BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

REQUEST FOR PROPOSALS

Item Description: **CUNLIFF LAKE BOARDWALK AT ROGER WILLIAMS PARK**

Procurement/MinuteTraq #: 48734

Date to be opened: 4/21/2025

Issuing Department: Parks

QUESTIONS

- Please direct questions related to the process, how to fill out forms, and how to submit an application(Pages 1-8) to the Purchasing Department.
    - Email: purchasing@providenceri.gov
        - Please use the subject line "**Solicitation Question**"
- Please direct questions relative to the Minority and Women's Business Enterprise Program and the corresponding forms (Pages 10-11) to the MBE/WBE Outreach Director for the City of Providence, Grace Diaz
    - Email: gdiaz@providenceri.gov
        - Please use subject line "**MBE WBE Forms**"
- Please direct questions relative to the specifications outlined (beginning on page 14) to the issuing department's subject matter expert:
    - Name: Megan E. Gardner
    - Title: Landscape Architect
    - Email Address: mgardner@providenceri.gov

Pre-submission Conference

There will be a Non-Mandatory Pre-Bid Conference

Date of Pre-Bid Conference: 4/8/2025 Time: 11:00 AM

Other details: **Project Site –Roger Williams Park, Maple Avenue, Providence, RI at existing boat ramp**

Deadline for questions submissions:

Monday, April 14, 2025 4:30 pm

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

INSTRUCTIONS FOR SUBMISSION

Meeting Date: 4/21/2025

Bids may be submitted up to **2:15 P.M.** on the above meeting date at the **Department of the City Clerk. Room 311, City Hall. 25 Dorrance Street, Providence.** At 2:15 P.M. all bids will be publicly opened and read at the Board of Contract Meeting in Conference Room 305, on the 3rd floor of City Hall.

- Bidders must submit **2 copies** of their bid in sealed envelopes or packages labeled with the captioned **Item Description** and the **City Department to which the solicitation and bid are related and must include the company name and address on the envelope as well**. (On page 1).
  -
- If required by the Department, please keep the original bid bond and check in only one of the envelopes.
- Communications to the Board of Contract and Supply that are not competitive sealed bids (i.e. product information/samples) should have "**NOT A BID**" written on the envelope or wrapper.
- Only use form versions and templates included in this solicitation. If you have an old version of a form do not recycle it for use in this bid.
- The bid envelope and information relative to the bid must be addressed to:

Board of Contract and Supply
Department of the City Clerk – City Hall, Room 311
25 Dorrance Street
Providence, RI 02903

****PLEASE NOTE: This bid may include details regarding information that you will need to provide (such as proof of licenses) to the issuing department before the formalization of an award.**

***This information is NOT requested to be provided in your initial bid by design*.**

All bids submitted to the City Clerk become public record. Failure to follow instructions could result in information considered private being posted to the city's Open Meetings Portal and made available as a public record. The City has made a conscious effort to avoid the posting of sensitive information on the City's Open Meetings Portal, by requesting that such sensitive information be submitted to the issuing department only at their request.

BID PACKAGE CHECKLIST

Digital forms are available in the City of Providence Purchasing Department Office or online at **http://www.providenceri.gov/purchasing/how-to-submit-a-bid/**

The bid package **MUST** include the following, in this order:

- **Bid Form 1**: Bidder's Blank as the cover page/ 1st page (s*ee page **6** of this document*)
- **Bid Form 2**: Certification of Bidder as 2nd page (s*ee page **7** of this document*)
- **Bid Form 3**: Certificate Regarding Public Records (s*ee page **8** of this document)*
- **Bid Form 4**: Affidavit of City Vendor (*see pages **9 and 10** of this document*)
- **Forms from the Minority and Women Business Enterprise Program**: Based on Bidder Category. S*ee forms and instructions enclosed (pages **10-11**) or on: https://www.providenceri.gov/purchasing/minority-women-owned-business-mbewbe-procurement-program/*
  ***Please note: MBE/WBE forms must be completed for EVERY bid submitted and must be inclusive of ALL required signatures. Forms without all required signatures will be considered incomplete.**
- **Supplemental Bid Form**: Formal response to the specifications outlined in this RFP, including pricing information and details related to the good(s) or service(s) being provided. Please be mindful of formatting responses as requested to ensure clarity.
- **Financial Assurance**, *if requested* (a*s indicated on page 5 of this document under "Bid Terms")*

All of the above listed documents are REQUIRED. (With the exception of financial assurances, which are only required if specified on page 5.)

******Failure to meet specified deadlines, follow specific submission instructions, or enclose all required documents with all applicable signatures will result in disqualification, or in an inability to appropriately evaluate bids.***

NOTICE TO VENDORS

1. The Board of Contract and Supply will make the award to the lowest qualified and responsible bidder.
2. In determining the lowest responsible bidder, cash discounts based on preferable payment terms will not be considered.
3. Where prices are the same, the Board of Contract and Supply reserves the right to award to one bidder, or to split the award.
4. No proposal will be accepted if the bid is made in collusion with any other bidder.
5. Bids may be submitted on an "equal in quality" basis. The City reserves the right to decide equality. Bidders must indicate brand or the make being offered and submit detailed specifications if other than brand requested.
6. A bidder who is an out-of-state corporation shall qualify or register to transact business in this State, in accordance with the Rhode Island Business Corporation Act, RIGL Sec. 7-1.2-1401, et seq.
7. The Board of Contract and Supply reserves the right to reject any and all bids.
8. Competing bids may be viewed in person at the Department of the City Clerk, City Hall, Providence, immediately upon the conclusion of the formal Board of Contract and Supply meeting during which the bids were unsealed/opened. Bids may also be accessed electronically on the internet via the City's Open Meetings Portal.
9. As the City of Providence is exempt from the payment of Federal Excise Taxes and Rhode Island Sales Tax, prices quoted are not to include these taxes.
10. In case of error in the extension of prices quoted, the unit price will govern.
11. The contractor will **NOT** be permitted to: a) assign or underlet the contract, or b) assign either legally or equitably any monies or any claim thereto without the previous written consent of the City Purchasing Director.
12. Delivery dates must be shown in the bid. If no delivery date is specified, it will be assumed that an immediate delivery from stock will be made.
13. A certificate of insurance will normally be required of a successful vendor.
14. For many contracts involving construction, alteration and/or repair work, State law provisions concerning payment of prevailing wage rates apply (RIGL Sec. 37-13-1 et seq.)
15. No goods should be delivered, or work started without a Purchase Order.
16. **Submit 2 copies of the bid to the City Clerk, unless the specification section of this document indicates otherwise.**
17. Bidder must certify that it does not unlawfully discriminate on the basis of race, color, national origin, gender, gender identity or expression, sexual orientation and/or religion in its business and hiring practices and that all of its employees are lawfully employed under all applicable federal, state and local laws, rules and regulations. (See Bid Form 2.)

BID TERMS

1. Financial assurances may be required in order to be a successful bidder for Commodity or Construction and Service contracts. If either of the first two checkboxes below is checked, the specified assurance **must accompany** a bid, or the bid will not be considered by the Board of Contract and Supply. The third checkbox indicates the lowest responsible bidder will be contacted and required to post a bond to be awarded the contract.

   a) ☐ A certified check for **$**_____ must be deposited with the City Clerk as a guarantee that the Contract will be signed and delivered by the bidder.

   b) ☒ A bid bond in the amount of **5** per centum (%) of the proposed total price, must be deposited with the City Clerk as a guarantee that the contract will be signed and delivered by the bidder; and the amount of such bid bond shall be retained for the use of the City as liquidated damages in case of default. Any person signing a bid bond as an attorney-in-fact shall include with the bid bond an original, or a photocopy or facsimile of an original, power of attorney.

   c) ☒ A performance and payment bond with a satisfactory surety company will be posted by the bidder in a sum equal to one hundred per centum (100%) of the awarded contract.

   d) ☐ No financial assurance is necessary for this item.

2. Awards will be made within **ninety (90) days of bid opening**. All bid prices will be considered firm, unless qualified otherwise. Requests for price increases will not be honored.
3. Failure to deliver within the time quoted or failure to meet specifications may result in default in accordance with the general specifications. It is agreed that deliveries and/or completion are subject to strikes, lockouts, accidents, and Acts of God.

The following entry applies only for COMMODITY BID TERMS:

4. Payment for partial delivery will not be allowed except when provided for in blanket or term contracts.

The following entries apply only for CONSTRUCTION AND SERVICE BID TERMS:

5. Only one shipping charge will be applied in the event of partial deliveries for blanket or term contracts.
6. Prior to commencing performance under the contract, the successful bidder shall attest to compliance with the provisions of the Rhode Island Worker's Compensation Act, RIGL 28-29-1, et seq. If exempt from compliance, the successful bidder shall submit a sworn Affidavit by a corporate officer to that effect, which shall accompany the signed contract.
7. Prior to commencing performance under the contract, the successful bidder shall, submit a certificate of insurance, in a form and in an amount satisfactory to the City.

BID FORM 1: Bidders Blank

1. Bids must meet the attached specifications. Any exceptions or modifications must be noted and fully explained.
2. Bidder's responses must be in ink or typewritten, and all blanks on the bid form should be completed.
3. The price or prices proposed should be stated both in **WRITING** and in **FIGURES**, and any proposal not so stated may be rejected. **Contracts exceeding twelve months must specify annual costs for each year.**
4. Bids **SHOULD BE TOTALED** so that the final cost is clearly stated (unless submitting a unit price bid), however **each item should be priced individually**. Do not group items. Awards may be made on the basis of ***total*** bid or by ***individual items***.
5. All bids **MUST BE SIGNED IN INK.**

Name of Bidder (Firm or Individual): _____

Contact Name: _____

Business Address: _____

Business Phone #: _____

Contact Email Address: _____

Agrees to bid on (Write the "Item Description" here): _____

If the bidder's company is based in a state *other than Rhode Island*, list name and contact information for a local agent for service of process that ***is located within Rhode Island*** _____

Delivery Date (if applicable): _____

Name of Surety Company (if applicable): _____

Total Amount in Writing*: _____

Total Amount in Figures*: _____

If you are submitting a unit price bid, please insert "Unit Price Bid"

Use additional pages if necessary for additional bidding details.

