPECIFICATIONS, AND THE CODES, OR IF ANY CHANGE IS REQUIRED, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY. NO CHANGE SHALL BE MADE WITHOUT WRITTEN APPROVAL OF THE ENGINEER.
- UPON COMPLETION OF THE PROJECT, CONTRACTOR IS TO PROVIDE A POST CONSTRUCTION SURVEY AND TWO AS-BUILT PLAN SETS TO THE OWNER DEPICTING ANY FIELD CHANGES OF DIMENSION OR DETAIL, LOCATION OF UNDERGROUND STRUCTURES AND/OR UTILITIES, CONSTRUCTION DEVIATIONS, CHANGES DUE TO FIELD OR CHANGE ORDER, AND DETAILS NOT ON THE ORIGINAL DRAWINGS.
- NO WORK SHALL BE COMPLETED UNTIL EACH OF THE FOLLOWING CONDITIONS ARE MET:
  - \* RIDES PERMIT IS RECEIVED FROM RIDEM
  - \* NOTICE OF ASSENT IS RECEIVED FROM CRMC
  - \* THE OWNER DIRECTS THE WORK TO BE COMPLETED
- CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN FOR THE PROPOSED WORK.

**DEMOLITION NOTES:**

- ALL DEMOLITION SHALL BE COORDINATED WITH THE OWNER PRIOR TO START OF WORK.
- THE CONTRACTOR SHALL COORDINATE ALL DEMOLITION OF STRUCTURES, PAVEMENT AND CONCRETE MATERIALS, AND UTILITIES WITH APPROPRIATE PROPOSED SITE GENERAL, GRADING, UTILITY, AND LANDSCAPE DRAWINGS.
- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS IN THE FIELD PRIOR TO ANY DEMOLITION OR CONSTRUCTION. ANY DISCREPANCIES RELATING TO THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
- ALL NOTED UTILITIES TO BE REMOVED AND DISPOSED OF, RELOCATED OR CAPPED REPRESENT ALL KNOWN SITE CONDITIONS TO BE DEMOLISHED. CONTRACTOR TO COORDINATE ALL UNFORESEEN CONDITIONS WITH THE OWNER, ENGINEER, AND/OR RESPECTIVE UTILITY COMPANIES PRIOR TO PROCEEDING WITH WORK.
- CONTRACTOR TO BE AWARE OF SELECTIVE DEMOLITION AT ALL SECTIONS OF WORK. CONTRACTOR WILL BE RESPONSIBLE FOR REPLACEMENT IN-KIND OF ALL WORK INADVERTENTLY REMOVED AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL REMOVE ITEMS TO BE DEMOLISHED AS INDICATED ON THE DRAWINGS WITH CARE AND NOT TO DAMAGE ADJACENT STRUCTURES. THE WORK AREA WILL BE LEFT READY TO RECEIVE NEW WORK.
- WATER, SEWER, DRAINAGE, GAS, AND OTHER SITE UTILITIES SERVICING THE EXISTING FACILITIES ARE TO REMAIN ACTIVE THROUGHOUT CONSTRUCTION. THERE SHALL BE NO INTERRUPTION OF UTILITY SERVICE DURING CONSTRUCTION OPERATIONS WITHOUT APPROVAL FROM THE OWNER.
- ALL UTILITIES REMOVED FROM THE SITE SHALL BE CUT AND CAPPED AT THE LIMIT OF DISTURBANCE UNLESS OTHERWISE NOTED.
- PAVEMENT DEMOLITION SHALL BE SAWCUT AND DISPOSED OF PROPERLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OFFSITE DISPOSAL OF ALL PROJECT DEMOLITION MATERIAL, TRASH, AND DEBRIS IN ACCORDANCE WITH LOCAL AND STATE LAWS.
- REFER TO SPECIFICATION SECTION 02100-"DEMOLITION AND REMOVAL" FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

**EROSION CONTROL NOTES:**

- THE CONTRACTOR AND RELEVANT SUBCONTRACTORS SHALL READ AND UNDERSTAND THE RICRMC ASSENT PERMIT AND THE SITE SPECIFIC SOIL EROSION AND SEDIMENT CONTROL PLAN (SESC) PREPARED FOR THE PROJECT. ALL EROSION CONTROL SHALL BE IN ACCORDANCE WITH THE RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST REVISION.
- THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE CONDITIONS ISSUED FOR THE PROJECT BY RICRMC AND BE RESPONSIBLE FOR CONFORMANCE WITH ALL PERMIT REQUIREMENTS AND CONSTRUCTION DOCUMENTS.
- SOIL EROSION AND SEDIMENTATION CONTROLS SHALL BE PROVIDED IN ACCORDANCE WITH THE "RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK", AND THE NOTES AND DETAILS SHOWN IN THIS PLAN SET.
- THE CONTRACTOR SHALL SCHEDULE HIS/HER WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PONDING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF SURFACE PAVING. PROVIDE TEMPORARY POSITIVE DRAINAGE, AS REQUIRED, TO STABILIZED DISCHARGE POINTS. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY UTILITY CONNECTIONS.
- CONTRACTOR SHALL INSTALL AND MAINTAIN ALL EROSION CONTROL DEVICES FOR THE DURATION OF THE PROJECT.
- CONTRACTOR SHALL PREVENT SEDIMENT FROM ENTERING ANY WATERWAY VIA DISCHARGES THROUGH ANY DRAINAGE STRUCTURES OR RUNOFF FROM WITHIN THE LIMITS OF WORK.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING, RESTORING AND REPAIRING ALL DAMAGE AS A RESULT OF UNAUTHORIZED WORK OR DISCHARGES AT NO ADDITIONAL COST TO THE OWNER.
- THE LIMITS OF EROSION CONTROL BARRIERS SHALL BE MODIFIED OR EXPANDED AS FIELD CONDITIONS WARRANT.
- ALL EROSION CONTROL BARRIERS SHALL BE INSPECTED AT LEAST ONCE PER WEEK AND AFTER EACH STORM EVENT OF 0.25 INCH OR GREATER. ANY DAMAGED AREAS OF THE EROSION CONTROL BARRIER SHALL BE REPAIRED WITHIN 24 HOURS OF DISCOVERY.
- DISCHARGE OF TURBID WATER TO ANY WATERWAY IS PROHIBITED.
- CONSTRUCTION SITE WASTE MATERIALS SHALL BE PROPERLY CONTAINED ONSITE AND DISPOSED OFF SITE IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE REGULATIONS.
- ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 14 DAYS OF COMPLETION OF WORK IN THAT AREA. THE CONTRACTOR SHALL NOT REMOVE ANY STRAW BALES, SILT FENCE OR OTHER EROSION CONTROLS UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED.
- ALL ON-SITE AND OFF-SITE DRAINAGE STRUCTURES AND PIPING SHALL BE JETTED AND CLEANED UPON COMPLETION OF THE SITE WORK.

**SPILL PREVENTION AND CONTROL NOTES:**

- SPILLS AND LEAKS SHALL BE AVOIDED THROUGH FREQUENT INSPECTION OF EQUIPMENT AND MATERIAL STORAGE AREAS, AND SHALL BE REMEDIATED AND REPAIRED AS NECESSARY.
- HAZARDOUS MATERIAL STORAGE TO BE PLACED ONLY IN DESIGNATED AREAS. MATERIAL STORAGE AREAS SHALL BE ROUTINELY INSPECTED FOR LEAKY CONTAINERS, OPEN CONTAINERS, OR IMPROPER STORAGE TECHNIQUES THAT MAY LEAD TO SPILLS OR LEAKS.
- APPROPRIATE SPILL REMEDIATION PROCEDURES AND SUPPLIES SHALL BE READILY AVAILABLE ON-SITE. TOOLS AND SUPPLIES SHALL BE CLEARLY MARKED SO THAT ALL PERSONNEL CAN LOCATE AND ACCESS THESE SUPPLIES.
- SPILL REMEDIATION SHALL BE PERFORMED IMMEDIATELY. CONTRACTOR SHALL FOLLOW PROPER RESPONSE PROCEDURES IN ACCORDANCE WITH ANY APPLICABLE REGULATORY REQUIREMENTS.
- AT NO TIME SHALL SPILLS BE DIVERTED TOWARD STORM DRAINS OR TO ANY WATERWAY.
- EQUIPMENT/VEHICLE FUELING AND REPAIR/MAINTENANCE OPERATIONS SHALL TAKE PLACE ONLY WITHIN DESIGNATED STAGING AREAS.
- THE EQUIPMENT OPERATOR SHALL FULLY MONITOR FUELING OPERATIONS TO EQUIPMENT AND VEHICLES AT ALL TIMES.
- ANY SPILLAGE SHALL BE IMMEDIATELY CLEANED WITH SPILL KITS KEPT ON SITE.
- IN THE CASE OF SMALL AMOUNTS OF SOIL CONTAMINATION, SUCH SOIL SHALL BE PLACED IN 55 GALLON DRUMS FOR DISPOSAL BY A LICENSED HAZARDOUS WASTE HAULER.
- IN THE CASE OF A LARGE AMOUNT OF SOIL CONTAMINATION OR DISCHARGE TO THE WATERWAY, RHODE ISLAND DEM AND APPLICABLE AGENCIES SHALL BE NOTIFIED AS REQUIRED. A HAZARDOUS WASTE REMEDIATION FIRM SHALL BE CONTRACTED TO REMOVE AND DISPOSE OF THE CONTAMINATED MATERIAL OR CONTAIN THE SPILL AT NO ADDITIONAL COST.

**GRADING AND UTILITY NOTES**

- ALL EXISTING CONDITIONS SHOWN SHALL BE CONSIDERED APPROXIMATE AND ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED. NO FIELD ADJUSTMENTS IN THE LOCATION OF SITE ELEMENTS SHALL BE MADE WITHOUT THE ENGINEER'S APPROVAL.
- ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINES AND GRADES ON THE PLANS AND SITE WORK SPECIFICATIONS, UNLESS OTHERWISE DIRECTED.
- AT ALL LOCATIONS WHERE EXISTING CURBING OR PAVEMENT ABUT NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT AND CURBS SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES AND JOINTS.
- ALL EXISTING AND PROPOSED UTILITY COVERS, GRATES, ETC. SHALL BE ADJUSTED TO BE FLUSH WITH THE SURROUNDING SURFACE OR PAVEMENT FINISH GRADE OF THIS CONTRACT. RIM ELEVATIONS OF STRUCTURES AND MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH THE PROPOSED FINAL GRADES.
- THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION OF PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED, INCLUDING OBTAINING ALL PERMITS. ALL COSTS AND FEES BY PRIVATE UTILITY COMPANIES TO BRING SERVICE TO THE SITE SHALL BE PAID FOR BY THE CONTRACTOR.
- THE CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION AT NO COST TO THE OWNER.
- DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES BY PROVIDING TEMPORARY SUPPORTS OR SHEETING AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
- SITE GRADES SHALL CONFORM WITH ADA REQUIREMENTS.
- CONTRACTOR IS REQUIRED TO APPLY FOR, OBTAIN, AND PAY ALL FEES ASSOCIATED WITH CONSTRUCTION PHASE PERMITS. PERMITS MAY INCLUDE, BUT NOT LIMITED TO:
  - \* RHODE ISLAND STATE BUILDING OFFICIAL
  - \* TOWN OF NARRAGANSETT DEPARTMENT OF PUBLIC WORKS PERMITS

**TIMBER NOTES**

- ALL NEW LUMBER SHALL BE SOUTHERN YELLOW PINE, VISUALLY GRADED NO. 1 (F<sub>b</sub>=1,350 PSI), UNLESS SPECIFIED OTHERWISE.
- NEW LUMBER SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AFWA STANDARD U1-11, UC3B WHEN NOT IN CONTACT WITH GROUND, UC4B FOR GROUND CONTACT, PERMANENT, OR INCIDENTAL.
- ALL FIELD CUTS AND BOLT HOLES SHALL BE PROTECTED IN ACCORDANCE WITH AFWA STANDARD M4.
- LUMBER DIMENSIONS PROVIDED IN THE PLANS ARE DRESSED SIZES UNLESS SPECIFIED OTHERWISE.

**CONCRETE NOTES**

- CONCRETE WORK SHALL CONFORM TO THE LATEST EDITION OF ACI 318 - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND THE RHODE ISLAND STATE BUILDING CODE.

- CONCRETE SHALL BE PLACED UNDER THE SUPERVISION OF THE APPROVED TESTING AGENCY.
- CONCRETE SHALL BE NORMAL WEIGHT, WITH TYPE II CEMENT, AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 5,000 PSI-TYPICAL. ALL CONCRETE DESIGN MIXES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
- ALL CONCRETE SHALL BE AIR-ENTRAINED WITH AN AIR CONTENT OF 6% +/- 1%.
- ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" x 45 DEGREES UNLESS NOTED OTHERWISE.
- WHEN CONCRETE IS PLACED AGAINST PREVIOUSLY HARDENED CONCRETE, THE INTERFACE SHALL BE CLEAN, FREE OF LAITANCE AND INTENTIONALLY ROUGHENED OR RAKED TO FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH.
- CONCRETE WASHOUT OPERATIONS TO OR WITHIN THE WATERWAY MUST NOT TAKE PLACE AT ANY TIME.

**REINFORCING STEEL NOTES**

- REINFORCING BARS SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 - "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND THE RHODE ISLAND STATE BUILDING CODE.
- COMPLETE SHOP DRAWINGS AND SCHEDULES OF ALL REINFORCING STEEL SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF THAT PORTION OF THE WORK. ALL ACCESSORIES MUST BE SHOWN ON THE SHOP DRAWINGS.
- REINFORCING BARS SHALL BE EPOXY COATED AND CONFORM TO ASTM A615 OR A706 (WELDABLE) GRADE 60.
- ALL SUPPORTS SUCH AS CHAIRS, BOLSTERS, SPACERS, BLOCKS AND HANGERS SHALL BE OF NON-CORROSIVE MATERIAL. BLOCKS SHALL BE MADE OF 4,000 PSI (UN-REINFORCED) CONCRETE.
- UNLESS NOTED ON THE DRAWINGS, THE MINIMUM CONCRETE PROTECTION (CLEAR COVER) FOR CAST-IN-PLACE CONCRETE COVER SHALL BE AS FOLLOWS:
  - A. FORMED CONCRETE EXPOSED TO EARTH OR WATER: 3"
  - B. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 4"
- MINIMUM REINFORCEMENT DEVELOPMENT LENGTH SHALL BE IN ACCORDANCE WITH ACI 318 FOR CLASS B LAPS UNLESS NOTED OTHERWISE.
- ALL REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS, AROUND CORNERS, AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.

**PRESTRESSED CONCRETE PILES**

- ALL REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS, AROUND CORNERS, AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.  
STRUCTURAL DEEP FOUNDATION (PILING) DESIGN IS BASED UPON THE USE OF PILES WITH THE FOLLOWING CAPACITIES:  
PRESTRESSED CONCRETE:  
VERTICAL COMPRESSIVE = 27 KIPS  
LATERAL = 55PSF (US), ACTING CONCURRENTLY WITH EITHER LOAD ABOVE  
ALL LOADS ARE APPLIED AT THE TOP OF THE PILE, UNLESS NOTED OTHERWISE.  
THIS WILL REQUIRE PRESTRESSED CONCRETE PILES WITH THE FOLLOWING PROPERTIES:  
12" PRESTRESSED CONCRETE PILE = (76) 35'-0"  
16" PRESTRESSED CONCRETE PILE = (88) 35'-0"  
2. ALL PRESTRESSED PILES WILL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD, TO INCLUDE CALCULATIONS EXECUTED BY A LICENSED PROFESSIONAL ENGINEER, IN ACCORDANCE WITH THE LOAD REQUIREMENTS LISTED IN THIS NOTE. REFER TO THE SUBSURFACE INVESTIGATION BORING LONGS BY PARE CORPORATION, PROJECT NUMBER 19131.00, DATED BETWEEN JANUARY 15 2020 AND JANUARY 16 2020 FOR ADDITIONAL INFORMATION.  
3. PILING IS TO BE HANDLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, SUCH THAT NO DAMAGE IS INCURRED.  
4. PILING DESIGN IS TO INCLUDE LONGITUDINAL STRANDS WHICH WILL DEVELOP THE SPECIFIED CAPACITIES. SPIRAL WIRE REINFORCING SHALL MEET THE REQUIREMENTS OF ASTM A82, BE A MINIMUM OF 5 GAGE, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 70 KSI  
5. PILES SHALL BE DRIVEN BY A SINGLE, OR DOUBLE ACTING STEAM, DIESEL, OR AIR HAMMER WITH A MINIMUM OF 15,000 FT-LBS OF ENERGY. LEADS SHALL BE FIXED TO THE BOOM AT THE TOP, AND TO THE CRANE AT THE BOTTOM; NO SWINGING LEADS ARE PERMITTED.  
6. ONCE PILE DRIVING HAS STARTED, DRIVE ALL PILES CONTINUOUSLY UNTIL THEY ARE AT THE REQUIRED TIP ELEVATION.  
7. FINAL PILE LOCATION SHALL BE WITHIN 3" OF THE DESIGN LOCATION.

**DESIGN CRITERIA**

**SNOW LOADS** (IBC SECT 1608)  
SNOW LOAD: P = 30 P/SF

**WIND LOADS** ASCE 7-16  
MEAN ROOF HEIGHT = 16.5 FEET  
BASIC WIND SPEED = 121 MPH

**FLOOD LOADS** (FEMA COASTAL CONSTRUCTION MANUAL FIRMETTE FLOOD ZONE VE)  
TOTAL BREAKING WAVE LOAD = 7530 PLF

**EARTHQUAKE LOADS** (IBC SECT. 1614)  
SURROUNDING SURFACE OR PAVEMENT FINISH GRADE OF THIS CONTRACT. RIM ELEVATIONS OF STRUCTURES AND MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH THE PROPOSED FINAL GRADES.  
S<sub>S</sub> = 0.164g  
S<sub>1</sub> = 0.058g

SITE CLASS D, F<sub>a</sub> = 1.0 S<sub>MS</sub> = 0.262g  
F<sub>v</sub> = 2.4 S<sub>M1</sub> = 0.140g

DESIGN SPECTRAL RESPONSE ACCELERATIONS AT 5% DAMPENING, S<sub>DS</sub> = 0.175g  
S<sub>D1</sub> = 0.093g

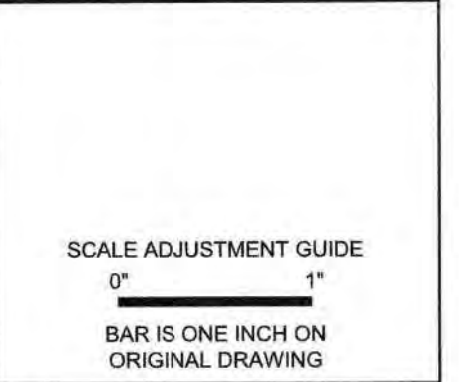
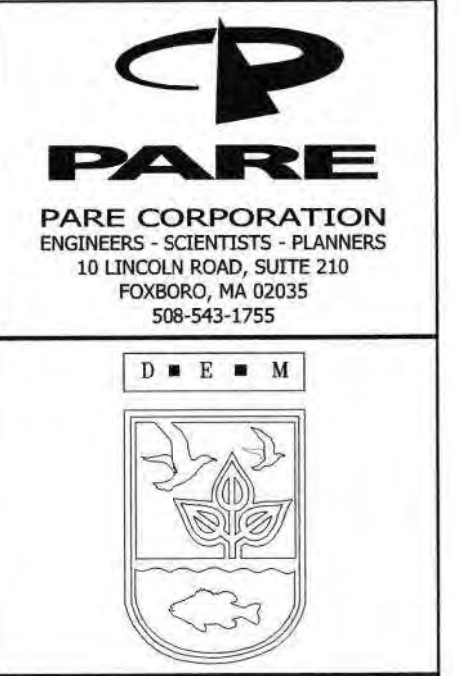
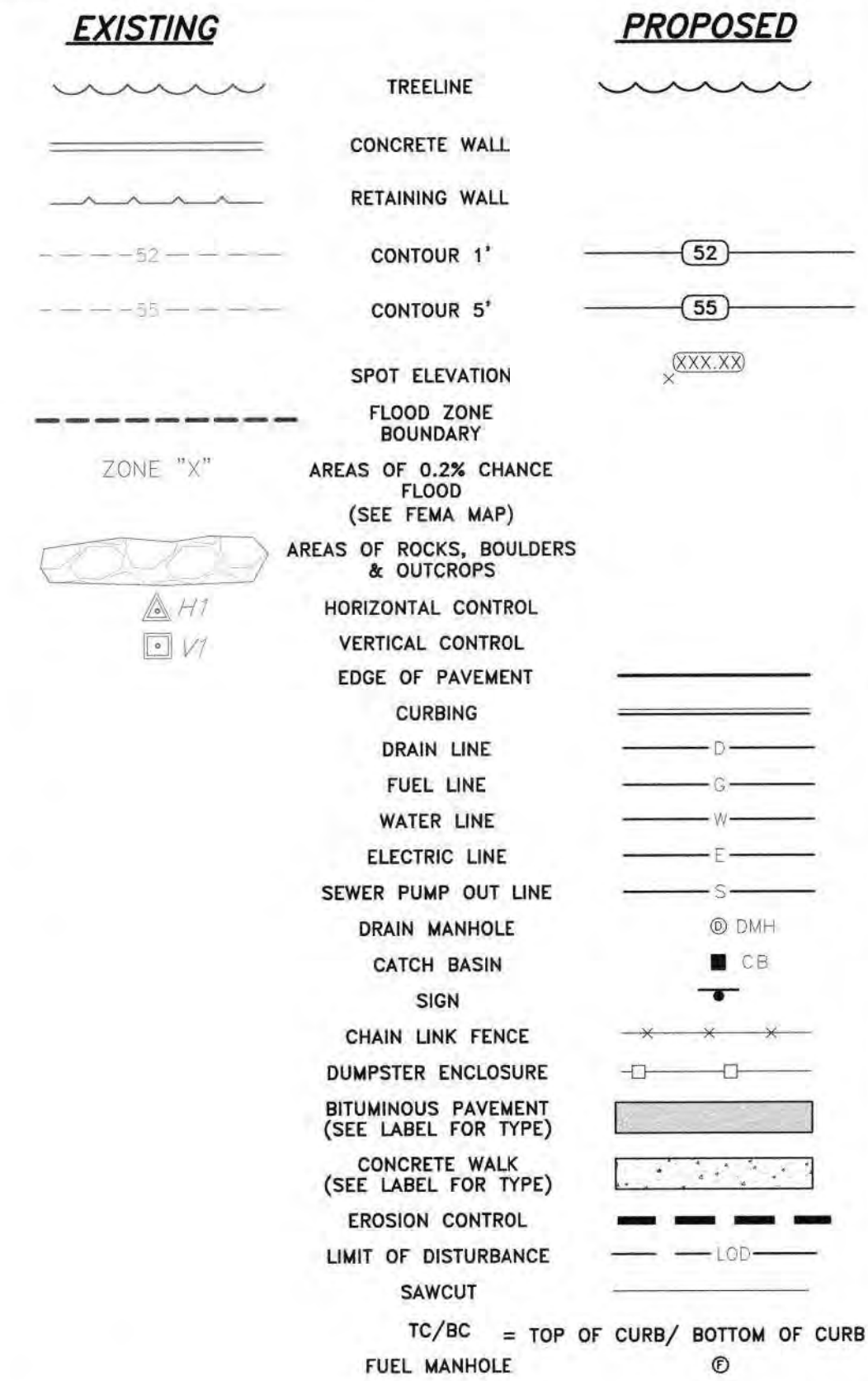
D1 GENERAL DESIGN RESPONSE SPECTRAL ACCELERATION, PGA = 0.188g  
B. SEISMIC DESIGN CATEGORY B

**ABBREVIATIONS**

- BCP = BITUMINOUS CONCRETE PAVEMENT
- CM = SAWCUT AND MATCH EXISTING GRADES
- CW = CEMENT CONCRETE SIDEWALK (STANDARD)
- GV = GATE VALVE (SEE DETAIL)
- JB = SPEAKER JUNCTION BOX
- R&D = REMOVE AND DISPOSE
- SCW = STRIPED CROSS WALK (SEE DETAIL)
- SHP = HANDICAP EPOXY RESIN PAVEMENT MARKING
- SW = 4" SOLID WHITE EPOXY RESIN PAVEMENT MARKING
- SW12 = 12" SOLID WHITE EPOXY RESIN PAVEMENT MARKING
- TIP = TEMPORARY INLET PROTECTION
- 7.1.0 = R.I. STD. CONCRETE CURB DETAIL
- 9.9.0 = R.I. STD. CONSTRUCTION ACCESS DETAIL
- 43.1.0 = R.I. STD. CEMENT CONCRETE SIDEWALK DETAIL
- 43.3.0 = R.I. STD. WHEELCHAIR RAMP DETAIL

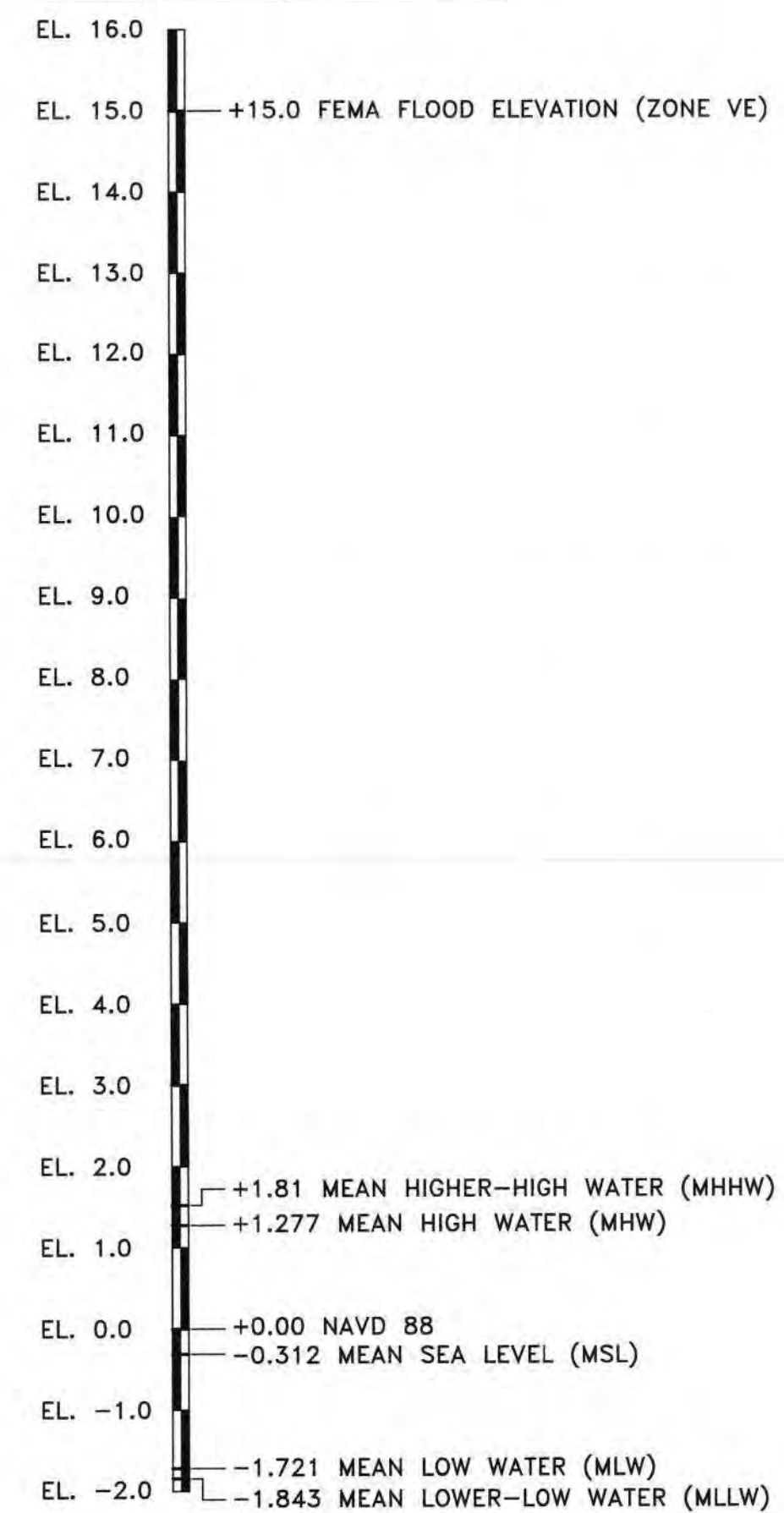
RIDOT STANDARD DETAILS CAN BE FOUND AT THE FOLLOWING WEBSITE:  
HTTP://WWW.DOT.RI.GOV/DOCUMENTS/DOINGBUSINESS/BLUEBOOK.PDF

**LEGEND**



ROGER WHEELER STATE BEACH BOARDWALK  
 NARRAGANSETT, RHODE ISLAND  
 RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**TIDAL REFERENCE**



**DATUM INFORMATION**

NOAA VERTICAL DATUM



REVISIONS:	

PROJECT NO.:	19131.00
DATE:	DECEMBER 2021
SCALE:	AS NOTED
DESIGNED BY:	KAD
CHECKED BY:	BMD
DRAWN BY:	LMC
APPROVED BY:	JMB

GENERAL NOTES AND LEGEND

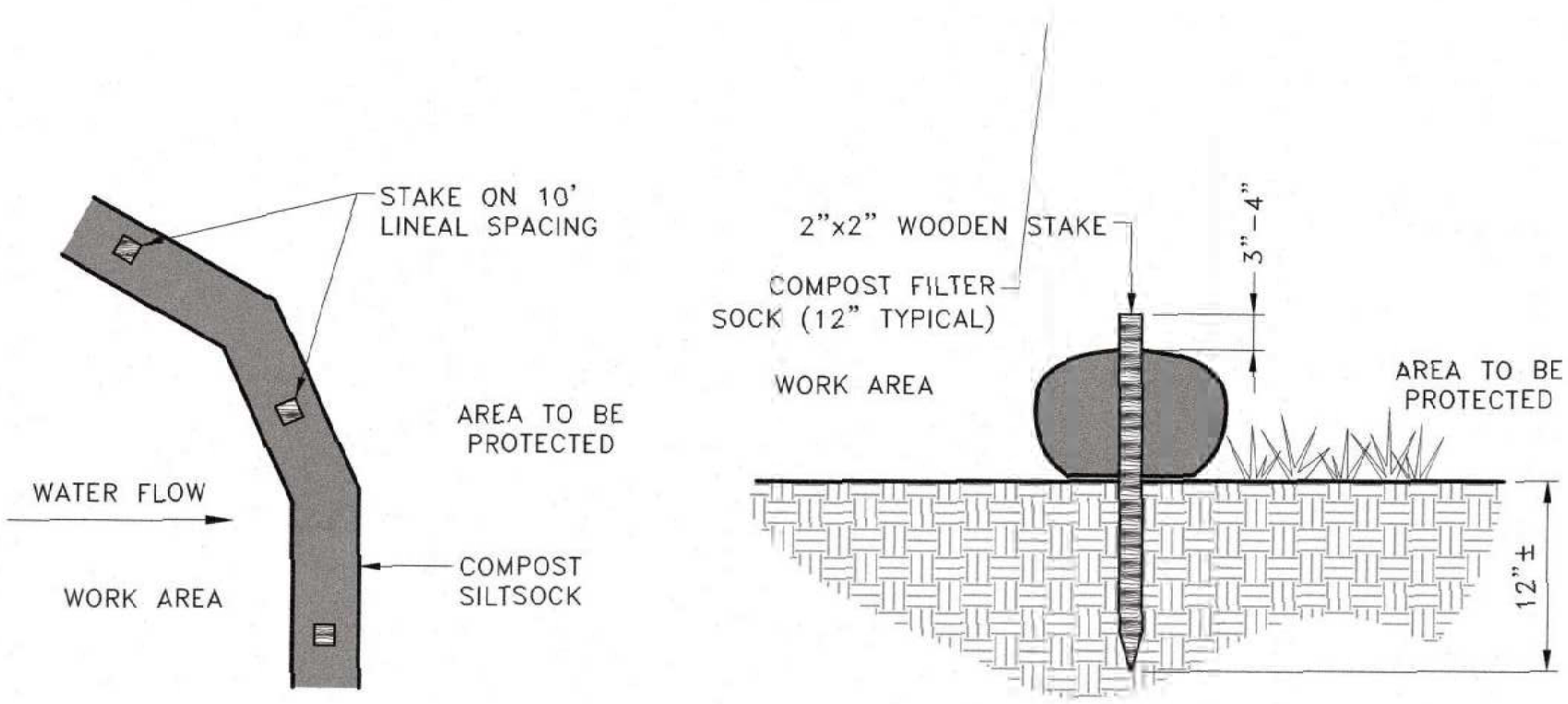
SHEET NO.: 1.0

90% DESIGN SUBMISSION  
NOT FOR CONSTRUCTION



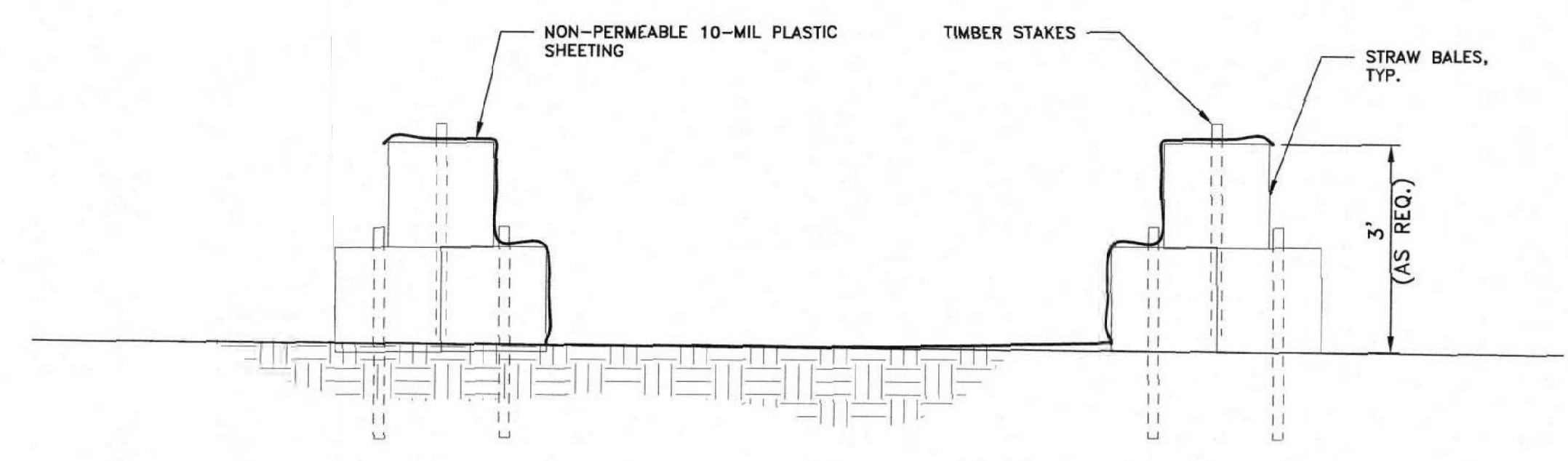




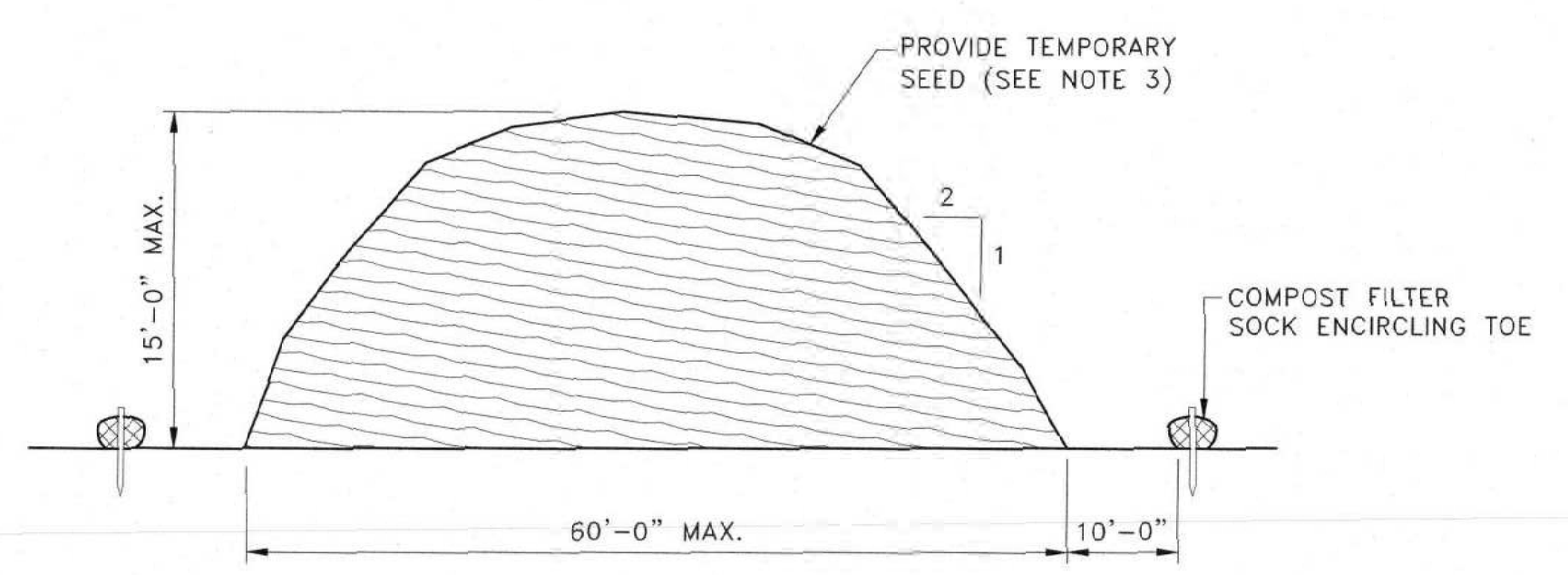


- NOTES:
1. COMPOST/ SOIL/ ROCK/ SEED FILL TO MEET APPLICATION REQUIREMENTS.
  2. COMPOST MATERIAL TO BE REMOVED OR DISPERSED ON SITE AS DETERMINED BY ENGINEER.