_____
Signature of Representation

_____
Title

BID FORM 2: Certification of Bidder
(Non-Discrimination/Hiring)

Upon behalf of_____ (Firm or Individual Bidding),

I,_____(Name of Person Making Certification),

being its_____(Title or "Self"), hereby certify that:

1. Bidder does not unlawfully discriminate on the basis of race, color, national origin, gender, sexual orientation and/or religion in its business and hiring practices.
2. All of Bidder's employees have been hired in compliance with all applicable federal, state and local laws, rules and regulations.

I affirm by signing below that I am duly authorized on behalf of Bidder, on this_____day of_____20____.

_____

Signature of Representation

_____

Printed Name

BID FORM 3: Certificate Regarding Public Records

Upon behalf of_____ (Firm or Individual Bidding),

I,_____(Name of Person Making Certification),

being its_____(Title or "Self"), hereby certify an

understanding that:

1. All bids submitted in response to Requests for Proposals (RFP's) and Requests for Qualification (RFQ's), documents contained within, and the details outlined on those documents become public record upon receipt by the City Clerk's office and opening at the corresponding Board of Contract and Supply (BOCS) meeting.
2. The Purchasing Department and the issuing department for this RFP/RFQ have made a conscious effort to request that sensitive/personal information be submitted directly to the issuing department and only at request if verification of specific details is critical the evaluation of a vendor's bid.
3. The requested supplemental information may be crucial to evaluating bids. Failure to provide such details may result in disqualification, or an inability to appropriately evaluate bids.
4. If sensitive information that has not been requested is enclosed or if a bidder opts to enclose the defined supplemental information prior to the issuing department's request in the bidding packet submitted to the City Clerk, the City of Providence has no obligation to redact those details and bears no liability associated with the information becoming public record.
5. The City of Providence observes a public and transparent bidding process. Information required in the bidding packet may not be submitted directly to the issuing department at the discretion of the bidder in order to protect other information, such as pricing terms, from becoming public. Bidders who make such an attempt will be disqualified.

I affirm by signing below that I am duly authorized on behalf of Bidder, on

this_____day of_____20____.

_____

Signature of Representation

_____

Printed Name

BID FORM 4: Affidavit of City Vendor

Per our Code of Ordinances Sec. 21.-28.1 (e), this form applies to a) the business, b) any political action committee whose name includes the name of the business, c) all persons holding ten (10) percent or greater equity interest or five thousand dollars ($5,000.00) or greater cash value interest in the business at any time during the reporting period, d) all executive officers of the business entity, e) any spouse or dependent child of any individual identified in a) though d) above.

Executive officers who are not residents of the state of Rhode Island are exempted from this requirement.

Per R.I.G.L. § 36-14-2, "Business" means a sole proprietorship, partnership, firm, corporation, holding company, joint stock company, receivership, trust, or any other entity recognized in law through which business for profit or not for profit is conducted.

Name of the person making this affidavit: _____

Position in the "Business" _____

Name of Entity _____

Address: _____

Phone number: _____

The number of persons or entities in your entity that are required to report under Sec. 21.-28.1 (e): _____

Read the following paragraph and answer one of the options:

Within the 12 month period preceding the date of this bid submission with the City of Providence, or with respect to the contracts that are not in writing within the 12 month period preceding the date of notification that the contract has reached the $100,000 threshold, have you made campaign contributions within a calendar year to (please list all persons or entities required under Sec. 21.-28.1 (e)).

a. Members of the Providence City Council? ☐ Yes ☐ No
   - If Yes, please complete the following:
     Recipient(s) of the Contribution:
     Contribution Date(s): Contribution Amount(s):

b. Candidates for election or reelection to the Providence City Council? ☐ Yes ☐ No
   - If Yes, please complete the following:
     Recipient(s) of the Contribution:
     Contribution Date(s): Contribution Amount(s):

c. The Mayor of Providence? ☐ Yes ☐ No
   - If Yes, please complete the following:
     Recipient(s) of the Contribution:
     Contribution Date(s): Contribution Amount(s):

d. Candidates for election or reelection to the office of Mayor of Providence? ☐ Yes ☐ No
   - If Yes, please complete the following:
     Recipient(s) of the Contribution:
     Contribution Date(s): Contribution Amount(s):

_____ _____

Signed under the pains and penalties of perjury. Position

MBE/WBE Participation Plan

Please complete separate forms for each MBE/WBE subcontractor/supplier to be utilized on the solicitation.

Bidder's Name:	
Bidder's Address:	
Point of Contact:	
Telephone:	
Email:	
Procurement #:	
Project Name:	

Which one of the following describes your business' status in terms of Minority and/or Woman Owned Business Enterprise certification with the State of Rhode Island? (Check all that apply).	☐MBE ☐WBE ☐Neither MBE nor WBE

This form is intended to capture commitments between the prime contractor/vendor and MBE/WBE subcontractors and suppliers, including a description of the work to be performed and the percentage of the work as submitted to the prime contractor/vendor. Please note that all MBE/WBE subcontractors/suppliers must be certified by the Office of Diversity, Equity and Opportunity at the time of bid. The MBE/WBE Directory can be found here. Please visit, the City's MBE/WBE page for details of the program (e.g. instructions and requirements).

- **Nonprofit organizations are not required to complete the rest of this form.**
- **Construction projects unable to identify subcontractors prior to bid submission (e.g. Design Build) are required to provide updates to the MBE/WBE Outreach Office**

Name of Subcontractor/Supplier:					
Type of RI Certification:	☐MBE ☐WBE ☐Neither				
Address:					
Point of Contact:					
Telephone:					
Email:					
Detailed Description of Work to Be Performed by Subcontractor or Materials to be Supplied by Supplier Per the Scope of Work provided in the RFP					
Total Contract Value ($):		Subcontract Value ($):		Participation Rate (%):	
Anticipated Date of Performance:					

I certify under penalty of perjury that the forgoing statements are true and correct.

Prime Contractor/Vendor Signature	**Title**	**Date**
Subcontractor/Supplier Signature	**Title**	**Date**

***If you did not meet the 20% MBE/WBE combined participation goal, submit a Waiver Request Form.**

MBE/WBE Waiver Request Form

Fill out this form only if you did not meet the 20% MBE/WBE participation goal.
State-certified MBE or WBE Prime Bidders are NOT REQUIRED to fill out this form.

Submit this form to the City of Providence MBE/WBE Outreach Director, Grace Diaz, at gdiaz@providenceri.gov, for review **prior to bid submission.** This waiver applies only to the current bid which you are submitting to the City of Providence and does not apply to other bids your company may submit in the future. **In case a waiver is needed, City Department Directors should not** recommend a bidder for an award if this form is not included, absent or is not signed by the city of Providence MBE/WBE director**.**

Prime Bidder: _____ Contact Email and Phone_____
Company Name, Address: _____ Trade _____
Project /Item Description (as seen on RFP):
_____
_____

To receive a waiver, you must list the certified MBE and/or WBE companies you contacted, the name of the primary individual with whom you interacted, and the reason the MBE/WBE company could not participate on this project.

MBE/WBE Company Name	Individual's Name	Company Name	Why did you choose not to work with this company?

I acknowledge the City of Providence's goal of a combined MBE/WBE participation is 20% of the total bid value. I am requesting a waiver of _____ % MBE/WBE (20% minus the value of **Box F** on the Subcontractor Disclosure Form). If an opportunity is identified to subcontract any task associated with the fulfillment of this contract, a good faith effort will be made to select MBE/WBE certified businesses as partners.

_____	_____	_____
Signature of Prime Contractor / or Duly Authorized Representative	Printed Name	Date Signed
_____	_____	_____
Signature of City of Providence MBE/WBE Outreach Director / or Duly Authorized Representative	Printed Name of City of Providence MBE/WBE Outreach Director	Date Signed

FOR CONSTRUCTION PROJECTS

APPRENTICE REQUIREMENTS (Construction Projects Valued at $100,000 or More).

Attention of prospective bidders is called to the fact that this project is to be bid upon and executed under the City of Providence Code of Ordinances Chapter 21 Art. II Section 21-28.1 c(1) and (2) related to utilizing apprentices in the contract. This ordinance outlines requirements for utilizing not less than 15% of total hours worked by apprentices. The City may lower this percentage only if it determines in writing that compliance is not feasible or that it would be unduly cost prohibitive to the project. The attention of prospective bidders is also called to the fact that reporting the efforts undertaken and progress towards achieving the requirements in this ordinance is a condition for payment. Compliance reporting shall be submitted with any contract payment requisition, in a format to be specified by the City. This demonstration of compliance through such reports shall be a condition of the requisition for payment to be processed. Upon the contract being awarded to the successful bidder, a mandatory meeting will be scheduled to review the project requirements relative to apprenticeship requirements and the process and protocols by which these goals will be achieved. At this meeting, specific forms and procedures for the documentation and achievement of these requirements by the successful bidder will be provided, discussed and agreed upon for the execution of the contract.

"FIRST SOURCE" REQUIREMENTS.

Attention of prospective bidders is called to the fact that this project is to be bid upon and executed under the City of Providence Code of Ordinances Chapter 21 Art. III 1/2 First Source Agreements Sec. 21-91 through 21-96. This ordinance outlines requirements for hiring Providence residents to work on this project. The City may waive this requirement only upon a determination in writing that qualified residents of Providence are not available for the project, pursuant to Sec. 21-94(e). The attention of prospective bidders is called to the fact that reporting the efforts undertaken and progress towards achieving the requirements in this ordinance is a condition for payment. Compliance reporting shall be submitted with any contract payment requisition, in a format to be specified by the City. This demonstration of compliance through such reports shall be a condition of the requisition for payment to be processed. Upon the contract being awarded to the successful bidder, a mandatory meeting will be scheduled to review the project requirements relative to the First Source Agreements and the process and protocols by which these goals will be achieved. At this meeting, specific forms and procedures for the documentation and achievement of these requirements by the successful bidder will be provided, discussed, and agreed upon for the execution of the contract.

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

SUPPLEMENTAL BID FORM

To whom it may concern:

1. The undersigned, having familiarized (himself) (themselves) (itself) with the **Cunliff Lake Boardwalk at Roger Williams Park** bid affecting the cost of work, and with the Contract Documents (which includes the Invitation for Bids, Instructions to Bidders, Form of Bid Bond, Form of Agreements, form of Non-Collusive Affidavit, Addenda (if any), Drawings, Technical Specification, Form of Surety Bond(s); as prepared by the Providence Parks Department, and on file in the office of the City Clerk 3rd Floor, City Hall, Providence, RI 02903, hereby proposes to furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment and services including utility and transportation services, and to perform such other required work for the **Cunliff Lake Boardwalk at Roger Williams Park** and such other required and incidental work, complete, all in accordance with the above listed documents and for the unit prices for work in-place for the following items and quantities.

2. In submitting this Bid, the bidder understands that the right is reserved by The Providence Parks Department to reject any and all Bids, If written notice of acceptance of this Bid is mailed, telegraphed or delivered to the undersigned within (90) days after the opening thereof, or at any time thereafter before this Bid is withdrawn, the undersigned agrees to execute and deliver an Agreement in the prescribed form and furnish the required bond within (10) days after the Agreement is presented to him/her for signature.

Herewith in accordance with the instructions to Bidders.

3. Attached hereto is an affidavit in proof that the undersigned has not colluded with any person in respect to this. Bid or any bids for the Contractor for which this Bid is submitted. Also attached is a Statement of Bidder's Qualifications.

4. Application unit prices are contained in the Agreement (established as the result of either a Unit Price Bid or a Supplemental Schedule of Unit Prices), the City of Providence may order the Contractor to proceed with desired changes in the work, the value of such changes to be determined by the measured quantities involved and the application unit prices specified in the Contract.

5. The City of Providence reserves the right to determine the lowest responsible Bidder based on past experience with the City and/or recommendations by City and/or state agencies with an interest in this procurement. The City reserves the right to award the project to the appropriate bidder in the best interest of the City of Providence.

CERTIFICATION OF NON-SEGREGATED FACILITIES

The Bidder certifies that he/she does not maintain or provide for his/her employees any segregated facilities at any of his establishments, and that he/she does not permit his/her employees to perform their services at any location, under his/her control, where segregation facilities are maintained. The Bidder agrees that a breach of this certification will be a violation of the Equal Opportunity Clause in any contract resulting from acceptance of this Bid. As used in this certification, term "segregation facilities" means any waiting rooms, work rooms, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employee which are segregated by explicit directive or are in fact segregated on basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Bidder agrees that (except where he/she has obtained identical certification from proposed subcontractors for specific time periods) he/she will obtain identical certification from proposed subcontractor prior to the award of subcontracts exceeding $10,000.00 which are not exempt from provisions of the Equal Opportunity Clause, and that he /she will retain such certifications in his/her files.

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. & 1001.

DATE _____, 20___

Name of Bidder and Official Address:

_____

_____

_____

E-Mail: _____

Name of Authorized Representative (Contact):

_____

By _____
(Signature)

Title _____

Phone: _____

Bidder shall indicate, in space provided,
the earliest possible Project Start-up Date:_____, 20 _____

ADDENDA: The undersigned acknowledges receipt of the following Addenda, if any, and has included the provisions thereof in this Bid (If Any):

Addendum No.	Date	Addendum No.	Date
_____	_____, 20 ____	_____	_____, 20 ____
_____	_____, 20 ____	_____	_____, 20 ____

Sub-Contractors (If Any):

Name: _____ **Scope of Work:** _____**MBE / WBE**

Name: _____ **Scope of Work:** _____**MBE / WBE**

Name: _____ **Scope of Work:** _____**MBE / WBE**

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

BID PACKAGE SPECIFICATIONS

Project Description:
With the goal of enhancing boating and fishing opportunities in historic Roger Williams Park, the City of Providence Parks Department is seeking qualified bidders to construct a new timber framed boardwalk with fishing overlook and to improve the existing boat ramp at the edge of Cunliff Lake. As the only location offering a public boat launch, Cunliff Lake is the largest water body within the 435 acre park. The boat ramps' current condition is subject to flooding and poses accessibility challenges. The work will also serve to redirect pedestrian circulation and improve safety between vehicles, bikers and pedestrians. In addition, improved stormwater management will be achieved by introducing additional native plantings to the existing bioretention area that to be protected from foot traffic via the boardwalk and timber guardrails. Site amenities including boardwalk lighting, site furnishings and additional permeable parking spaces are listed as add alternates.

BASE BID: The Base Bid scope of work for this project shall include, but not be limited to the following: Following regulations within the RIDEM Freshwaster Wetlands Permit, the scope includes furnish and install a heavy duty timber framed boardwalk and fishing overlook with composite decking and SS cable railings supported by fiber reinforced polymer (FRP) piles along the south western edge of Cunliff Lake; furnish and install an articulating concrete block system at the boat ramp and newly configured parking area; furnish and install concrete pavement with timber guard rails to meet existing path conditions; and furnish and install plantings in the existing bioretention area and adjacent to improved boat ramp and parking.

ADD ALTERNATES include:

- F&I Parking Lot Articulated Blocks (Southern Section)
- F&I Geogrid Reinforced Parking with granite cobble edge (Southern Middle and Northern Sections)
- F&I Solar Integrated Light Bollards
- F&I Solid curved benches with back rest
- F&I 6' Benches
- F&I 55 gallon trash receptacles with dome lid

In addition to stating the Total Base Bid, the bidder shall state Unit Prices for related work listed under each bid item which represents the work items included in the Total Base Bid. The Unit Prices are quoted for computing adjustments to the Base Bid prior to Contract award, as well as during the course of construction, based upon extra work ordered by the City or for work countermanded, reduced or omitted by the City in order to stay within the Project budget.

Base Bid Items and Unit prices are to be Completed prices to be added or deducted on the basis of quantities of work involved, for each item in place in the unit indicated.

All Work Included in this Project Shall be Completed for the lump sum of:

_____**Dollars**

($_____), TOTAL BASE BID

ALLOWANCE: $50,000.00

BASE BID W/ ALLOWANCE: $_____

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

ABBREVIATIONS

R&S	Remove & Stockpile	EA	Each
R&D	Remove & Dispose	LF	Linear Foot
D&I	Deliver & Install, owner provided	SF	Square Foot
F&I	Furnish & Install	CY	Cubic Yard
LS	Lump Sum	TN	Ton

ADD ALTERNATES:

1. **Add Alt #1 – F&I Parking Lot Articulated Blocks (Southern Section)- Complete - Per Lump Sum**

_____ **LS** **$**_____

price in writing

2. **Add Alt #2 – F&I Geogrid Reinforced Parking with granite cobble edge (Southern Section)- Complete - Per Lump Sum**

_____ **LS** **$**_____

price in writing

3. **Add Alt #3 – F&I Geogrid Reinforced Parking with granite cobble edge (Middle and Northern Sections)- Complete - Per Lump Sum**

_____ **LS** **$**_____

price in writing

4. **Add Alt #4 – F&I Solar Integrated Light Bollards Complete - Per Lump Sum**

_____ **LS** **$**_____

price in writing

5. **Add Alt #5– F&I Solid curved benches with back rest (Surface Mount) - Per Lump Sum**

_____ **LS** **$**_____

price in writing

6. **Add Alt #6– F&I 6' Benches (Mount varies) - Per Lump Sum**

_____ **LS** **$**_____

price in writing

7. **Add Alt #7– F&I 55 gallon trash receptacles with dome lid - Per Lump Sum**

_____ **LS** **$**_____

price in writing

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

UNIT PRICES – BASE BID:

1. **Mobilization and Demobilization- Per Lump Sum**

_____ **LS** **$**_____

price in writing

2. **F&I Temporary Tree Protection, complete. – Per Linear Foot**

_____ **LF** **$**_____

price in writing

3. **F&I Erosion Control Silt Sock, complete. – Per Linear Foot**

_____ **LF** **$**_____

price in writing

4. **F&I Temporary inlet protection, complete. – Per Each**

_____ **EA** **$** _____

price in writing

5. **F&I Aqua Barrier Cofferdam complete. – Per Linear Foot**

_____ **LF** **$**_____

price in writing

6. **Sawcut Ex Asphalt pavement – Per Linear Foot**

_____ **LF** **$**_____

price in writing

7. **R &D cast in-place concrete curbing Per Linear Foot**

_____ **LF** **$**_____

price in writing

8. **Strip Turf & Remove Turf & Topsoil to +/- 16" Depth. – Per Cubic Yard**

_____ **CY** **$**_____

price in writing

9. **Rough Grading of Site per Grading Plan. – Per Cubic Yard**

_____ **CY** **$**_____

price in writing

10. **F&I Boardwalk – FRP Piles, complete. – Per Each**

_____ **EA** **$**_____

price in writing

11. **F&I Boardwalk – Superstructure, complete. – Per Square Foot**

_____ **SF** **$**_____

price in writing

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

12. F&I Boardwalk – composite decking, complete. – Per Linear Foot

_____ **LF** **$**_____

price in writing

13. F&I Boardwalk – Stainless Steel Railings, complete. – Per Linear Foot

_____ **LF** **$**_____

price in writing

14. F&I Wood curb mounted to Boardwalk, complete. – Per Linear Foot

_____ **LF** **$**_____

price in writing

15. F&I Solar Integrated Light Bollards Complete - Per Each

_____ **EA** **$**_____

price in writing

16. F&I 4" Permeable concrete walkway, complete. – Per Cubic Foot

_____ **CF** **$**_____

price in writing

17. F&I Wood guard rail, complete. – Per Linear Foot

_____ **LF** **$**_____

price in writing

18. F&I Boat Ramp and ADA Parking, Articulated concrete block - complete. – Per Square Foot

_____ **SF** **$**_____

price in writing

19. F&I Southern Parking Area, articulated concrete block - complete. – Per Square Foot

_____ **SF** **$**_____

price in writing

20. F&I Southern Parking Area, ¾" crushed stone - complete. – Per CY

_____ **CY** **$**_____

price in writing

21. F&I Geogrid Reinforced Parking with granite cobble edge- Per Square Foot

_____ **SF** **$**_____

price in writing

22. F&I 6' Dumor TMA Bench (Mount varies) - Per Lump Sum

_____ **EA** **$**_____

price in writing

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

23. F&I Solid curved benches with back rest (Surface Mount) - Per Lump Sum

_____ **LS** **$**_____

price in writing

24. F&I 55 gallon trash receptacle with dome lid - Per Each

_____ **EA** **$**_____

price in writing

25. Remove and reset existing boulders at boat ramp – Per Each

_____ **EA** **$**_____

price in writing

26. F&I Cornus sericea 'Cardinal' #5 - complete. – Per Each

_____ **EA** **$**_____

price in writing

27. F&I Ilex verticillate 'Afterglow' #5 - complete. – Per Each

_____ **EA** **$**_____

price in writing

28. F&I Rhododendron viscosum #5 - complete. – Per Each

_____ **EA** **$**_____

price in writing

29. F&I Viburnum dentatum #5 - complete. – Per Each

_____ **EA** **$**_____

price in writing

30. F&I Aster novi-beingii 'Professor Anton Kippenberg' #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

31. F&I Carex stricta #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

32. F&I Echinacea purpurea 'Pica Bella' #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

33. F&I Iris veriscolor #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

34. F&I Matteuccia struthiopteris #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

35. F&I Panicum virgatum 'Shenandoah' #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

36. F&I Sorghastrum nutans 'Indian Steel' #1- complete. – Per Each

_____ **EA** **$**_____

price in writing

37. Loam and Seed - complete – Per Square Foot

_____ **SF** **$**_____

price in writing

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

ADDITIONAL BID DOCUMENTS

The complete set of Bid Documents includes the pages above & the following:

- **PREVAILING WAGE DECISION**
- **SAMPLE CONTRACT**
- **TECHNICAL SPECIFICATIONS:**
  - **01 00 00 GENERAL REQUIREMENTS**
  - **01 56 39 TEMPORARY TREE AND PLANT PROTECTION**
  - **02 41 19 SELECTIVE DEMOLITION**
  - **03 11 00 CONCRETE FORMING**
  - **03 20 00 CONCRETE REINFORCING**
  - **03 30 00 CAST IN PLACE CONCRETE**
  - **05 05 00 MISCELLANEOUS METALS**
  - **05 73 00 DECORATIVE METAL RAILINGS**
  - **06 13 00 HEAVY TIMBER CONSTRUCTION**
  - **06 73 00 COMPOSITE WOOD DECKING**
  - **31 10 00 SITE CLEARING**
  - **31 22 13 ROUGH GRADING**
  - **31 25 00 EROSION AND SEDIMENTATION CONTROLS**
  - **31 62 23 COMPOSITE PILES**
  - **32 13 73 CONCRETE PAVING JOINT SEALANTS**
  - **32 33 00 SITE FURNISHINGS**
  - **32 52 00 DEWATERING, DIVERSION, CONTROL OF WATER**
  - **32 91 13 SOIL PREPARATION**
  - **32 91 19 LANDSCAPE GRADING**
  - **32. 92 00 TURF AND GRASSES**
  - **32 93 00 PLANTS**
  - **34 71 13 VEHICLE BARRIERS**
- **TEST BORINGS LOG:**
- **DRAWINGS:**
  - **0-0 COVER**
  - **G1.01 GENERAL NOTES**
  - **C1.0 EXISTING CONDITIONS SURVEY BY MCA**
  - **C1.1 EXISTING CONDITIONS SURVEY BY MCA**
  - **C1.2 AERIAL**
  - **C2.0 EXISTING SITEAND DEMOLITION PLAN**
  - **C3.0 PROPOSED SITE PLAN**
  - **C4.0 BOAT RAMP SECTIONS AND DETAILS**
  - **C4.1 RETAINING WALL DETAILS**
  - **C5.0 MISCELLANEOUS DETAILS**

Please note that the list above is not intended to include all items required to complete the base bid scope of work but can and shall be used to adjust the contract prior to or after award – in the best interest of the City of Providence.

BIDDER: _____

- **S1.0 OVERALL STRUCTURAL FRAMING PLAN**
- **S1.1 STRUCTURAL FRAMING PLAN I**
- **S1.2 STRUCTURAL FRAMING PLAN II**
- **S1.3 STRUCTURAL FRAMING PLAN III**
- **S2.0 STRUCTURAL DETAILS**
- **L1-21 HARDSCAPE PLAN**
- **L1-31 LAYOUT PLAN**
- **L3-01 DETAILS**
- **L3-02 DETAILS**
- **LP1-01 OVERALL LANDSCAPE PLAN**
- **LP1-21 LANDSCAPE PLAN**
- **LP1-22 LANDSCAPE PLAN**
- **LP3-01 PLANTING DETAILS**

ADDITIONAL INFORMATION REQUIRED WITH BID:

- Qualifications to Perform Work – See Form Below for Information Required
- Addenda (If Any) - Must Be Acknowledged on Bid Form (Page 14)
- Product Information for Items Submitted as 'Or Equal' to Specified Materials

PROVISIONS OF THIS PROJECT:

- Upon the Issuance of the Award from the Board of Contract – the City shall issue a Contract to be executed by the City and the vendor incorporating the bid specifications. All Provisions of the Specifications are binding.
- Any Permits Required by the City of Providence and/or State of Rhode Island Shall be Obtained by the Vendor – Permit Fees by the City of Providence Shall be Waived – the State ADA Fee Must be Paid
- The Davis Bacon Act Applies (HUD Projects) – Prevailing Wages Must Be Paid for On Site Hours – On-Site Interviews will be Conducted During the Project – Employees Shall be Advised of the Prevailing Wage Rates Prior to Mobilization on Site
- Certified payrolls Must be Submitted With Pay Requests Including Monthly Utilizations Form
- Performance and Payment Bonds (If Required) Must be Submitted within 10 Days of Award or Bid Bond Will be Forfeited
- An Insurance Certificate Shall be Submitted to the City Within 10 Days of Award
- A Copy of the Vendors Contractor's License Must be Submitted within 10 Days of Award
- All On-Site Personnel Shall be Licensed (If Required) and Shall have Proof of All Licenses Required by the State of Rhode Island to Perform the Work Required
- Pay Requests Must be Submitted on Approved AIA Billing Documents (City will Provide if Needed)
- All Subcontractors Shall be Listed on the Bid Form – All Insurance & Payroll Requirements Apply
    - General Contractor Shall be the Insurance Certificate Holder and the City Shall be Named as 'Additionally Insured' with Respect to Liability Insurance
- A Submittal Log Must be Submitted within 10 Days of Award

CLOSE OUT DOCUMENTS:

- Prior to Final Payment the Vendor Shall Provide the Following:
    - Copies of Permits Signed off and Approved (If Any)
    - Operating Manuals and Warranties Shall Be Transferred and/or Delivered
    - Full and Completed As-Built Drawings Shall be Submitted for Approval

- Training Shall be Provided to City Personnel (If Required)
- Certification by Manufactures Representative (If Required)

QUALIFICATIONS:

Qualifications will be evaluated on the basis of similar project experience for:

a. Completion of at least 3 similar projects within the past five years.
b. Size and dollar value of similar completed projects.
c. Contractor's performance with similar projects. (references will be checked)
d. Relevant experience of individuals assigned to the project.

Questions regarding this bid package shall be submitted via e-mail to Purchasing at purchasing@providenecri.gov and **(Megan Gardner, RLA mgardner@providenceri.gov)**, no later than five (5) working days before the bid opening date.

SUPPLEMENTAL INFORMATION

If the issuing department for this RFP determines that your firm's bid is best suited to accommodate their need, you will be asked to provide proof of the following prior to formalizing an award.

An inability to provide the outlined items at the request of the department may lead to the disqualification of your bid.

This information is NOT requested to be provided in your initial bid that you will submit to the City Clerk's office by the "date to be opened" noted on page 1. This list only serves as a list of items that your firm should be ready to provide on request.

All bids submitted to the City Clerk become public record. Failure to follow instructions could result in information considered private being posted to the city's Open Meetings Portal and made available as a public record.

You must be able to provide:

- Business Tax ID will be requested after an award is approved by the Board of Contract and Supply.
- Proof of Insurance.
- Certificate of Good Standing with the Rhode Island Secretary of State.