**COMPOST FILTER SOCK DETAIL**  
NOT TO SCALE

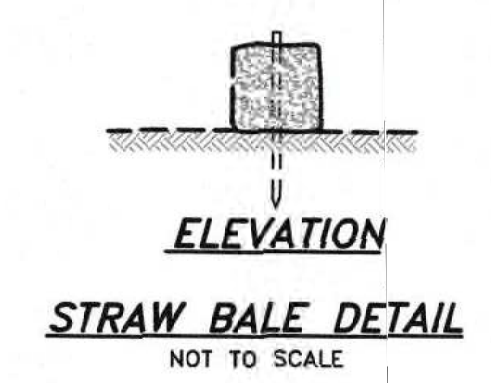
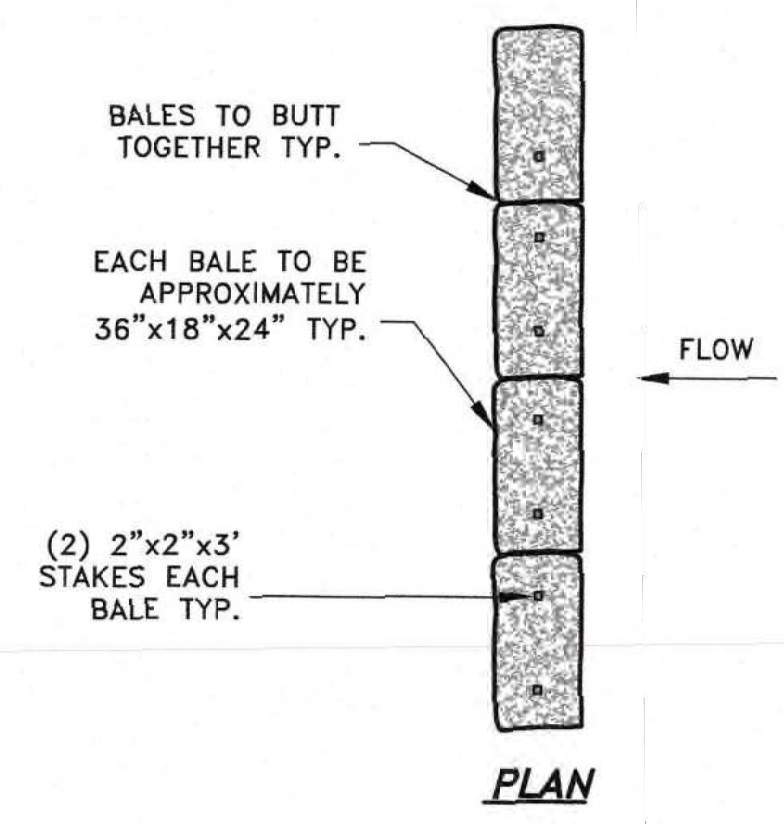


**CONCRETE WASHOUT**  
NOT TO SCALE

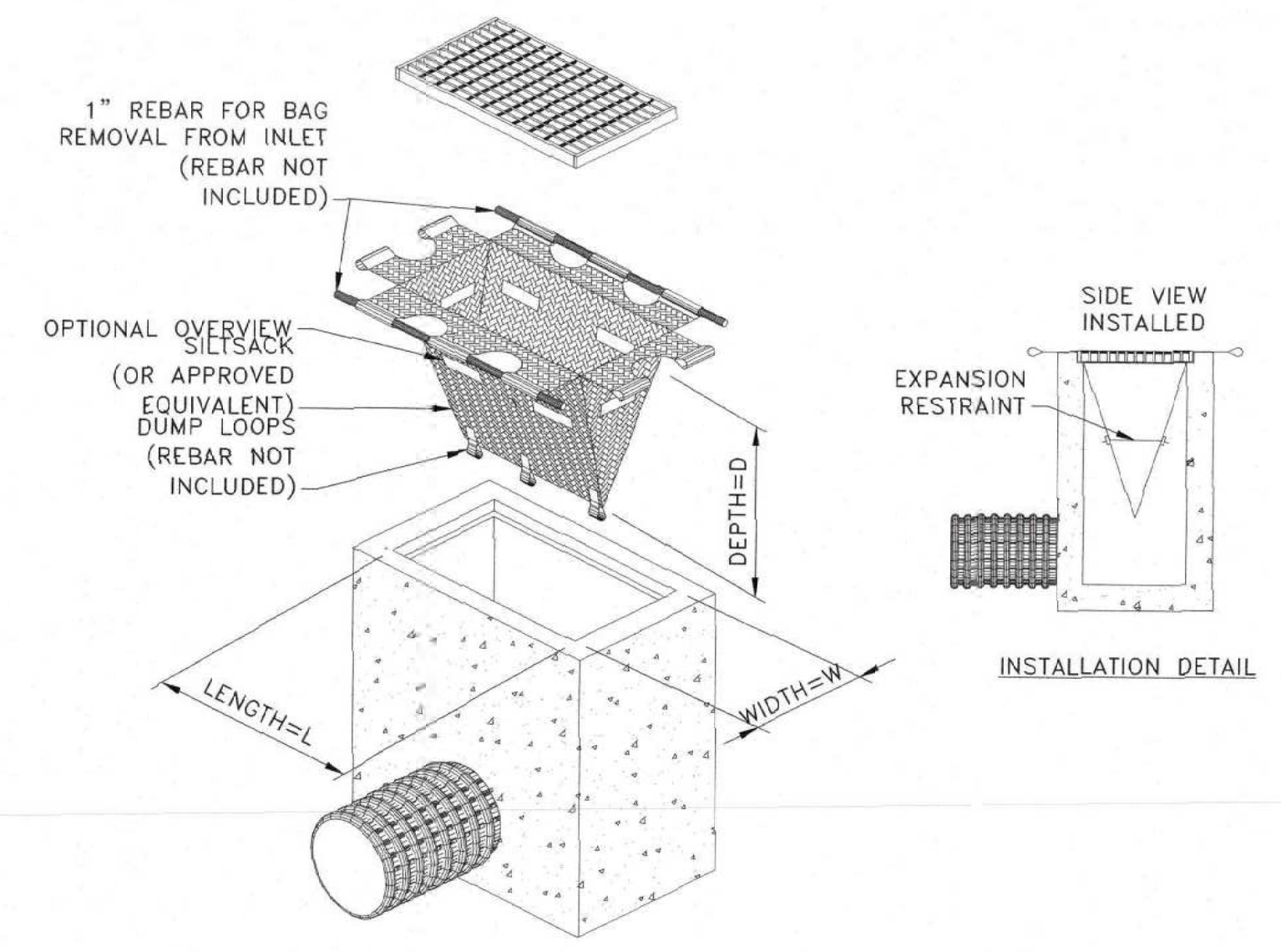


- NOTES:
1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL PREPARE A PLAN SHOWING THE PROPOSED LOCATION OF ALL STOCKPILE AREAS.
  2. STOCKPILE AREA SHALL NOT EXCEED SPECIFIED DIMENSIONS WITHOUT APPROVAL FROM ENGINEER.
  3. STOCKPILED ERODIBLE MATERIAL THAT WILL NOT BE USED FOR GREATER THAN 14 DAYS SHALL BE STABILIZED WITH TEMPORARY SEED IMMEDIATELY FOLLOWING PLACEMENT. USE RIDOT STD. M.18.10.5 SEED MIX. USE MADOT STD. M.6.03.1 EROSION SEED.

**ERODIBLE MATERIAL STOCKPILE**  
NOT TO SCALE



**STRAW BALE DETAIL**  
NOT TO SCALE



- NOTES:
1. INLET PROTECTION SHALL BE CLEANED OF SILT AND DEBRIS ON A REGULAR BASIS AS REQUIRED BY PROJECT SPECIFIC SWPPP.
  2. INSPECTIONS SHALL BE DONE AFTER EACH RAIN EVENT AND AT A MINIMUM EVERY TWO WEEKS AND AS REQUIRED BY PROJECT SPECIFIC SWPPP.

**TIP TEMPORARY INLET PROTECTION**  
NOT TO SCALE



SCALE ADJUSTMENT GUIDE  
0' 1'  
BAR IS ONE INCH ON ORIGINAL DRAWING

ROGER WHEELER STATE BEACH  
BOARDWALK  
NARRAGANSETT, RHODE ISLAND  
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



REVISIONS:

NO.	DESCRIPTION

PROJECT NO.: 19131.00  
DATE: DECEMBER 2021  
SCALE: AS NOTED  
DESIGNED BY: KAD  
CHECKED BY: BMD  
DRAWN BY: LMC  
APPROVED BY: JMB

EROSION CONTROL DETAILS

SHEET NO.: 2.2



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## APPENDIX C

### Copy of RIPDES Construction General Permit and Authorization to Discharge

*(To save paper and file space, this is not included in DEM submittal,  
a copy will be provided to the operator)*



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**APPENDIX D**

Copy of Regulatory Permits

*(Copies will be provided when received)*



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**APPENDIX E**

Copy of RIPDES NOI  
*(Copies will be provided when received)*



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**APPENDIX F**

Inspection Reports w/ Corrective Action Log





## SESC Plan Inspection Report

Project Information			
Name	Roger Wheeler State Beach Boardwalk		
Location	100 Sand Hill Cove Road		
DEM Permit No.			
Site Owner	RI Department of Environmental Management		
Site Operator			
Inspection Information			
Inspector Name	Name	Phone	Email
Inspection Date		Start/End Time	
Inspection Type	<input type="checkbox"/> Weekly <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event <input type="checkbox"/> Other		
Weather Information			
Last Rain Event	Date:	Duration (hrs):	Approximate Rainfall (in):
Rain Gauge Location & Source:			
Weather at time of this inspection:			

**Check statement that applies then sign and date below:**

I, as the designated Inspector, certify that this site has been inspected as required by regulation and I have determined that maintenance and corrective actions are not required at this time.

I, as the designated Inspector, certify that this site has been inspected as required by regulation and I have made the determination that the site requires corrective actions. The required corrective actions are noted within this inspection report.

	Print Name	Signature	Date
Inspector:			

The Site Operator acknowledges by his/her signature, the receipt of this SESC Plan inspection report and its findings. He/she acknowledges that all recommended corrective actions must be completed and documentation of all such corrective actions must be made in this inspection report per applicable regulations.

	Print Name	Signature	Date
Operator:			

**Site-specific Control Measures**

Number the structural and non-structural stormwater control measures identified in the SESC Plan and on the SESC Site Plans and list them below (add as necessary). Bring a copy of this inspection form and any applicable SESC Site Plans with you during your inspections. This list will assist you to inspect all control measures at your site.

**FILL THIS TABLE USING THE SESC PLAN TABLES 2.11 & 3.12.**

	<b>Location/Station</b>	<b>Control Measure Description</b>	<b>Installed &amp; Operating Properly?</b>	<b>Assoc. Photo/ Figure #</b>	<b>Corrective Action Needed (Yes or No; if 'Yes', please detail action required)</b>
1	See 2.1	Compost Filter Sock/Silt Fence, straw bales	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2	See 2.1	Construction Entrances	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3	See 2.1 and 2.2	Stockpile Management	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4	See 2.1 and 2.2	Concrete Washout	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5	See 2.1	Temporary Inlet Protection	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6			<input type="checkbox"/> Yes <input type="checkbox"/> No		
7			<input type="checkbox"/> Yes <input type="checkbox"/> No		
8			<input type="checkbox"/> Yes <input type="checkbox"/> No		
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
	<b>Attention Operator:</b>	<b>You must modify this inspection form as the project progresses, control measure locations change, and amendments to the SESC Plan are instituted in the field.</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10			<input type="checkbox"/> Yes <input type="checkbox"/> No		
11			<input type="checkbox"/> Yes <input type="checkbox"/> No		
12			<input type="checkbox"/> Yes <input type="checkbox"/> No		

	<b>Location/Station</b>	<b>Control Measure Description</b>	<b>Installed &amp; Operating Properly?</b>	<b>Assoc. Photo/ Figure #</b>	<b>Corrective Action Needed (Yes or No; if 'Yes', please detail action required)</b>
13			<input type="checkbox"/> Yes <input type="checkbox"/> No		
14			<input type="checkbox"/> Yes <input type="checkbox"/> No		
15			<input type="checkbox"/> Yes <input type="checkbox"/> No		
16			<input type="checkbox"/> Yes <input type="checkbox"/> No		
17			<input type="checkbox"/> Yes <input type="checkbox"/> No		
18			<input type="checkbox"/> Yes <input type="checkbox"/> No		
19			<input type="checkbox"/> Yes <input type="checkbox"/> No		
20			<input type="checkbox"/> Yes <input type="checkbox"/> No		
21			<input type="checkbox"/> Yes <input type="checkbox"/> No		
22			<input type="checkbox"/> Yes <input type="checkbox"/> No		
23			<input type="checkbox"/> Yes <input type="checkbox"/> No		
24			<input type="checkbox"/> Yes <input type="checkbox"/> No		
25			<input type="checkbox"/> Yes <input type="checkbox"/> No		

**General Site Issues**

Below are some general site issues that should be assessed during inspections. Please **customize** this list as needed for conditions at the site.

	<b>Compliance Question</b>		<b>Assoc. Photo/ Figure #</b>	<b>Corrective Action Needed (If 'Yes', please detail action required and include location/station)</b>
1	Have all control measures been installed as specified in the RISESC Handbook and prior to any earth disturbing activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
2	Are appropriate limits of disturbance (LOD) established?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
3	Are controls that limit runoff from exposed soils by diverting, retaining, or detaining flows (such as check dams, sediment basins, etc.) in place?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
4	Are all temporary conveyance practices installed correctly and functioning as designed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
5	Has maintenance been performed as required to ensure continued proper function of all temporary conveyances practices?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
6	Were all exposed soils seeded by October 15 <sup>th</sup> ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
7	Have soils been stabilized where earth disturbance activities have permanently or temporarily ceased on any portion of the site and will not resume for more than 14 days?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
8	In instances where adequate vegetative stabilization was not established by November 15 <sup>th</sup> , have non-vegetative erosion control measures must be employed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
9	If work is to continue from October 15 <sup>th</sup> through April 15 <sup>th</sup> , are steps taken to ensure that only the day's work area will be exposed and all erodible soil is stabilized within 5 working days?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
10	Have inlet protection measures (such as fabric drop inlet protection, curb drop inlet protection, etc.) been properly installed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
11	Has the operator cleaned and maintained inlet protection measures when needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
12	Has the operator removed accumulated sediment adjacent to inlet protection measures within 24 hours of detection?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
13	Has the operator properly installed outlet protection (such as riprap, turf mats, etc.) at all temporary and permanent discharge points?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
14	Are all outlet protection measures functioning properly in order to reduce discharge velocity, promote infiltration, and eliminate scour?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
15	Have all discharge points been inspected to ensure the prevention of scouring and channel erosion?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
16	Have sediment controls been installed along perimeter areas that will receive stormwater from earth disturbing activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
17	Is the operator maintaining sediment controls in accordance with the requirements in the <i>RI SESC Handbook</i> ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
18	Have temporary sediment barriers been installed around permanent infiltration areas (such as bioretention areas, infiltration basins, etc.)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
19	Have staging areas and equipment routing been implemented to avoid compaction where permanent infiltration areas will be located?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
20	Are surface outlet structures (such as skimmers, siphons, etc.) installed for each temporary sediment basin? [Exception: frozen conditions]	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
21	Have all temporary sediment basins or traps been inspected and maintained as required to ensure proper function?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
22	Does the project include the use of polymers, flocculants, or other chemicals to control erosion, sedimentation, or runoff from the site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
23	Are all chemicals being managed in accordance with Appendix J of the <i>RI SESC Handbook</i> and current best management practices?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
24	Has the site operator taken steps to <b>prohibit</b> the following pollutant discharges on the site?			
a	Contaminated groundwater.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
b	Wastewater from washout of concrete; unless properly contained, managed, and disposed of.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
c	Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction products.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
d	Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
e	Soaps or solvents used in vehicle and equipment washing.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
f	Toxic or hazardous substances from a spill or other release.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
25	Is the operator using properly constructed entrances/exits to the site so sediment removal occurs prior to vehicles exiting?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
26	If needed, are additional controls (such as rumble strips, rattle plates, etc.) in place to remove sediment from tires prior to exiting?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
27	Is sediment track-out being removed by the end of the same workday in which it occurs (via sweeping, shoveling, or vacuuming)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
28	Are all wastes generated at the site being managed and properly disposed of by the end of each workday?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
29	Are all chemicals and hazardous waste materials stored properly in covered areas and surrounded by containment control systems?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
30	Has the operator established highly visible locations for the storage of spill prevention and control equipment on the construction site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
31	Are allowable non-stormwater discharges being managed properly with adequate controls?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
32	Is the site operator properly managing groundwater or stormwater that is removed from excavations, trenches, or similar points of accumulation?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
33	Are proper procedures and controls in place for the storage of materials that may discharge pollutants if	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		



	<b>Compliance Question</b>		<b>Assoc. Photo/ Figure #</b>	<b>Corrective Action Needed (If 'Yes', please detail action required and include location/station)</b>
	exposed to stormwater?			
	Are stockpiles located within the limits of disturbance?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Are stockpiles being protected from contact with stormwater using a temporary sediment barrier?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Where needed, has cover or appropriate temporary vegetative or structural stabilization been utilized for stockpiles?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Is the operator effectively managing the generation of dust through the use of water, chemicals, or minimization of exposed soil?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Are designated washout areas (such as wheel washing stations, washout for concrete, paint, stucco, etc.) clearly marked on the site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Are vehicle fueling and maintenance areas properly located to prevent pollutants from impacting stormwater and sensitive receptors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	(Other)			

(add more as necessary)

**General Field Comments:**

**Photos:**

(Associated photos – each photo should be dated and have a unique identification # and written description indicating where it is located within the project area. If a close up photo is required, it should be preceded with a photo including both the detail area and some type of visible fixed reference point. Photos should be annotated with Station numbers and other identifying information where needed.)

<b>Photo #:</b> (insert Photo here)	<b>Station:</b>
	<b>Description:</b>

<b>Photo #:</b> (insert Photo here)	<b>Station:</b>
	<b>Description:</b>

<b>Photo #:</b> (insert Photo here)	<b>Station:</b>
	<b>Description:</b>

<b>Photo #:</b> (insert Photo here)	<b>Station:</b>
	<b>Description:</b>

<b>Photo #:</b> (insert Photo here)	<b>Station:</b>
	<b>Description:</b>

<b>Photo #:</b> (insert Photo here)	<b>Station:</b>
	<b>Description:</b>

(add more as necessary)

# Corrective Action Log

## TO BE FILLED OUT BY SITE OPERATOR

Describe repair, replacement, and maintenance of control measures, actions taken, date completed, and note the person that completed the work.

	Location/Station	Corrective Action	Date Completed	Person Responsible
Operator Signature:				Date:

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**APPENDIX G**

SESC Amendment Log



## **Amendment Log**

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### **TO BE FILLED OUT BY SITE OPERATOR**

*Describe amendment(s) to be made to the SESC Plan, the date, and the person/title making the amendment. ALL amendments must be approved by the Site Owner.*

<b>#</b>	<b>Date</b>	<b>Description of Amendment</b>	<b>Amended by: Person/Title</b>	<b>Site Owner Must Initial</b>
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Add more lines/pages as necessary



State of Rhode Island  
Coastal Resources Management Council  
Oliver H. Stedman Government Center  
4808 Tower Hill Road, Suite 116  
Wakefield, RI 02879-1900

(401) 783-3370  
Fax (401) 783-3767

ASSENT

CRMC File No.: 2022-01-010

CRMC Assent No.: B2022-01-010

Whereas,  
of

**Department of Environmental Management  
Division of Planning and Development  
235 Promenade Street  
Providence, RI 02908**

has applied to the Coastal Resources Management Council for assent to: Construct a new boardwalk comprised of precast piles, beams, and deck panels to be installed along the north side of the existing bulkhead over the existing impervious bituminous parking lot. A cast-in-place concrete wall will be constructed along the existing steel sheet pile wall alignment to support the south side of the boardwalk. Ancillary "bump-outs" along the southern side of the board walk include two shade structures, two patios, and two foot-wash stations. In addition to these bump-outs, numerous stairs and ramps will be located throughout the length of the boardwalk to provide ADA accessible access to boardwalk and shoreline. The Applicant represents that they are the owners of the riparian rights attached to the property involved and submitted plans of the work to be done.

Now, said Council, having fully considered said application in accordance with all the regulations as set forth in the Administrative Procedures Act does hereby authorize said applicant, subject to the provisions of Title 46, Chapter 23 of the General Laws of Rhode Island, 1956, as amended, and all laws which are or may be in force applicable thereto: **Construct a new boardwalk comprised of precast piles, beams, and deck panels to be installed along the north side of the existing bulkhead over the existing impervious bituminous parking lot. A cast-in-place concrete wall will be constructed along the existing steel sheet pile wall alignment to support the south side of the boardwalk. Ancillary "bump-outs" along the southern side of the board walk include two shade structures, two patios, and two foot-wash stations. In addition to these bump-outs, numerous stairs and ramps will be located throughout the length of the boardwalk to provide ADA accessible access to boardwalk and shoreline. This project is located at plat J|N, lot 35|175; Roger Wheeler State Beach; 100 Sand Hill Cove Road, Narragansett, RI,** in accordance with said plans submitted to this Council and approved by this Council. All work being permitted must be completed on or before **January 26, 2026** after which date this assent is null and void, (unless written application requesting an extension is received by CRMC sixty (60) days prior to expiration date).

Applicant agrees that as a condition to the granting of this assent, members of the Coastal Resources Management Council or its staff shall have access to applicant's property to make on-site inspections to insure compliance with the assent.

Licensee shall be fully and completely liable to State, and shall waive any claims against State for contribution or otherwise, and shall indemnify, defend, and save harmless State and its agencies, employees, officers, directors, and agents with respect to any and all liability, damages (including damages to land, aquatic life, and other natural resources), expenses, causes of action, suits, claims, costs (including testing, auditing, surveying, and investigating costs), fees (including attorneys' fees and costs), penalties (civil and criminal), and response, cleanup, or remediation costs assessed against or imposed upon Licensee, State, or the Property, as a result of Licensee's control of the Property, or Licensee's use, disposal, transportation, generation and/or sale of Hazardous Substances or that of Licensee's employees, agents, assigns, sublicensees, contractors, subcontractors, permittees, or invitees.

Nothing in this assent shall be construed to impair the legal rights of this granting authority or of any person. By this assent the granting authority by no manner, shape, or form assumes any liability or responsibility implied, or in fact, for the stability or permanence of said project; nor by this assent is there any liability implied or in fact assumed or imposed on the granting authority. Further, the granting authority by its representatives or duly authorized agents shall have the right to inspect said project at all times including, but not limited to, the construction, completion, and all times thereafter.

This Assent is granted with the specific proviso that the construction authorized therein will be maintained in good condition by the owner thereof, his heirs, successors, or assigns for a period of fifty (50) years from the date thereof, after which time this permission shall terminate necessitating either complete removal or a new application.

Permits issued by the CRMC are issued for a finite period of time, confer no property rights, and are valid only with the conditions and stipulations under which they are granted. Permits imply no guarantee of renewal, and may be subject to denial, revocation, or modification.

If this matter appeared before the full Council, a copy of the legal decision from this proceeding may be acquired by contacting the CRMC office in writing.

A copy of this Assent shall be kept on site during construction.

Application for future alteration of the shoreline or other construction or alteration within the CRMC jurisdiction shall be submitted to the CRMC for review prior to commencing such activity.

All applicable policies, prohibitions, and standards of the RICRMP shall be upheld.

All local, state or federal ordinances and regulations must be complied with.

Please be advised that as a further conditions of this Assent, it is hereby stipulated that you and/or your agents shall comply at all times with Federal and State Water Quality Standards and other State standards and regulations regarding water quality, and shall exercise such supervision over and control of these facilities to prevent the dumping or discarding or refuse, sanitary wastes and other pollutants in the tidal waters, either from vessels docked at said facilities or from land adjacent thereto.

No work that involves alteration to wetlands or waters of the United States shall be done under this Assent until the required Federal Permit has been obtained.

Non-compliance with this assent shall result in legal action and/or revocation of this permit.

CAUTION:

**The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations in which deviate from this assent or what was detailed on the CRMC approved plans will require a separate application and review. Additionally, if the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information or data, then this permit may be found to be null and void. Plans for any future alteration of the shoreline or construction or alteration within the 200' zone of CRMC jurisdiction or in coastal waters must be submitted for review to the CRMC prior to commencing such activity.**



**Permits, licenses or easements issued by the Council are valid only with the conditions and stipulation under which they are granted and imply no guarantee of renewal. The initial application or an application for renewal may be subject to denial or modification. If an application is granted, said permit, license and easement may be subject to revocation and/or modification for failure to comply with the conditions and stipulations under which the same was issued or for other good cause.**

**ATTENTION: ALL STRUCTURES AND FILLED AREAS IN THE TIDAL, COASTAL, OR NAVIGABLE WATERS OF THE STATE OF RHODE ISLAND ARE SUBJECT TO:**

1. The Superior Property Rights of the State of Rhode Island in the Submerged and Submersible Lands of the Coastal, Tidal, and Navigable Waters;
2. The Superior Navigation Servitude of the United States;
3. The Police Powers of the State of Rhode Island and the United States to regulate Structures in the Tidal, Coastal, or Navigable Waters.

THE SUBMERGED AND SUBMERSIBLE LANDS OF THE TIDAL, COASTAL, AND NAVIGABLE WATERS OF THE STATE ARE OWNED BY THE STATE AND HELD IN TRUST FOR THE PUBLIC. CONVEYANCE OF THESE LANDS IS ILLEGAL; TITLES PURPORTING TO TRANSFER SUCH LANDS ARE VOID. ASSENTS THAT INVOLVE THE FILLING OR USE OF THE STATES SUBMERGED LANDS ARE GRANTED WITH THE PROVISIO THAT IT IS SUBJECT TO THE IMPOSITION OF A USAGE FEE TO BE ESTABLISHED BY THE COASTAL RESOURCES MANAGEMENT COUNCIL.

The lands adjacent to tidal waters and/or access to these lands may be impacted or rendered unusable in the future due to sea level rise, storm surge, and shoreline erosion. Online resources including STORMTOOLS, Shoreline Change Maps, and Sea Levels Affecting Marshes Model (SLAMM) Maps can be accessed through the CRMC website ([www.crmc.ri.gov](http://www.crmc.ri.gov)). The Council recommends the use of these resources to evaluate the flood extent and inundation from sea level rise, storm surge and erosion and damages to land, aquatic life, loss of public access and other natural resources on and near the site of the above assent. The project life may be shortened by these processes and may require additional adaptation measure up to and including relocation of the project. By issuing this assent the granting authority neither explicitly nor implicitly assumes any liability or responsibility for the stability or permanence of said project under future climate and shoreline conditions.

#### SPECIFIC STIPULATIONS OF APPROVAL

##### **General Stipulations**

**A. The applicant shall record this assent in its entirety in the land evidence records of the Town of Narragansett within thirty (30) days of the date of assent issuance. Certification by the Town Clerk's office that this stipulation has been complied with shall be furnished to Coastal Resources Management Council by the applicant within fifteen (15) days thereafter. Failure to comply with provision will render this assent null and void.**

B. For the purpose of this permit, the coastal feature shall be the moderately developed barrier beach; and the for the purpose of establishing setbacks the inland edge of the coastal feature shall be the inland edge of the coastal beach.

C. The approved plan shall be those entitled "Department of Environmental Management, Division of Planning and Development, Roger Wheeler State Beach, Boardwalk..." sheets 1-13 last revised September 2022, by Pare Corporation stamped by J. Matthew Bellisle P.E. Except as stipulated or modified herein, all details and specifications thereon shall be strictly adhered to. Any and all changes require written approval from this office.

**D. RIDEM shall contact USFW to coordinate appropriate requirements for protecting piping plover's habitat construction. RIDEM shall incorporate these guidelines to this project.**

### **Earthwork Stipulations**

A. The Permittee shall construct and maintain all soil erosion, runoff, and sediment control practices in accordance with the CRMC approved site plan (referenced herein).

B. Prior to conducting earthwork and other land disturbing activities, erosion, runoff and sediment control measures shall be installed and maintained in accordance with good engineering practices including the applicable details found in the manufacturer's specifications and/or in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended). These measures must be maintained until the site is stabilized through the establishment of vegetative cover and/or construction of the approved facilities (buildings, roadways, parking areas, etc.) has stabilized soils sufficiently to prevent erosion and sedimentation.

C. All discharges which result from dewatering operations must flow into pumping settling basins, portable sediment tanks or portable sediment bags which are properly installed and maintained in accordance with good engineering practices including the applicable details found in the manufacturer's specifications and/or in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended).

D. There shall be no discharge or disposal of toxic waste, hazardous materials, oil, grease and other lubricants, excess fertilizer, pesticides or other chemicals or controlled materials either on site or in any area which may enter a wetland, watercourse or groundwater. All spills of such materials shall be reported to the RI Department of Environmental Management for appropriate remediation. All used lubricants, excess chemicals, fertilizers, pesticides, etc., shall be removed from the site for transport, handling and disposal in accordance with all applicable state and federal regulations.

E. All excess excavated materials (soils, rock, gravel, etc.), excess construction materials, demolition debris, temporary erosion, runoff and sediment control measures, etc., shall be removed from the site for appropriate re-use and/or proper disposal at a suitable upland location or landfill. All toxic materials and waste shall be properly transported and disposed of in accordance applicable state and federal regulations.

F. Upon the successful stabilization of exposed soils, all temporary (interim) erosion, runoff and sediment control measures as well as pollution prevention measures shall be appropriately decommissioned and removed from the site for re-use and/or for disposal at a suitable, legal upland location or landfill. All temporary sediment basins, sediment traps and channels, etc., shall be removed and/or restored in accordance with the approved site plans.

### **Building Stipulations**

A. All pertinent requirements of the RI State Building Code as administered by the State building official shall be strictly adhered to.

RIDEM/Division of Planning  
CRMC Assent B2022-01-010  
January 26, 2023  
Page Five

In Witness Whereof, said Coastal Resources Management Council has hereto set their hands and seal this 26th day of January in the year two-thousand-and-twenty-three.

  
\_\_\_\_\_  
Laura Miguel, Deputy Director  
Coastal Resources Management Council

/lat



State of Rhode Island  
COASTAL RESOURCES MANAGEMENT COUNCIL  
NOTICE OF

ASSENT

CRMC Assent No.: B2022-01-010 Date: January 26, 2023

This certifies that **Department of Environmental Management - Division of Planning** has permission to Construct a new boardwalk comprised of precast piles, beams, and deck panels to be installed along the north side of the existing bulkhead over the existing impervious bituminous parking lot. A cast-in-place concrete wall will be constructed along the existing steel sheet pile wall alignment to support the south side of the boardwalk. Ancillary "bump-outs" along the southern side of the board walk include two shade structures, two patios, and two foot-wash stations. In addition to these bump-outs, numerous stairs and ramps will be located throughout the length of the boardwalk to provide ADA accessible access to boardwalk and shoreline

situated at 100 Sand Hill Cove Road – Roger Wheeler State Beach  
Plat No. J|N Lot No. 35|175

Said construction operations to be done in accordance with an approved assent on file in the Offices of the Coastal Resources Management Council and subject further to all the provisions of the building ordinances of the :

City/Town of Narragansett

and to all the applicable State, Local and Federal provisions. This assent shall expire three (3) years from the date of this assent.

*Jan Abbuzzese*  
Official Designee  
Coastal Resources Management Council

**THIS CARD MUST BE DISPLAYED IN A CONSPICUOUS PLACE ON THE PREMISES.  
FAILURE TO DISPLAY WILL RESULT IN LEGAL ACTION.**



# Index of Drawings

Sheet No.	Dwg. No.	Description
1	-	COVER SHEET
2	1.0	GENERAL NOTES AND LEGEND
3	2.0	EXISTING SITE PLAN
4	2.1	DEMOLITION AND EROSION CONTROL PLAN
5	2.2	EROSION CONTROL DETAILS
6	3.0	PROPOSED SITE PLAN
7	3.1	PROPOSED SECTIONS AND DETAILS
8	3.2	TIMBER SHADE STRUCTURE DETAILS
9	3.3	VIEWING PLATFORM SECTION
10	3.4	STAIR AND RAMP DETAILS
11	4.0	HANDRAIL DETAILS
12	4.1	MISCELLANEOUS DETAILS
13	4.2	MISCELLANEOUS WATER DETAILS

# STATE OF RHODE ISLAND

D ■ E ■ M



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF PLANNING AND DEVELOPMENT

# ROGER WHEELER STATE BEACH BOARDWALK

NARRAGANSETT, RHODE ISLAND

Pare Project No. 19131.00



PARE CORPORATION  
ENGINEERS - SCIENTISTS - PLANNERS  
10 LINCOLN ROAD, SUITE 210  
FOXBORO, MA 02035  
508-543-1755

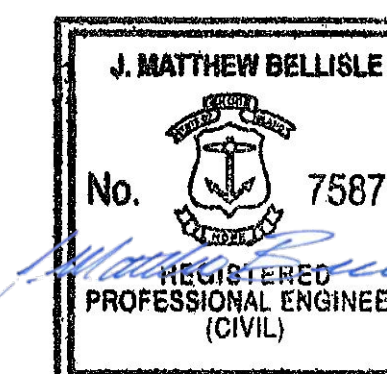
DECEMBER 2021  
REVISED SEPTEMBER 2022



Locus Map

Scale: 1"=1000'

PERMIT  
SUBMISSION



90% DESIGN SUBMISSION  
NOT FOR CONSTRUCTION

V:\2021\19\_1031\19131.00\_2022\Design\_Sheet\Cover\Worksheet\_Balanced\_Permit.dwg 21/09/2022 10:03:00 Cover\_Sheet.dwg



GENERAL NOTES:

- 1. FOR THE PURPOSE OF THIS PROJECT
OWNER - DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 PROMENADE STREET, FL 3
PROVIDENCE, RI 02908
ENGINEER - PARE CORPORATION
10 LINCOLN ROAD, SUITE 210
FOXBORO, MA 02035
CONTACT - J. MATTHEW BELLISLE, P.E., SENIOR VICE PRESIDENT
BRIAN DUTRA, P.E., PROJECT ENGINEER
2. ALL CONSTRUCTION INDICATED ON THESE PLANS SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE RHODE ISLAND STATE BUILDING CODE, ALL FEDERAL AND MUNICIPAL BUILDING CODES, AND THE SPECIFICATIONS INCLUDED IN THIS CONTRACT. THESE PLANS ARE INCOMPLETE UNLESS ACCOMPANIED BY THE SPECIFICATIONS INCLUDED IN THE CONTRACT DOCUMENTS.
3. THE BASE PLAN WAS DEVELOPED BASED UPON PLAN ENTITLED "EXISTING CONDITIONS AND TOPOGRAPHY PLAN ROGER WHEELER STATE BEACH" PREPARED BY NARRAGANSETT ENGINEERING INC. OF PORTSMOUTH, RI DATED MARCH 2021. ANY DISCREPANCIES ON THESE PLANS WITH REGARD TO DIMENSIONS OR CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PORTION OF WORK.
4. HORIZONTAL DATUM: RHODE ISLAND STATE PLANE - NAD83
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVDB88) AS ESTABLISHED BY NOS TIDAL BENCH MARK
5. INFORMATION REGARDING THE LOCATION OF SURROUNDING STRUCTURES AND UTILITIES IS FURNISHED SOLELY FOR THE CONVENIENCE OF THE CONTRACTOR AND SHALL BE FIELD VERIFIED. THE CONTRACTOR SHALL CONDUCT ITS OWN INDEPENDENT EXAMINATION OF SITE CONDITIONS FOR THE PURPOSE OF BIDDING, FABRICATION, AND CONSTRUCTION ASSOCIATED WITH THE PROJECT. ANY RELIANCE UPON INFORMATION MADE AVAILABLE BY THE OWNER OR THE ENGINEER SHALL BE AT THE CONTRACTOR'S RISK.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS. PLANS SHALL NOT BE SCALED FOR DIMENSIONS.
7. CONSTRUCTION SHALL BE MADE FROM APPROVED SHOP DRAWINGS ONLY.
8. NOTES, TYPICAL DETAILS, AND SCHEDULES APPLY TO ALL WORK UNLESS OTHERWISE NOTED. FOR CONDITIONS NOT SPECIFICALLY SHOWN, PROVIDE DETAILS OF SIMILAR NATURE. VERIFY APPLICABILITY BY SUBMITTING SHOP DRAWINGS FOR REVIEW.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL PROJECT DEMOLITION AND EXCESS MATERIAL IN ACCORDANCE WITH RHODE ISLAND, LOCAL, AND FEDERAL LAWS.
10. THE CONTRACTOR SHALL PROTECT ALL ADJACENT STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ALL DAMAGE TO ADJACENT STRUCTURES AND UTILITIES AT NO ADDITIONAL COST TO THE OWNER.
11. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL VISIT THE SITE AND SHALL NOTIFY THE ENGINEER OF ANY ADDITIONAL UTILITIES, STRUCTURES, OR ANY OTHER ELEMENTS WHICH MAY IMPEDE WORK. UTILITY AND/OR STRUCTURE RELOCATIONS, IF NECESSARY, SHALL BE COORDINATED THROUGH THE OWNER'S ENGINEER.
12. THE LOCATION AND DEPTH OF EXISTING UTILITIES ARE APPROXIMATE AND HAVE BEEN PLOTTED FROM THE LATEST AVAILABLE INFORMATION. THE UTILITY LOCATIONS ARE APPROXIMATE AND MAY NOT BE ALL INCLUSIVE. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "DIG SAFE" AT 1-888-DIG-SAFE TO ACCURATELY LOCATE ALL EXISTING UTILITIES, BOTH OVERHEAD AND UNDERGROUND, 72 HOURS PRIOR TO COMMENCING WORK. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. COSTS OF SUCH DAMAGE SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL COMMENCE UNTIL ALL INVOLVED UTILITY COMPANIES AND/OR TOWN WHOSE FACILITIES MIGHT BE AFFECTED BY ANY WORK TO BE PERFORMED BY THE CONTRACTOR ARE PROPERLY NOTIFIED.
13. THE CONTRACTOR SHALL FOLLOW ALL OSHA, FEDERAL, STATE, AND LOCAL STANDARDS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL SITE SAFETY PROCEDURES AND PRACTICES REGARDLESS OF THE PRESENCE OF THE OWNER OR ENGINEER.
14. ALL CONSTRUCTION ACTIVITIES SHALL BE CONFINED TO THE LIMITS OF WORK AND TEMPORARY EASEMENTS DEFINED HEREIN.
15. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT A CONSTRUCTION SCHEDULE TO THE OWNER WITHIN 5 DAYS OF THE NOTICE OF AWARD. THE CONTRACTOR SHALL UPDATE SCHEDULE AS NEEDED THROUGHOUT THE COURSE OF WORK.
16. THE CONTRACTOR SHALL STAGE ALL EQUIPMENT IN THE DESIGNATED STAGING AREA. ALL GREASING AND REFUELING ACTIVITIES SHALL OCCUR IN THE STAGING AREA. ALL NECESSARY MEASURES SHALL BE TAKEN TO PREVENT BY ANY METHOD, OIL, CONSTRUCTION DEBRIS, STOCKPILED MATERIALS, AND OTHER MATERIALS ON THE SITE, FROM ENTERING THE WATERWAY. STAGING/LAYDOWN AREAS, AS APPROVED BY THE ENGINEER, SHALL BE RESTORED BY THE CONTRACTOR TO THE EXISTING CONDITION. IN ADDITION, THE CONTRACTOR SHALL REPLACE ALL DAMAGED MATERIALS AS A RESULT OF HIS OPERATIONS, TO THE SATISFACTION OF THE ENGINEER.
17. THE CONTRACTOR SHALL MAINTAIN A SECURE SITE AND PROVIDE APPROPRIATE SAFETY MEASURES TO PREVENT ACCIDENTS. THE SAFETY MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO SIGNAGE, BARRICADES, FENCES, FLASHING WARNING LIGHTS, AND POLICING IF NECESSARY.
18. IN CASE OF CONTRADICTION BETWEEN THE DRAWINGS, THE SPECIFICATIONS, AND THE CODES, OR IF ANY CHANGE IS REQUIRED, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY. NO CHANGE SHALL BE MADE WITHOUT WRITTEN APPROVAL OF THE ENGINEER.
19. UPON COMPLETION OF THE PROJECT, CONTRACTOR IS TO PROVIDE A POST CONSTRUCTION SURVEY AND TWO AS-BUILT PLAN SETS TO THE OWNER DEPICTING ANY FIELD CHANGES OF DIMENSION OR DETAIL, LOCATION OF UNDERGROUND STRUCTURES AND/OR UTILITIES, CONSTRUCTION DEVIATIONS, CHANGES DUE TO FIELD OR CHANGE ORDER, AND DETAILS NOT ON THE ORIGINAL DRAWINGS.
20. NO WORK SHALL BE COMPLETED UNTIL EACH OF THE FOLLOWING CONDITIONS ARE MET:
- RIDGES PERMIT IS RECEIVED FROM RIDEM
- NOTICE OF ASSENT IS RECEIVED FROM CRMC
- THE OWNER DIRECTS THE WORK TO BE COMPLETED
21. CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN FOR THE PROPOSED WORK.