CITY OF PROVIDENCE STANDARD TERMS & CONDITIONS

1. The terms "you" and "your" contained herein refer to the person or entity that is a party to the agreement with the City of Providence ("the City") and to such person's or entity's employees, officers, and agents.
2. The Request For Proposals ("RFP") and these Standard Terms and Conditions together constitute the entire agreement of the parties ("the Agreement") with regard to any and all matters. By your submission of a bid proposal or response to the City's RFP, you accept these Standard Terms & Conditions and agree that they supersede any conflicting provisions provided by bid or in any terms and conditions contained or linked within a bid and/or response. Changes in the terms and conditions of the Agreement, or the scope of work thereunder, may only be made by a writing signed by the parties.
3. You are an independent contractor and in no way does this Agreement render you an employee or agent of the City or entitle you to fringe benefits, workers' compensation, pension obligations, retirement or any other employment benefits. The City shall not deduct federal or state income taxes, social security or Medicare withholdings, or any other taxes required to be deducted by an employer, and this is your responsibility to yourself and your employees and agents.
4. You shall not assign your rights and obligations under this Agreement without the prior written consent of the City. Any assignment without prior written consent of the City shall be voidable at the election of the City. The City retains the right to refuse any and all assignments in the City's sole and absolute discretion.
5. Invoices submitted to the City shall be payable sixty (60) days from the time of receipt by the City. Invoices shall include support documentation necessary to evidence completion of the work being invoiced. The City may request any other reasonable documentation in support of an invoice. The time for payment shall not commence, and invoices shall not be processed for payment, until you provide reasonably sufficient support documentation. In no circumstances shall the City be obligated to pay or shall you be entitled to receive interest on any overdue invoice or payment. In no circumstances shall the City be obligated to pay any costs associated with your collection of an outstanding invoice.
6. For contracts involving construction, alteration, and/or repair work, the provisions of applicable state labor law concerning payment of prevailing wage rates (R.I. Gen. Laws §§ 37-13-1 et seq., as amended) and the City's First Source Ordinance (Providence Code of Ordinances §§ 21-91 et seq., as amended) apply.
7. With regard to any issues, claims, or controversies that may arise under this Agreement, the City shall not be required to submit to dispute resolution or mandatory/binding arbitration. Nothing prevents the parties from mutually agreeing to settle any disputes using mediation or non-binding arbitration.
8. To the fullest extent permitted by law, you shall indemnify, defend, and hold harmless the City, its employees, officers, agents, and assigns from and against any and all claims, damages, losses, allegations, demands, actions, causes of action, suits, obligations, fines, penalties, judgments, liabilities, costs and expenses, including but not limited to attorneys' fees, of any nature whatsoever arising out of, in connection with, or resulting from the performance of the work provided in the Agreement.
9. You shall maintain throughout the term of this Agreement the insurance coverage that is required by the RFP or, if none is required in the RFP, insurance coverage that is considered in your industry to be commercially reasonable, and you agree to name the City as an additional insured on your general liability policy and on any umbrella policy you carry.
10. The City shall not subject itself to any contractual limitations on liability. The City shall have the time permitted within the applicable statute of limitations, and no less, to bring or assert any and all causes of action, suits, claims or demands the City may have arising out of, in connection with, or resulting from the performance of the work provided in the Agreement, and in no event does the City agree to limit your liability to the price of the Agreement or any other monetary limit.
11. The City may terminate this Agreement upon five (5) days' written notice to you if you fail to observe any of the terms and conditions of this Agreement, or if the City believes your ability to perform the terms and conditions of this Agreement has been materially impaired in any way, including but in no way limited to loss of insurance coverage, lapsing of a surety bond, if required, declaration of bankruptcy, or appointment of a receiver. In the event of termination by the City, you shall be entitled to just and equitable compensation for any satisfactory work completed and expenses incurred up to the date of termination.
12. Written notice hereunder shall be deemed to have been duly served if delivered in person to the individual or member of the

firm or entity or to an officer of the entity for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known by the party providing notice.

13. In no event shall the Agreement automatically renew or be extended without a writing signed by the parties.
14. You agree that products produced or resulting from the performance of the Agreement are the sole property of the City and may not be used by you without the express written permission of the City.
15. For any Agreement involving the sharing or exchange of data involving potentially confidential and/or personal information, you shall comply with any and all state and/or federal laws or regulations applicable to confidential and/or personal information you receive from the City, including but not limited to the Rhode Island Identity Theft Protection Act, R.I. Gen. Laws § 11-49.3-1, during the term of the Agreement. You shall implement and maintain appropriate physical, technical, and administrative security measures for the protection of, and to prevent access to, use, or disclosure of, confidential and/or personal information. In the event of a breach of such information, you shall notify the City of such breach immediately, but in no event later than twenty-four (24) hours after discovery of such breach.
16. The Agreement is governed by the laws of the State of Rhode Island. You expressly submit yourself to and agree that any and all actions arising out of, in connection with, or resulting from the performance of the Agreement or relationship between the parties shall occur solely in the venue and jurisdiction of the State of Rhode Island or the federal court located in Rhode Island.
17. The failure of the City to require performance of any provision shall not affect the City's right to require performance at any time thereafter, nor shall a waiver of any breach or default of this Agreement constitute a waiver of any subsequent breach or default or a waiver of the provision itself.
18. If any term or provision of this Agreement, or the application thereof to any person or circumstance shall, in any extent, be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each term and provision shall be valid and enforceable to the fullest extent permitted by law.

PREVAILING WAGE

This project qualifies for prevailing wages per the Prevailing Wages Statute or the Davis Bacon Act (HUD). Certified payrolls will need to be submitted to the owner for all hours worked on site for this project.

The Wage Decision for this project shall be as recorded on the Bid Date and is available on the RI Department of Labor website.

Federal Labor Standards

U.S. Department of Housing & Urban Development

Applicability

The Project of Program to which the Construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A.1. (i) Minimum Wages. All laborers and mechanics employed or working up on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction of development of the project) will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers of mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification or work actually performed, without regard to skill, excepts as provided in 29 CFR Part 5.5 (a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFT part 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contact shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of

receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withhold from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much that the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract. HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic record relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonable anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) or the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits ins enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-34 is available for this purpose and may be purchases from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), Government Printing Office, Washington, Dc 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under 20 CFR Part 5.5 (a)(3)(i) and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less that the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a property executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph AA.3. (ii)(b) of this section.

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code. (iii) The contractor of subcontractor shall make the records required under paragraph A.3. (i) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.

4. (i) Apprentices and Trainees. Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprentice program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the age determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the

applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the even the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less that the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirement of Executive Order 11246, s amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.
6. Subcontracts. The contractor or subcontractor will insert in any subcontract the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all contract clauses in 29 CFR Part 5.5
7. Contracts termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor as provided in 29 CFR 5.12
8. Compliance with Davis-Bacon and Related Act Requirements. All ruling and interpretations of the Davis-Bacon and Related Act contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.
10. (i) Certification of Eligibility. By entering in to this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR part 24.

    (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act of 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

    (iii) The penalty to making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transaction", provides in part: "Whoever,

for the purpose of …influencing in any way the action of such Administration…makes, utter of publishes any statement, knowing the same to be false…shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work I excess of forty hours I such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) or this paragraph, the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $25 for each calendar day on which such individual was required or permitted to work in excess of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages for liquidated damages. HUD or its designees shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold of cause to be withheld form any moneys payable on account of work performed by the contractor or subcontractor under any such contract or nay other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidates damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety

(1) No laborer or mechanic shall be required to work in surrounding or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly Part 1518) and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96).

(3) The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The Contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

"General Decision Number: RI20250005 01/03/2025

Superseded General Decision Number: RI20240005

State: Rhode Island

Construction Type: Heavy Dredging

Counties: Rhode Island Statewide.

ALL DREDGING (except self propelled hopper dredging) on the Atlantic Coast and tributary waters emptying into the Atlantic Ocean

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

|_____|_____|

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025

ENGI0025-001 10/01/2023

STATEWIDE

	Rates	Fringes
Dredging:		
CLASS A1	$ 45.26	15.17+a+b
CLASS A2	$ 40.33	14.82+a+b
CLASS B1	$ 39.14	14.74+a+b
CLASS B2	$ 36.84	14.58+a+b
CLASS C1	$ 35.83	14.26+a+b
CLASS C2	$ 34.68	14.18+a+b
CLASS D	$ 28.81	13.77+a+b

CLASSIFICATIONS:
CLASS A1: Deck Captain; Mechanical Dredge Operator, Leverman, Licensed Tug Operator over 1000 HP.
CLASS A2: Crane Operator (360 swing).
CLASS B1: Derrick Operator (180 swing), Spider/Spill Barge Operator, Engineer, Electrician, Chief Welder, Chief Mate, Fill Placer, Operator II, Maintenance Engineer, Licensed Boat Operator, Licensed Crew Boat Operator.
CLASS B2: Certified Welder.
CLASS C1: Mate, Drag Barge Operator, Assistant Fill Placer, Welder, Steward.
CLASS C2: Boat Operator.
CLASS D: Oiler, Deckhand, Shoreman, Rodman, Scowman, Cook, Messman, Porter/Janitor.

INCENTIVE PAY: (Add to Hourly Rate)
Operator (NCCCO License/Certification) $1.80 Licensed Tug

Operator over 1000 HP (Assigned as Master) (USCG licensed Master of Towing Vessels (MOTV) $1.80; Licensed Boat Operator (Assigned as lead boat captain) USCG licensed boat operator $1.30; Engineer (QMED and Tankerman endorsement or licensed engineer (USCG) $1.80 Oiler (QMED and Tankerman endorsement (USCG) $1.80; All classifications (Tankerman endorsement only) USCG $1.55; Deckhand or Mate (AB with Lifeboatman endorsement (USCG) $1.80; All classifications (lifeboatman endorsement only (USCG) $1.55; Welder (ABS certification) $1.55

FOOTNOTES APPLICABLE TO ABOVE CRAFTS:
a. PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr.'s Birthday, Memorial Day, Good Friday, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day
b. VACATION: Eight percent (8%) of the straight time rate, multiplied by the total hours worked.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates
in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

CONSTRUCTION AGREEMENT

This Construction Agreement ("Agreement") is made and entered into as of this ____ day of _____ **2023** by and between the **City of Providence Board of Park Commissioners,** having an address of The Dalrymple Boathouse, Roger Williams Park, 1000 Elmwood Ave., Providence, RI ("City") and **[Contractor Name],** having an address of **[Contractor Address]** ("Contractor").

WITNESSETH:

WHEREAS, the **[Park Name]** is located at **[Park Address].** The City plans to make improvements to the park under the **[RFP Name]** project (the "Project"), as detailed in the Request for Proposals ("RFP") issued by the City on [**RFP Date]** (attached and incorporated by reference as Exhibit A); and

WHEREAS, the Contractor proposed to handle the Project, as detailed in a responsive bid opened on **[bid opening date]** (attached and incorporated by reference as Exhibit B); and

WHEREAS, the Board of Contract and Supply awarded the contract to the Contractor, pursuant to the Board's Memorandum dated **[award letter date]** (attached and incorporated by reference as Exhibit C).