DEMOLITION NOTES:

- 1. ALL DEMOLITION SHALL BE COORDINATED WITH THE OWNER PRIOR TO START OF WORK.
2. THE CONTRACTOR SHALL COORDINATE ALL DEMOLITION OF STRUCTURES, PAVEMENT AND CONCRETE MATERIALS, AND UTILITIES WITH APPROPRIATE PROPOSED SITE GENERAL, GRADING, UTILITY, AND LANDSCAPE DRAWINGS.
3. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS IN THE FIELD PRIOR TO ANY DEMOLITION OR CONSTRUCTION. ANY DISCREPANCIES RELATING TO THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. ALL NOTED UTILITIES TO BE REMOVED AND DISPOSED OF, RELOCATED OR CAPPED REPRESENT ALL KNOWN SITE CONDITIONS TO BE DEMOLISHED. CONTRACTOR TO COORDINATE ALL UNFORESEEN CONDITIONS WITH THE OWNER, ENGINEER, AND/OR RESPECTIVE UTILITY COMPANIES PRIOR TO PROCEEDING WITH WORK.
5. CONTRACTOR TO BE AWARE OF SELECTIVE DEMOLITION AT ALL SECTIONS OF WORK. CONTRACTOR WILL BE RESPONSIBLE FOR REPLACEMENT IN-KIND OF ALL WORK INADVERTENTLY REMOVED AT NO ADDITIONAL COST TO THE OWNER.
6. THE CONTRACTOR SHALL REMOVE ITEMS TO BE DEMOLISHED AS INDICATED ON THE DRAWINGS WITH CARE AND NOT TO DAMAGE ADJACENT STRUCTURES. THE WORK AREA WILL BE LEFT READY TO RECEIVE NEW WORK.
7. WATER, SEWER, DRAINAGE, GAS, AND OTHER SITE UTILITIES SERVICING THE EXISTING FACILITIES ARE TO REMAIN ACTIVE THROUGHOUT CONSTRUCTION. THERE SHALL BE NO INTERRUPTION OF UTILITY SERVICE DURING CONSTRUCTION OPERATIONS WITHOUT APPROVAL FROM THE OWNER.
8. ALL UTILITIES REMOVED FROM THE SITE SHALL BE CUT AND CAPPED AT THE LIMIT OF DISTURBANCE UNLESS OTHERWISE NOTED.
9. PAVEMENT DEMOLITION SHALL BE SAWCUT AND DISPOSED OF PROPERLY.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OFFSITE DISPOSAL OF ALL PROJECT DEMOLITION MATERIAL, TRASH, AND DEBRIS IN ACCORDANCE WITH LOCAL AND STATE LAWS.
11. REFER TO SPECIFICATION SECTION 02100-DEMOLITION AND REMOVAL" FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

EROSION CONTROL NOTES:

- 1. THE CONTRACTOR AND RELEVANT SUBCONTRACTORS SHALL READ AND UNDERSTAND THE RICRMC ASSENT PERMIT AND THE SITE SPECIFIC SOIL EROSION AND SEDIMENT CONTROL PLAN (SESC) PREPARED FOR THE PROJECT. ALL EROSION CONTROL SHALL BE IN ACCORDANCE WITH THE RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST REVISION.
2. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE CONDITIONS ISSUED FOR THE PROJECT BY RICRMC AND BE RESPONSIBLE FOR CONFORMANCE WITH ALL PERMIT REQUIREMENTS AND CONSTRUCTION DOCUMENTS.
3. SOIL EROSION AND SEDIMENTATION CONTROLS SHALL BE PROVIDED IN ACCORDANCE WITH THE "RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK", AND THE NOTES AND DETAILS SHOWN IN THIS PLAN SET.
4. THE CONTRACTOR SHALL SCHEDULE HIS/HER WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PONDING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF SURFACE PAVING. PROVIDE TEMPORARY POSITIVE DRAINAGE, AS REQUIRED, TO STABILIZED DISCHARGE POINTS. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY UTILITY CONNECTIONS.
5. CONTRACTOR SHALL INSTALL AND MAINTAIN ALL EROSION CONTROL DEVICES FOR THE DURATION OF THE PROJECT.
6. CONTRACTOR SHALL PREVENT SEDIMENT FROM ENTERING ANY WATERWAY VIA DISCHARGES THROUGH ANY DRAINAGE STRUCTURES OR RUNOFF FROM WITHIN THE LIMITS OF WORK.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING, RESTORING AND REPAIRING ALL DAMAGE AS A RESULT OF UNAUTHORIZED WORK OR DISCHARGES AT NO ADDITIONAL COST TO THE OWNER.
8. THE LIMITS OF EROSION CONTROL BARRIERS SHALL BE MODIFIED OR EXPANDED AS FIELD CONDITIONS WARRANT.
9. ALL EROSION CONTROL BARRIERS SHALL BE INSPECTED AT LEAST ONCE PER WEEK AND AFTER EACH STORM EVENT OF 0.25 INCH OR GREATER. ANY DAMAGED AREAS OF THE EROSION CONTROL BARRIER SHALL BE REPAIRED WITHIN 24 HOURS OF DISCOVERY.
10. DISCHARGE OF TURBID WATER TO ANY WATERWAY IS PROHIBITED.
11. CONSTRUCTION SITE WASTE MATERIALS SHALL BE PROPERLY CONTAINED ONSITE AND DISPOSED OFF SITE IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE REGULATIONS.
12. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 14 DAYS OF COMPLETION OF WORK IN THAT AREA. THE CONTRACTOR SHALL NOT REMOVE ANY STRAW BALES, SILT FENCE OR OTHER EROSION CONTROLS UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED.
13. ALL ON-SITE AND OFF-SITE DRAINAGE STRUCTURES AND PIPING SHALL BE JETTED AND CLEANED UPON COMPLETION OF THE SITE WORK.

SPILL PREVENTION AND CONTROL NOTES:

- 1. SPILLS AND LEAKS SHALL BE AVOIDED THROUGH FREQUENT INSPECTION OF EQUIPMENT AND MATERIAL STORAGE AREAS, AND SHALL BE REMEDIATED AND REPAIRED AS NECESSARY.
2. HAZARDOUS MATERIAL STORAGE TO BE PLACED ONLY IN DESIGNATED AREAS. MATERIAL STORAGE AREAS SHALL BE ROUTINELY INSPECTED FOR LEAKY CONTAINERS, OPEN CONTAINERS, OR IMPROPER STORAGE TECHNIQUES THAT MAY LEAD TO SPILLS OR LEAKS.
3. APPROPRIATE SPILL REMEDIATION PROCEDURES AND SUPPLIES SHALL BE READILY AVAILABLE ON-SITE. TOOLS AND SUPPLIES SHALL BE CLEARLY MARKED SO THAT ALL PERSONNEL CAN LOCATE AND ACCESS THESE SUPPLIES.
4. SPILL REMEDIATION SHALL BE PERFORMED IMMEDIATELY. CONTRACTOR SHALL FOLLOW PROPER RESPONSE PROCEDURES IN ACCORDANCE WITH ANY APPLICABLE REGULATORY REQUIREMENTS.
5. AT NO TIME SHALL SPILLS BE DIVERTED TOWARD STORM DRAINS OR TO ANY WATERWAY.
6. EQUIPMENT/VEHICLE FUELING AND REPAIR/MAINTENANCE OPERATIONS SHALL TAKE PLACE ONLY WITHIN DESIGNATED STAGING AREAS.
7. THE EQUIPMENT OPERATOR SHALL FULLY MONITOR FUELING OPERATIONS TO EQUIPMENT AND VEHICLES AT ALL TIMES.
8. ANY SPILLAGE SHALL BE IMMEDIATELY CLEANED WITH SPILL KITS KEPT ON SITE.
9. IN THE CASE OF SMALL AMOUNTS OF SOIL CONTAMINATION, SUCH SOIL SHALL BE PLACED IN 55 GALLON DRUMS FOR DISPOSAL BY A LICENSED HAZARDOUS WASTE HAULER.
10. IN THE CASE OF A LARGE AMOUNT OF SOIL CONTAMINATION OR DISCHARGE TO THE WATERWAY, RHODE ISLAND DEM AND APPLICABLE AGENCIES SHALL BE NOTIFIED AS REQUIRED. A HAZARDOUS WASTE REMEDIATION FIRM SHALL BE CONTRACTED TO REMOVE AND DISPOSE OF THE CONTAMINATED MATERIAL OR CONTAIN THE SPILL AT NO ADDITIONAL COST.

GRADING AND UTILITY NOTES

- 1. ALL EXISTING CONDITIONS SHOWN SHALL BE CONSIDERED APPROXIMATE AND ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED. NO FIELD ADJUSTMENTS IN THE LOCATION OF SITE ELEMENTS SHALL BE MADE WITHOUT THE ENGINEERS APPROVAL.
2. ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINES AND GRADES ON THE PLANS AND SITE WORK SPECIFICATIONS, UNLESS OTHERWISE DIRECTED.
3. AT ALL LOCATIONS WHERE EXISTING CURBING OR PAVEMENT ABUT NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT AND CURBS SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES AND JOINTS.
4. ALL EXISTING AND PROPOSED UTILITY COVERS, GRATES, ETC. SHALL BE ADJUSTED TO BE FLUSH WITH THE SURROUNDING SURFACE OR PAVEMENT FINISH GRADE OF THIS CONTRACT. RIM ELEVATIONS OF STRUCTURES AND MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH THE PROPOSED FINAL GRADES.
5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION OF PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED, INCLUDING OBTAINING ALL PERMITS. ALL COSTS AND FEES BY PRIVATE UTILITY COMPANIES TO BRING SERVICE TO THE SITE SHALL BE PAID FOR BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION AT NO COST TO THE OWNER.
7. DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES BY PROVIDING TEMPORARY SUPPORTS OR SHEETING AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
8. SITE GRADES SHALL CONFORM WITH ADA REQUIREMENTS.
9. CONTRACTOR IS REQUIRED TO APPLY FOR, OBTAIN, AND PAY ALL FEES ASSOCIATED WITH CONSTRUCTION PHASE PERMITS. PERMITS MAY INCLUDE, BUT NOT LIMITED TO:
- RHODE ISLAND STATE BUILDING OFFICIAL
- TOWN OF NARRAGANSETT DEPARTMENT OF PUBLIC WORKS PERMITS

TIMBER NOTES

- 1. ALL NEW LUMBER SHALL BE SOUTHERN YELLOW PINE, VISUALLY GRADED NO. 1 (Fv=1,350 PSI), UNLESS SPECIFIED OTHERWISE.
2. NEW LUMBER SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AWPA STANDARD U1-11, UC3B WHEN NOT IN CONTACT WITH GROUND, UC4B FOR GROUND CONTACT, PERMANENT, OR INCIDENTAL.
3. ALL FIELD CUTS AND BOLT HOLES SHALL BE PROTECTED IN ACCORDANCE WITH AWPA STANDARD M4.
4. LUMBER DIMENSIONS PROVIDED IN THE PLANS ARE DRESSED SIZES UNLESS SPECIFIED OTHERWISE.

CONCRETE NOTES

- 1. CONCRETE WORK SHALL CONFORM TO THE LATEST EDITION OF ACI 318 - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND THE RHODE ISLAND STATE BUILDING CODE.

- 2. CONCRETE SHALL BE PLACED UNDER THE SUPERVISION OF THE APPROVED TESTING AGENCY.
3. CONCRETE SHALL BE NORMAL WEIGHT, WITH TYPE II CEMENT, AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 5,000 PSI-TYPICAL. ALL CONCRETE DESIGN MIXES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
4. ALL CONCRETE SHALL BE AIR-ENTRAINED WITH AN AIR CONTENT OF 6% +/- 1%.
5. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" x 45 DEGREES UNLESS NOTED OTHERWISE.
6. WHEN CONCRETE IS PLACED AGAINST PREVIOUSLY HARDENED CONCRETE, THE INTERFACE SHALL BE CLEAN, FREE OF LAITANCE AND INTENTIONALLY ROUGHENED OR RAKED TO FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH.
7. CONCRETE WASHOUT OPERATIONS TO OR WITHIN THE WATERWAY MUST NOT TAKE PLACE AT ANY TIME.

REINFORCING STEEL NOTES

- 1. REINFORCING BARS SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 - "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND THE RHODE ISLAND STATE BUILDING CODE.
2. COMPLETE SHOP DRAWINGS AND SCHEDULES OF ALL REINFORCING STEEL SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF THAT PORTION OF THE WORK. ALL ACCESSORIES MUST BE SHOWN ON THE SHOP DRAWINGS.
3. REINFORCING BARS SHALL BE EPOXY COATED AND CONFORM TO ASTM A615 OR A706 (WELDABLE) GRADE 60.
4. ALL SUPPORTS SUCH AS CHAIRS, BOLSTERS, SPACERS, BLOCKS AND HANGERS SHALL BE OF NON-CORROSIVE MATERIAL. BLOCKS SHALL BE MADE OF 4,000 PSI (UN-REINFORCED) CONCRETE.
5. UNLESS NOTED ON THE DRAWINGS, THE MINIMUM CONCRETE PROTECTION (CLEAR COVER) FOR CAST-IN-PLACE CONCRETE COVER SHALL BE AS FOLLOWS:
A. FORMED CONCRETE EXPOSED TO EARTH OR WATER: 3"
B. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 4"
6. MINIMUM REINFORCEMENT DEVELOPMENT LENGTH SHALL BE IN ACCORDANCE WITH ACI 318 FOR CLASS B LAPS UNLESS NOTED OTHERWISE.
7. ALL REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS, AROUND CORNERS, AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.

PRESTRESSED CONCRETE PILES

- 1. ALL REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS, AROUND CORNERS, AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.
STRUCTURAL DEEP FOUNDATION (PILING) DESIGN IS BASED UPON THE USE OF PILES WITH THE FOLLOWING CAPACITIES:
PRESTRESSED CONCRETE:
VERTICAL COMPRESSIVE = 27 KIPS
LATERAL = 55PSF (US), ACTING CONCURRENTLY WITH EITHER LOAD ABOVE
ALL LOADS ARE APPLIED AT THE TOP OF THE PILE, UNLESS NOTED OTHERWISE.
THIS WILL REQUIRE PRESTRESSED CONCRETE PILES WITH THE FOLLOWING PROPERTIES:
12" PRESTRESSED CONCRETE PILE = (76) 35'-0"
16" PRESTRESSED CONCRETE PILE = (88) 35'-0"
2. ALL PRESTRESSED PILES WILL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD, TO INCLUDE CALCULATIONS EXECUTED BY A LICENSED PROFESSIONAL ENGINEER, IN ACCORDANCE WITH THE LOAD REQUIREMENTS LISTED IN THIS NOTE. REFER TO THE SUBSURFACE INVESTIGATION BORING LOGS BY PARE CORPORATION, PROJECT NUMBER 19131.00, DATED BETWEEN JANUARY 15 2020 AND JANUARY 16 2020 FOR ADDITIONAL INFORMATION.
3. PILING IS TO BE HANDLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, SUCH THAT NO DAMAGE IS INCURRED.
4. PILING DESIGN IS TO INCLUDE LONGITUDINAL STRANDS WHICH WILL DEVELOP THE SPECIFIED CAPACITIES. SPIRAL WIRE REINFORCING SHALL MEET THE REQUIREMENTS OF ASTM A82, BE A MINIMUM OF 5 GAGE, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 70 KSI
5. PILES SHALL BE DRIVEN BY A SINGLE OR DOUBLE ACTING STEAM, DIESEL, OR AIR HAMMER WITH A MINIMUM OF 15,000 FT-LBS OF ENERGY. LEADS SHALL BE FIXED TO THE BOOM AT THE TOP, AND TO THE CRANE AT THE BOTTOM; NO SWINGING LEADS ARE PERMITTED.
6. ONCE PILE DRIVING HAS STARTED, DRIVE ALL PILES CONTINUOUSLY UNTIL THEY ARE AT THE REQUIRED TIP ELEVATION.
7. FINAL PILE LOCATION SHALL BE WITHIN 3" OF THE DESIGN LOCATION.

DESIGN CRITERIA

SNOW LOADS (IBC SECT 1608)
SNOW LOAD: P = 30 P/SF
WIND LOADS ASCE 7-16
MEAN ROOF HEIGHT = 16.5 FEET
BASIC WIND SPEED = 121 MPH
FLOOD LOADS (FEMA COASTAL CONSTRUCTION MANUAL FIRMETTE FLOOD ZONE VE
TOTAL BREAKING WAVE LOAD = 7530 PLF
EARTHQUAKE LOADS (IBC SECT. 1614)
MAPPED ACCELERATIONS: S\_s = 0.164g s
S\_1 = 0.058g l
SITE CLASS D, F\_g = 1.0 S\_MS = 0.262g
F\_v = 2.4 S\_M1 = 0.140g

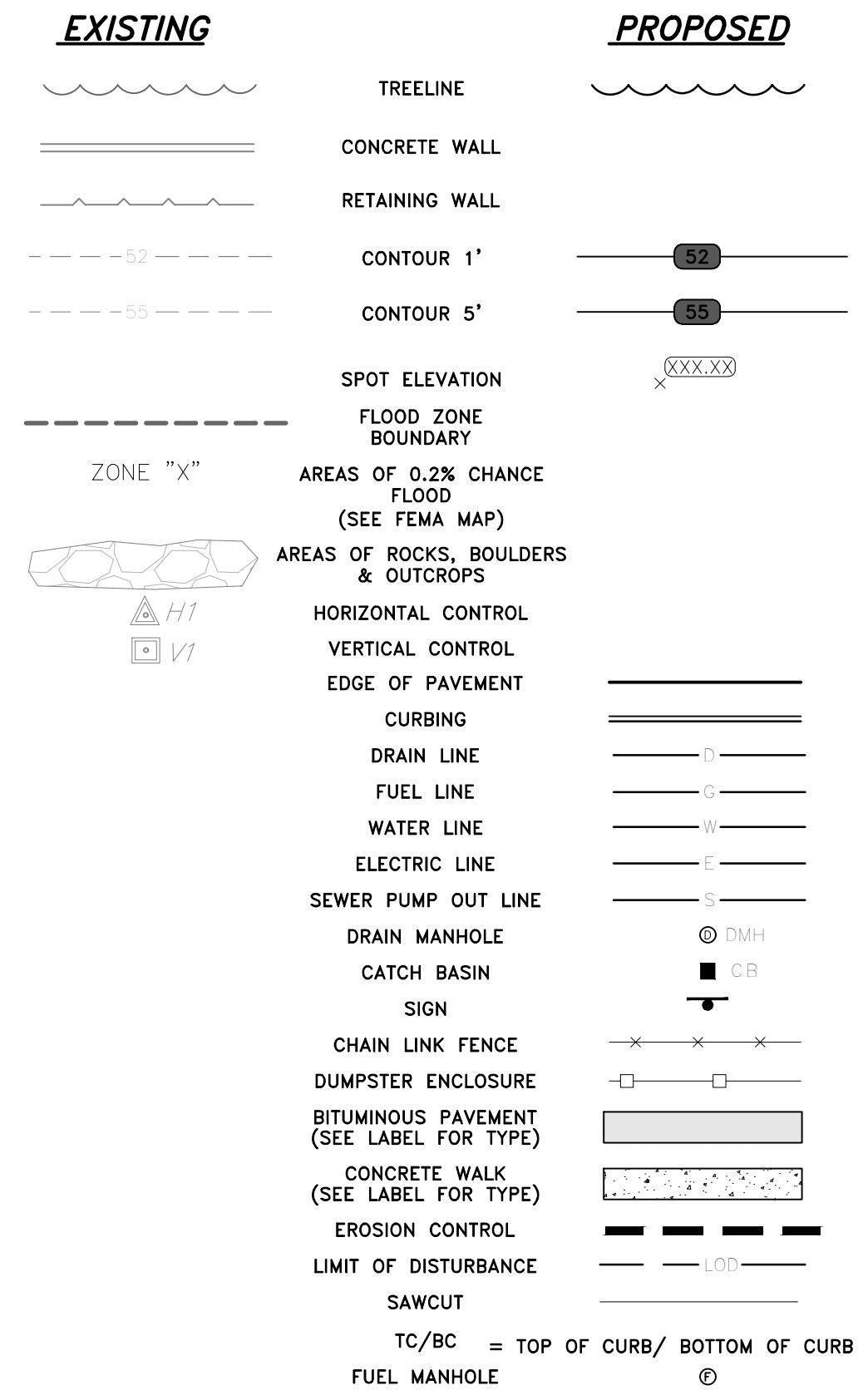
DESIGN SPECTRAL RESPONSE ACCELERATIONS AT
5% DAMPENING, S\_DS = 0.175g
S\_D1 = 0.093g
D1 GENERAL DESIGN RESPONSE SPECTRAL
ACCELERATION, PGA = 0.158g
8. SEISMIC DESIGN CATEGORY B

ABBREVIATIONS

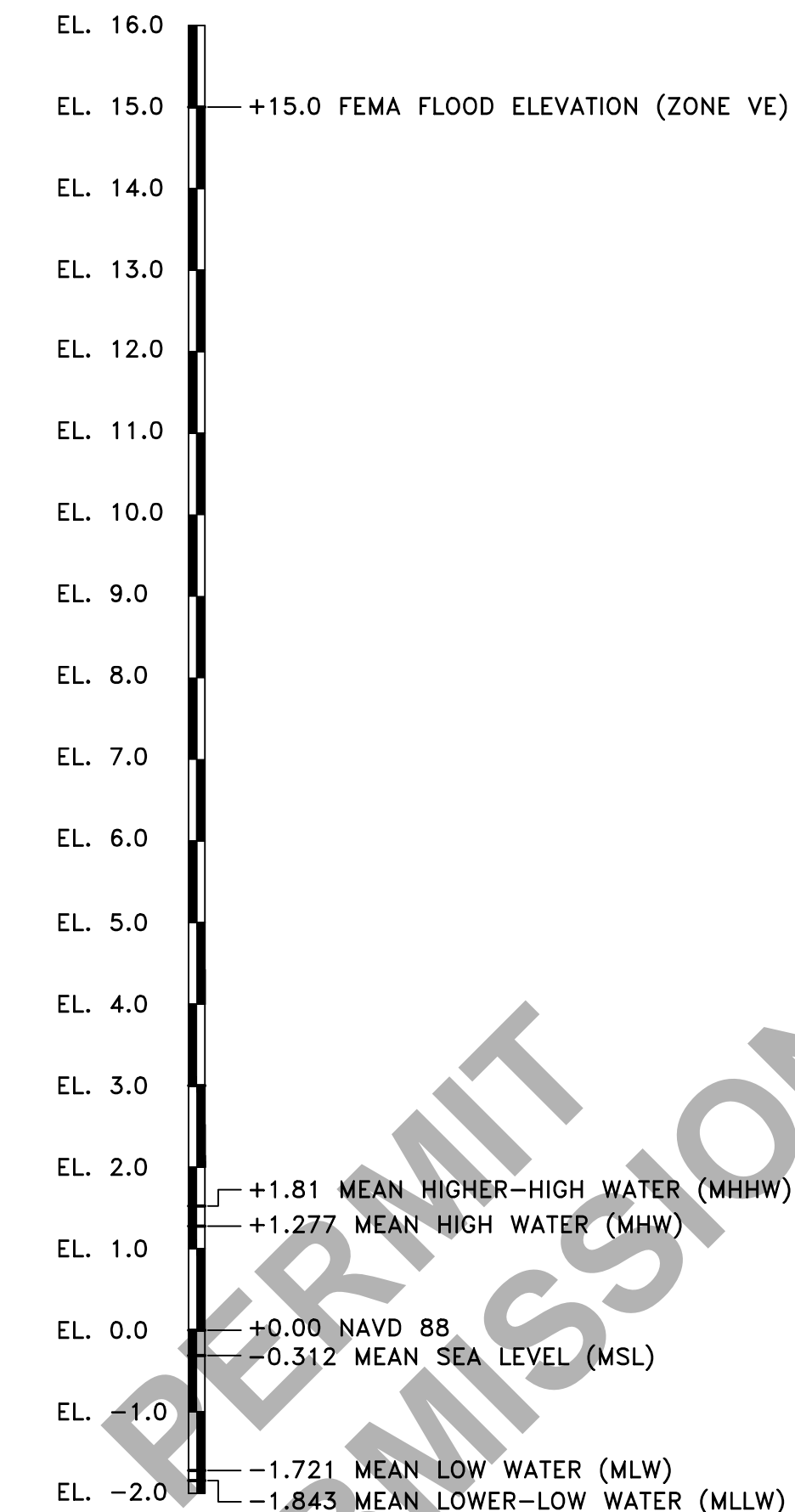
- (BCP) = BITUMINOUS CONCRETE PAVEMENT
(CM) = SAWCUT AND MATCH EXISTING GRADES
(CW) = CEMENT CONCRETE SIDEWALK (STANDARD)
(GV) = GATE VALVE (SEE DETAIL)
(JB) = SPEAKER JUNCTION BOX
(R&D) = REMOVE AND DISPOSE
(SCW) = STRIPED CROSS WALK (SEE DETAIL)
(SHP) = HANDICAP EPOXY RESIN PAVEMENT MARKING
(SW) = 4" SOLID WHITE EPOXY RESIN PAVEMENT MARKING
(SW12) = 12" SOLID WHITE EPOXY RESIN PAVEMENT MARKING
(TIP) = TEMPORARY INLET PROTECTION
(7.1.0) = R.I. STD. CONCRETE CURB DETAIL
(9.9.0) = R.I. STD. CONSTRUCTION ACCESS DETAIL
(43.1.0) = R.I. STD. CEMENT CONCRETE SIDEWALK DETAIL
(43.3.0) = R.I. STD. WHEELCHAIR RAMP DETAIL

RIDOT STANDARD DETAILS CAN BE FOUND AT THE FOLLOWING WEBSITE:
HTTP://WWW.DOT.RI.GOV/DOCUMENTS/DOINGBUSINESS/BLUEBOOK.PDF

LEGEND

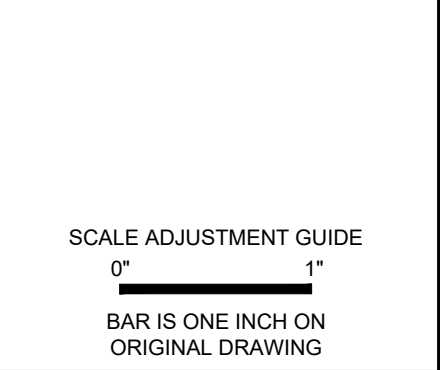
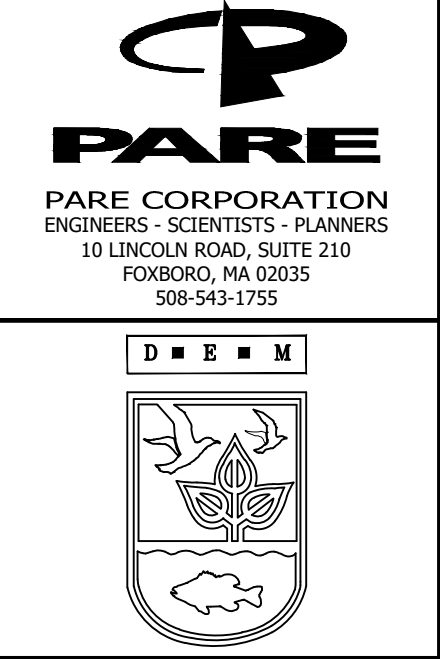


TIDAL REFERENCE



DATUM INFORMATION

NOAA VERTICAL DATUM



ROGER WHEELER STATE BEACH BOARDWALK
NARRAGANSETT, RHODE ISLAND
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

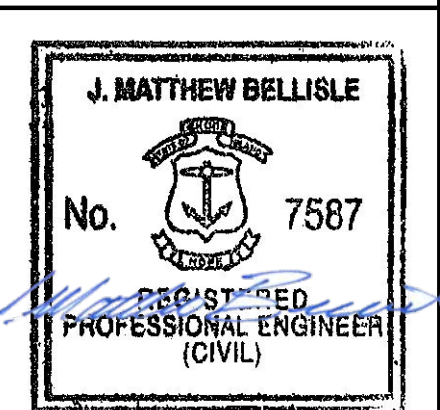


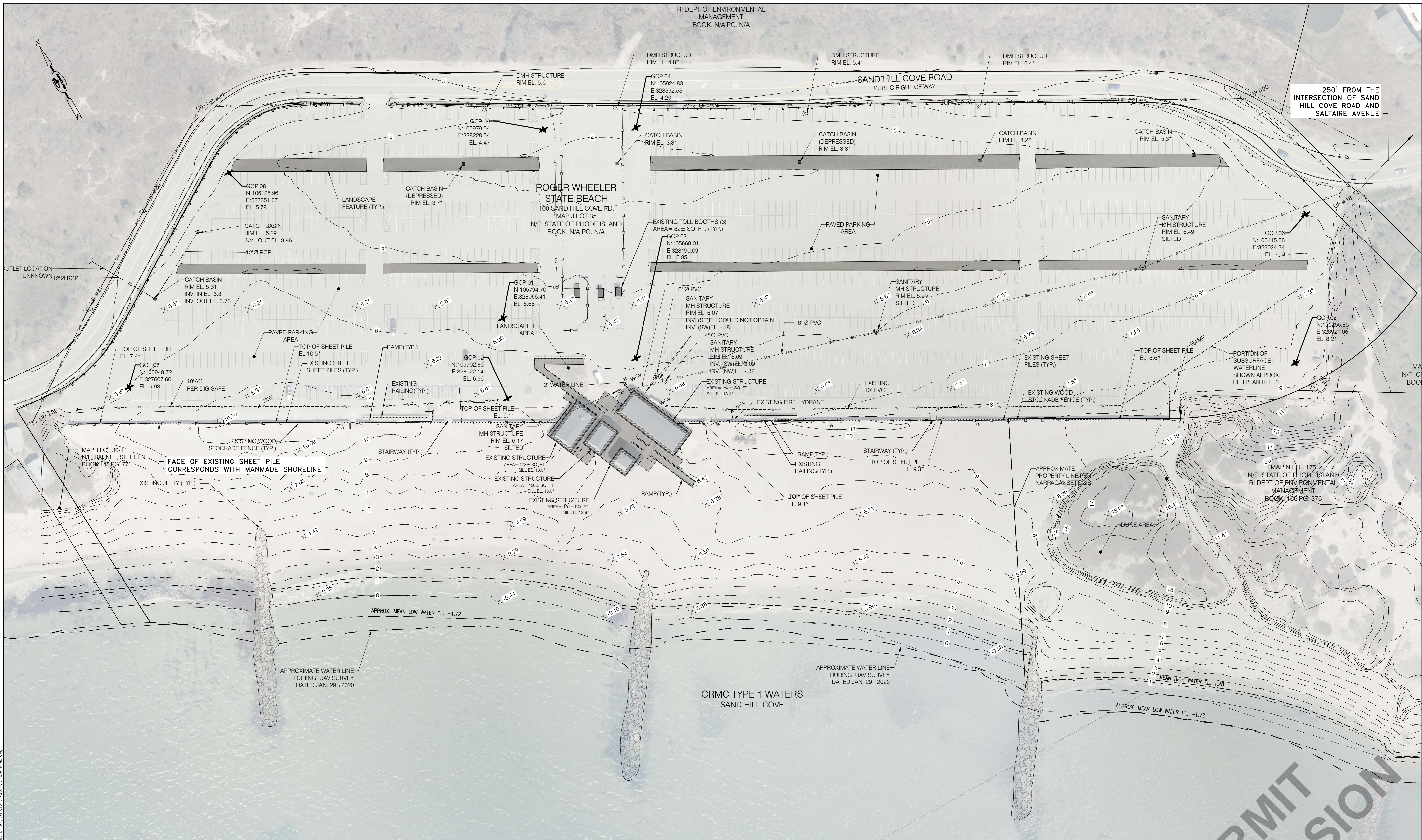
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PROJECT NO.: 19131.00
DATE: DECEMBER 2021
SCALE: AS NOTED
DESIGNED BY: KAD
CHECKED BY: BMD
DRAWN BY: LMC
APPROVED BY: JMB

GENERAL NOTES AND LEGEND
SHEET NO.: 1.0

90% DESIGN SUBMISSION NOT FOR CONSTRUCTION

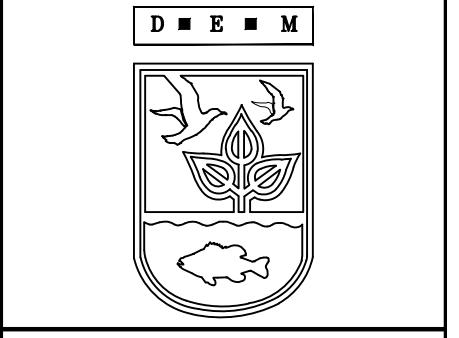
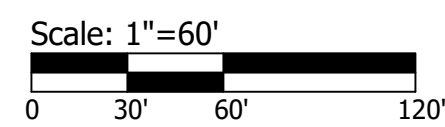




**EXISTING SITE PLAN**  
SCALE: 1"=60'±

**NOTES:**

- EXISTING CONDITIONS BASED UPON PLAN ENTITLED "EXISTING CONDITIONS AND TOPOGRAPHY PLAN ROGER WHEELER STATE BEACH" PREPARED BY NARRAGANSETT ENGINEERING INC. OF PORTSMOUTH, RI DATED MAY 2020.