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained in this Agreement, the Parties agree as follows:

1. SELECTION. The City hereby selects the Contractor to provide construction services outlined in its **[bid opening date]** submission.

2. TERM. The term of this agreement shall be from and after the date of execution through completion of the Project, which shall be not later than **[completion date].**

3. TERMS OF PAYMENT. The total amount of the awarded contract is **[contract amount]**. The City shall make a good-faith effort to pay the Contractor within sixty (60) days of receipt of a pay requisition for work completed and accepted, less retainage.

4. COMPENSATION. The Contractor shall be paid according to the breakdown contained in its bid package.

5. MERGER AND INTEGRATION. The procurement documents prepared and issued for purposes of this Project, including the RFP, the bid submitted by Contractor, and any other documents referenced in or attached to this Agreement, are hereby incorporated in and form a part of this Agreement; provided, however, that to the extent those documents differ or contradict the terms of this Agreement, this Agreement shall control.

6. INDEMNIFICATION AND LIABILITY. The Contractor is alone responsible for the safety, efficiency, and adequacy of the construction and for any damage which may result from improper construction, maintenance, or operation. The Contractor shall indemnify, defend, and hold harmless the City, and its employees, representatives, agents, successors and assigns (the "City Indemnified Parties") from and against any and all demands, claims, suits, cause or cause of action, whether at law or in equity, costs, expenses and attorneys' fees and any liability whatsoever to anyone for any bodily injury or property damage resulting from or arising out of the willful misconduct or negligent acts or omissions of the Contractor and/or its employees, representatives, subcontractors, and agents in the performance of this Agreement.

7. RETAINAGE: The City shall retain **5%** of all pay requests paid during the Project. When the City and/or its representatives deem the Project as "Substantially Complete," or 85% of the work has been completed, the retainage may be reduced to 2.5% for the work completed. The final payment will be released when all the work has been completed, inspected, and approved by the City's representative and all closeout documents, warranties and as-built plans have been received and approved by the City.

8. INSURANCE. The Contractor is required to carry liability insurance in the amount of not less than one million dollars ($1,000,000) per occurrence and two million dollars ($2,000,000) general aggregate and shall furnish to the City an insurance certificate naming the City of Providence, and the Board of Park Commissioners, and the Providence Public Buildings Authority as additional named insureds on a primary but non-contributing basis for General Liability.

9. BINDING EFFECT. This Agreement and all the covenants, provisions, and conditions herein contained shall inure to the benefit of and be binding upon the heirs, successors and assigns of the parties. Neuter pronouns shall be read as masculine or feminine, and words in the singular person as plural, if the nature or number of the parties require.

10. GOVERNING LAW. This Agreement is entered into pursuant to and shall be governed by and construed in accordance with the laws of the State of Rhode Island.

11. NATURE OF RELATIONSHIP. Nothing in this Agreement shall create a partnership, joint venture, trust or other fiduciary relationship between the Contractor and the City.

12. AMENDMENTS AND SUPPLEMENTS. The Contractor and the City may amend, modify, supplement, or waive any provisions of this Agreement in such manner as may be agreed upon by the Parties in a written instrument executed by both Parties.

13. MBE/WBE. The parties acknowledge that the City sets an MBE goal of 10% and a WBE goal of 10%, and the Contractor will make good faith efforts to comply with these goals.

14. TERMINATION. The City may terminate this Agreement at any time upon ninety (90) days prior written notice. This Agreement may be terminated by either party if the other party materially breaches any provision of this Agreement and fails to cure the material breach within 30 days after receiving notice thereof from the non-breaching party. Without limiting the City's right to terminate this Agreement, the City may suspend the Contractor's right to access the Project upon any actual, threatened, or suspected breach of this Agreement.

15. COUNTERPARTS. This Agreement may be executed in multiple counterparts, each of which shall constitute an original, but all of which shall constitute one document.

IN WITNESS WHEREOF, the parties have caused this Agreement to be duly executed as of the date first above written.

CITY OF PROVIDENCE:

By: _____
Brett P. Smiley, Mayor

Approved as to form and correctness:

_____
Jeff Dana, City Solicitor

CONTRACTOR:

By: _____
[Contractor name and title]

EXHIBIT A: RFP
EXHIBIT B: Bid
EXHIBIT C: Board of Contract and Supply Memorandum dated **[award letter date]**
EXHIBIT D: ARPA Amendment

DOCUMENT 000110

TABLE OF CONTENTS

END OF SECTION

SECTION 010000

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

1.2 ALL WORK DONE UNDER THIS CONTRACT SHALL ALSO BE IN CONFORMANCE WITH THE DRAWINGS AND THESE SUPPLEMENTAL TECHNICAL SPECIFICATIONS.

A. SCOPE OF WORK.
   1. The general summary of work to be done under this contract consists of, but shall not be limited, to the following as shown in the Contract Documents:

B. WORK COVERED BY CONTRACT DOCUMENTS.

C. The Contractor shall execute the scope of work indicated on Plans and Specifications to enhance the use and operations of the site as shown within the project limits.

D. Work shall be as specifically indicated, shown or described in the Drawings, Technical Specifications, and other Contract Documents.

E. PROJECT INFORMATION.
   1. OWNER.
      a. City of Providence Parks Department Roger Williams Park Dalrymple Boathouse, 1000 Elmwood Avenue, Providence, RI 02907, Telephone: 401.680.7200.
      b. Superintendent of Parks: Wendy Nilsson.
   2. OWNER’S REPRESENTATIVE.
      a. Megan Gardner, RLA, Providence Parks Department 401.248.5044.

1.3 PROJECT LOCATION

A. Roger Williams Park Cunliff Lake - Maple Ave - Providence, RI 02907.

PART 2 PRODUCTS

2.1 CONTRACTOR USE OF PREMISES

A. The Contractor's use of premises shall be within the limits shown on the Drawings and as defined in the Standard Form of Agreement, for the performance of the Work.
   1. The Contractor shall maintain vehicular access and utility service to the abutting properties at all times throughout the course of the construction.
   2. The Contractor shall assume full responsibility for security of all materials and equipment on the site, including those of the subcontractors.
   3. If directed by the Owner's Representative, the Contractor shall relocate or move any stored items that interfere with operations of the Owner.
   4. The Contractor may elect to obtain (at no cost to the Owner) additional storage or work areas off-site if needed to perform the work.

2.2 OWNER OCCUPANCY REQUIREMENTS

A. The Owner (City) anticipates that site inclusive of all on-site amenities beyond the Limit of Work will remain open throughout the course of construction.

B. Contractor shall provide the Owner's Representative with a written plan describing the sequences and durations anticipated for the execution of the Work.

2.3 MOBILIZATION, SITE PREPARATION, & DEMOLITION

A. THE WORK SPECIFIED IN THIS SECTION INCLUDES:
   1. Mobilization of all personnel and equipment;
   2. Preparing the construction site for construction operations;
   3. Materials to be removed and legally disposed of off site;
   4. When applicable, verifying and utilizing survey control points as shown on the Drawings;
   5. Protecting existing site features to remain, such as fences, trees, shrubs and grassed areas outside the limit of work;
   6. Protecting underground and overhead utilities and other existing facilities from damage;
   7. Where applicable, provisions for site access and of traffic control;
   8. At cessation of site improvement operations: Site clean-up;
   9. De-mobilization of all personnel and equipment.

2.4 CONSTRUCTION STAGING/STOCKPILE AREAS

A. Staging areas within the Park is permitted as shown on the Plans with the prior consent of and coordination with the Owner.

B. Restoration of the site to pre-existing condition shall be the sole responsibility of the Contractor.

2.5 MATERIALS AND EQUIPMENT:

A. Materials to be Removed and Stockpiled.
   1. Materials directed to be removed and stockpiled shall be removed, transported to and stacked in a location directed by the Owner's Representative. All materials shall be neatly stacked as directed.
   2. If the Owner's Representative determines that any part of the materials identified to be stockpiled are unsuitable for re use on the site or by the Owner elsewhere, such materials shall be evaluated for legal disposal by Owner's Representative and Contractor.

B. Signs: Conform to requirements of Temporary Facilities and Controls.

C. Temporary Site Protection: Temporary chain-link fence, if so desired shall be furnished, installed and maintained at no additional cost to the Owner. At the completion of all work at the site, the Contractor shall remove all temporary fencing and restore the site to its original condition at no additional cost to the Owner.

2.6 TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES

A. Make arrangements with the Owner's Representative for storage of materials and equipment in designated locations at the construction site. If staged on site, materials shall be secured from vandalism and or theft.

B. Plastic construction fence or snow fencing if installed shall be maintained in good condition. Provide barricades, barrels, fencing and/or other barriers around excavations and trenches as required for safety. Upon completion, temporary fencing shall be removed and the affected area restored to existing condition.

2.7 SITE MAINTENANCE

A. Control dust from Contractor operations in accordance with specified dust control measures.

B. Maintain the Site during construction in a manner that will not obstruct use on neighborhood streets. Proceed with the work in an orderly manner, maintaining the construction site free of debris and unnecessary equipment or materials.

C. Legally dispose of all debris, rubbish, hazardous materials, oil, and grease in accordance with local ordinances.

D. Maintain safety and security of the construction site and any stockpiled or staged materials or equipment if left on site.

2.8 TRAFFIC CONTROL

A. For all of his operations, the Contractor shall provide appropriate traffic control in accordance with, TEMPORARY FACILITIES AND CONTROLS. The purposes of the traffic control are 1) to ensure that operations in the project area are performed in a safe and orderly manner, and 2) to minimize the impact of truck and equipment traffic and noise on adjacent homes near the project area. The Contractor shall be responsible for obtaining any and all required permits and approvals.