SCALE ADJUSTMENT GUIDE  
0" = 1"  
BAR IS ONE INCH ON ORIGINAL DRAWING

**ROGER WHEELER STATE BEACH BOARDWALK**  
 NARRAGANSETT, RHODE ISLAND  
 RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



REVISIONS:		
1	2022-9-23	WEST END ADJUSTMENTS

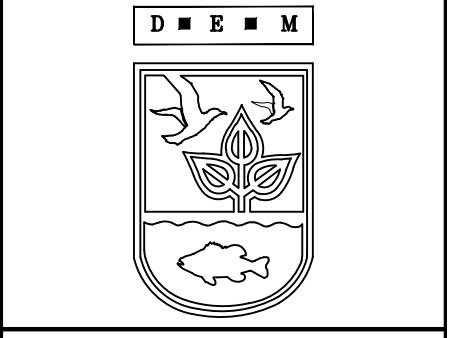
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DATE: DECEMBER 2021  
SCALE: AS NOTED  
DESIGNED BY: KAD  
CHECKED BY: BMD  
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APPROVED BY: JMB

EXISTING SITE PLAN  
SHEET NO.: 2.0

PERMIT SUBMISSION

90% DESIGN SUBMISSION  
 NOT FOR CONSTRUCTION





SCALE ADJUSTMENT GUIDE  
0" = 1"  
BAR IS ONE INCH ON ORIGINAL DRAWING

**ROGER WHEELER STATE BEACH  
BOARDWALK**  
NARRAGANSETT, RHODE ISLAND  
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

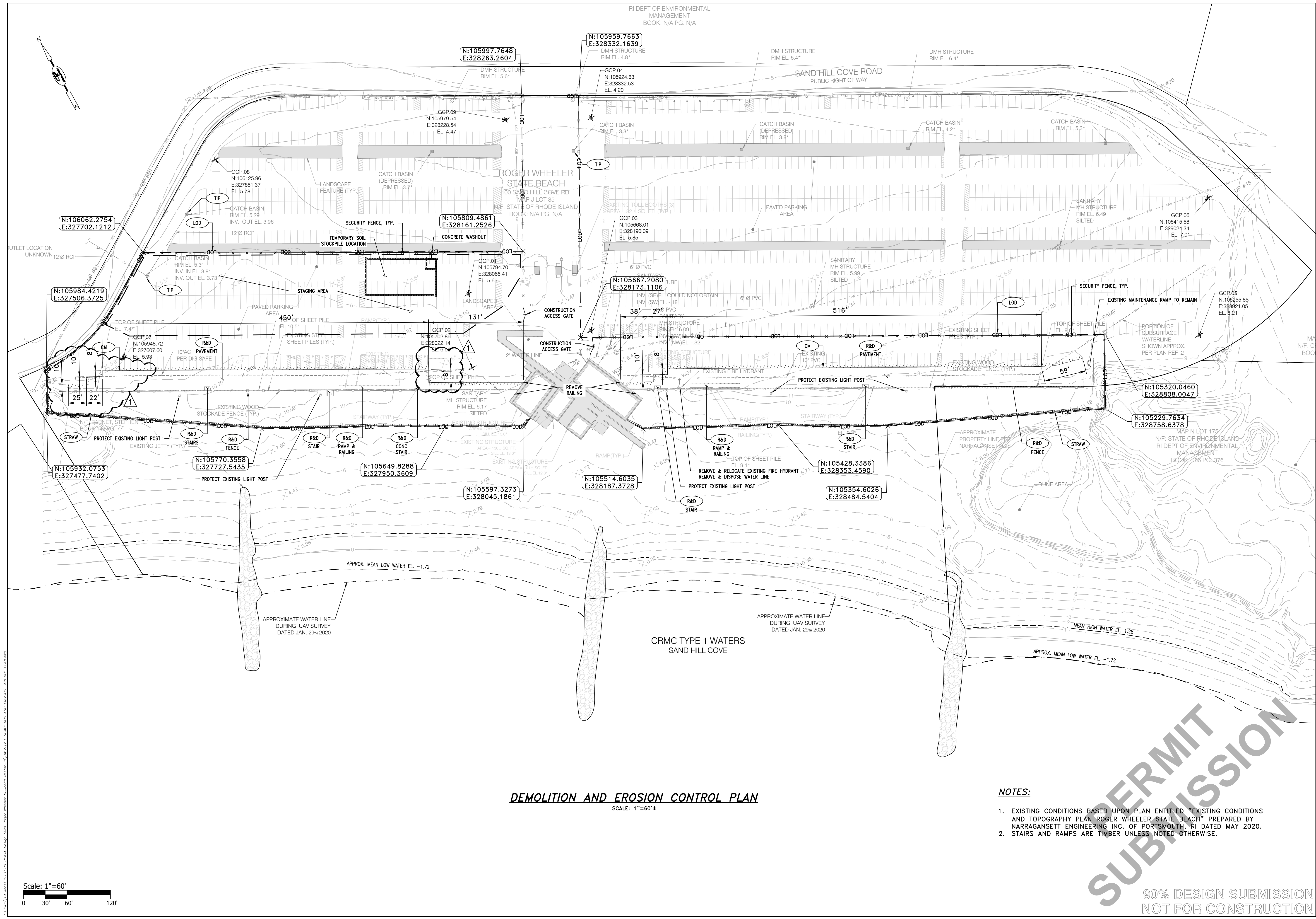


REVISIONS:

1	2022-9-23	WEST END ADJUSTMENTS

PROJECT NO.: 19131.00  
DATE: DECEMBER 2021  
SCALE: AS NOTED  
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DRAWN BY: LMC  
APPROVED BY: JMB

DEMOLITION AND EROSION CONTROL PLAN  
SHEET NO.: 2.1



**DEMOLITION AND EROSION CONTROL PLAN**  
SCALE: 1"=60'±

**NOTES:**

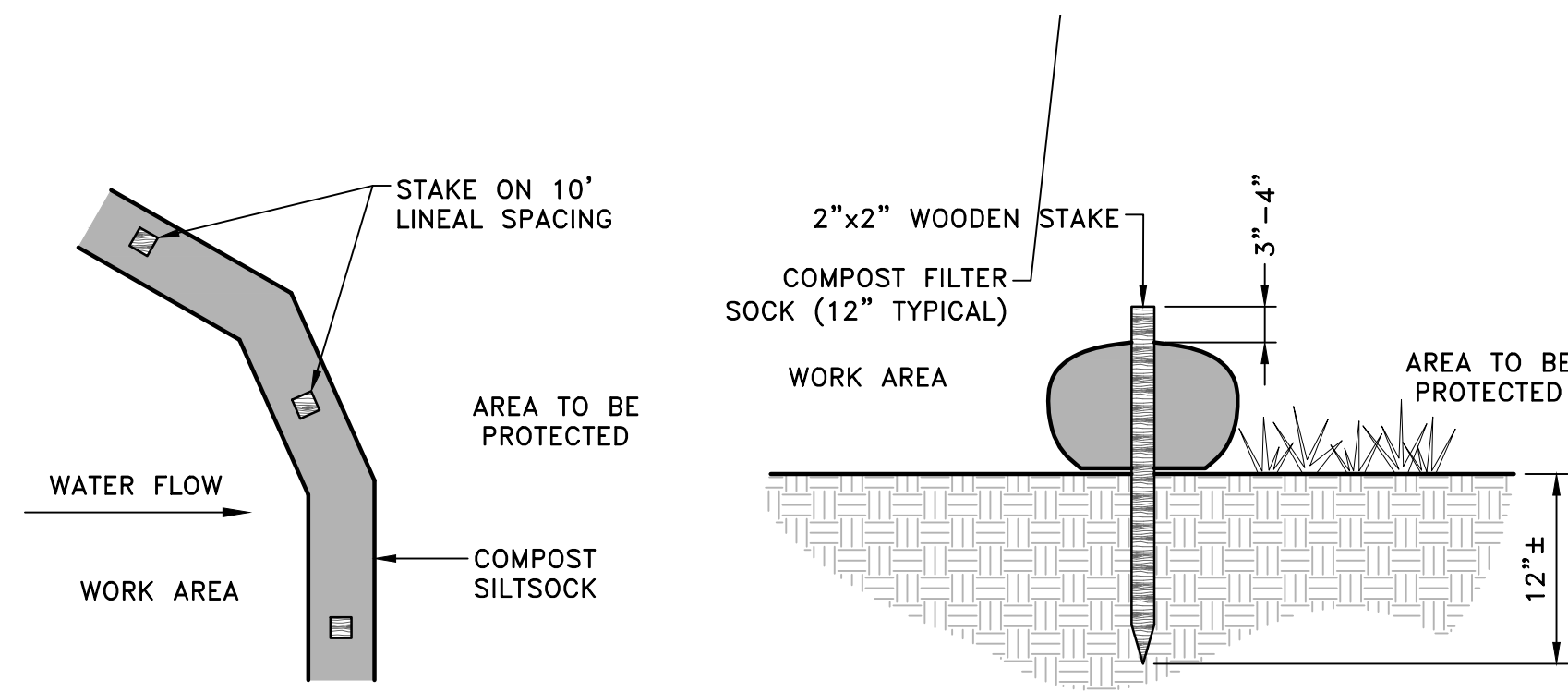
- EXISTING CONDITIONS BASED UPON PLAN ENTITLED "EXISTING CONDITIONS AND TOPOGRAPHY PLAN ROGER WHEELER STATE BEACH" PREPARED BY NARRAGANSETT ENGINEERING INC. OF PORTSMOUTH, RI DATED MAY 2020.
- STAIRS AND RAMPS ARE TIMBER UNLESS NOTED OTHERWISE.

Scale: 1"=60'  
0 30' 60' 120'

**PERMIT SUBMISSION**  
90% DESIGN SUBMISSION  
NOT FOR CONSTRUCTION

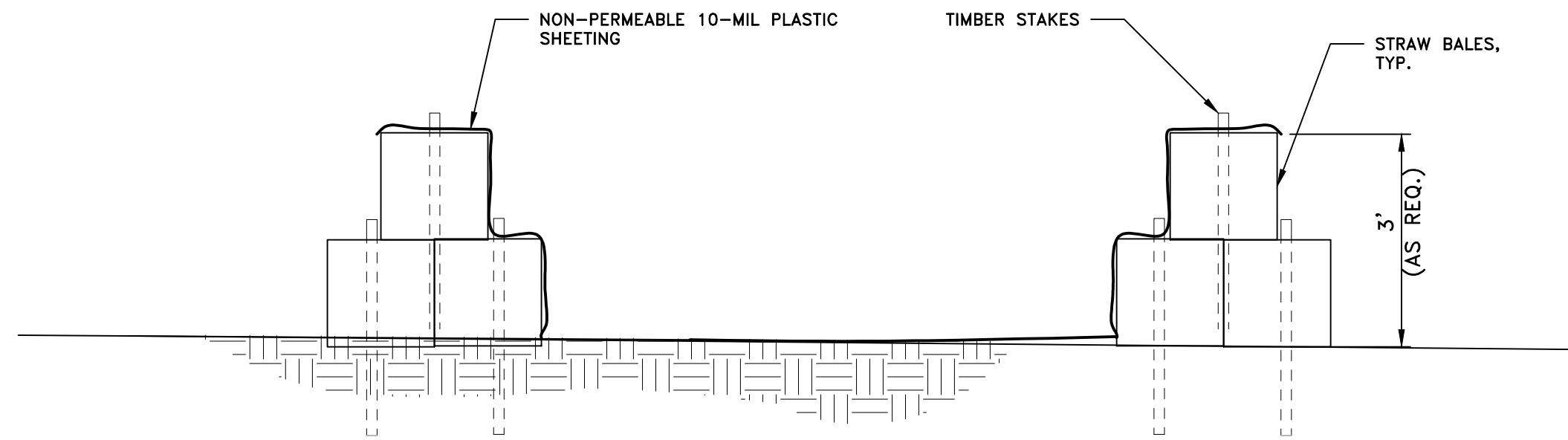
P:\WORKSPACE\19\_000\19131.00\19131.00\_0001.dwg, Roger Wheeler State Beach Boardwalk, Revision: 01/2022, P.L. DEMOLITION AND EROSION CONTROL PLAN



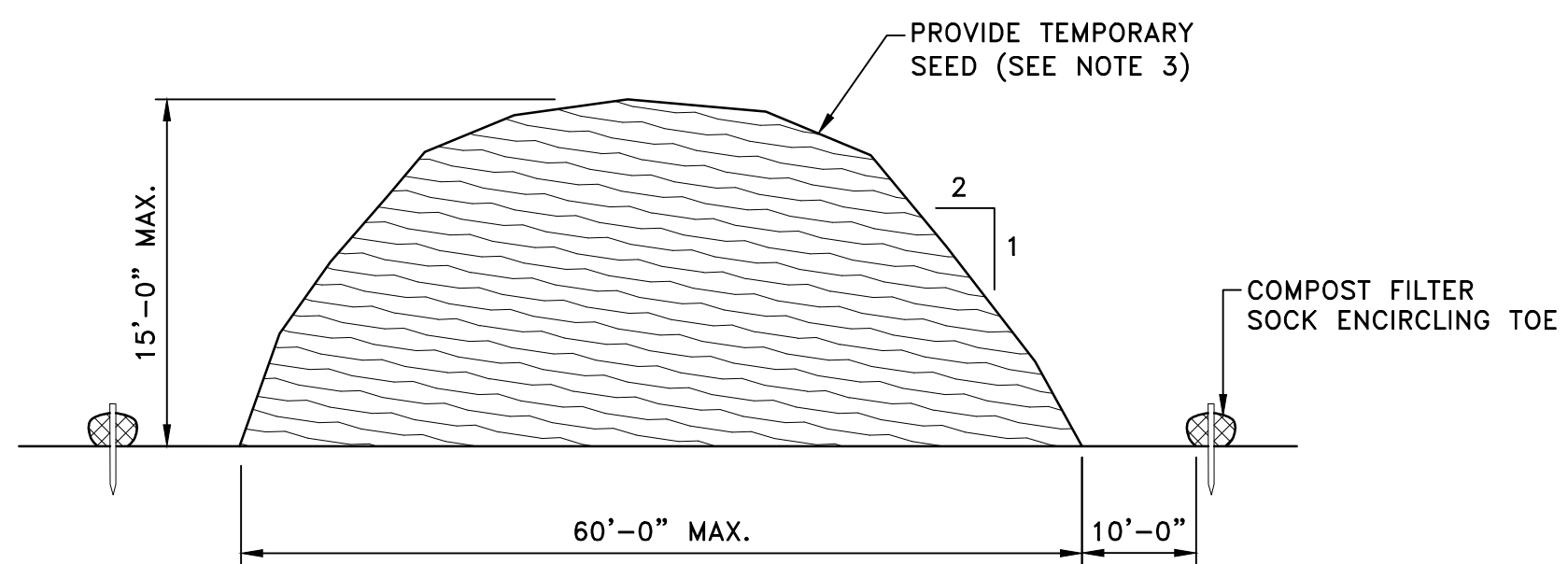


- NOTES:**
1. COMPOST/ SOIL/ ROCK/ SEED FILL TO MEET APPLICATION REQUIREMENTS.
  2. COMPOST MATERIAL TO BE REMOVED OR DISPERSED ON SITE AS DETERMINED BY ENGINEER.

**COMPOST FILTER SOCK DETAIL**  
NOT TO SCALE

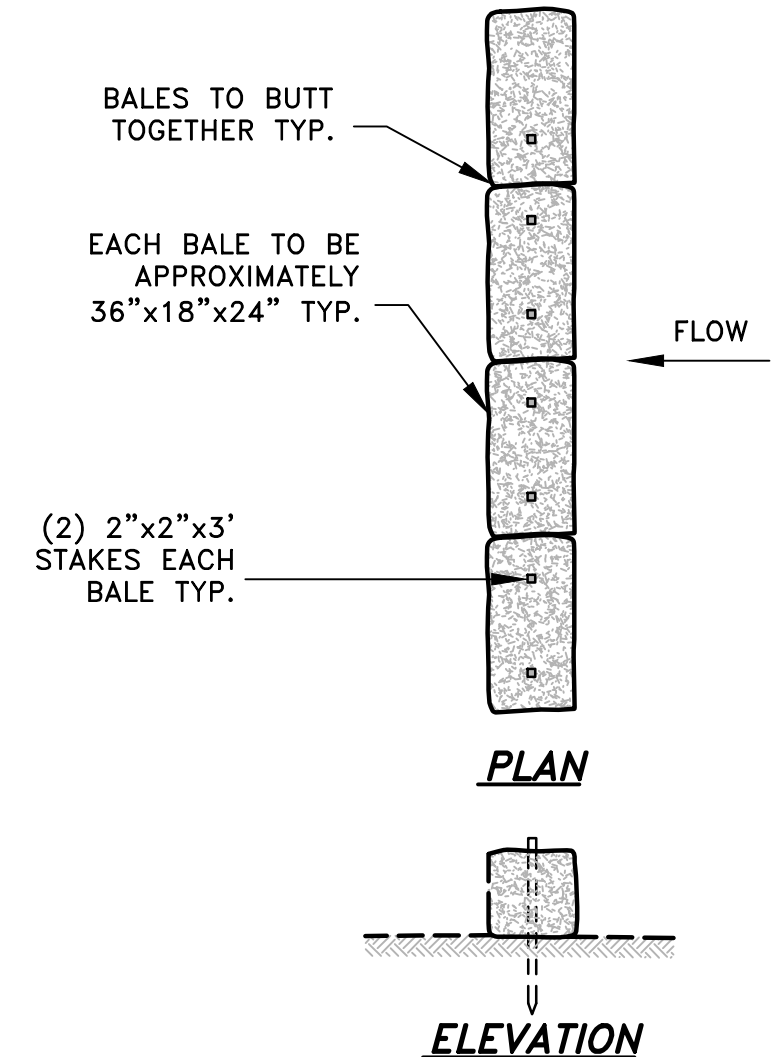


**CONCRETE WASHOUT**  
NOT TO SCALE

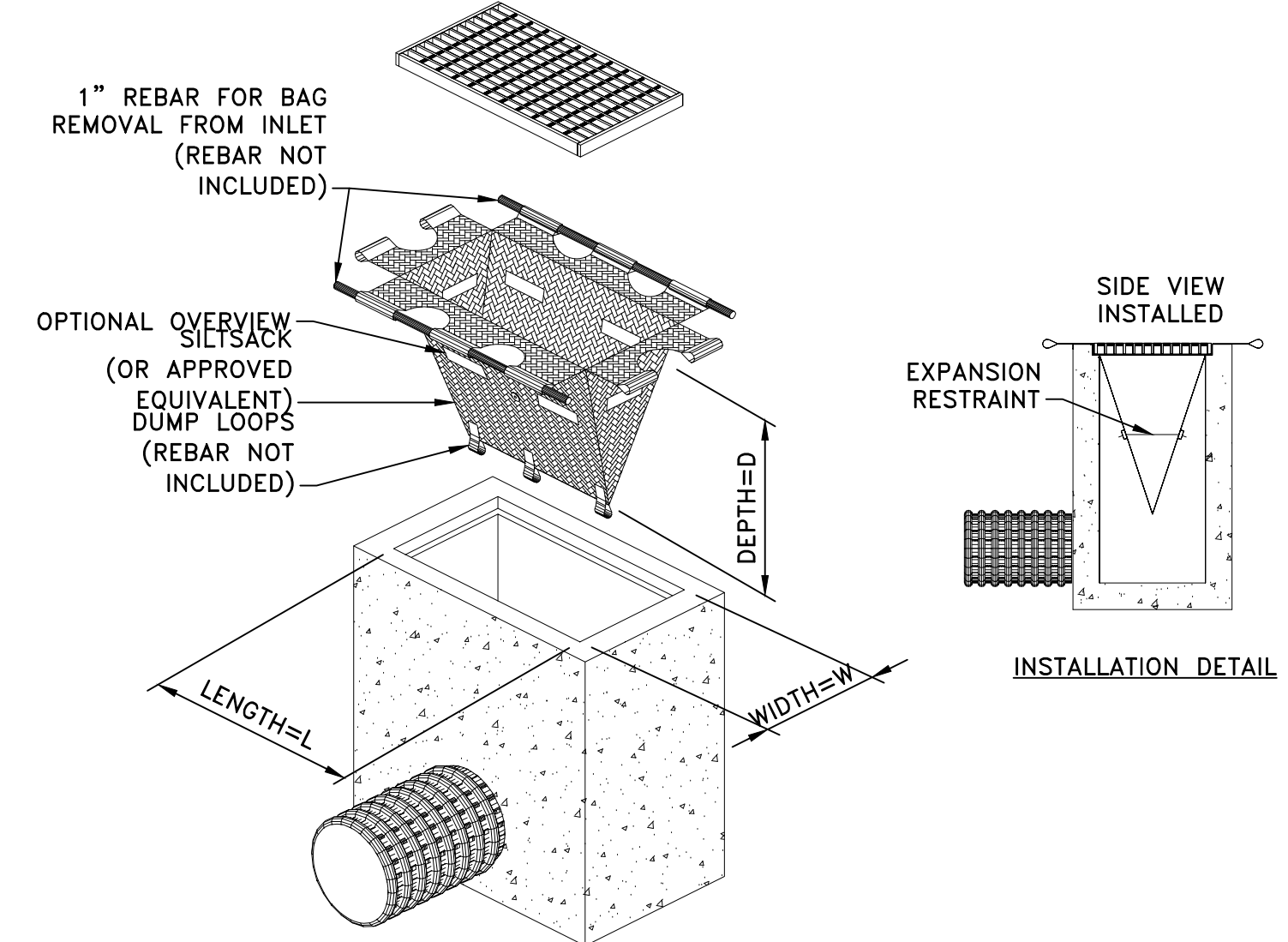


- NOTES:**
1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL PREPARE A PLAN SHOWING THE PROPOSED LOCATION OF ALL STOCKPILE AREAS.
  2. STOCKPILE AREA SHALL NOT EXCEED SPECIFIED DIMENSIONS WITHOUT APPROVAL FROM ENGINEER.
  3. STOCKPILED ERODIBLE MATERIAL THAT WILL NOT BE USED FOR GREATER THAN 14 DAYS SHALL BE STABILIZED WITH TEMPORARY SEED IMMEDIATELY FOLLOWING PLACEMENT. USE RIDOT STD. M.18.10.5 SEED MIX. USE MADOT STD. M.6.03.1 EROSION SEED.

**ERODIBLE MATERIAL STOCKPILE**  
NOT TO SCALE



**STRAW BALE DETAIL**  
NOT TO SCALE



- NOTES:**
1. INLET PROTECTION SHALL BE CLEANED OF SILT AND DEBRIS ON A REGULAR BASIS AS REQUIRED BY PROJECT SPECIFIC SWPPP.
  2. INSPECTIONS SHALL BE DONE AFTER EACH RAIN EVENT AND AT A MINIMUM EVERY TWO WEEKS AND AS REQUIRED BY PROJECT SPECIFIC SWPPP.

**TIP TEMPORARY INLET PROTECTION**  
NOT TO SCALE



SCALE ADJUSTMENT GUIDE  
0' 1'  
BAR IS ONE INCH ON ORIGINAL DRAWING

ROGER WHEELER STATE BEACH  
BOARDWALK

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



**REVISIONS:**

1	2022-9-23	WEST END ADJUSTMENTS
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PROJECT NO.:	19131.00
DATE:	DECEMBER 2021
SCALE:	AS NOTED
DESIGNED BY:	KAD
CHECKED BY:	BMD
DRAWN BY:	LMC
APPROVED BY:	JMB

EROSION CONTROL DETAILS

SHEET NO.: 2.2

PERMIT SUBMISSION

90% DESIGN SUBMISSION  
NOT FOR CONSTRUCTION





SCALE ADJUSTMENT GUIDE  
 0 1'  
 BAR IS ONE INCH ON ORIGINAL DRAWING

**ROGER WHEELER STATE BEACH BOARDWALK**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**J. MATTHEW BELLISLE**  
 No. 7587  
 REGISTERED PROFESSIONAL ENGINEER (CIVIL)

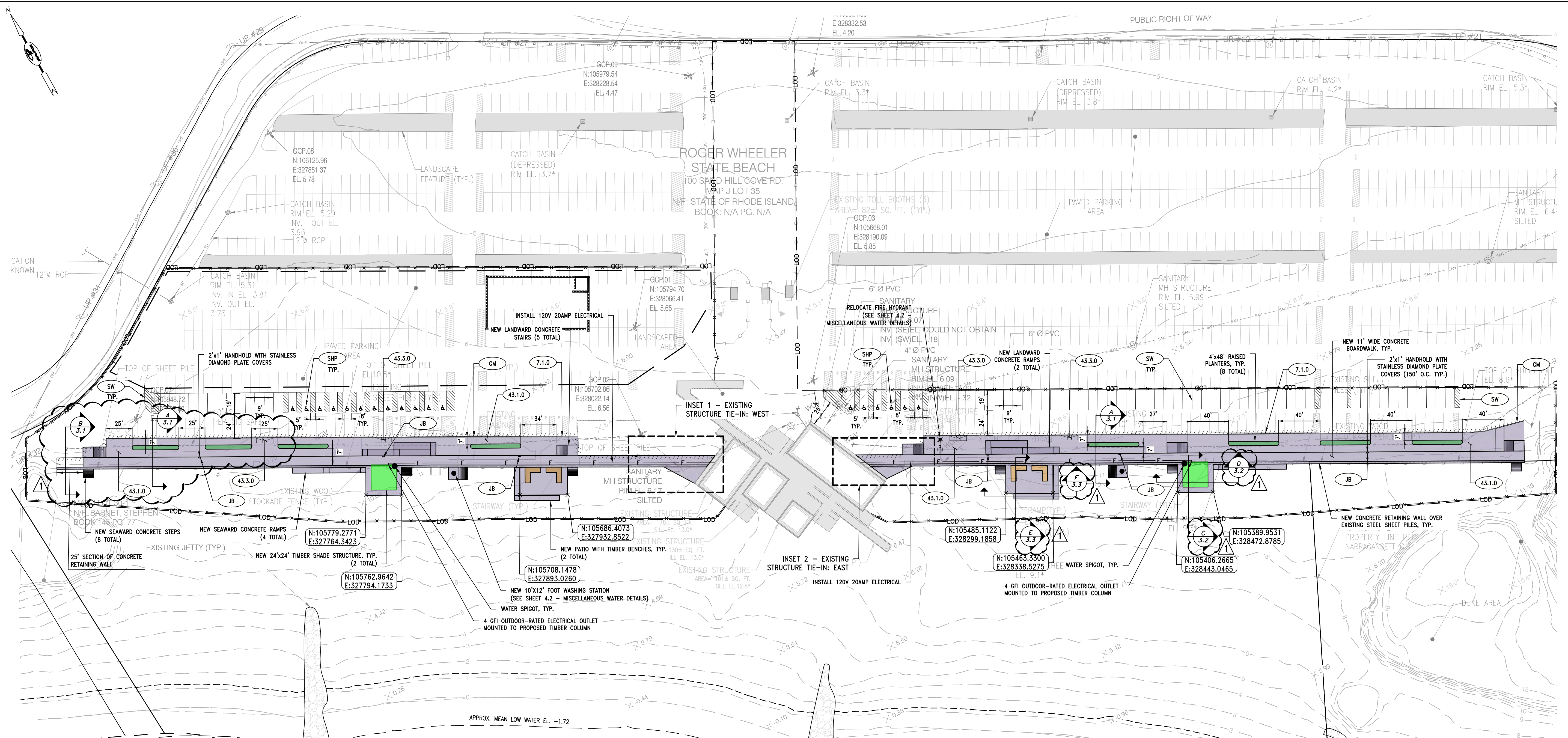
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PROJECT NO.: 19131.00  
 DATE: DECEMBER 2021  
 SCALE: AS NOTED  
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 CHECKED BY: BMD  
 DRAWN BY: LMC  
 APPROVED BY: JMB

PROPOSED SITE PLAN

SHEET NO.:

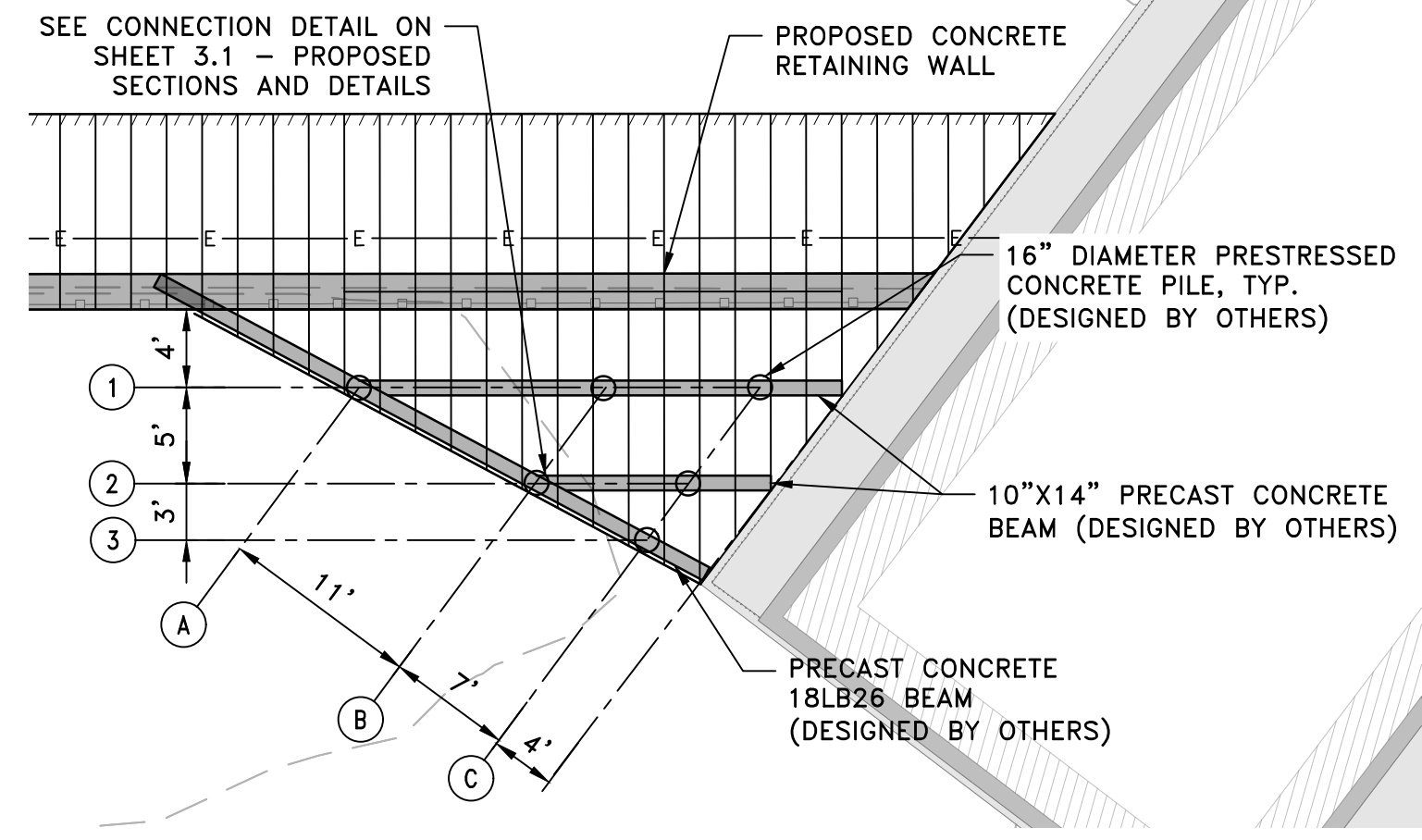
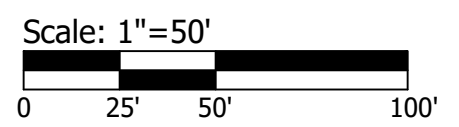
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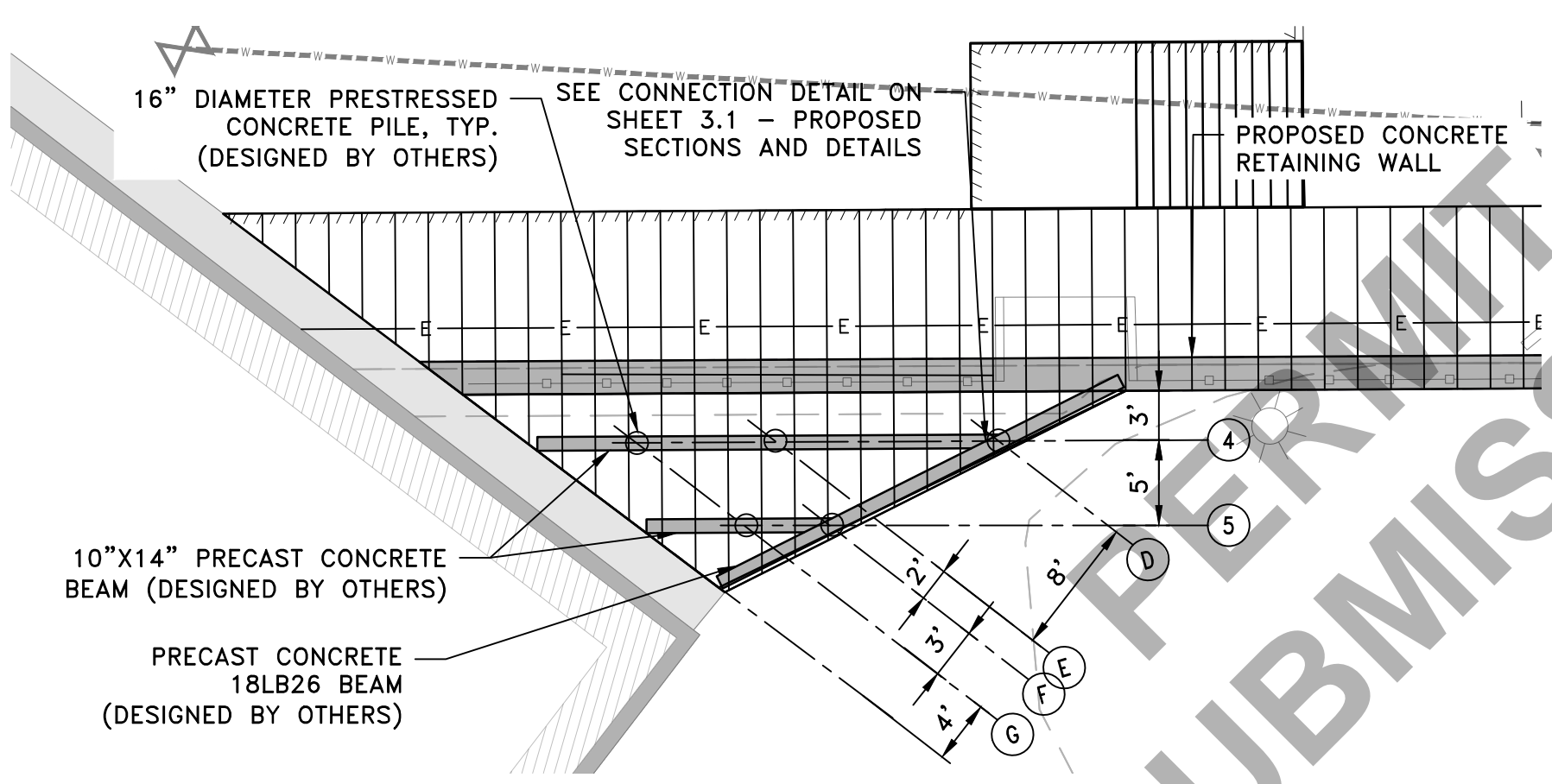
**PROPOSED SITE PLAN**  
 SCALE: 1"=50'±

**GENERAL SCOPE OF WORK**

1. PRIOR TO PROJECT COMMENCEMENT, NOTIFY AND COORDINATE WITH ALL STATE LOCAL AND FEDERAL AUTHORITIES AS REQUIRED.
2. MOBILIZE CONSTRUCTION EQUIPMENT AND PERSONNEL TO THE SITE. INSTALL EROSION CONTROL AND TEMPORARY SECURITY FENCING. UTILIZATION OF A STAGING AREA WILL BE COORDINATED WITH THE OWNER OR ENGINEER AS APPROPRIATE AND NECESSARY. LOCATE/VERIFY EXISTING UTILITIES WITHIN THE PROPOSED AREAS OF WORK. MARK UTILITIES AND MAINTAIN UTILITY MARKS FOR THE DURATION OF THE PROJECT.
3. MOVE EXISTING HYDRANT TO PROPOSED LOCATION.
4. REMOVE AND DISPOSE EXISTING RAMPS AND STAIRS ALONG THE EXISTING STEEL SHEET PILE WALL. SAWCUT AND REMOVE PAVEMENT WITHIN THE AREA OF THE PROPOSED SIDEWALK.
5. CONSTRUCT NEW CONCRETE PIER INCLUDING THE INSTALLATION OF NEW PILES, CONCRETE RETAINING WALL, STRINGERS, DECKING, RAMPS, STAIRS, ALUMINUM FENCING/RAILS, BENCHES, TIMBER SHADE STRUCTURES, AND APPURTENANCES.
6. REGRADE AND PLACE CONCRETE SIDEWALK, PLANTINGS, AND CURB ALONG THE PARKING LOT. PAINT OVER EXISTING STRIPING AND PAINT NEW STRIPING/MARKS AS INDICATED ON THE DRAWINGS.
7. PERFORM SITE CLEANUP, RESTORATION, OF STAGING AREAS AS NECESSARY PERFORM FINAL WALK THROUGH WITH KEY PROJECT PERSONNEL UPON COMPLETION.
8. COMPLETE DEMOBILIZATION AND PROJECT CLOSEOUT INCLUDING NEW SITE SURVEY AND AS-BUILT DRAWINGS.



**INSET 1 - EXISTING STRUCTURE TIE-IN: WEST**  
 SCALE: 1"=10'±



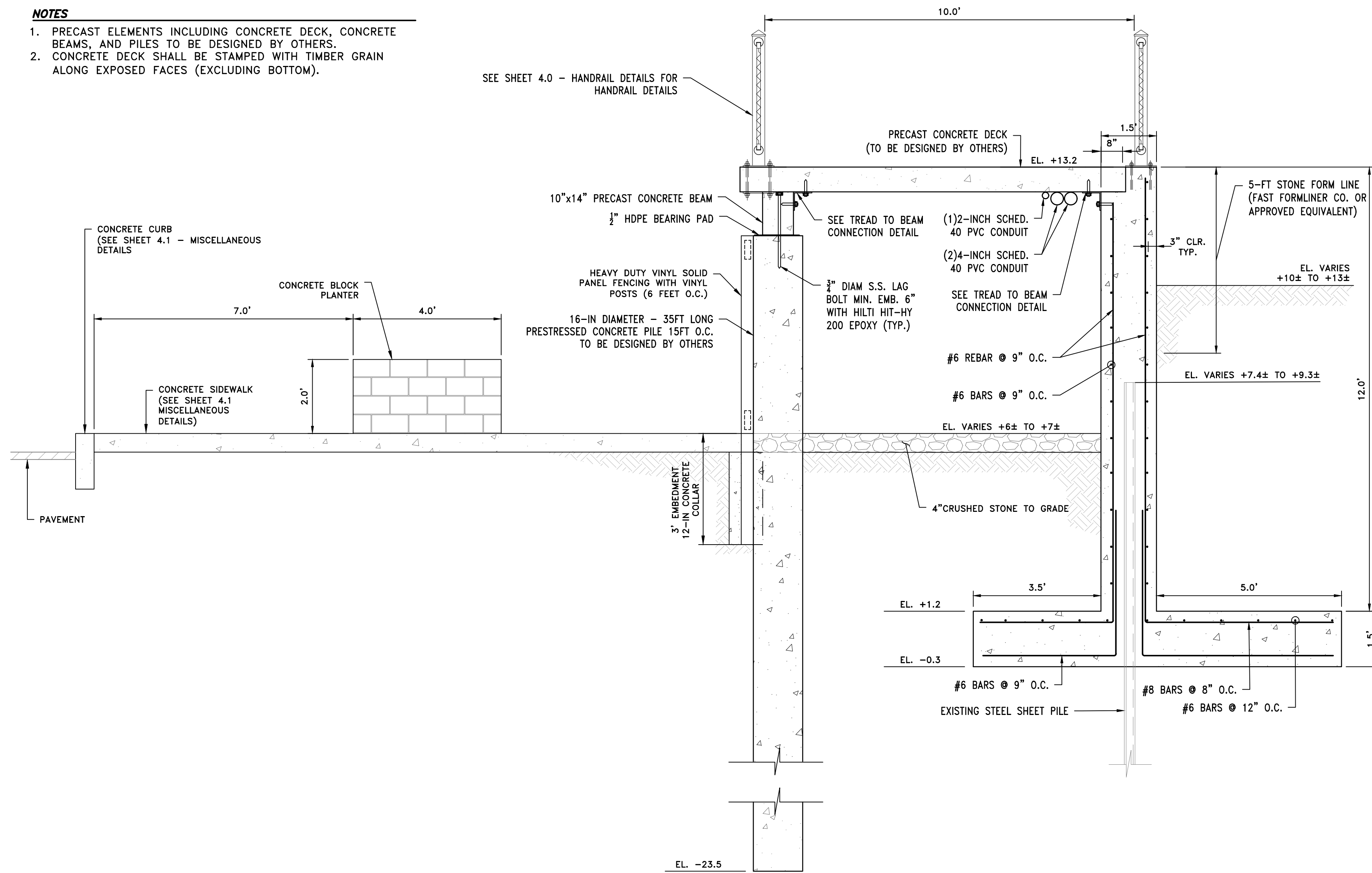
**INSET 2 - EXISTING STRUCTURE TIE-IN: EAST**  
 SCALE: 1"=10'±

90% DESIGN SUBMISSION  
 NOT FOR CONSTRUCTION



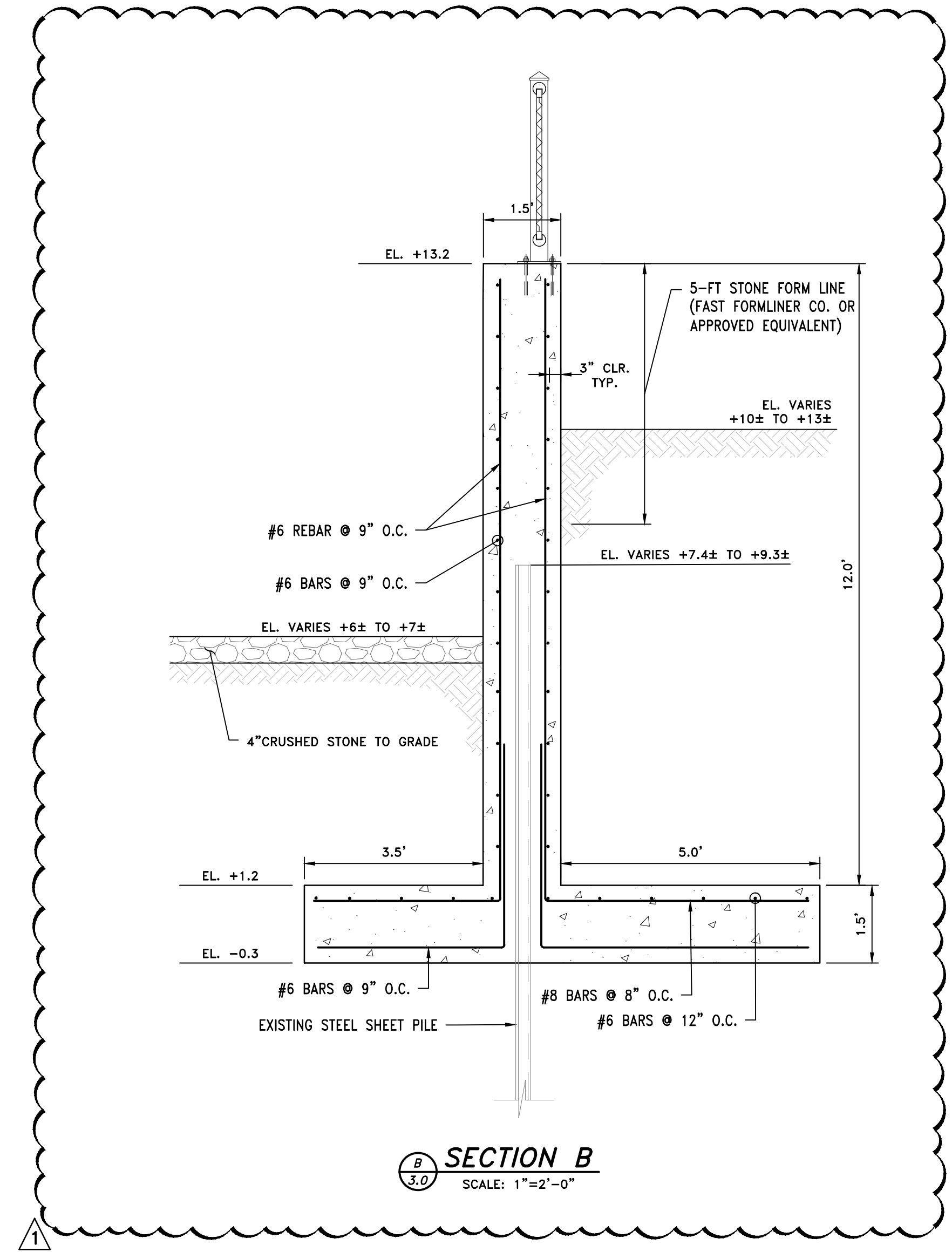
**NOTES**

1. PRECAST ELEMENTS INCLUDING CONCRETE DECK, CONCRETE BEAMS, AND PILES TO BE DESIGNED BY OTHERS.
2. CONCRETE DECK SHALL BE STAMPED WITH TIMBER GRAIN ALONG EXPOSED FACES (EXCLUDING BOTTOM).