B. Police Details, if required by the City, shall be paid directly to and coordinated with Providence Public Safety by the Owner.

2.9 DEMOBILIZATION

A. Contractor shall be responsible for site security and safety at all times. Upon substantial completion of the work, Contractor shall remove all excess materials, equipment, construction debris, temporary facilities and construction measures (fencing, signs, barriers, etc.) from the project area, and shall leave the site in suitable condition for full occupancy and use by the Owner. The sedimentation and erosion controls installed as part of the Work may not necessarily be removed at this time (see below).

B. The Owner’s Representative shall be the sole judge of whether the site has been suitably cleaned.

C. Upon suitable stabilization of all disturbed “erodible” areas (e.g. acceptable level of grass growth in loamed and seeded areas, mulch applied and stable in planting areas, etc.), contractor shall remove and legally dispose of all sedimentation and erosion control measures (silt fence, hay bales, catch basin inserts, etc.). See Section 024119 Selective Demolition and 329200 Turf and Grasses for directives and procedures.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. The construction site entrance shall be as indicated on the plans. The Owner will provide access to any locked gate. Any tracked debris from the site present on adjacent roadways shall be removed and the roads swept daily to remove any excess mud, dirt, or rock originating from the site. Trucks hauling material shall be covered and equipped with gates that prevent material from falling out. If present, catch basins within 100 feet of site entry and exit locations shall be protected with inlet sediment control devices and maintained for the duration of the work.

B. Identify, clearly mark and protect all survey monuments, temporary bench marks as well as any adjacent contractors’ work and facilities (if applicable). Repair or replacement shall be at Contractor’s sole expense if damaged by Contractor.

C. Protect existing culverts, sewers, and all other utilities including gas, telecommunications, electricity, and water. Repair or replace at Contractor’s sole expense if damaged by Contractor.

D. Utilize or install drum or sawhorse barricades or backfill all open excavations, holes, trenches, and depressions occurring at construction sites or occurring as part of this work.

3.2 CHANGE ORDER PROCEDURE

A. DESCRIPTION.
   1. The Contractor shall comply with this procedure in the process of giving notification of change and preparing and submitting a proposal for adjustment due to a desired, perceived, or actual change in the work. Changes in the work, or period of performance of the work, may be directed in writing by the Owner's Representative or may be requested by the Contractor. In either case, payment for work accomplished under a modification may not be made until a formal contract modification, incorporating the change into the contract, has been issued and executed. Therefore, it is incumbent upon the Contractor to comply fully with this procedure and to expedite the resolution of changes.

3.3 CHANGE SUBMITTALS

A. When requested, the Contractor shall submit the following to the Owner's Representative in accordance with the Submittals procedures described in these specifications:
   1. Proposal cover letter on Contractor's letterhead;
   2. Detailed price proposal;
   3. Drawings or other explanatory data; and.
   4. Time extension statement with justification if any time extension is requested.

3.4 COMPLIANCE

A. The Contractor shall take such measures as needed to assure familiarity and compliance by its staff with these procedures. If change proposals are incomplete, unclear, or ambiguous or are not supported by adequate documentation, the data will be returned and the Contractor shall resubmit or supplement the proposal as requested by the Owner’s Representative. Delay resulting from the Contractor's noncompliance with this procedure shall not in itself constitute the basis for an extension in the time of performance under the contract.

3.5 PROCESSING CHANGES INITIATED BY THE OWNER’S REPRESENTATIVE

A. The Owner’s Representative will initiate changes only in writing. The Owner will sign any Request for Proposal (RFP). This will establish an Extra Work Order (EWO) number, by which the change will be identified until such time as it may be incorporated into the contract by formal Change Order (CO).

B. The Contractor may or may not be authorized to proceed with the changed work pending resolution of changes in the contract price or time of performance. If the work described in the RFP becomes critical to the timely performance of the Contractor's work, a written request for a Notice to Proceed must be forwarded to the Owner immediately. The Owner will issue any Notice to Proceed. This unilateral modification to the contract may be subject to further negotiation regarding price and time for completion.

C. Payment for changed work, covered by an authorized modification, will not be made until a notice to proceed covering the changed work has been executed.

D. The Contractor shall prepare and submit its proposal for change to include at a minimum:
   1. A cover letter referencing the EWO number and citing the attachments, if any, which constitute the Contractor's total proposal.
   2. A detailed price proposal showing labor, construction equipment, and material quantities and prices at the lowest practical level of each element of the work.
   3. Any drawings, sketches, catalog cuts, samples, certifications, or other data required to be submitted by the Owner's Representative that is required to fully document.
   4. A statement of the proposed change in the time of completion of the contract, together with all required justification for such a change.
   5. A statement to the effect that there is "no change in price and/or time of completion of the work under this contract as a result of this proposed change", if that is the case.

E. The Owner may accept the Contractor's proposal without negotiation. Alternatively, upon receipt of a proposal which is satisfactory in form, the Owner's Representative may require negotiation with the Contractor to arrive at a fair and equitable change in the contract price and time of completion. Upon agreement, a contract modification will be issued by the Owner for Contractor's execution.

3.6 PROCESSING CHANGES INITIATED BY THE CONTRACTOR

A. Should the Contractor feel that a change to the work under the contract, or to the contract itself, is necessary or desirable, it shall propose such a change to the Owner's Representative. This proposed change shall include a clear and concise description of the proposed change, along with that information cited in above.

B. Within a reasonable time, the Owner's Representative will review the Contractor's proposal and determine if the proposed change is in the Owner's best interest. If so, Contractor will be advised of this and a an EWO number will be assigned to Contractor's proposal.

3.7 EXECUTING CHANGED WORK

A. The Contractor is cautioned not to proceed with the work described in a proposed change until it is authorized to do so in writing by the Owner's Representative.

3.8 TERMINATIONS AND DELAYS

A. Termination of Contract: If the Contractor or any of his/her subcontractors refuses or fails to prosecute the work with such diligence as will insure its completion within the time specified in these Contract Documents, or as modified, as provided for in these Contract Drawings, or violates any other Provisions of this Contract, the, City, by written notice to the Contractor, may terminate the Contractor's right to proceed with the Work. Upon such termination, the City of Providence may take over the work and prosecute the same to completion, by contract or otherwise, and the Contractor and his/her sureties shall be liable to the City of Providence for any additional cost incurred by the City of Providence in its completion of the work and they shall also be liable to the City of Providence for liquidated damages for any delay in the

completion of the work as provided below. If the Contractor's right to proceed is so terminated, the City may take possession of and utilize in completing the work such materials, tools, equipment, and plants as may be on the site of the work and necessary thereof. Project work must commence 30 days after award of Contract or as mutually agreed upon by the Contractor and the Owner. The Contractor is required to submit a Work Schedule including all items included in the scope of work. The Work Schedule shall mirror the Schedule of Values which should be in chronological order. Both items are identified in the standard Pre-Bid and Pre-Construction Meeting Minutes as required. The work shall be continuous and the Contractor shall staff the project appropriately to meet the agreed upon work schedule. De-Mobilization from the project, prior to completion, must be agreed upon in writing by the Owner.

3.9 INSPECTION OF WORK

A. DESCRIPTION.

1. Work included in this Section consists of periodic observation of construction of the project. The Contractor's work shall be monitored periodically by the Owner's Representative.
2. The Owner's Representative presence on site or construction observation work is inspectional in nature and will not include supervision or direction of the actual work of the contractor.
3. In no event will the Owner's Representative be responsible or liable for the contractor's use or administration of personnel, machinery, staging, or other temporary or precautionary construction, safety precautions or procedures, or for compliance by the contractor with the provisions, terms, or specifications of the contract. Observation services provided by the Owner's Representative are solely for the benefit of the Owner.
4. The Contractor shall keep the Owner's Representative informed concerning the work status and projected work schedule through regular communications.
5. The Contractor shall not cover any work related to the required field visits until one of the following occurs:
    a. The Contractor is authorized by the Owner's Representative to proceed after the field visit.
    b. The field visit is re-scheduled by the Owner's Representative to a later construction event.
    c. The field visit is waived in writing by the Owner's Representative.
6. The Contractor shall request a Final Inspection seven calendar days in advance of the planned completion date. After review of the Notice of Completion, the Owner's Representative may reject the Notice for cause or schedule the Final Inspection. The Owner's Representative will perform its Final Inspection on all phases of the work and develop a comprehensive punch list, which will be provided to the Contractor.
7. The Final Inspection will be scheduled when the punch list items discovered during the Final Inspection have been corrected. If discovered, the Owner's Representative may add new items to the punch list at this inspection.
8. The Contractor is advised that the Owner's Representative will not accept the work until the Owner's Representative determines Substantial Completion has been achieved. Therefore, to minimize its risk, the Contractor should schedule its work to be substantially complete in time to allow the Final Inspection and punch list work to occur in advance of the Project Close Out Date. Due to the construction time period and the anticipated weather conditions, substantially complete will be defined as the completion of construction for all item and the temporary stabilization of all disturbed areas,

excluding planting and final seeding. Planting and final seeding is to occur during the time periods specified.

9. Nothing in this Section shall be construed to limit the Owner's Representative right to inspect the work at any time.

3.10 CONSTRUCTION SCHEDULES

A. DESCRIPTION.
   1. Work included in this Section consists of preparation, submittal, and updating of the project.

3.11 CONSTRUCTION SCHEDULE

A. Submit the following to the Owner's Representative in accordance with the Submittals Section. Submittals are for the record or approval as indicated.
   1. The proposed construction schedule shall be submitted for approval within five (5) calendar days after receipt of Notice to Proceed.
   2. Submit contract Weekly Summary Reports to the Owner's Representative for the record at weekly site meeting at request by the Owner.
   3. Submit construction progress schedule including a two week look ahead as back up to progress invoices.