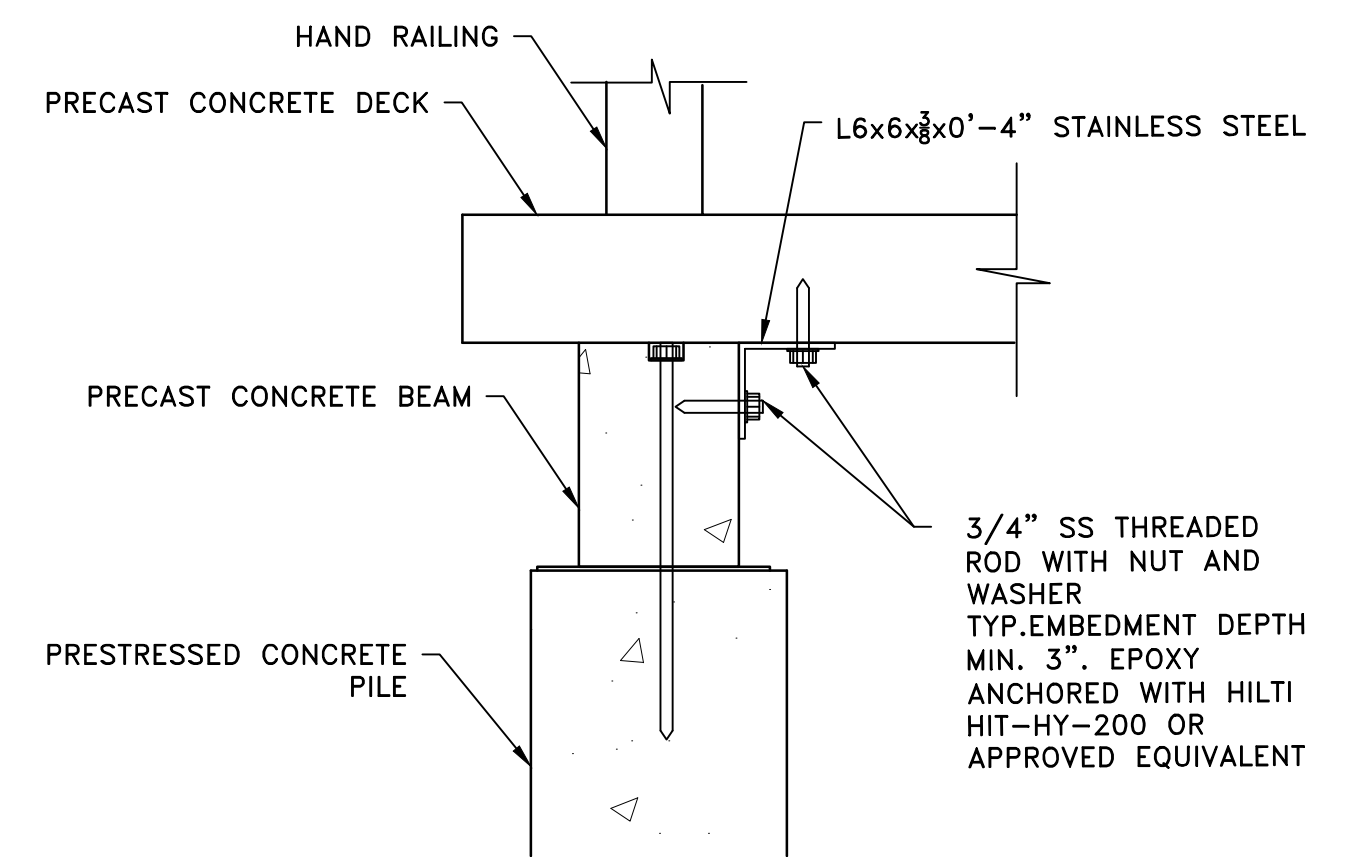
**SECTION A - TYPICAL WEST AND EAST BOARDWALK SECTION**

SCALE: 1"=2'-0"



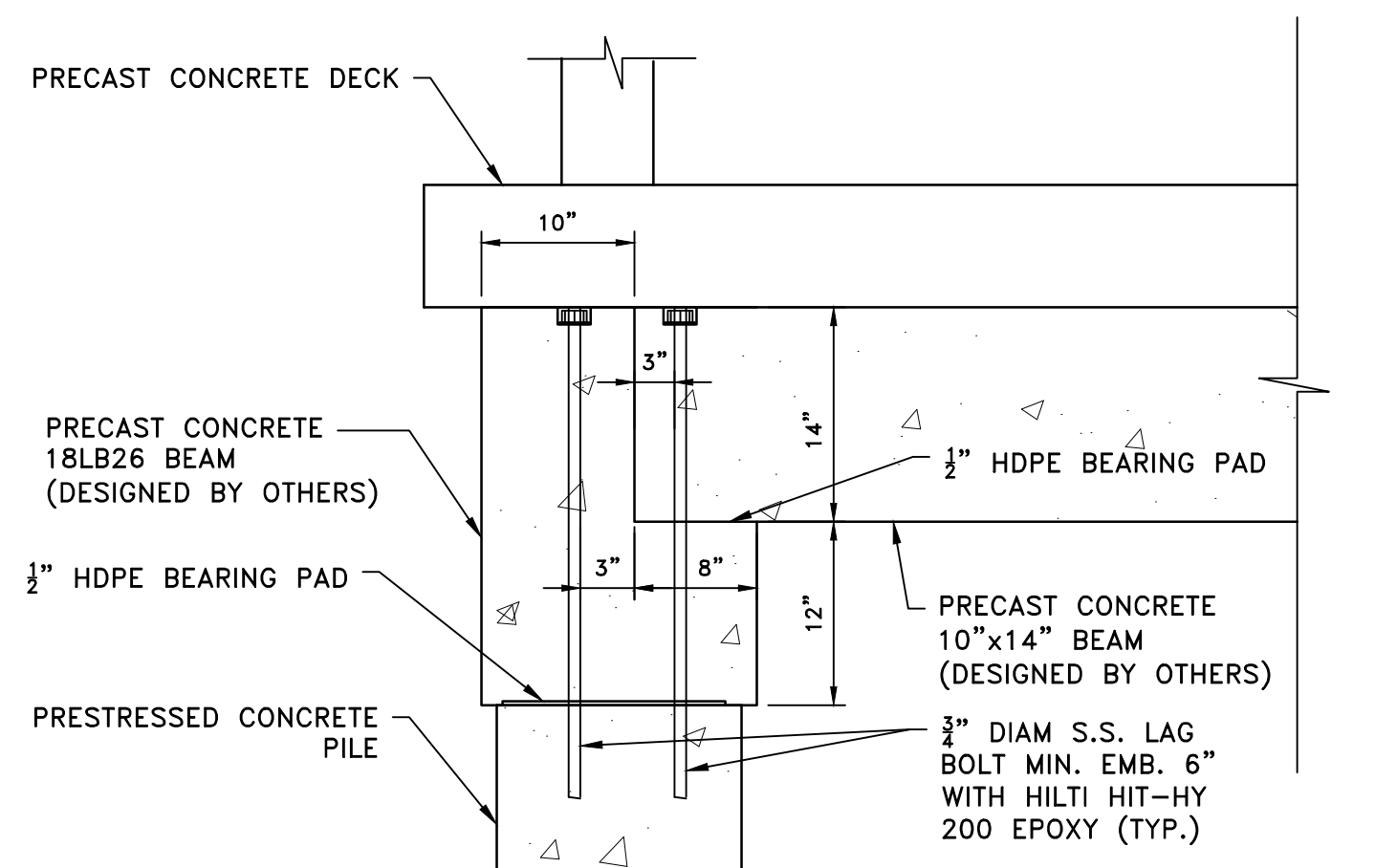
**SECTION B**

SCALE: 1"=2'-0"



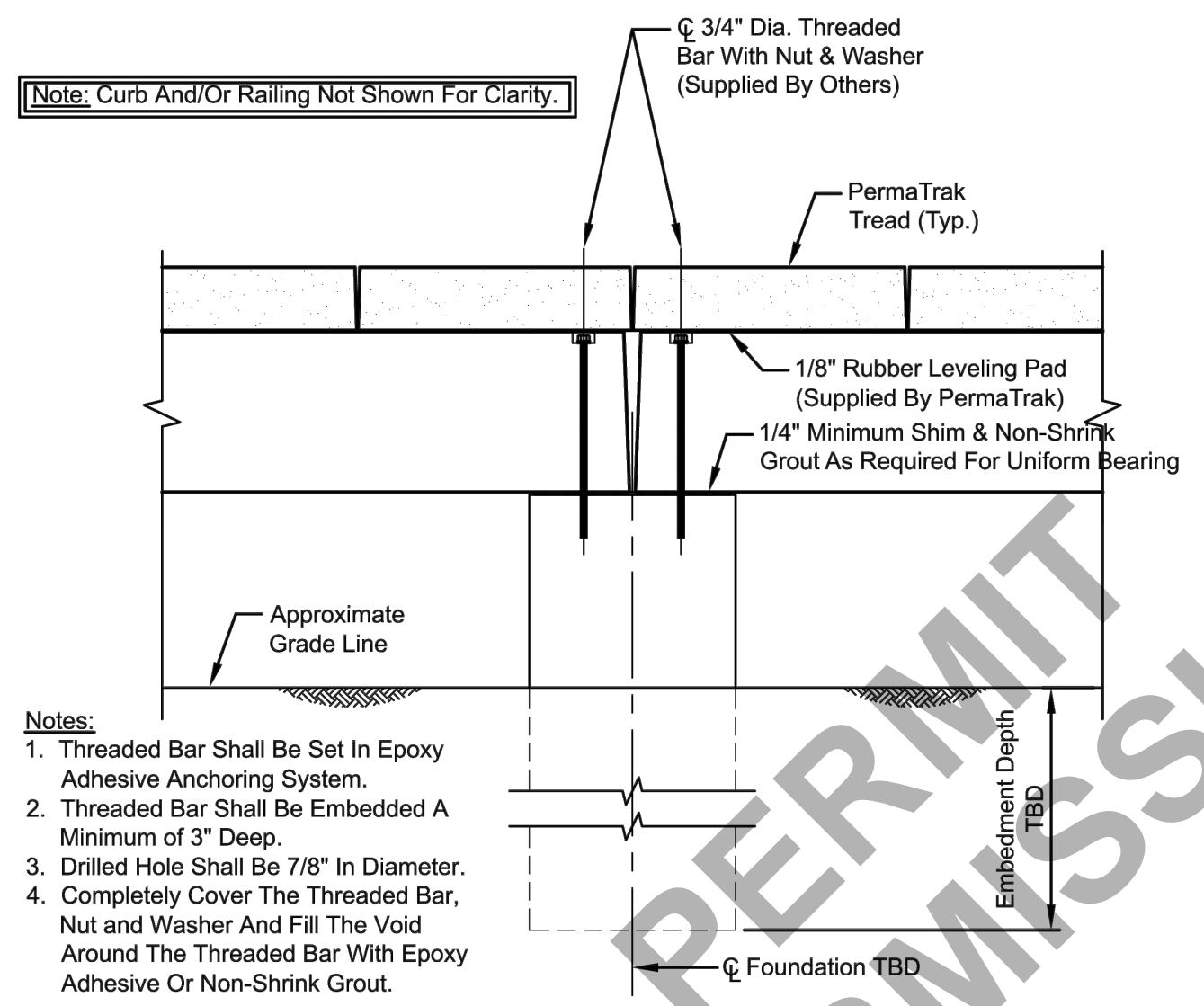
**TREAD TO BEAM/CONCRETE WALL CONNECTION**

SCALE: 1"=1'



**EXISTING STRUCTURE TIE-IN PLATFORM CONNECTION DETAIL**

SCALE: 1"=1'



**TYPICAL PIER CONNECTION DETAIL**

Scale: Not To Scale

- Notes:**
1. Threaded Bar Shall Be Set In Epoxy Adhesive Anchoring System.
  2. Threaded Bar Shall Be Embedded A Minimum of 3" Deep.
  3. Drilled Hole Shall Be 7/8" In Diameter.
  4. Completely Cover The Threaded Bar, Nut and Washer And Fill The Void Around The Threaded Bar With Epoxy Adhesive Or Non-Shrink Grout.

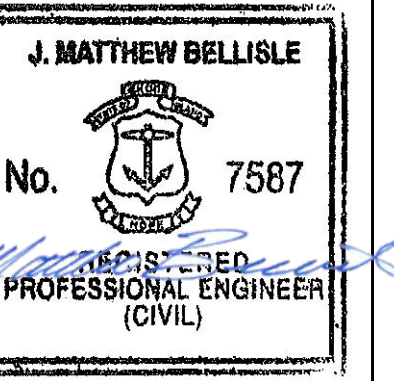


SCALE ADJUSTMENT GUIDE  
 0 1"  
 BAR IS ONE INCH ON ORIGINAL DRAWING

**ROGER WHEELER STATE BEACH BOARDWALK**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



REVISIONS:		
1	2022-9-23	WEST END ADJUSTMENTS

PROJECT NO.: 19131.00  
 DATE: DECEMBER 2021  
 SCALE: AS NOTED  
 DESIGNED BY: KAD  
 CHECKED BY: BMD  
 DRAWN BY: LMC  
 APPROVED BY: JMB

PROPOSED SECTIONS AND DETAILS

SHEET NO.: 3.1

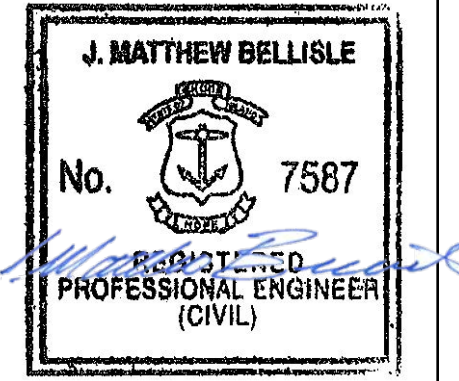
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 NOT FOR CONSTRUCTION





SCALE ADJUSTMENT GUIDE  
 0 1"  
 BAR IS ONE INCH ON ORIGINAL DRAWING

ROGER WHEELER STATE BEACH  
 BOARDWALK  
 NARRAGANSETT, RHODE ISLAND  
 RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

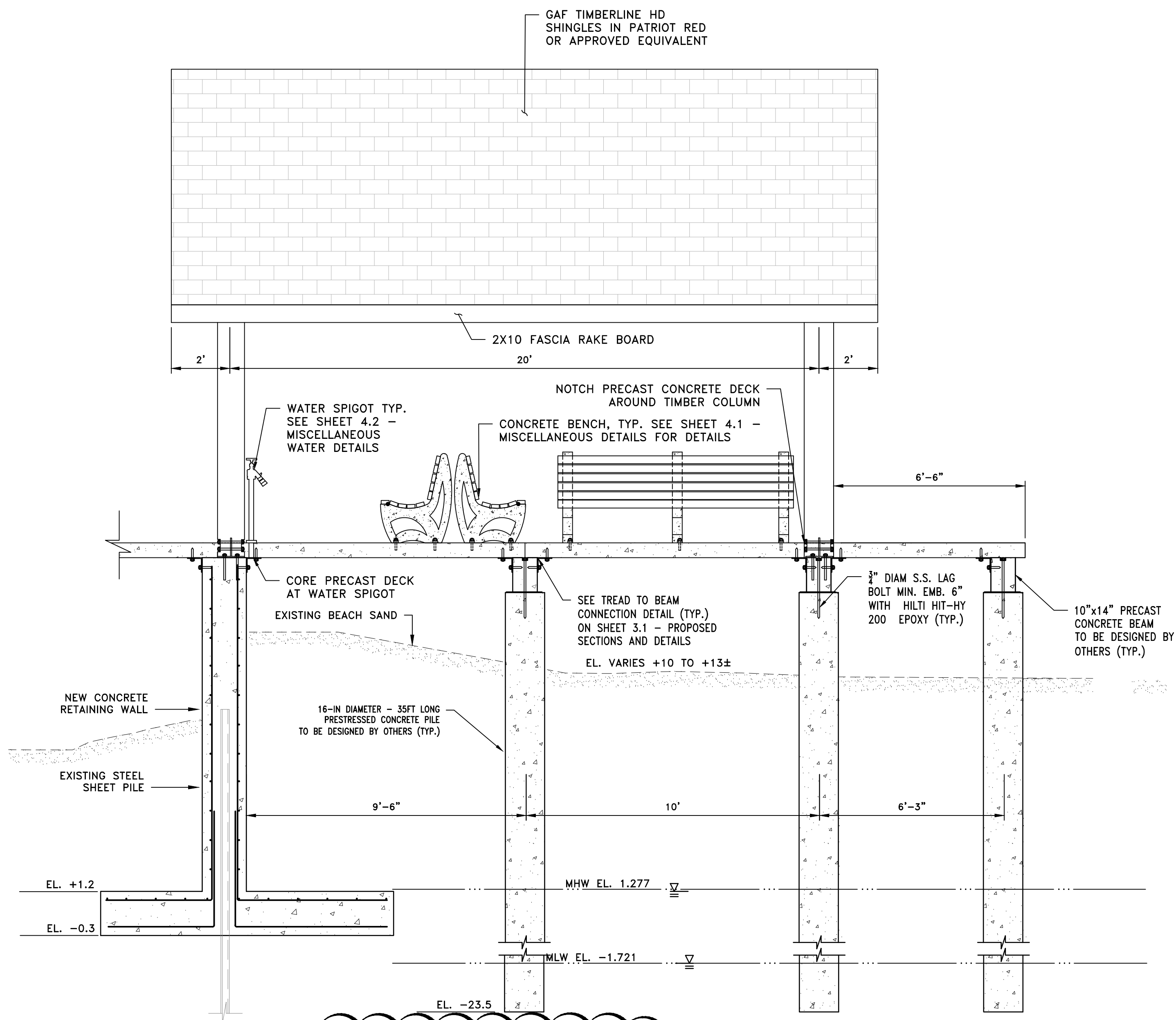


REVISIONS:		
1	2022-9-23	WEST END ADJUSTMENTS

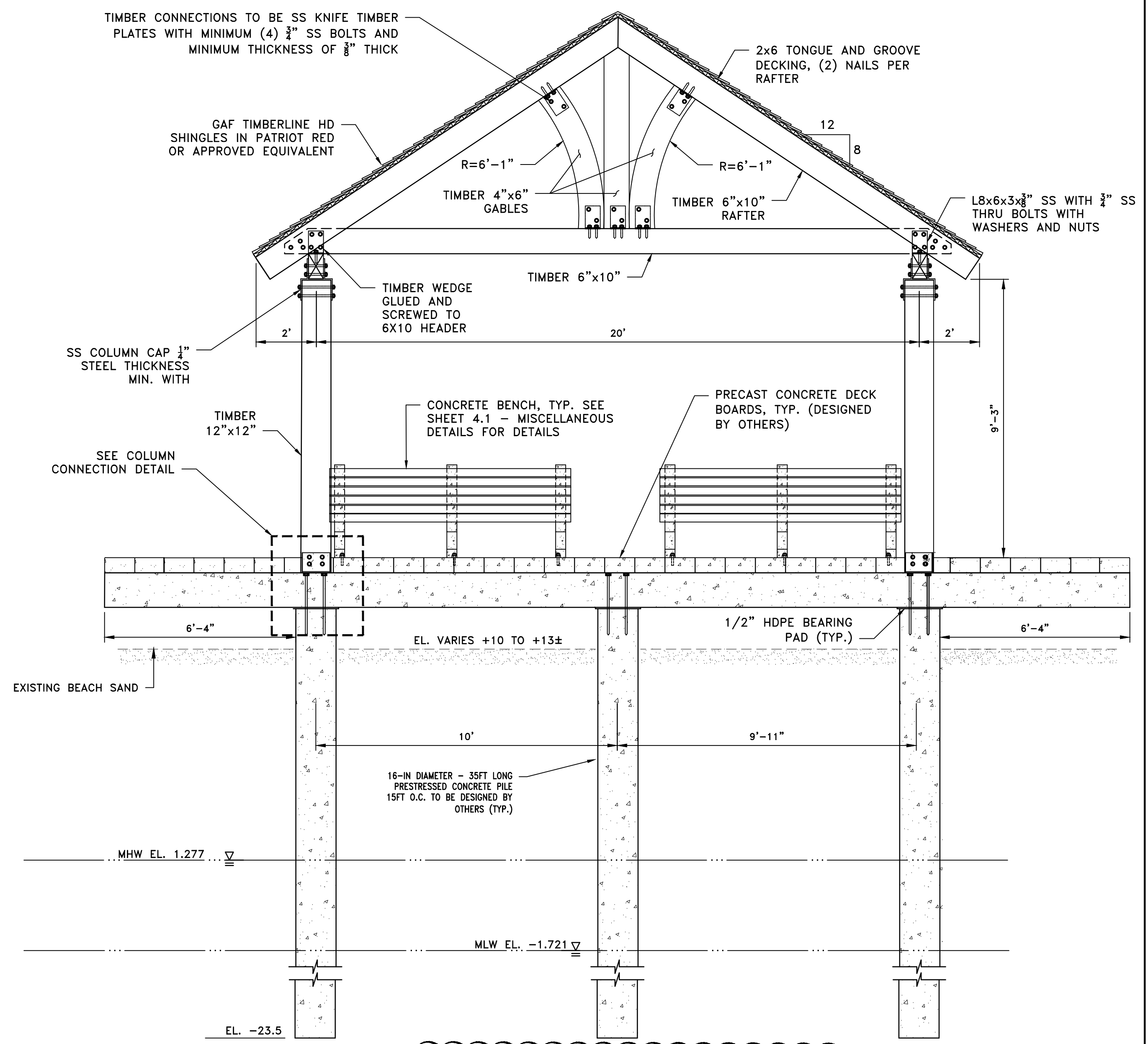
PROJECT NO.: 19131.00  
 DATE: DECEMBER 2021  
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 APPROVED BY: JMB

TIMBER SHADE STRUCTURE DETAILS

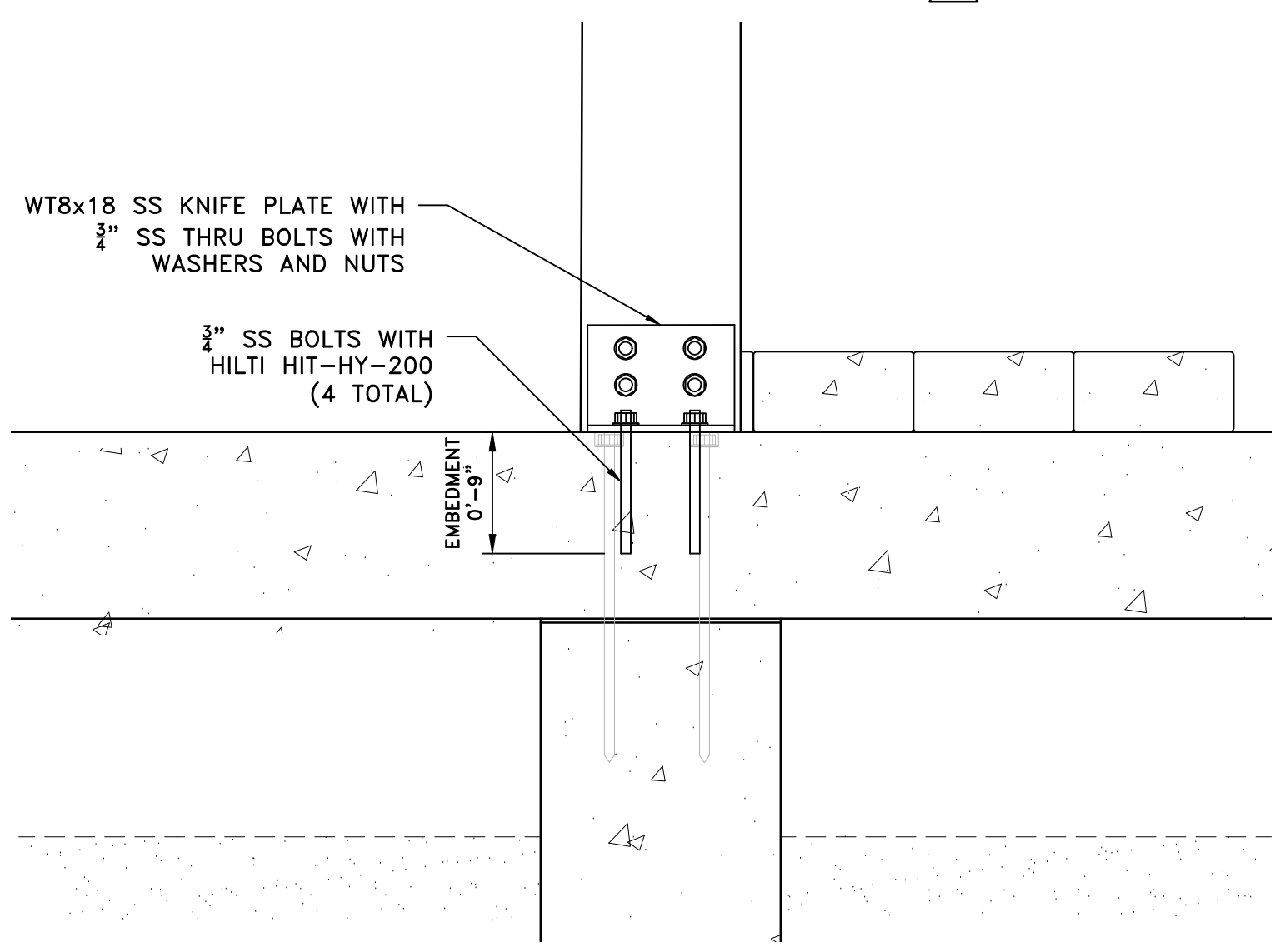
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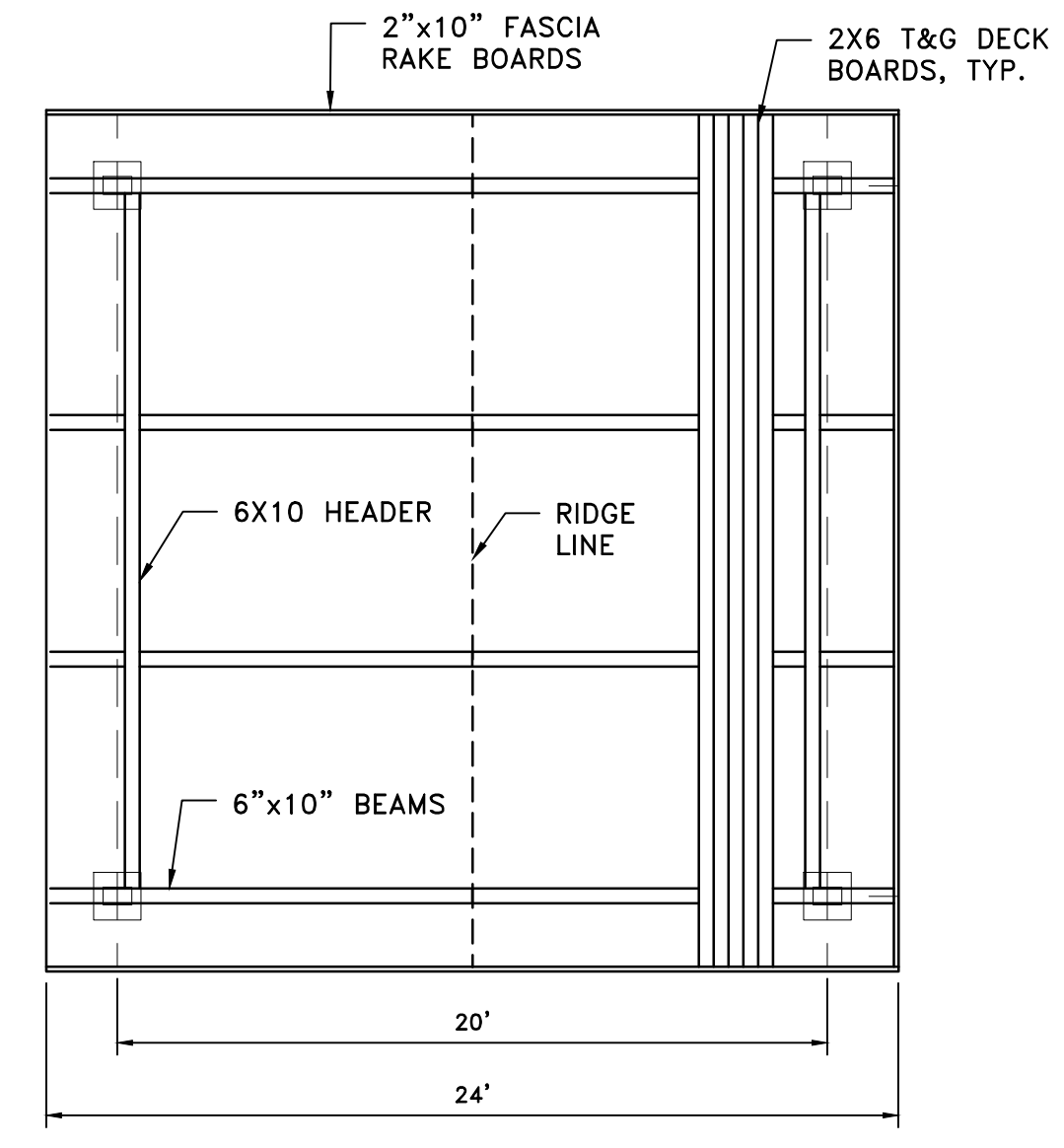
**SECTION C (2 PLACES)**  
 SCALE: 3/8"=1'-0"



**SECTION D (2 PLACES)**  
 SCALE: 3/8"=1'-0"



**COLUMN CONNECTION DETAIL**  
 SCALE: 1" = 1'-0"



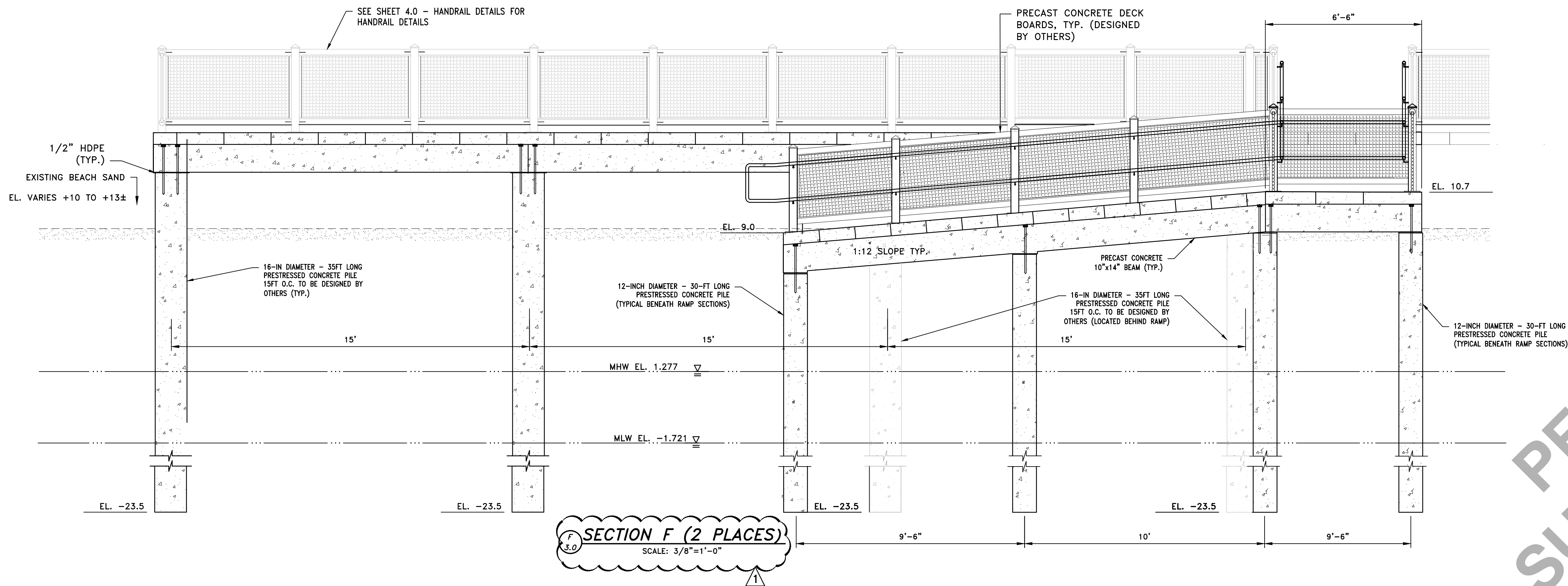
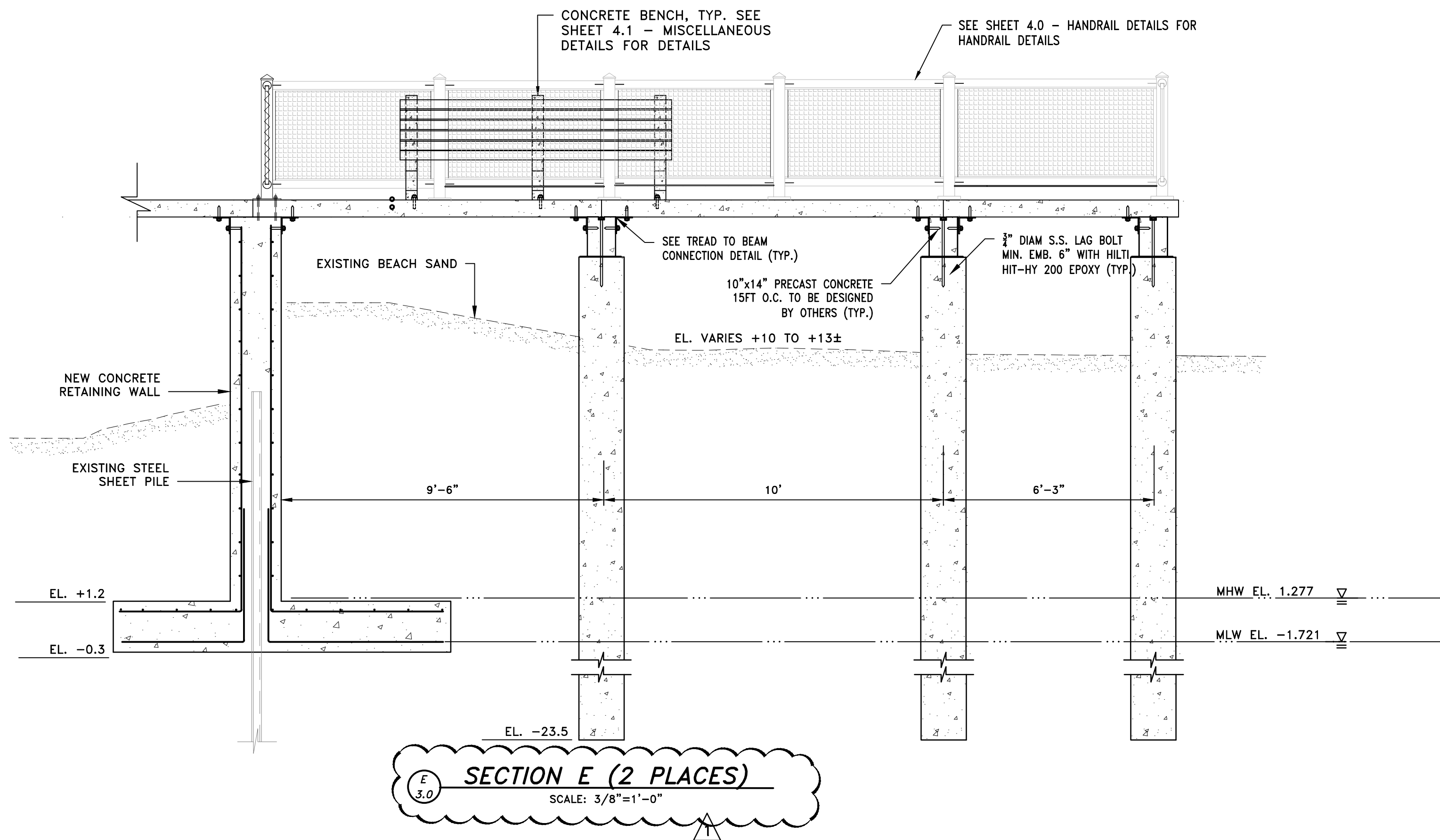
**ROOF FRAMING PLAN**  
 SCALE: 3/16" = 1'-0"

- NOTES:**
- PROPOSED RAIL AND LATTICE NOT SHOWN FOR CLARITY.
  - TIMBER MEMBERS SHALL BE STRUCTURAL NO. 1 SOUTHERN YELLOW PINE DESIGNED FOR 30 PSF LIVE LOAD AND A NET UPLIFT OF 57 PSF (ULTIMATE WIND PRESSURE). UNLESS NOTED AS "SERVICE LOAD" ON THESE PLANS, DESIGN WIND LOADS ARE IN ACCORDANCE WITH ASCE 7-16 AND SHALL BE FACTORED AS REQUIRED FOR ASD OR STRENGTH DESIGN METHODS.

PERMIT SUBMISSION

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SCALE ADJUSTMENT GUIDE  
0" 1"  
BAR IS ONE INCH ON ORIGINAL DRAWING

ROGER WHEELER STATE BEACH  
BOARDWALK

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**J. MATTHEW BELLISLE**  
No. 7587  
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

REVISIONS:		
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PROJECT NO.: 19131.00  
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DRAWN BY: LMC  
APPROVED BY: JMB

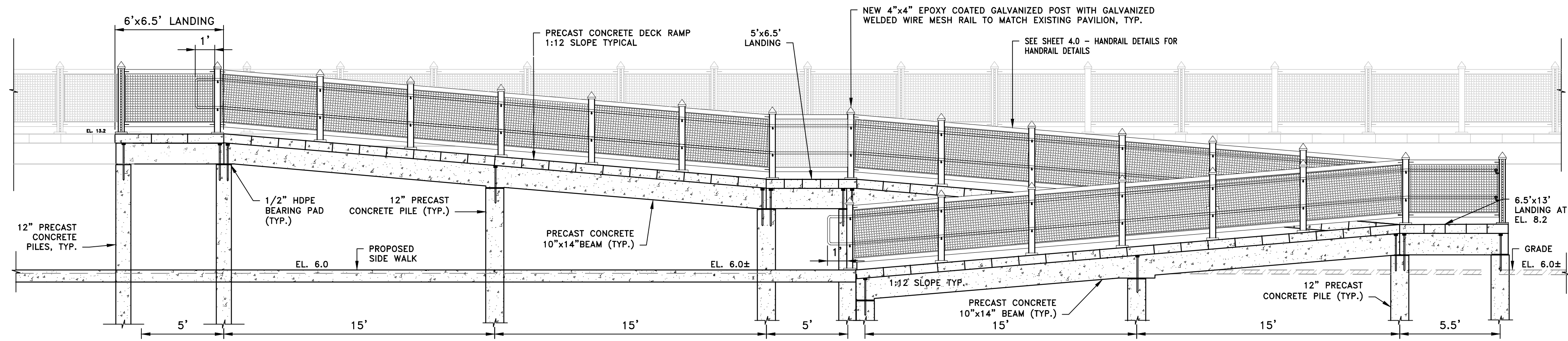
VIEWING PLATFORM SECTIONS

SHEET NO.: 3.3

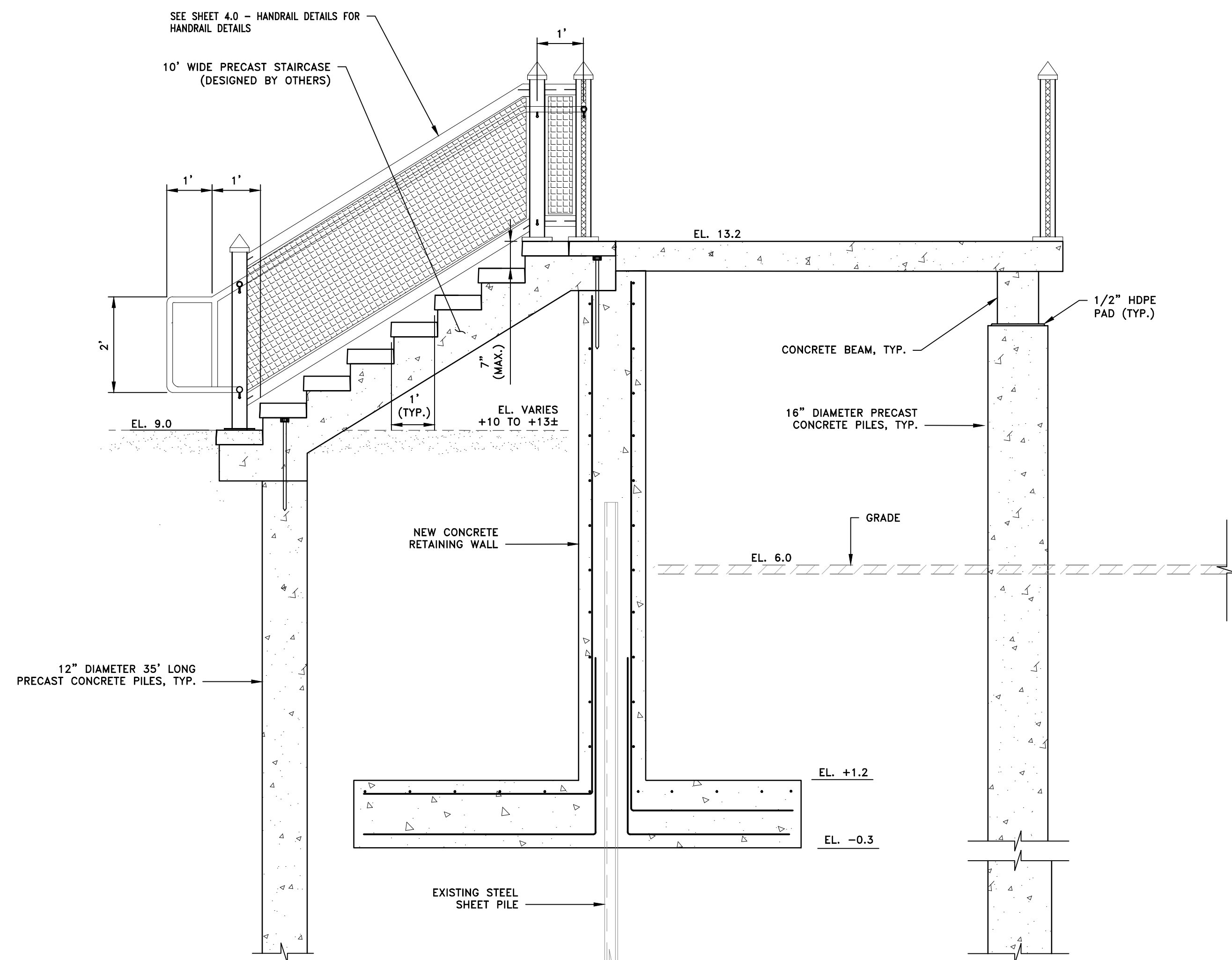
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90% DESIGN SUBMISSION  
NOT FOR CONSTRUCTION

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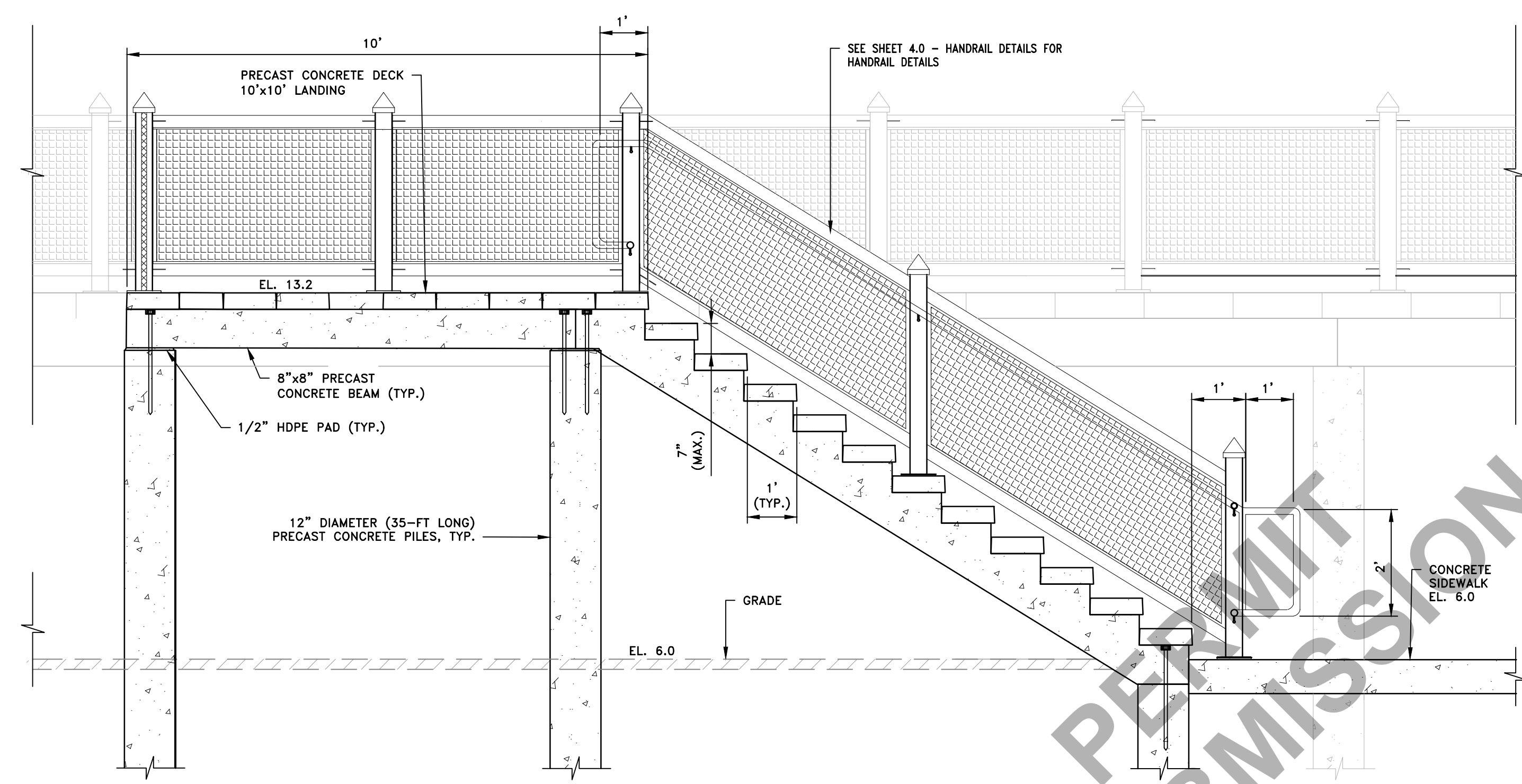




**SECTION VIEW RAMPS (TYP. 2 PLACES)**  
SCALE: 1"=4'



**SEAWARD STAIR SECTION (TYP 6 PLACES)**  
SCALE: 1"=2'



**LANDWARD STAIR SECTION (TYP 6 PLACES)**  
SCALE: 1"=2'



SCALE ADJUSTMENT GUIDE  
0" 1"  
BAR IS ONE INCH ON ORIGINAL DRAWING

**ROGER WHEELER STATE BEACH  
BOARDWALK**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**J. MATTHEW BELLISLE**  
No. 7587  
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

REVISIONS:

1	2022-9-23	WEST END ADJUSTMENTS
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PROJECT NO.:	19131.00
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SCALE:	AS NOTED
DESIGNED BY:	KAD
CHECKED BY:	BMD
DRAWN BY:	LMC
APPROVED BY:	JMB

STAIRS AND RAMP DETAILS

SHEET NO.: **3.4**

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**PARE CORPORATION**  
 ENGINEERS - SCIENTISTS - PLANNERS  
 10 LINCOLN ROAD, SUITE 210  
 FOXBORO, MA 02035  
 508-543-1735



SCALE ADJUSTMENT GUIDE  
 0" 1"  
 BAR IS ONE INCH ON ORIGINAL DRAWING

ROGER WHEELER STATE BEACH  
 BOARDWALK

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

J. MATTHEW BELLISLE

No. 7587

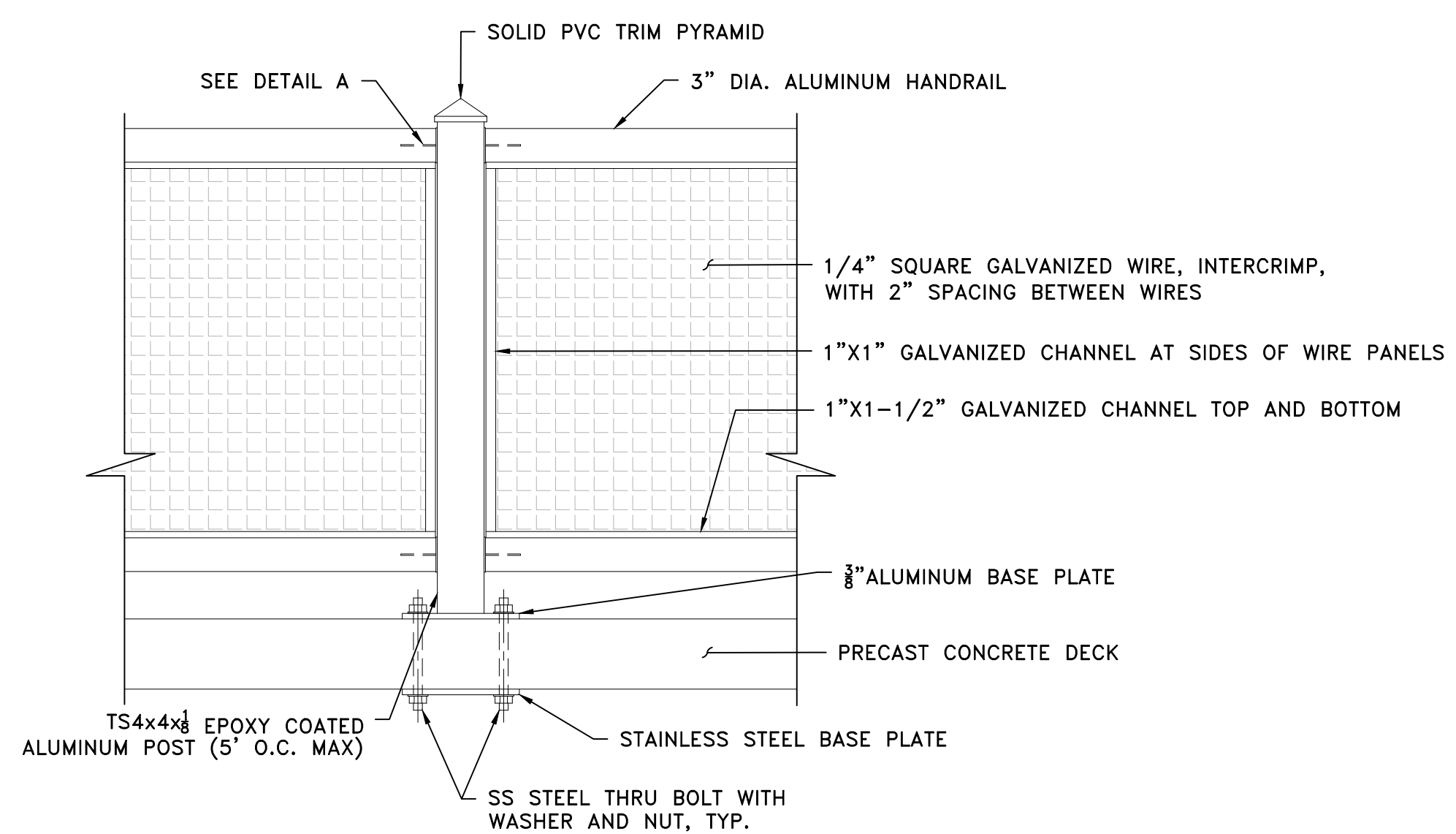
REGISTERED  
 PROFESSIONAL ENGINEER  
 (CIVIL)

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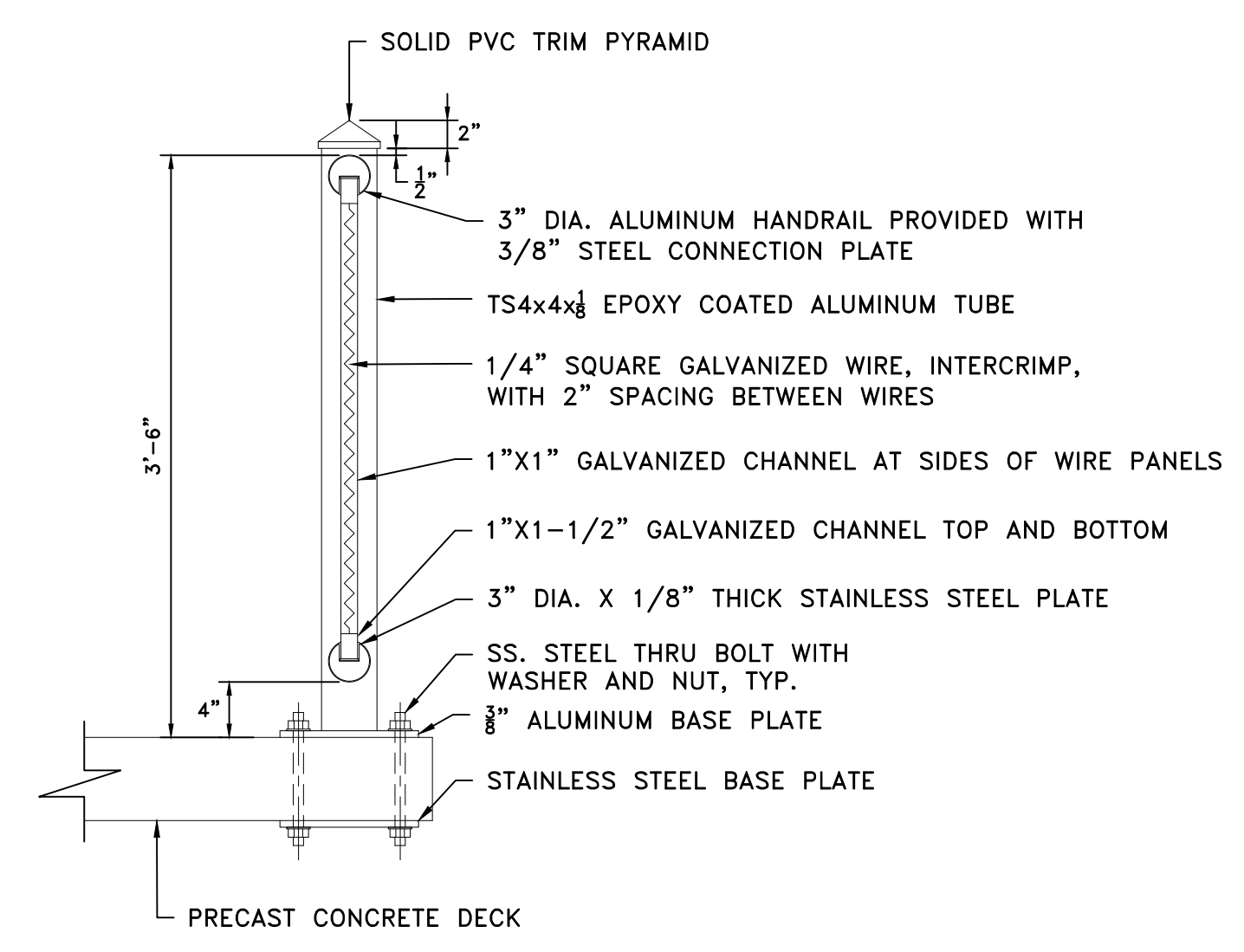
HANDRAIL  
 DETAILS

SHEET NO.: 4.0

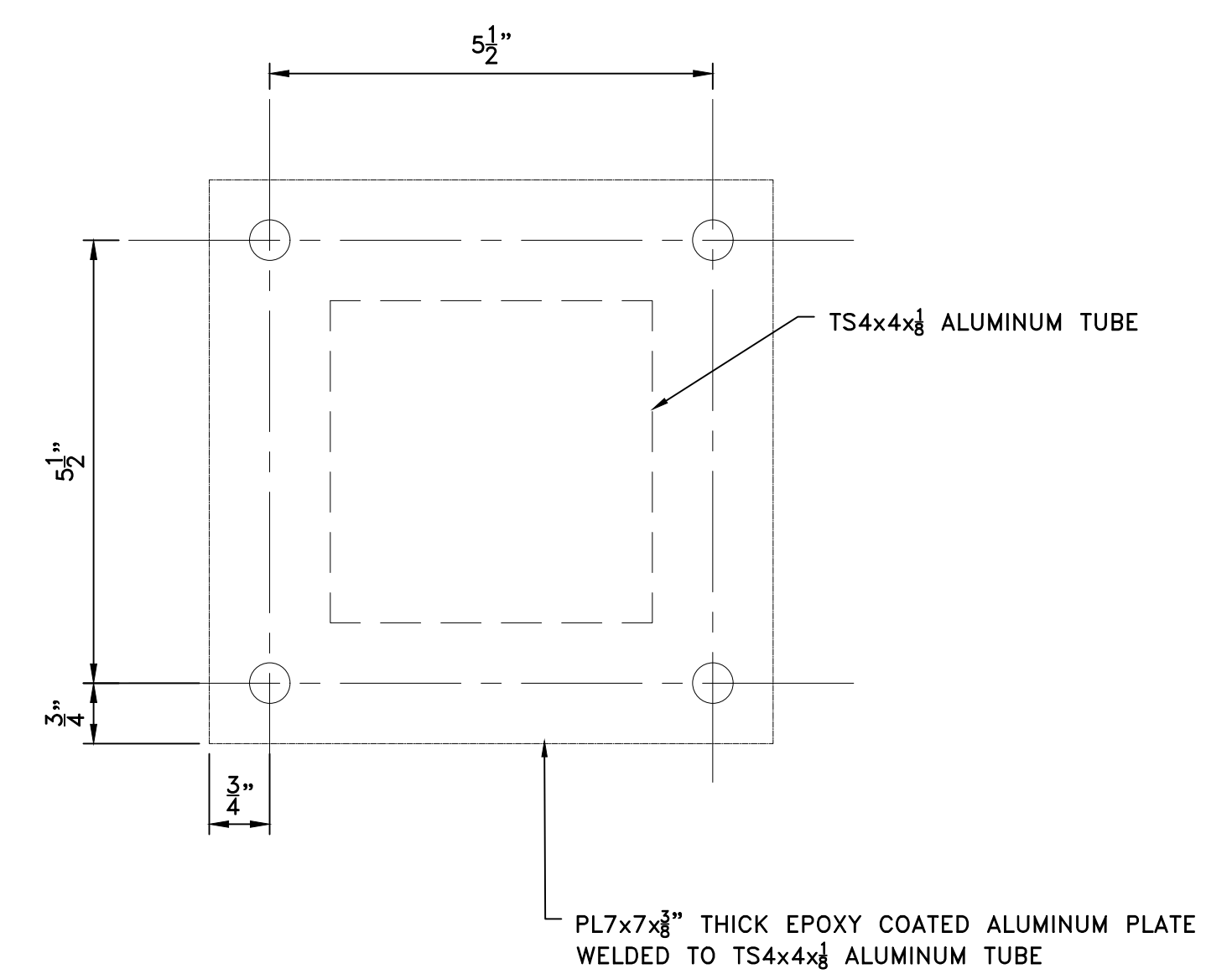


**NOTE:**  
 RAIL COLUMNS SHALL BE SPACED 5' O.C., MAX.

**ALUMINUM RAIL ELEVATION DETAIL**  
 SCALE: 1"=1'-0"

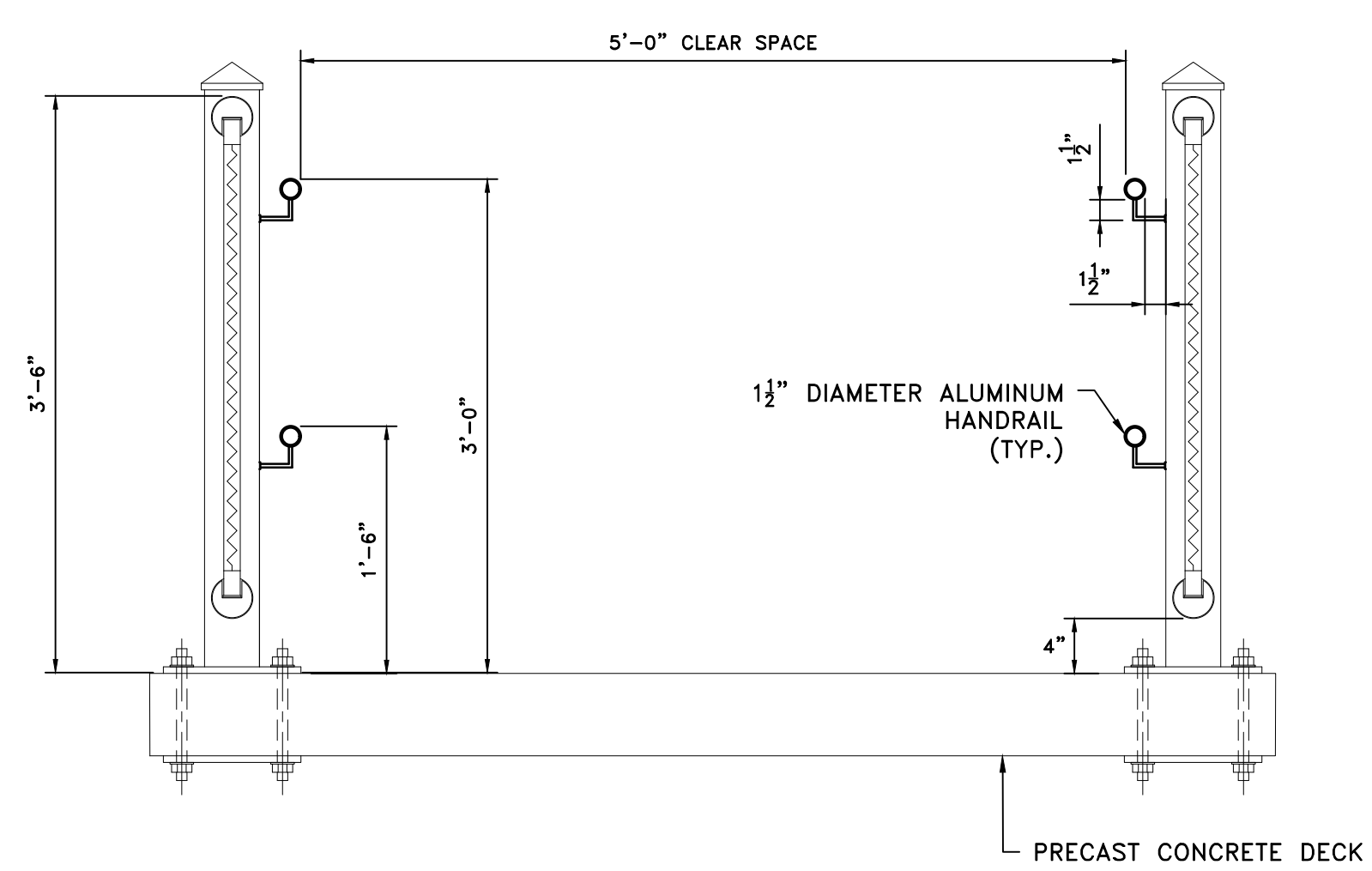


**RAIL SECTION DETAIL**  
 SCALE: 1"=1'-0"



**NOTE:**  
 ANGLE OF PLATE TO CONFORM TO ANGLE OF RAILS.

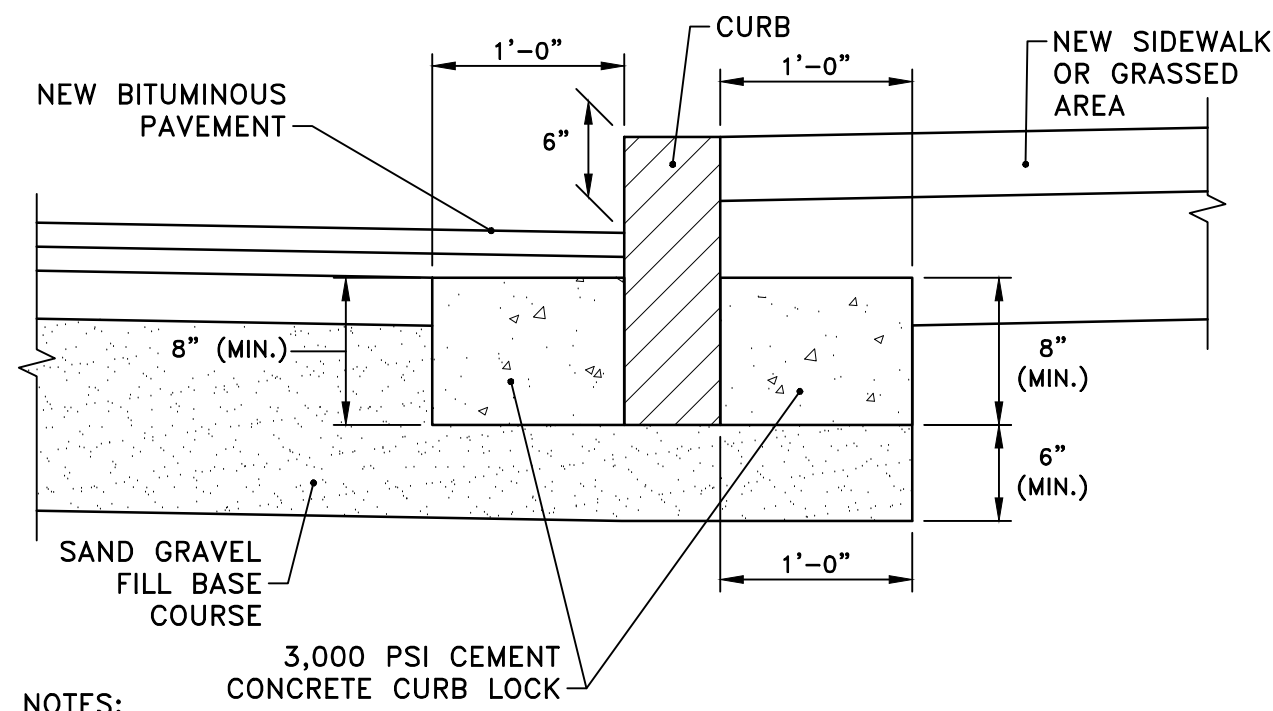
**DETAIL A**  
 SCALE: 6"=1'



**TYPICAL HANDRAIL DETAIL**  
 SCALE: 1"=1'-0"

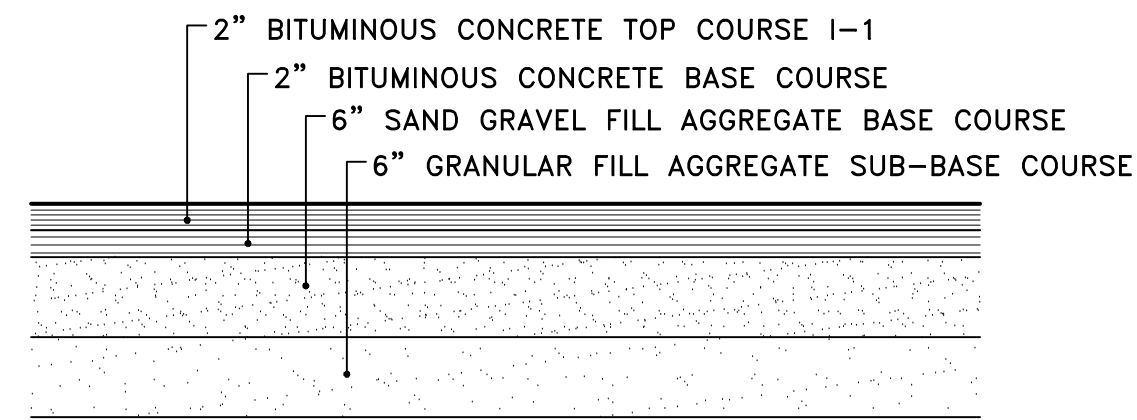
PERMIT  
 SUBMISSION

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 NOT FOR CONSTRUCTION



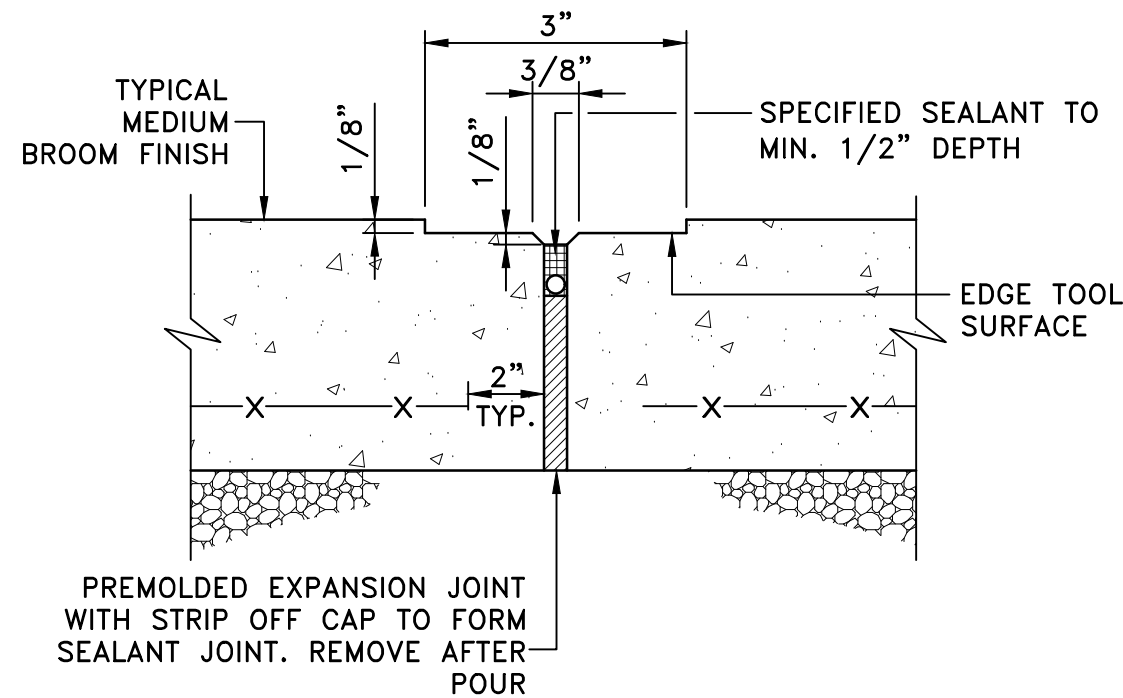
- NOTES:**
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
  2. PROVIDE CEMENT CONCRETE CURB LOCK ON ALL CURBS

**CURB SETTING DETAIL**  
NOT TO SCALE



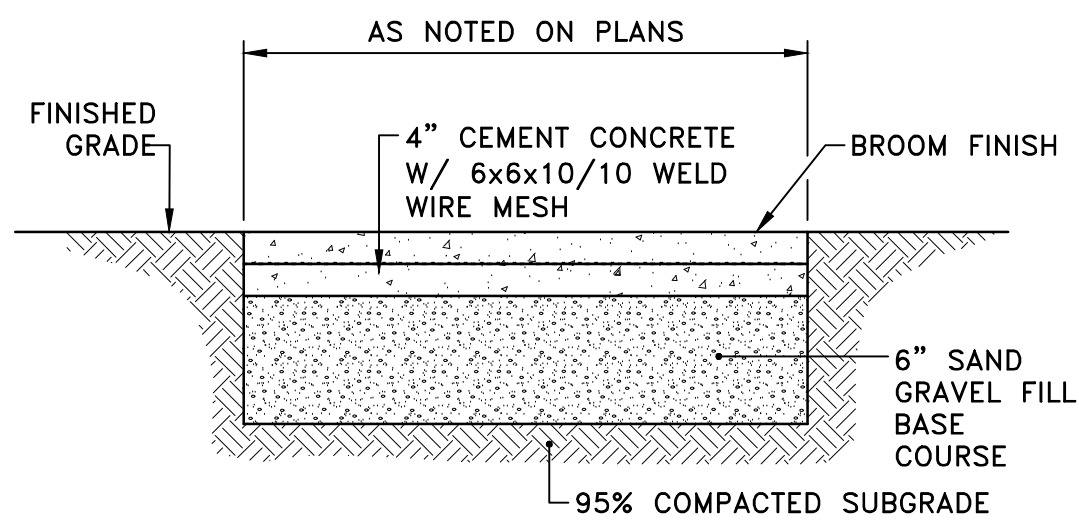
- NOTES:**
1. ASPHALT EMULSION TACK COAT IS TO BE APPLIED BETWEEN BITUMINOUS LAYERS

**PAVEMENT DETAIL**  
NOT TO SCALE



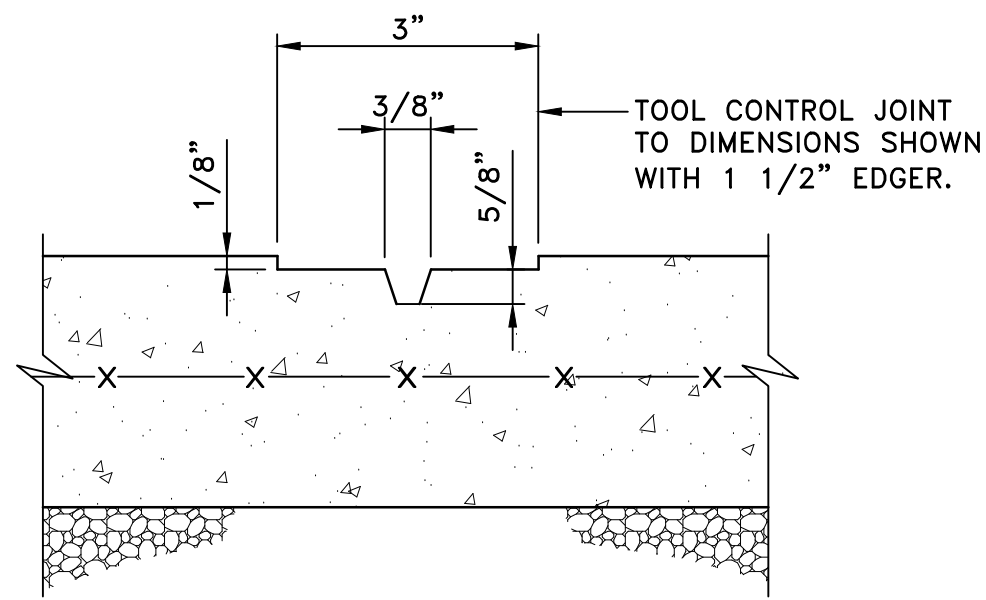
**EXPANSION JOINT AT 20' O.C. (TYP)**

- NOTES:**
1. EXPANSION JOINTS (E.J.) 20 FEET O.C. UNLESS OTHERWISE NOTED.
  2. CONTROL JOINTS (C.J.) 5 FEET O.C. UNLESS OTHERWISE NOTED.
  3. WHERE EXISTING AND NEW CONCRETE SIDEWALKS MEET, SAWCUT EXISTING WALK AND INSTALL EXPANSION JOINT AND DOWELS AS SHOWN. DRILL EXISTING CONCRETE WALK EDGE TO RECEIVE STEEL DOWELS AT EXPANSION JOINT.
  4. REFER TO LANDSCAPE PLANS FOR LOCATIONS.

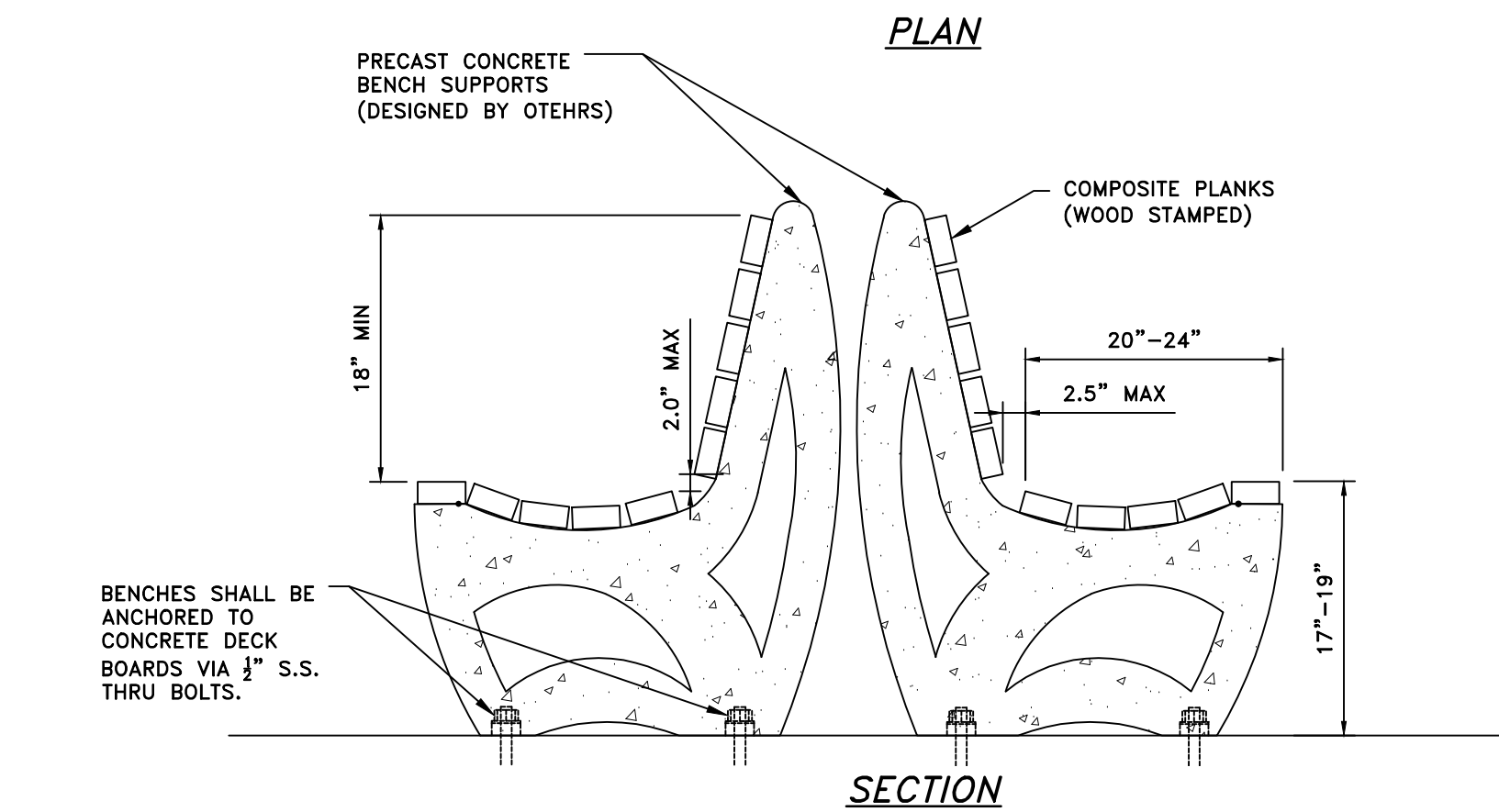
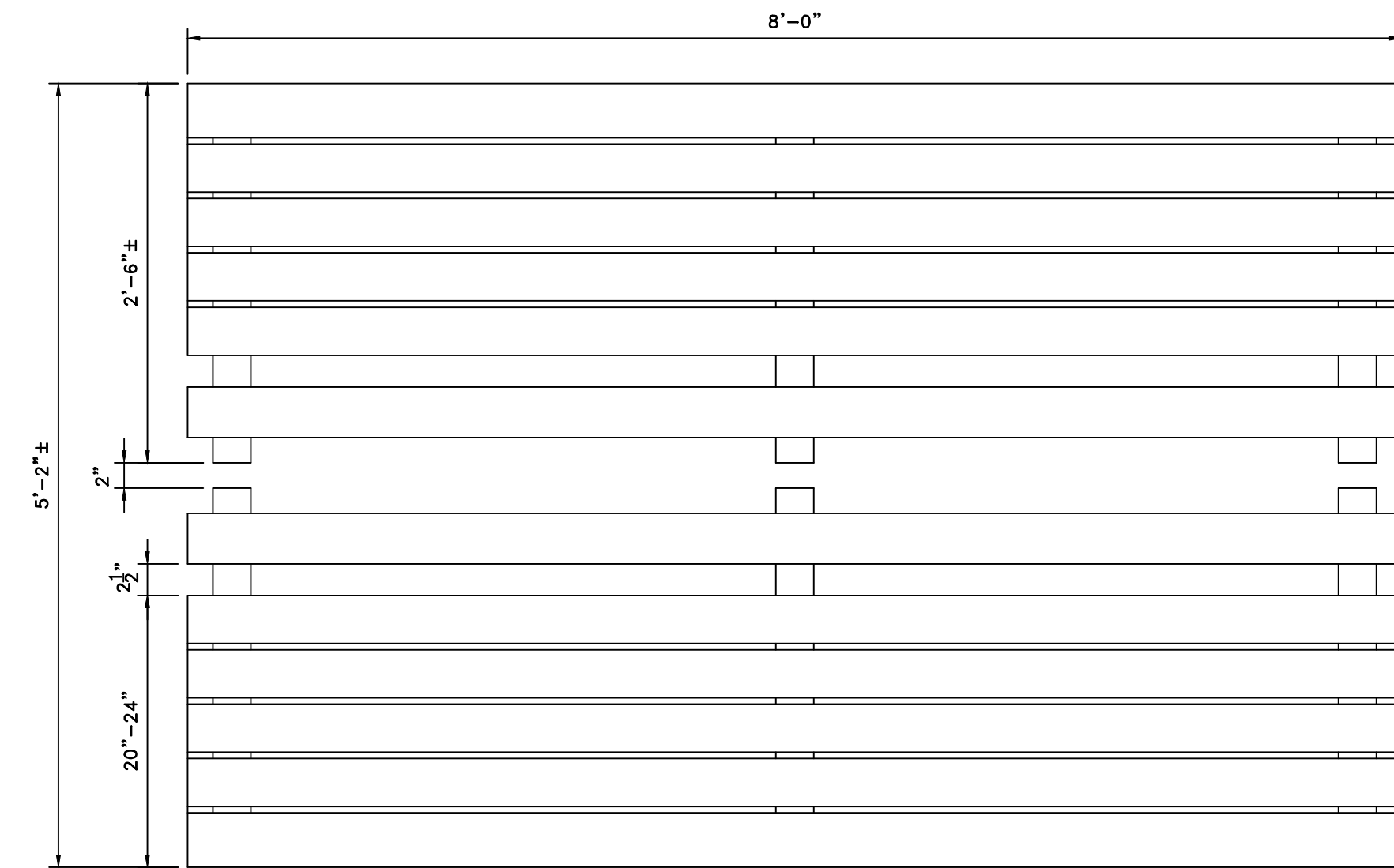


- NOTES:**
1. CONCRETE SIDEWALK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 905 OF THE RI STANDARD SPECIFICATIONS.
  2. WIRE MESH SHALL BE IN ACCORDANCE WITH SECTION M.05.02 OF THE RI STANDARD SPECIFICATIONS.

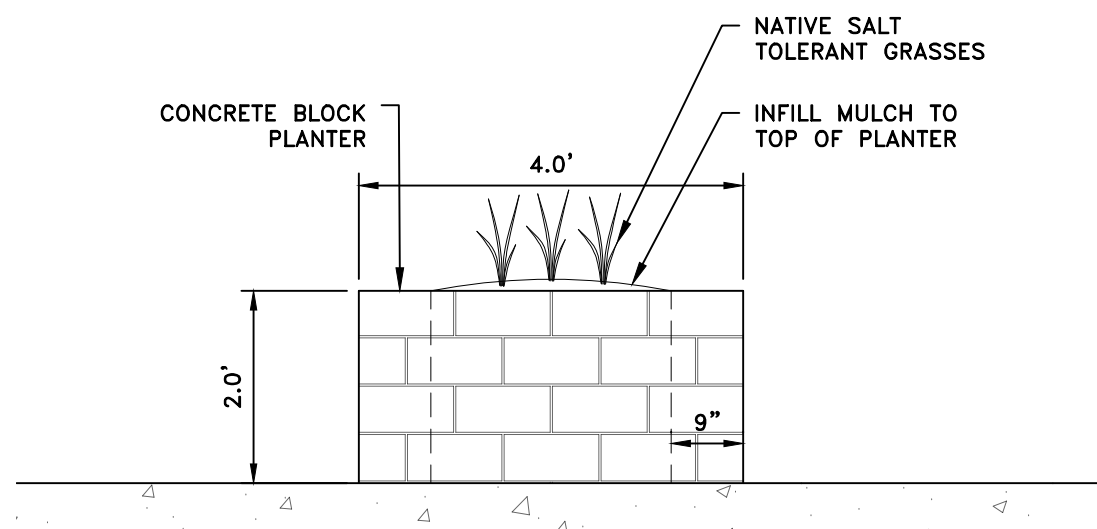
**TYPICAL CEMENT CONCRETE SIDEWALK**  
NOT TO SCALE



**CONTROL JOINT AT 5' O.C. (TYP)**



**CONCRETE BENCH DETAIL**  
SCALE: 1"=1'



**PLANTER DETAIL**  
SCALE: 1"=2'

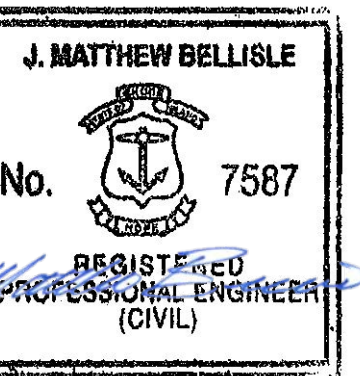


SCALE ADJUSTMENT GUIDE  
0 1'  
BAR IS ONE INCH ON ORIGINAL DRAWING

ROGER WHEELER STATE BEACH  
BOARDWALK

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



REVISIONS:		
1	2022-9-23	WEST END ADJUSTMENTS

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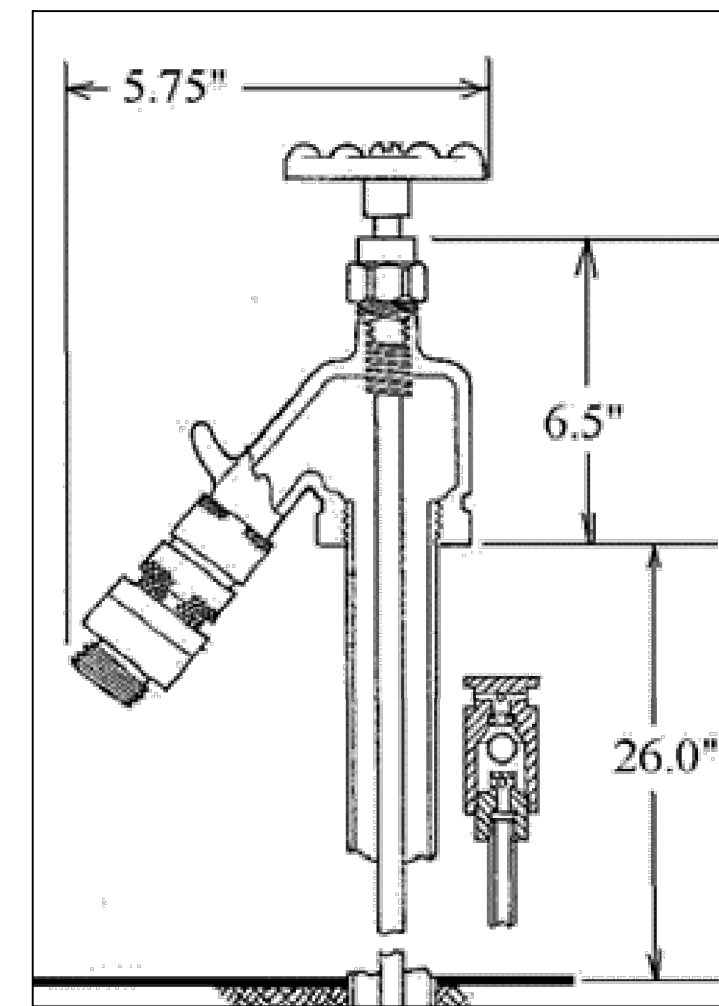
MISCELLANEOUS DETAILS

SHEET NO.: 4.1

PERMIT SUBMISSION

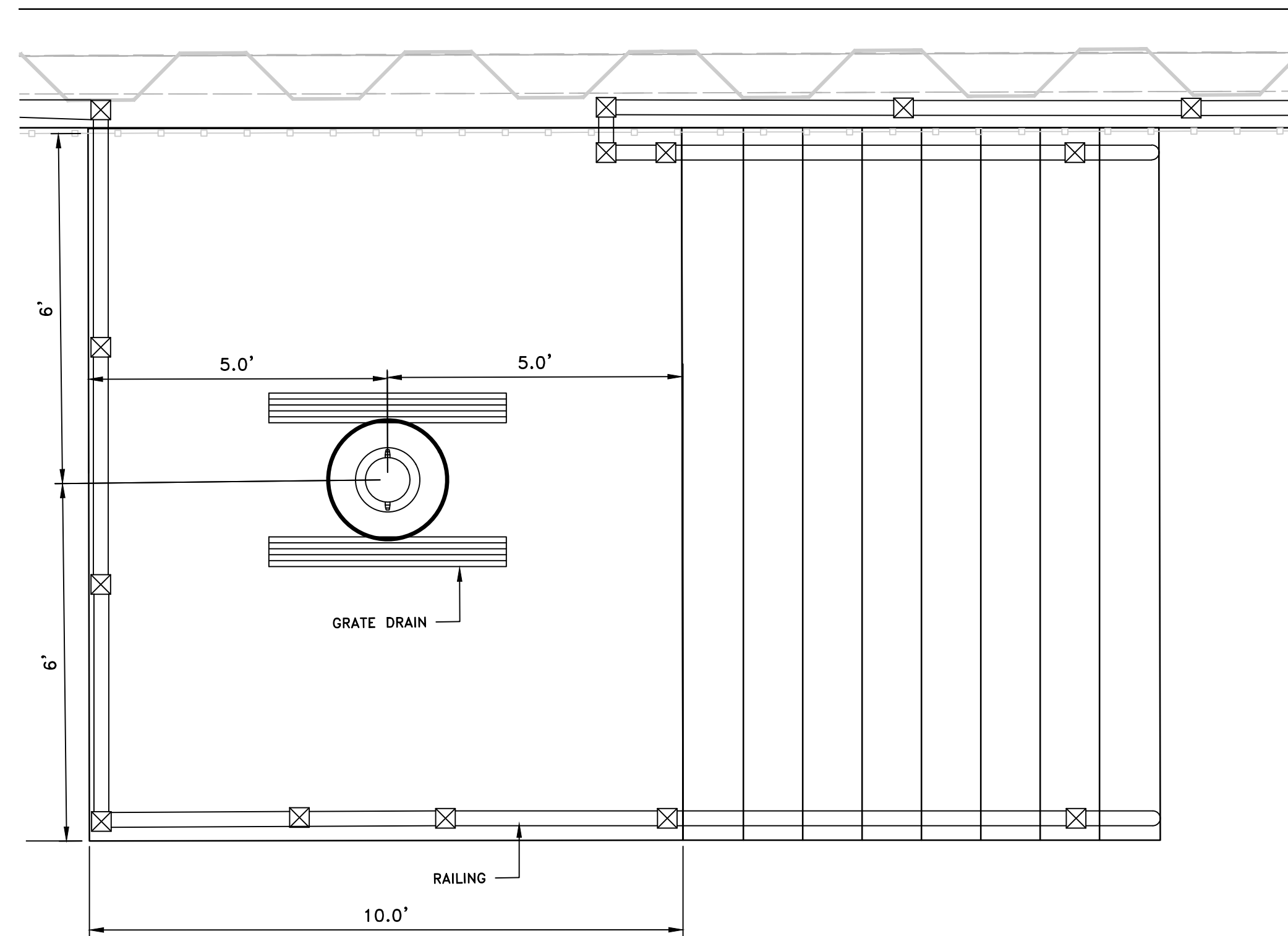
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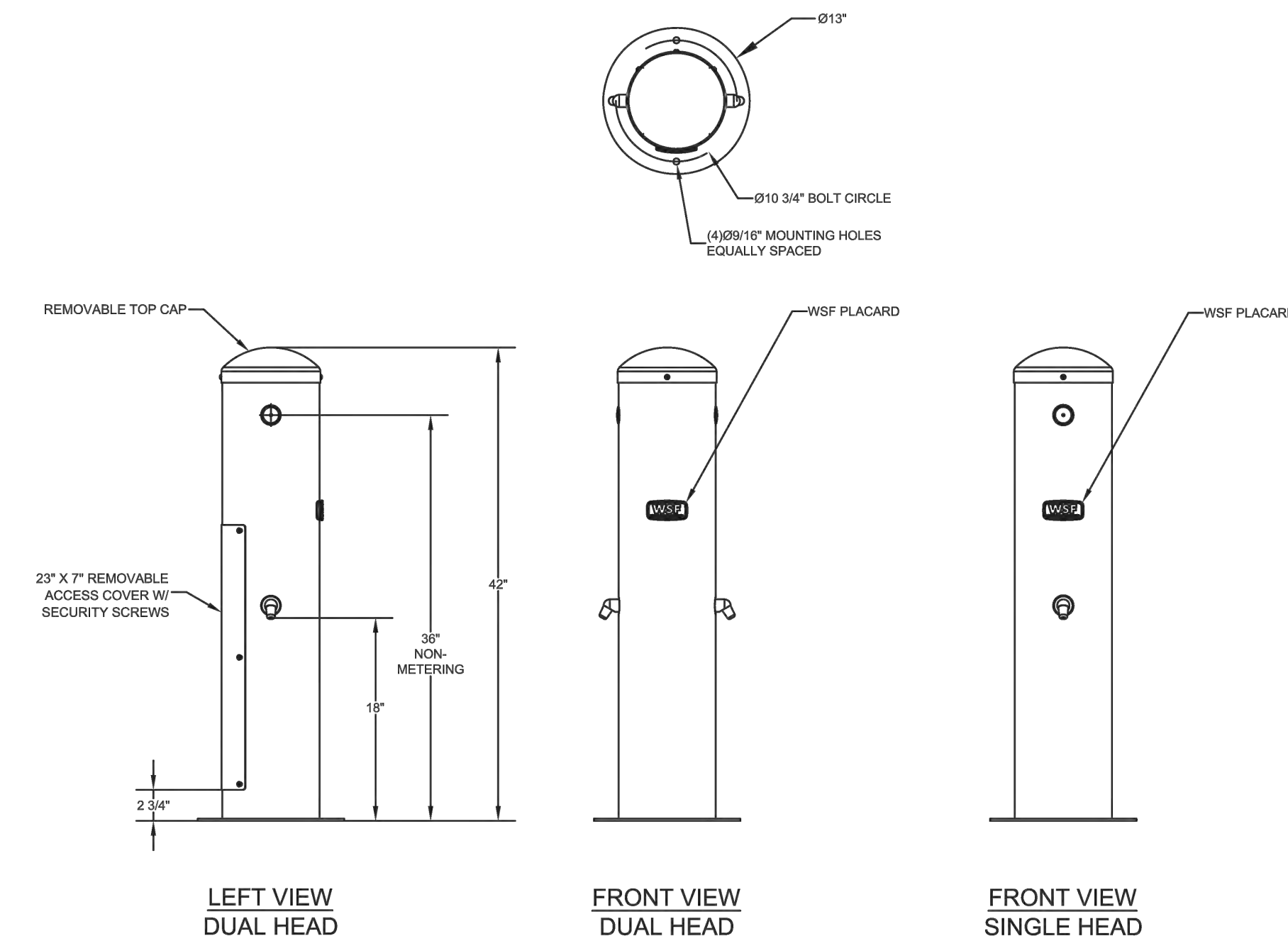


**WATER SPIGOT DETAIL**  
NOT TO SCALE

NOTE:  
HOSE BIB SHALL BE EQUIPPED WITH WATER FAUCET LOCK.

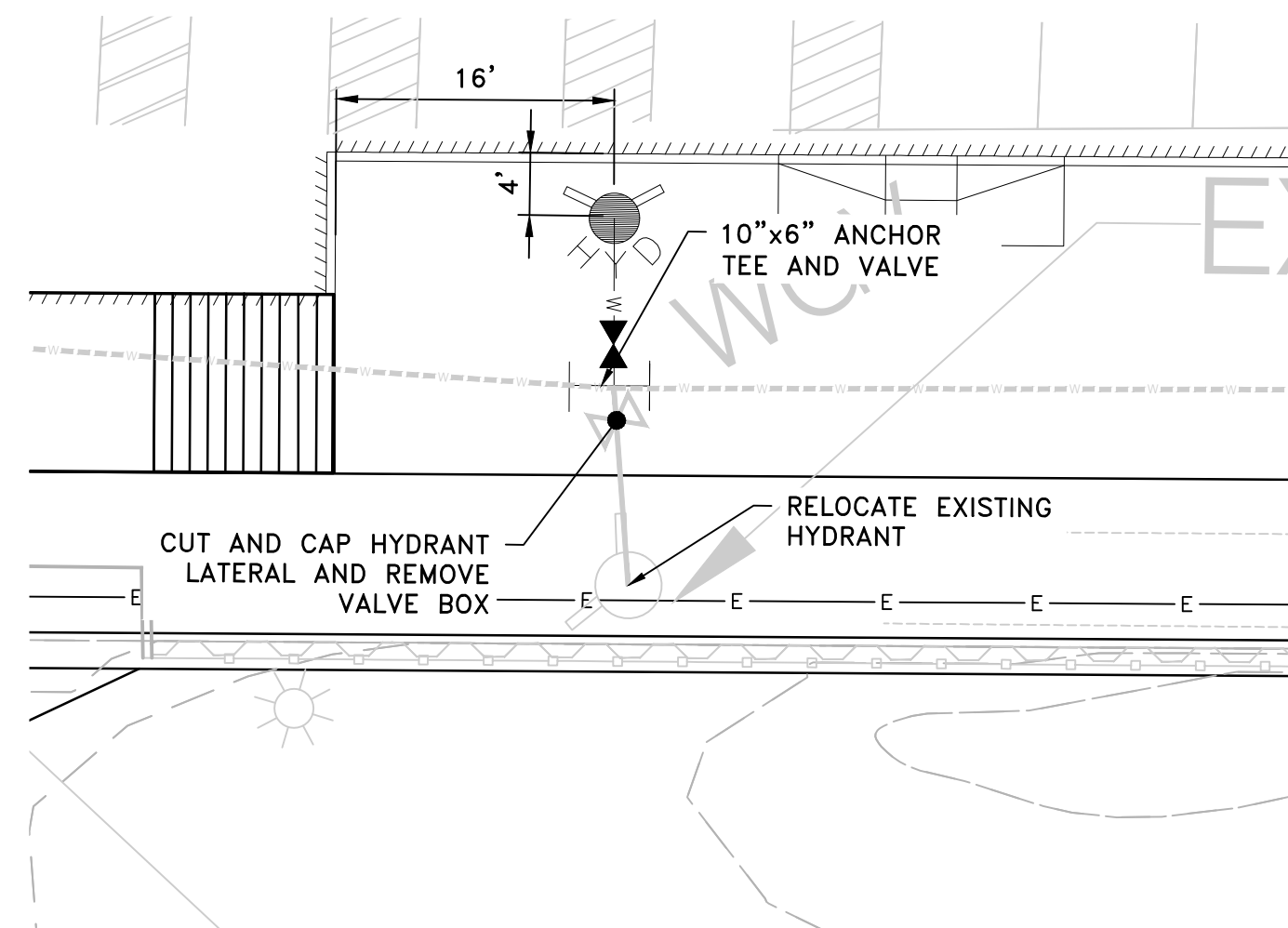


**FOOT WASHING STATION PLAN**  
SCALE: 1"=10'

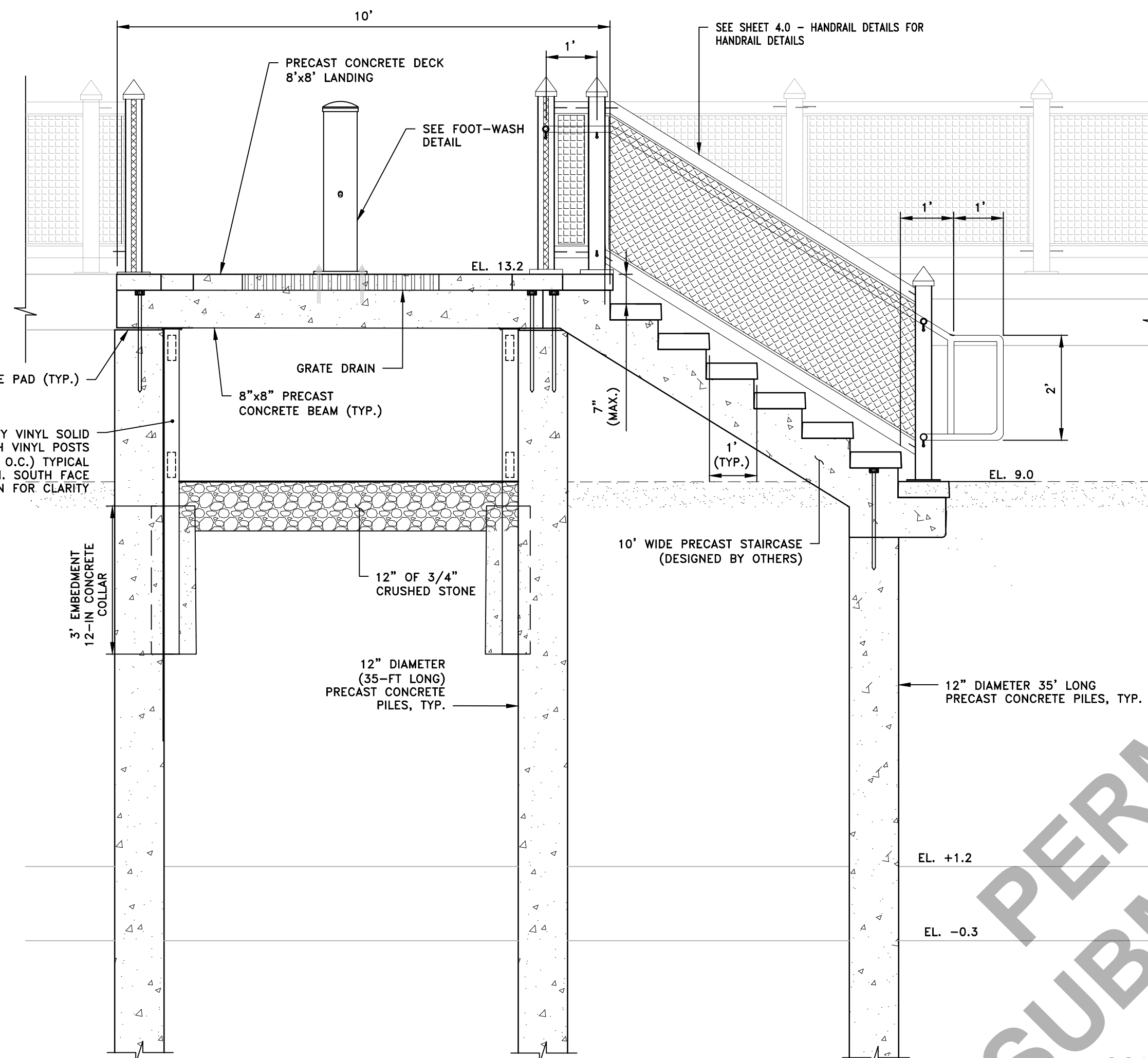


**FOOT WASHING CONNECTION DETAIL**  
NOT TO SCALE

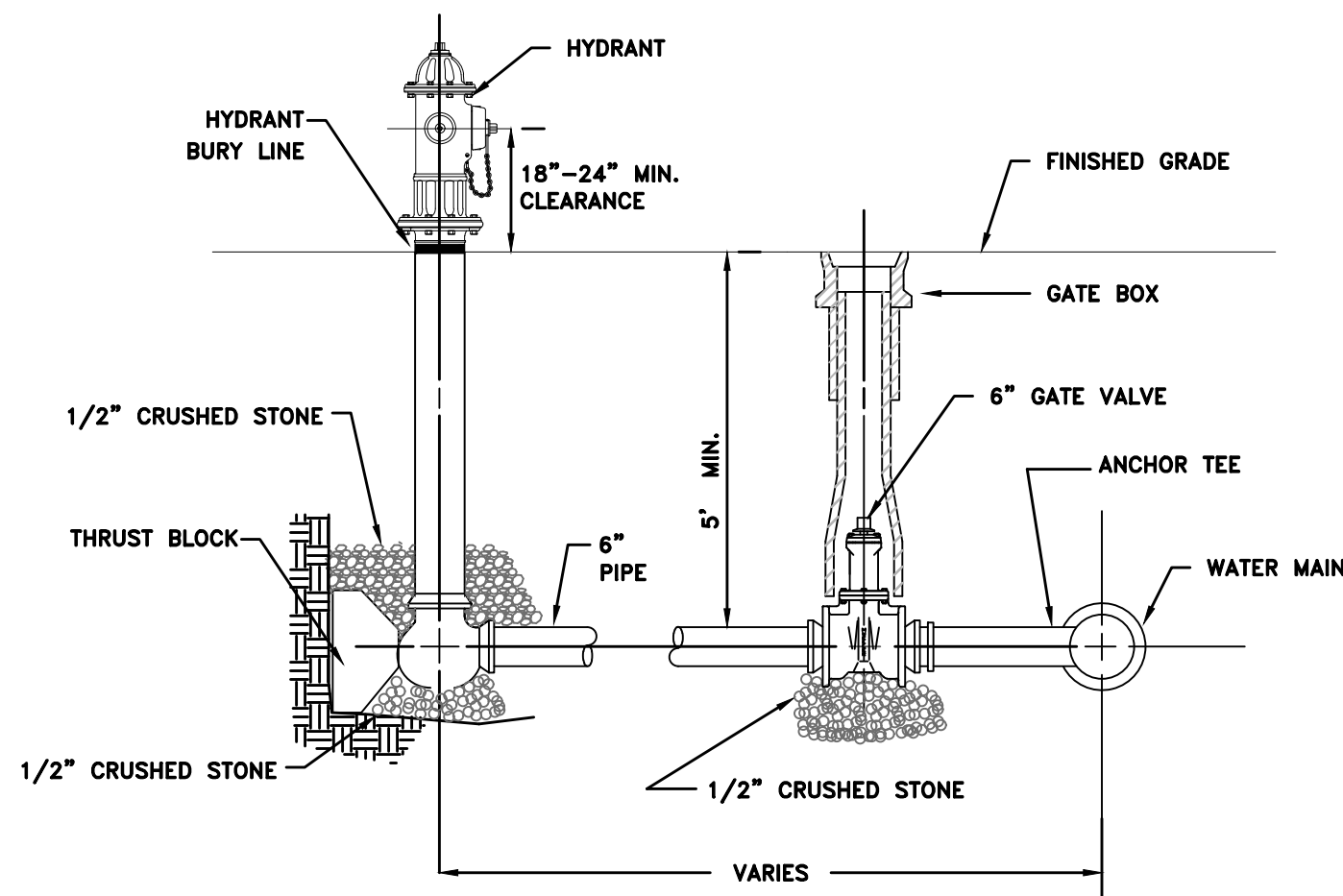
NOTE:  
1. FOOT WASH STATION SHALL BE WILLOUGHBY WODFS SERIES STAINLESS STEEL OUTDOOR FOOT SHOWER OR PRE-APPROVED EQUIVALENT.



**HYDRANT RELOCATION PLAN**  
SCALE: 1"=10'



**FOOT WASHING STATION DETAIL**  
SCALE: 1"=2'-0"



**HYDRANT ASSEMBLY DETAIL**  
NOT TO SCALE

NOTES:  
1. ALL HYDRANT, VALVE, AND TEE JOINTS TO BE RESTRAINED MECHANICAL JOINTS.  
2. DEPTH OF HYDRANT BURY SHALL SUIT INSTALLED DEPTH OF COVER OVER WATER MAIN. INSTALL RISERS AS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.  
3. 6" PIPE MATERIAL TO MATCH WATER MAIN MATERIAL.

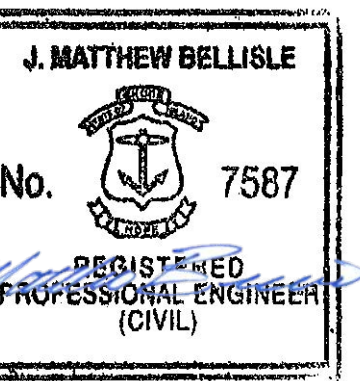


SCALE ADJUSTMENT GUIDE  
0 1'  
BAR IS ONE INCH ON ORIGINAL DRAWING

**ROGER WHEELER STATE BEACH BOARDWALK**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



REVISIONS:

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APPROVED BY: JMB

MISCELLANEOUS WATER DETAILS

SHEET NO.: 4.2

PERMIT SUBMISSION

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NOT FOR CONSTRUCTION

THE STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Business Regulation

**BUILDING CODE COMMISSION**

560 Jefferson Blvd., Warwick, Rhode Island 02886



November 28, 2023

**Project Approval Letter**

**RISBC Project  
Number and Name**

4912 DEM Roger Wheeler State Beach- Renovation of  
beach facility 2021

**DESIGNER**

Name: J. M BELLISLE

Company: PARE CORPORATION

Address: 1070 TEN ROD RD EXETER RI 02822

**DESCRIPTION**

Renovation of Roger Wheeler Beach facility through the  
installation of a new bulkhead, boardwalk, and shade  
structures.

**AGENCY**

Agency Contact Name: David DeCost

Agency/Department Name: Ri Department of  
Environmental Management

Agency Address: 235 Promenade Street; Providence,  
Rhode Island 02908

Dear Sirs/Madams:

Plans and Specifications submitted for the above-referenced project have been reviewed and approved. Please be advised that permits will be issued upon application and payment of fees by the select Contractor.

The approval letter does not constitute permission to proceed to reproduce documents required by the agency or purchasing division for bidding purposes. Such authorization can only be granted by the User Agency or Department, who you should contact for authorization to proceed.

The User, Department, or Agency, is advised by copy of this notice that documents required for bidding purposes must be in a format designated by the Division of Purchasing. The contract recipient will submit a copy of this document and a copy of an approval requisition for the project to proceed to permitting, along with any conditions of this approval to be accepted by the Building Code Commission.

Very truly yours,

James Cambio, CBO

State Building Commissioner

To learn more, scan this barcode or visit [rhodeisland.viewpointcloud.com/#!/records/48402](https://rhodeisland.viewpointcloud.com/#!/records/48402)



STATE OF RHODE ISLAND

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House 150 Benefit Street Providence, RI 02903

Telephone 401-222-2678  
TTY 401-222-3700

Fax 401-222-2968  
[www.preservation.ri.gov](http://www.preservation.ri.gov)

9 March 2021

Via email: [spierce@parecorp.com](mailto:spierce@parecorp.com)

Sarah Pierce  
Senior Environmental Scientist  
Pare Corporation  
10 Lincoln Road, Suite 210  
Foxboro, Massachusetts 02035

Re: RIHPHC Project No. 15303 - Pare Project No. 19131.00  
Roger Wheeler State Beach bulkhead improvements  
Sand Hill Cove Road  
Narragansett, Rhode Island

Dear Ms. Pierce:

The Rhode Island Historical Preservation and Heritage Commission (RIHPHC) staff has reviewed the information that you provided for the above-referenced project. The State of Rhode Island Department of Environmental Management is proposing a project to improve the bulkhead at Roger Wheeler State Beach, in Narragansett, Rhode Island. The project will include, but is not limited to, the replacement of an existing stockade fence with a sand barrier and the construction of a new boardwalk supported in part by a new concrete retaining wall.

Based on our review of available information, it is the conclusion of the RIHPHC that no historic properties will be affected by the project.

These comments are provided in accordance with the Rhode Island Historic Preservation Act and Rhode Island General Laws. If you have any questions, please contact RIHPHC Deputy Director Jeffrey Emidy at 401-222-4134 or [jeffrey.emidy@preservation.ri.gov](mailto:jeffrey.emidy@preservation.ri.gov).

Sincerely,

J. Paul Loether  
Executive Director  
State Historic Preservation Officer



February 5, 2021

Rhode Island Historical Preservation & Heritage Commission  
150 Benefit Street  
Providence, Rhode Island 02908

Re: **Cultural Resource Coordination**  
**Roger Wheeler State Beach Bulkhead Improvements**  
**Narragansett, Rhode Island**  
(Pare Project No. 19131.00)

Dear Reviewer,

On behalf of the State of Rhode Island Department of Environmental Management (Owner), Pare Corporation (Pare) respectfully submits this letter and supporting documentation in connection with the proposed Roger Wheeler State Beach bulkhead improvement project in Narragansett, Rhode Island (Map J, Lot 35 and Map G, Lot 175). This information is provided for your review in compliance with the regulations governing Section 106 of the National Historic Preservation Act.

The steel sheet pile bulkhead retaining the Roger Wheeler State Beach is in a state of disrepair as reported by the RIDEM. The sand from the beach is continuously being blown into the parking lot, requiring a substantial cleanup effort from State crews. RIDEM's goal is to replace the existing stockade fence with a new sand barrier to minimize the amount of sand that is transported to the parking lot, while maintaining a view of the water/beach from a new boardwalk, intended to enhance the public access and use of the beach.

RIDEM proposes that the new concrete boardwalk be supported by precast concrete piles on one side of the boardwalk and a new concrete retaining wall integrated into the existing steel sheet pile wall with a pier consisting of concrete beams and decking. The new boardwalk is to match the elevation of the existing boardwalk surrounding the existing beach pavilion. The new concrete piles will be placed to the north of the existing sheet pile wall on land currently occupied by the southernmost portion of the beach parking lot; thus providing support for the new boardwalk without encroaching onto the beach, and utilizing an existing impervious area.

Work is being coordinated with the CRMC as a Category B State Assent application.

On behalf of the RIDEM, we respectfully request information from the Rhode Island Historical Preservation & Heritage Commission related to cultural resources that may be affected by the proposed work. Written comments should be submitted to Sarah Pierce at Pare Corporation via email at [spierce@parecorp.com](mailto:spierce@parecorp.com), or by mail to the following address: Pare Corporation, 8 Blackstone Valley Place, Lincoln RI 02865 Attn: Sarah Pierce, Senior Environmental Scientist.







RIHPHC

(2)

February 5, 2021

Thank you for your consideration. If you have any questions or require additional information, please feel free to contact me at 401-334-4100 or by email at: [spierce@parecorp.com](mailto:spierce@parecorp.com).

Sincerely,

Sarah Pierce  
Senior Environmental Scientist

cc: RIDEM Division of Planning and Development, c/o David DeCost

Attachments: Annotated Site Photographs  
Figure 1 – Site Location Map  
Plan Sheets: Existing Conditions Plan (sheet 2.0), Proposed Site Plan (sheet 3.0)

Y:\JOBS\19 Jobs\19131.00 RIDEM-Design Svcs Roger Wheeler Bulkhead Restor-RI\Permitting\HPHC Coordination\Coordination\_Letter\_RIHPHC\_Doc



Photo No. 1: Typical view of existing steel sheet pile bulkhead with wooden fence above



Photo No. 2: Example of sand drifts at stairs and along bulkhead impeding foot traffic



Photo No. 3: Existing concession building and environmental education area at center of beach along the existing bulkhead.



Photo No. 4: Proximity of play structure to parking lot and concession building



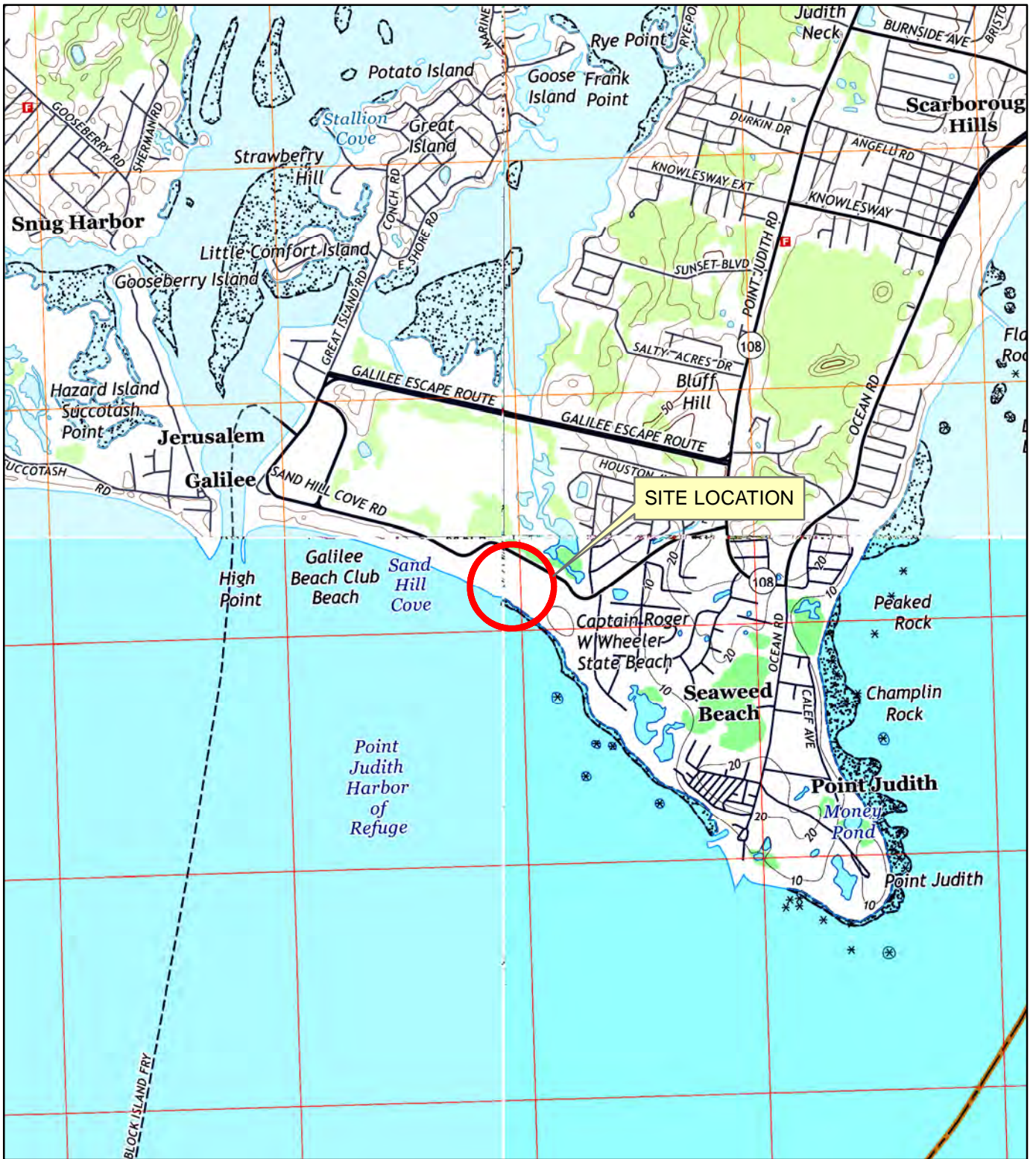


Photo No. 5: Easternmost extents of bulkhead, facing east



Photo No. 6: Panorama of eastern beach limits including maintenance ramp (to remain).





**SITE LOCATION MAP**

SCALE: 1"=2,000'



8 BLACKSTONE VALLEY PLACE  
 LINCOLN, RI 02865  
 (401) 334-4100

10 LINCOLN ROAD, SUITE 210  
 FOXBORO, MA 02035  
 (508) 543-1755

PARE PROJECT No. 19131.00

JANUARY 2021

**FIGURE 1**

**ROGER WHEELER STATE BEACH BULKHEAD  
 NARRAGANSETT, RI**







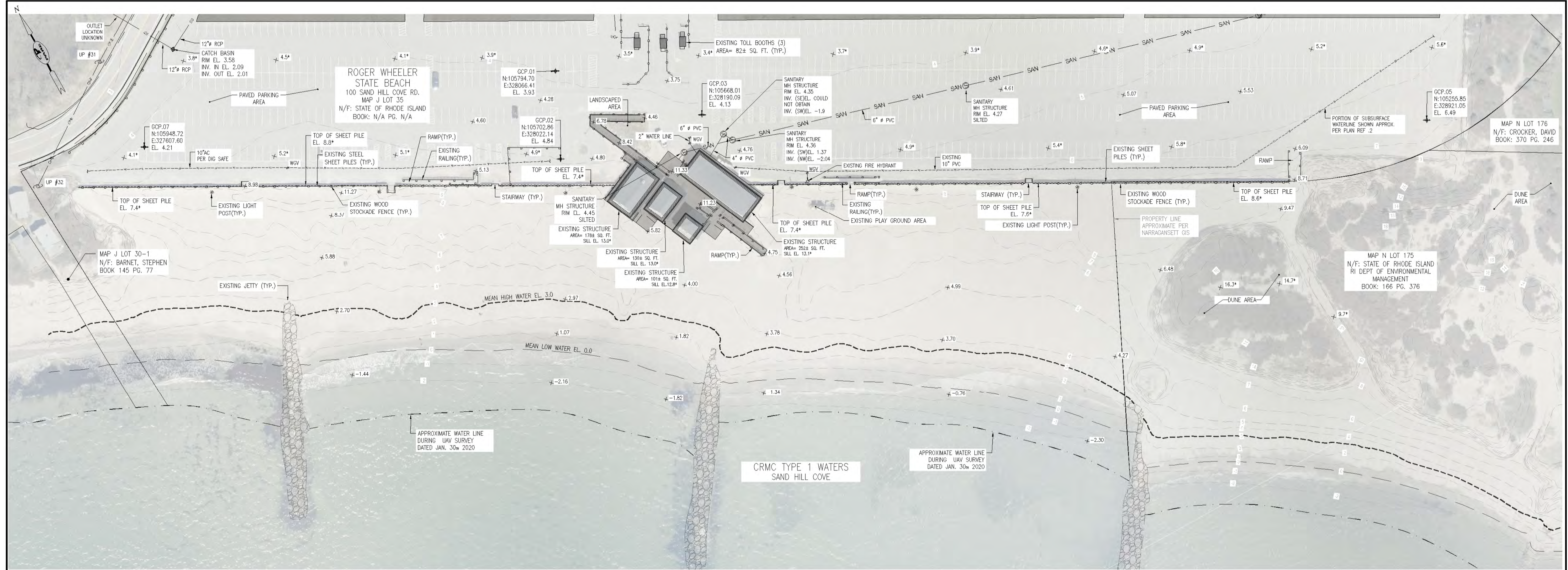
**PARE CORPORATION**  
 ENGINEERS - SCIENTISTS - PLANNERS  
 10 LINCOLN ROAD, SUITE 210  
 FOXBORO, MA 02335  
 508-543-1725



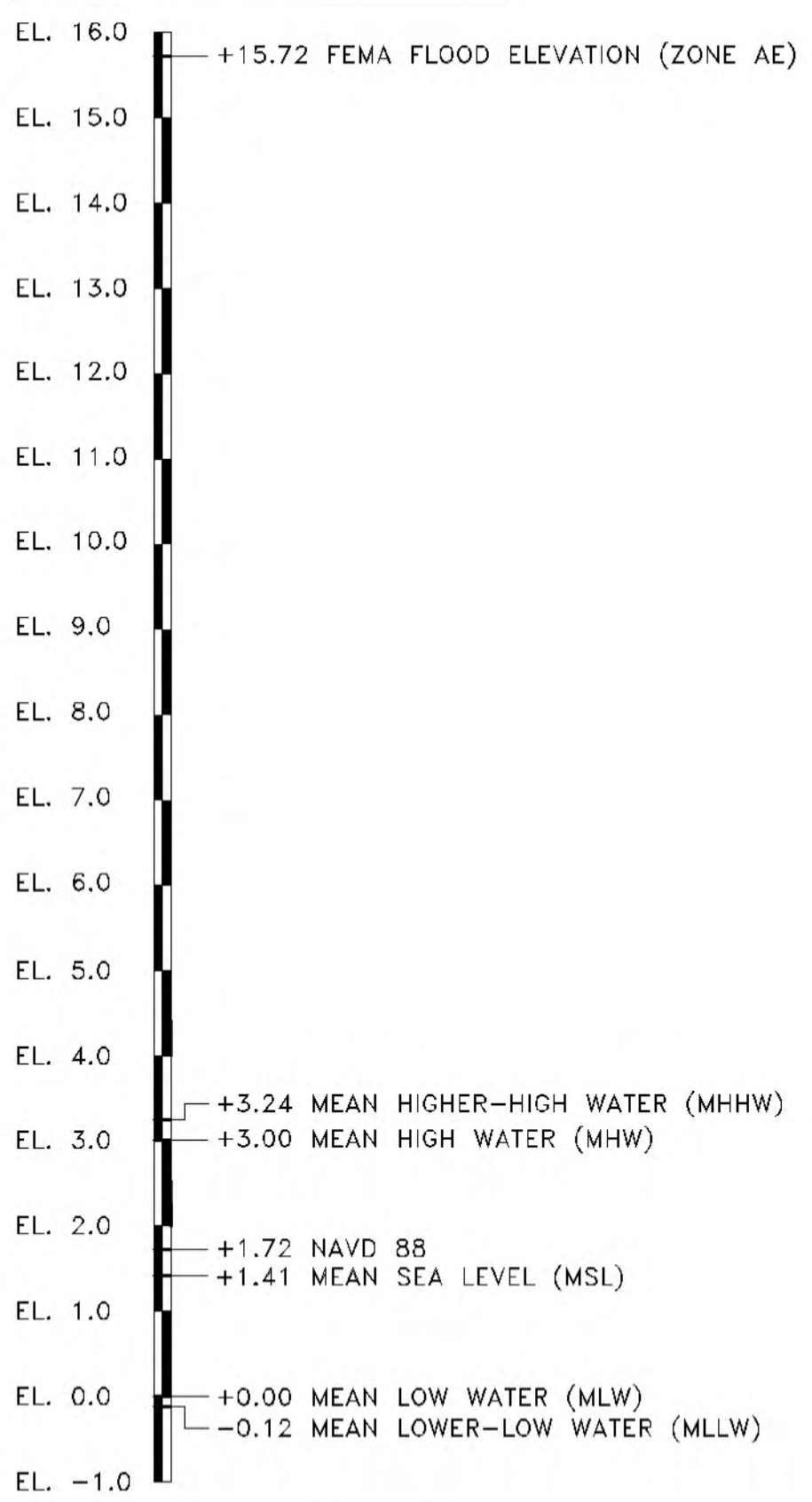
**ROGER WHEELER STATE BEACH  
 BULKHEAD DESIGN**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



**TIDAL REFERENCE**



**EXISTING SITE PLAN**

SCALE: 1"=60'±

**NOTES:**

1. EXISTING CONDITIONS BASED UPON PLAN ENTITLED "EXISTING CONDITIONS AND TOPOGRAPHY PLAN ROGER WHEELER STATE BEACH" PREPARED BY NARRAGANSETT ENGINEERING INC. OF PORTSMOUTH, RI DATED MAY 2020.

**REVISIONS:**

NO.	DATE	DESCRIPTION

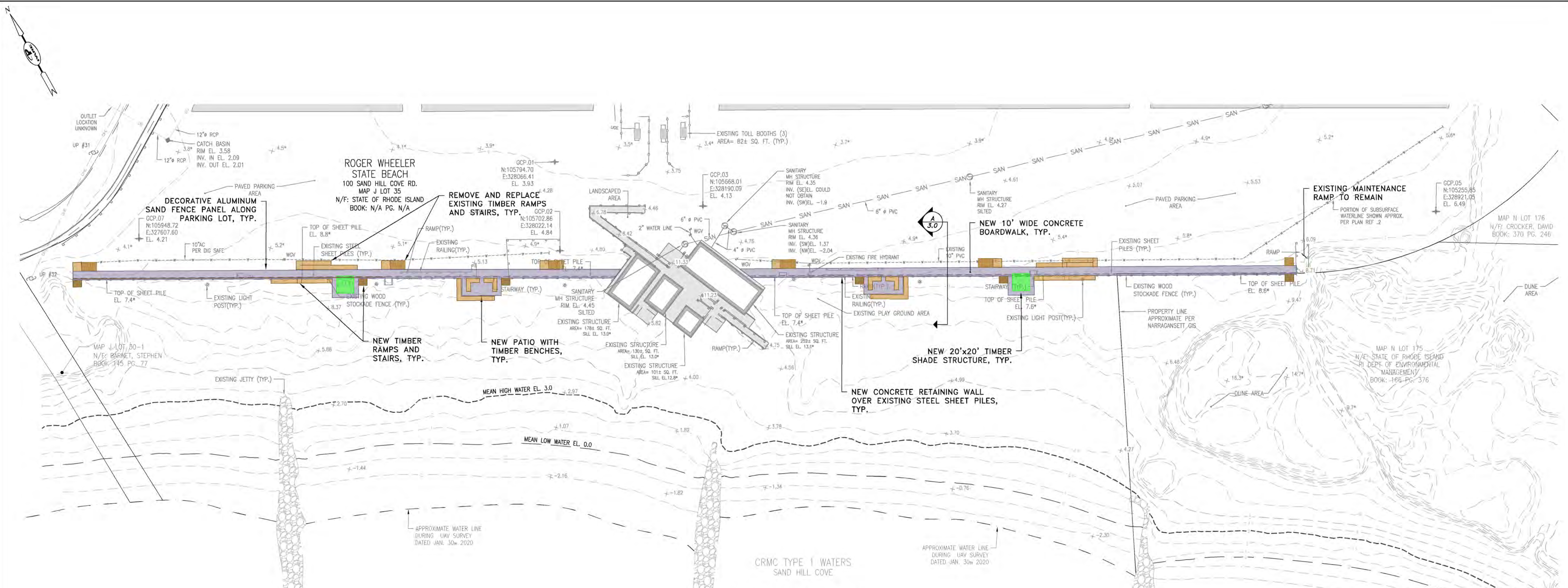
PROJECT NO.:	19131.00
DATE:	MAY 2020
SCALE:	AS NOTED
DESIGNED BY:	DIG
CHECKED BY:	RMM
DRAWN BY:	LMC
APPROVED BY:	JMB

EXISTING SITE PLAN

SHEET NO. 2.0

SCHEMATIC DESIGN  
 NOT FOR CONSTRUCTION

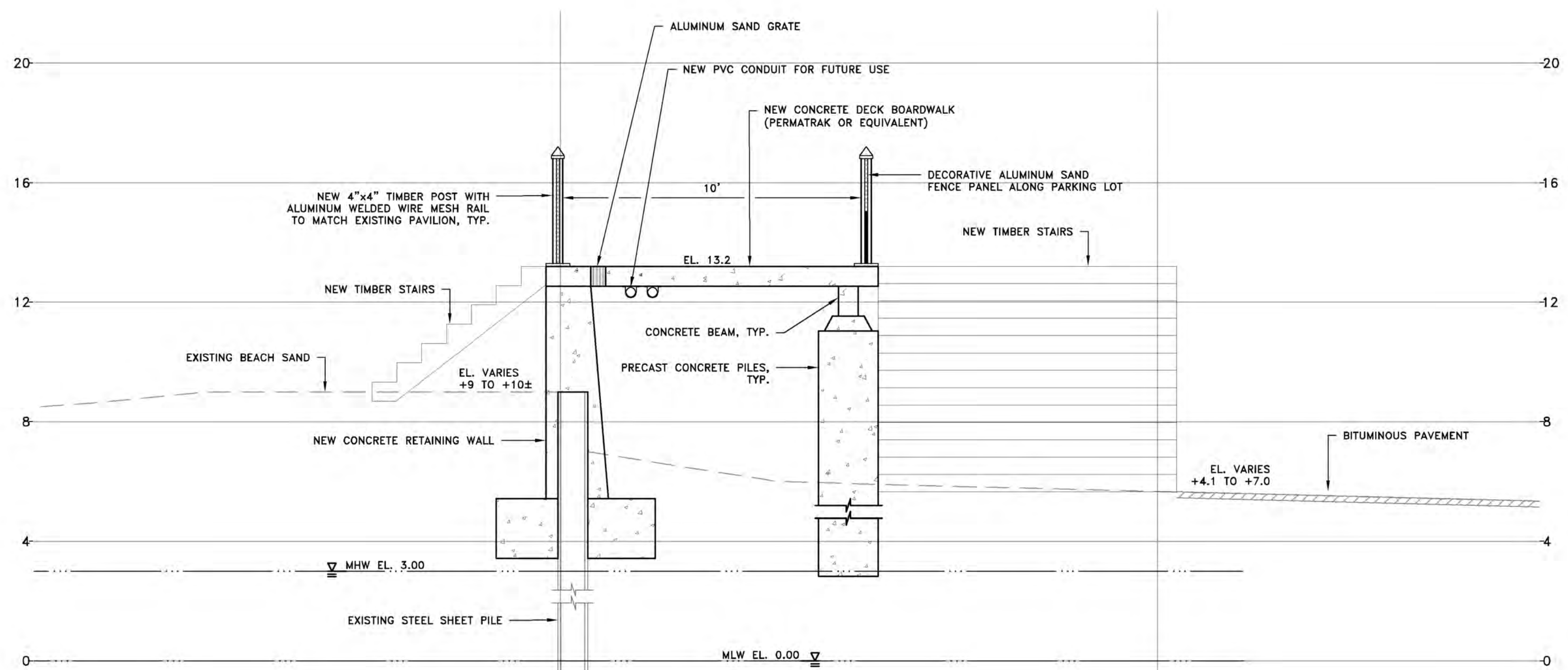




**PROPOSED SITE PLAN**  
SCALE: 1"=60'±

**FEATURES:**

- CONCRETE BOARDWALK (PERMATRAK OR APPROVED EQUIVALENT)
  - PRECAST CONCRETE PILE SUPPORTS
  - KEEP EXISTING STEEL SHEET PILE AND ENCASE IN CONCRETE HEADWALL
  - 20x20 TIMBER SHADE STRUCTURES AND PAVILIONS
- PROS**
- CONCRETE BOARDWALK AND PILES HAVE LONGER DESIGN LIFE THAN TIMBER MEMBERS
  - NO SAND FENCE REQUIRED
  - CONCRETE BOARDWALK AND PILES HAVE GREATER LOAD CAPACITY THAN TIMBER MEMBERS
  - CONTINUED MAINTENANCE OF EXISTING SSP WON'T BE REQUIRED
- CONS**
- DEMOLITION MAY BE REQUIRED BELOW MHW DEPENDING ON CONCRETE HEADWALL DESIGN
  - CONTINUED MAINTENANCE OF EXISTING SSP REQUIRED
  - CONCRETE MORE EXPENSIVE THAN TIMBER MEMBERS



**SECTION A**  
SCALE: 1"=3'

SCHMATIC DESIGN  
NOT FOR CONSTRUCTION



**ROGER WHEELER STATE BEACH  
BULKHEAD DESIGN**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**REVISIONS:**

NO.	DATE	DESCRIPTION

PROJECT NO.:	19131.00
DATE:	JULY 2020
SCALE:	AS NOTED
DESIGNED BY:	JPN
CHECKED BY:	BMD
DRAWN BY:	LMC
APPROVED BY:	JMB

PROPOSED  
SITE PLAN

SHEET NO.: **3.0**



**Rhode Island Department of Environmental Management  
ROGER WHEELER STATE BEACH BULKHEAD**

**APPENDIX C  
SOIL BORING LOGS**



Pare Corporation  
10 Lincoln Road, Suite 210  
Foxboro, MA 02035  
508-543-1755

# BORING NUMBER B20-1

PAGE 1 OF 1

**CLIENT** RIDEM Planning and Development **PROJECT NAME** Roger Wheeler State Park Bulkhead Design  
**PROJECT NUMBER** 19131.00 **PROJECT LOCATION** Narragansett, RI  
**DATE STARTED** 1/16/2020 **COMPLETED** 1/16/2020 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4 in.  
**DRILLING CONTRACTOR** Geologic-Earth Exploration, Inc. **GROUND WATER LEVELS:**  
**DRILLING METHOD** Wash & Drive with Automatic Hammer **AT TIME OF DRILLING** 4.0 ft Below Ground Surface  
**LOGGED BY** KAD **CHECKED BY** BMD **AT END OF DRILLING** 6.2 ft Below Ground Surface  
**BORING LOCATION** EXISTING SITE PLAN **N:** \_\_\_\_\_ **E:** \_\_\_\_\_

PARE BORING LOG - GINT STD US LAB.GDT - 3/12/24 11:36 - \\MAHOSTD-SERVER\JOBS\19 JOBS\19131.00 RIDEM-DESIGN SVCS ROGER WHEELER BULKHEAD RESTOR-RIBORINGS\BORINGS\19131.00 BORING LOG.GPJ

DEPTH (ft)	ELEVATION (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in/in)	DEPTH (ft)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0										
			S-1	12 / 18	0.5 - 2	14-15-9 (24)			1A: (Top 6") Dry, medium dense, gray to brown, fine SAND. 1B: (Bottom 12") Moist, medium dense, brown to black, f to c SAND.	6" ASPHALT
			S-2	16 / 24	2 - 4	14-13-15-19 (28)			2A: 11" - Wet, medium dense, black, fine to coarse SAND. 2B: 5" - Medium dense, gray, fine SAND, trace medium to coarse sand.	SAND
5			S-3	9 / 24	4 - 6	6-8-16-13 (24)			Wet, medium dense, gray to brown, fine to medium SAND, trace coarse sand.	
			S-4	14 / 24	6 - 8	8-4-5-6 (9)			Wet, loose, gray, fine to coarse SAND, some fine gravel.	
10			S-5	10 / 24	8 - 10	7-7-8-10 (15)			Wet, medium dense, gray, fine to coarse SAND and fine to coarse GRAVEL.	SAND & GRAVEL
15			S-6	13 / 24	14 - 16	14-7-9-12 (16)			Wet, medium dense, gray, fine to coarse SAND and fine to coarse GRAVEL.	
20			S-7	9 / 24	19 - 21	16-14-17-12 (31)			Wet, dense, gray, fine to medium SAND, trace fine to coarse gravel.	SAND
25			S-8	12 / 24	24 - 26	7-10-15-14 (25)		Wet, medium dense, gray, fine SAND, little medium sand.		
30			S-9	17 / 24	29 - 31	10-9-10-13 (19)		9A: (Top 15") Wet, medium dense, gray, fine to coarse SAND. 9B: (Bottom 2") Wet, medium dense, gray, fine SAND, some silt, odor.	SILT AND FINE SAND	
									Bottom of borehole at 31.0 feet.	

GRANULAR SOILS		COHESIVE SOILS		REMARKS:	BURMISTER CLASSIFICATION
BLOWS/FT	DENSITY	BLOWS/FT	CONSIST.		
0 - 4	V. LOOSE	<2	V. SOFT		TRACE 0 - 10%
4 - 10	LOOSE	2 - 4	SOFT		LITTLE 10 - 20%
10 - 30	M. DENSE	4 - 8	M. STIFF		SOME 20 - 35%
30 - 50	DENSE	8 - 15	STIFF		AND 35 - 50%
>50	V. DENSE	15 - 30	V. STIFF		
		>30	HARD		

**NOTES:** 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.



Pare Corporation  
10 Lincoln Road, Suite 210  
Foxboro, MA 02035  
508-543-1755

# BORING NUMBER B20-2

PAGE 1 OF 1

**CLIENT** RIDEM Planning and Development **PROJECT NAME** Roger Wheeler State Park Bulkhead Design  
**PROJECT NUMBER** 19131.00 **PROJECT LOCATION** Narragansett, RI  
**DATE STARTED** 1/16/2020 **COMPLETED** 1/16/2020 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4 in.  
**DRILLING CONTRACTOR** Geologic-Earth Exploration, Inc. **GROUND WATER LEVELS:**  
**DRILLING METHOD** Wash & Drive with Automatic Hammer **AT TIME OF DRILLING** 4.0 ft Below Ground Surface  
**LOGGED BY** KAD **CHECKED BY** BMD **AT END OF DRILLING** 7.3 ft Below Ground Surface  
**BORING LOCATION** EXISTING SITE PLAN **N:** \_\_\_\_\_ **E:** \_\_\_\_\_

PARE BORING LOG - GINT STD US LAB.GDT - 3/12/24 11:36 - \\MAHOSTD-SERVER\JOBS\19 JOBS\19131.00 RIDEM-DESIGN SVCS ROGER WHEELER BULKHEAD RESTOR-RIBORINGS\BORINGS\19131.00 BORING LOG.GPJ

DEPTH (ft)	ELEVATION (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in/in)	DEPTH (ft)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0										
			S-1	13 / 18	0.5 - 2	12-13-16 (25)			1A: (Top 7") Dry, medium dense, brown to black SILT, little coarse gravel. 1B: (Bottom 6") Wet, medium dense, gray, fine to coarse SAND.	6" ASPHALT
			S-2	24 / 24	2 - 4	19-18-34-31 (52)			2A: (Top 5") Moist, very dense, gray to black, fine to coarse SAND. 2B: (Middle 4") Moist, very dense, brown, fine to coarse SAND, some fine gravel.	SAND
5			S-3	12 / 24	4 - 6	22-39-34-19 (73)			2C: (Bottom 15") Moist, very dense, gray, fine to coarse SAND. Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND.	GRAVEL & SAND
			S-4	10 / 24	6 - 8	31-31-21-16 (52)			Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND, trace silt.	
10			S-5	9 / 24	8 - 10	23-23-25-16 (48)			5A: (Top 5") Wet, dense, gray, fine to coarse GRAVEL, some fine to coarse sand, trace silt. 5B: (Bottom 4") Wet, dense, gray, fine to coarse GRAVEL.	
			S-6	13 / 24	14 - 16	7-8-13-11 (21)			Wet, medium dense, gray, fine to coarse SAND, trace silt.	SAND
15										
			S-7	10 / 24	19 - 21	6-11-15-12 (26)			Wet, medium dense, gray, fine SAND.	
20										SAND
			S-8	11 / 24	24 - 26	5-7-11-10 (18)		Wet, medium dense, gray, fine SAND.		
25										
			S-9	11 / 24	29 - 31	6-7-12-16 (19)		Wet, medium dense, gray, fine SAND, some silt, some organics, odor.	SAND & SILT	
30									Bottom of borehole at 31.0 feet.	
35										

GRANULAR SOILS		COHESIVE SOILS		REMARKS:	BURMISTER CLASSIFICATION
BLOWS/FT	DENSITY	BLOWS/FT	CONSIST.		
0 - 4	V. LOOSE	<2	V. SOFT		TRACE 0 - 10%
4 - 10	LOOSE	2 - 4	SOFT		LITTLE 10 - 20%
10 - 30	M. DENSE	4 - 8	M. STIFF		SOME 20 - 35%
30 - 50	DENSE	8 - 15	STIFF		AND 35 - 50%
>50	V. DENSE	15 - 30	V. STIFF		PERCENT BY WEIGHT
		>30	HARD		

**NOTES:** 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.



Pare Corporation  
 10 Lincoln Road, Suite 210  
 Foxboro, MA 02035  
 508-543-1755

# BORING NUMBER B20-3

PAGE 1 OF 1

**CLIENT** RIDEM Planning and Development **PROJECT NAME** Roger Wheeler State Park Bulkhead Design  
**PROJECT NUMBER** 19131.00 **PROJECT LOCATION** Narragansett, RI  
**DATE STARTED** 1/15/2020 **COMPLETED** 1/15/2020 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4 in.  
**DRILLING CONTRACTOR** Geologic-Earth Exploration, Inc. **GROUND WATER LEVELS:**  
**DRILLING METHOD** Wash & Drive with Automatic Hammer **AT TIME OF DRILLING** 4.0 ft Below Ground Surface  
**LOGGED BY** KAD **CHECKED BY** BMD **AT END OF DRILLING** 6.0 ft Below Ground Surface  
**BORING LOCATION** EXISTING SITE PLAN **N:** \_\_\_\_\_ **E:** \_\_\_\_\_

PARE BORING LOG - GINT STD US LAB.GDT - 3/12/24 11:36 - \\MAHOSTD-SERVER\JOBS\19 JOBS\19131.00 RIDEM-DESIGN SVCS ROGER WHEELER BULKHEAD RESTOR-RIBORINGS\BORINGS\19131.00 BORING LOG.GPJ

DEPTH (ft)	ELEVATION (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in/in)	DEPTH (ft)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0										
			S-1	12 / 18	0.5 - 2	12-12-16 (28)			Moist, medium dense, brown to gray, fine to coarse SAND, little fine to coarse gravel, trace black organics.	6" ASPHALT
			S-2	17 / 24	2 - 4	15-18-33-20 (51)			Moist, very dense, black and gray, fine to coarse SAND, trace fine to coarse gravel.	
5			S-3	8 / 24	4 - 6	19-16-20-15 (36)			Wet, dense, gray to brown, fine to coarse SAND, some fine to coarse gravel.	
			S-4	11 / 24	6 - 8	11-20-11 (31)			Wet, dense, gray to black, fine to coarse SAND, little fine to coarse gravel, trace silt.	
			S-5	4 / 24	8 - 10	9-5-1-4 (6)			Wet, loose, gray, fine to coarse GRAVEL and fine to coarse SAND.	
15			S-6	10 / 24	14 - 16	8-7-7-7 (14)			Wet, medium dense, gray, fine to coarse SAND, little fine to coarse gravel.	SAND & GRAVEL
20			S-7	4 / 24	19 - 21	1-6-4-2 (10)			Wet, loose, gray, fine to coarse SAND, little fine to coarse gravel, trace silt, odor.	
25			S-8	13 / 24	24 - 26	8-6-11-10 (17)		Wet, medium dense, gray SILT, trace fine to coarse sand, trace fine gravel.	SILT	
30			S-9	13 / 24	29 - 31	14-16-26-34 (42)		Wet, dense, gray, fine to coarse SAND, some fine to coarse gravel, little silt.	SAND & GRAVEL	
35									Bottom of borehole at 31.0 feet.	

GRANULAR SOILS		COHESIVE SOILS		REMARKS:	BURMISTER CLASSIFICATION
BLOWS/FT	DENSITY	BLOWS/FT	CONSIST.		
0 - 4	V. LOOSE	<2	V. SOFT	1.S-6: Rocks stuck in spoon tip, limited sample recovery.	TRACE 0 -10%
4 -10	LOOSE	2 - 4	SOFT		LITTLE 10 - 20%
10 - 30	M. DENSE	4 - 8	M. STIFF		SOME 20 - 35%
30 - 50	DENSE	8 - 15	STIFF		AND 35 - 50%
>50	V. DENSE	15 - 30	V. STIFF		PERCENT BY WEIGHT
		>30	HARD		

**NOTES:** 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.





Pare Corporation  
10 Lincoln Road, Suite 210  
Foxboro, MA 02035  
508-543-1755

# BORING NUMBER B20-4

PAGE 1 OF 1

**CLIENT** RIDEM Planning and Development **PROJECT NAME** Roger Wheeler State Park Bulkhead Design  
**PROJECT NUMBER** 19131.00 **PROJECT LOCATION** Narragansett, RI  
**DATE STARTED** 1/15/2020 **COMPLETED** 1/15/2020 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4 in.  
**DRILLING CONTRACTOR** Geologic-Earth Exploration, Inc. **GROUND WATER LEVELS:**  
**DRILLING METHOD** Wash & Drive with Automatic Hammer **AT TIME OF DRILLING** 4.0 ft Below Ground Surface  
**LOGGED BY** KAD **CHECKED BY** BMD **AT END OF DRILLING** ---  
**BORING LOCATION** EXISTING SITE PLAN **N:** \_\_\_\_\_ **E:** \_\_\_\_\_

PARE BORING LOG - GINT STD US LAB.GDT - 3/12/24 11:36 - \\MAHOSTD-SERVER\JOBS\19 JOBS\19131.00 RIDEM-DESIGN SVCS ROGER WHEELER BULKHEAD RESTOR-RIBORINGS\BORINGS\19131.00 BORING LOG.GPJ

DEPTH (ft)	ELEVATION (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in/in)	DEPTH (ft)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0										
			S-1	11 / 18	0.5 - 2	13-13-12 (26)			Moist, medium dense, brown to black, fine to coarse SAND, fine gravel.	6" ASPHALT
			S-2	4 / 24	2 - 4	15-12-15-15 (27)			Moist, medium dense, gray to brown, fine to medium SAND.	SAND
			S-3	11 / 24	4 - 6	8-12-16-14 (28)			Wet, medium dense, gray to brown, fine to medium SAND.	
			S-4	17.5 / 24	6 - 8	38-15-15-15 (30)			Wet, medium dense to dense, gray, fine to coarse SAND, some fine gravel.	
			S-5	10 / 24	8 - 10	8-9-7-8 (16)			Wet, gray, fine to coarse SAND, some fine to coarse gravel.	SAND
									Wet, loose, gray, fine to coarse GRAVEL, trace fine to coarse sand.	GRAVEL
			S-6	6 / 24	14 - 16	7-6-4-4 (10)			Wet, medium dense, dark gray, fine to coarse SAND, some fine to coarse gravel.	SAND & GRAVEL
									8A: (Top 9") Wet, dense, brown to gray, fine to coarse SAND, some silt, trace coarse gravel. 8B: (Bottom 9") Wet, dense, brown to gray, coarse SAND, little silt.	SAND & SILT
			S-7	9.5 / 24	19 - 21	5-3-10-10 (13)			9A: (Top 7") Wet, medium dense, gray SILT and fine to coarse SAND, little fine to coarse gravel. 9B: (Bottom 3") Fine to coarse GRAVEL, some fine to coarse sand, trace silt.	GRAVEL & SAND
			S-8	18 / 24	24 - 26	15-21-22-25 (43)				
			S-9	8 / 24	29 - 31	9-11-16-16 (27)				
									Bottom of borehole at 31.0 feet.	

GRANULAR SOILS		COHESIVE SOILS		REMARKS:	BURMISTER CLASSIFICATION
BLOWS/FT	DENSITY	BLOWS/FT	CONSIST.		
0 - 4	V. LOOSE	<2	V. SOFT		TRACE 0 - 10%
4 - 10	LOOSE	2 - 4	SOFT		LITTLE 10 - 20%
10 - 30	M. DENSE	4 - 8	M. STIFF		SOME 20 - 35%
30 - 50	DENSE	8 - 15	STIFF		AND 35 - 50%
>50	V. DENSE	15 - 30	V. STIFF		PERCENT BY WEIGHT
		>30	HARD		

**NOTES:** 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.





**PARE**  
 PARE CORPORATION  
 ENGINEERS - SCIENTISTS - PLANNERS  
 10 LINCOLN ROAD, SUITE 210  
 FOXBORO, MA 02035  
 508-543-1735



**ROGER WHEELER STATE BEACH  
 BULKHEAD DESIGN**

NARRAGANSETT, RHODE ISLAND

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



**EXISTING SITE PLAN**  
 SCALE: 1"=60'±

- NOTES:**
- EXISTING CONDITIONS BASED UPON PLAN ENTITLED "EXISTING CONDITIONS AND TOPOGRAPHY PLAN ROGER WHEELER STATE BEACH" PREPARED BY NARRAGANSETT ENGINEERING INC. OF PORTSMOUTH, RI DATED MAY 2020.

REVISIONS:

NO.	DATE	DESCRIPTION

PROJECT NO.:	19131.00
DATE:	MAY 2020
SCALE:	AS NOTED
DESIGNED BY:	LRM/DJB
CHECKED BY:	RMM
DRAWN BY:	AWB/LMC
APPROVED BY:	JMB

EXISTING SITE PLAN

SHEET NO.: 2.0