B. The construction schedule shall show all work activities for completion of the work to be performed under this contract and will reflect Contractor's general sequential approach to the work. The construction schedule will be in a bar chart format. The minimum level of detail (number of activities) shall include the activities described in the Schedule of Values and the Scope of the Work. The construction schedule shall demonstrate completion of all work within the period of performance of the contract in a reasonable and achievable manner.

3.12 PERIODIC SCHEDULE UPDATES

A. The Contractor shall support monthly payment requests with an approved construction schedule marked to indicate progress. Submit updated schedule as necessary.

B. When in the opinion of the Owner's Representative changes in the work occur that significantly affect the schedule, the Contractor shall submit a revised construction schedule for approval. The revised construction schedule shall be submitted within 10 calendar days after it is requested by the Owner's Representative The current approved construction schedule shall be used as a baseline for progress reporting.

C. Acts of God: Claims for additional compensation for 'Acts of God' will be reviewed by the Owner. It is the Contractor's responsibility to secure the work site daily and failure to provide adequate provisions to do so may result in repairs to the site at the Contractor's expense. Documented 'Acts of God' such as the state issuing a 'State of Emergency' may result in the Owner's authorization to proceed repair funded by the Owner. No work shall proceed without written authorization by the Owner.

3.13 SUBMITTAL PROCEDURES

A. DESCRIPTION.
   1. This Specification Section covers the preparation and submission of all work plans, drawings, samples, manufacturer's literature and brochures, installation instructions, and operation and maintenance manuals as specified herein and in the various sections of these Specifications.
   2. A Submittal Schedule shall be submitted for approval within five (5) calendar days after receipt of Notice to Proceed.

3.14 DRAWINGS

A. The term "drawings" as used herein includes ‘Shop Drawings’ as required for fabrication, erection and installation, layout, and setting of proposed improvements; lists or schedules of materials and catalogues and brochures; performance and test data; and all other drawings and descriptive data pertaining to materials and methods of construction as may be required to show that the materials, equipment, or systems and the positions thereof conform to the requirements of the Contract Documents.

B. Where specified and if so directed by the Owner’s Representative provide shop drawings that are accompanied by design computations.

C. Sheet sizes of drawings shall not exceed 24 in. by 36 in. The title block on all drawings shall bear the name of the Owner, the name of the project, and the project location.

D. The Contractor's drawings shall be submitted electronically in PDF format to the Owner’s Representative for review and approval.

E. The Contractor shall maintain a complete set of construction drawings at the jobsite, clearly marked to reflect as-built conditions. Upon completion of the work, the Contractor shall submit these Record Drawings to the Owner’s Representative.

F. The Owner’s Representative will review drawings and schedules only for conformance with the design of the Project and for compliance with the Contract Documents and Contract Drawings. The Contractor shall make any and all updates and corrections required by the Owner’s Representative.

G. Drawings shall be reviewed and returned within ten (10) working days of receipt of drawings at jobsite. Drawings and all supporting data, catalogs, or similar information shall be prepared by the Contractor or his suppliers and subcontractors but shall be submitted as instruments of the Contractor.

H. The Owner’s Representative review of drawings will be of a general nature and shall not relieve the Contractor from responsibility for errors and omissions of any sort, for deviations from Drawings or Specifications, or for conflict with the work of others that may result from such deviations. The Owner’s Representative review of drawings will not relieve the Contractor of responsibility to complete the work in accordance with the requirements of the Contract Documents.

I. After Notice of Award, the Contractor shall submit a Submittal Schedule to the Owner’s

Representative. The Contractor's schedule shall be brought up to date from time to time to show the latest changes, omissions, and additions. The Schedule will be based on the Contractor's Construction Schedule and will show when the Contractor will submit the drawings and when he/she expects them to be returned so that construction activities shown on the Construction Schedule are not interrupted. There will be a minimum of three weeks between these two activities. Specific methods and routines for handling drawing reviews shall be established in advance within the general framework of the Contract Documents.

J. Work for which the Contractor's submittals are required shall not be started until the submittals have been reviewed and accepted in writing by the Owner's Representative. Any revision by the Contractor of a previously accepted submittal must be accepted in writing by the Owner's Representative before implementation.

3.15 SAMPLES

A. The Contractor shall, at his or her expense, furnish the Owner's Representative with samples of the various materials as specified in these Specification and Drawings. Samples shall be delivered to the office of the Owner's Representative at the Contractor's expense.

3.16 PRODUCT DATA

A. The Contractor shall submit to the Owner's Representative all required Material Safety Data Sheets (MSDS) and all Product Data Sheets and any other relevant product information for all items identified in the Technical Specifications and Drawings. All data shall be furnished by the Contractor in accordance with the approved schedule.

B. SUBMITTAL LOG.
1. Contractor to provided the following information:
    a. An I.D. number for each item.
    b. Specification Section, Paragraph Number and Line Item Number (ie. 321313 / 1.3 / A).
    c. Item Name.
    d. Description of the Item.
    e. Date Submitted.
    f. Status: Approved / Approved As Noted / Rejected.
    g. Sub-Contractor (If any) providing the material.
    h. Comments.

3.17 QUALITY CONTROL DESCRIPTION

A. This Section provides the requirements for Contract quality control (QC) pertaining to the Work, including:
1. QC of products and workmanship;
2. Manufacturer's instructions; and.
3. Manufacturer's certificates and field services.

3.18 WORKMANSHIP

A. The Contractor shall comply with industry standards of the region, except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. The Contractor shall provide suitably-qualified personnel to produce work of specified quality.

C. The Contractor shall secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

D. The Contractor shall provide materials to match approved samples.

3.19 MANUFACTURER'S INSTRUCTIONS

A. The Contractor shall require compliance with instructions in full detail, including each step in sequence. Should instructions conflict with the Contract Documents, the Contractor shall request clarification from the Owner’s Representative before proceeding.

3.20 MANUFACTURER'S CERTIFICATES

A. When required in individual Specifications sections, the Contractor shall submit manufacturer's certificates, in duplicate, certifying that products meet or exceed specified requirements.

3.21 TESTING LABORATORY SERVICES (NIC)

A. Not Utilized in this Contract.

3.22 MANUFACTURER'S FIELD SERVICES

A. When required by the manufacturer or Owner’s Representative, the Contractor shall have the manufacturer provide a qualified representative to observe field conditions, conditions of surfaces and installation, and quality of workmanship as applicable and to make written report of observations and recommendations to the Owner’s Representative.

3.23 AUTHORITY OF OWNER’S REPRESENTATIVE

A. The Owner’s Representative will decide all questions that may arise as to the quality and acceptability of materials furnished. All questions that may arise as to the interpretation of the Contract Drawing and Specifications shall be determined by the Owner’s Representative.

B. The Owner and Owner’s Representative shall not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, and the Owner’s Representative will not be responsible for the Contractor's failure to perform the work in accordance with the Contract Documents.

C. The Owner's Representative will not be responsible for the acts or omissions of the Contractor or any subcontractors, of the agents or employees of any Contractor or subcontractor, or of any other persons at the site or otherwise performing any of the work.

3.24 COORDINATION OF DRAWINGS AND SPECIFICATIONS

A. The Contractor shall take no advantage of any apparent error or omission in the Contract Drawings or Specifications. In the event the Contractor discovers such a discrepancy, error or omission, he shall immediately notify the Owner's Representative. After review and consultation with the Owner's Representative the Owner's Representative will issue clarifications, provide interpretations and make such corrections as may be deemed necessary for the Contractor to proceed with fulfilling the intent of the Contract Drawings and Specifications.

B. When general reference is made on the Contract Drawings or within the Specifications to any cited Standard Specifications, it shall refer to the current edition of such Specifications or the latest revision thereof or interim Specifications adopted and in effect on the date of Effective Date of Agreement. In the event of a conflict between the Contract Drawings and the specifications, the Owner's Representative shall be notified to provide a clarification to the Contractor.

3.25 COOPERATION WITH UTILITIES

A. The Contractor will notify all utility companies, all pipeline owners, or other parties affected and endeavor to have all necessary adjustments of the public or private utility fixtures, pipelines, and other appurtenances within or adjacent to the limits of construction made as soon as practical.

B. Water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals, and all other utility appurtenances within the limits of the proposed construction which are to be crossed, relocated or adjusted are to be moved by the Contractor or its designated agents, except as otherwise noted on the Contract Drawings. In the case of utility lines, the Contractor shall coordinate with the respective utilities for their removal and relocation.

C. Attention is directed to the possible existence of underground facilities not known to the Owner's Representative or in a location different from that which is shown on the Contract Drawings. The Contractor shall take steps to ascertain the exact location of all underground facilities prior to doing work that may damage such facilities or interfere with their service.

3.26 INDEPENDENT TESTING AND INSPECTION (NIC)

A. Not Applicable under this Contract.

3.27 REQUIREMENTS

A. The requirements for sampling and testing or inspection are specified in the Specifications and

Drawings. The Contractor shall maintain a complete and up-to-date file of all quality control documentation at the jobsite.

3.28 MATERIAL AND EQUIPMENT

A. DESCRIPTION.
   1. This Specification Section includes the requirements for the transportation, handling, storage, and protection of materials and equipment as specified herein and in the various Sections of these Specifications. This Section also addresses the procedure for Contractor-proposed product substitutions.

3.29 MANUFACTURER REQUIREMENTS

A. In general, the Contractor shall receive, handle, and store materials and equipment in accordance with manufacturer's recommendations and in a manner which will protect such items from damage or deterioration.

B. GENERAL.

C. Products include the material, equipment, and systems used on this Project. Comply with the Specifications, Drawings and referenced standards as minimum requirements.

3.30 TRANSPORTATION AND HANDLING

A. The Contractor shall receive, handle, and store materials and equipment supplied by him/her in a manner that will protect such items from damage or deterioration in accordance with procedures provided by product manufacturers and the Owner.

B. Promptly inspect the shipments to assure that the products comply with requirements, the quantities are correct, and the products are undamaged.

3.31 STORAGE AND PROTECTION

A. Materials and equipment shall be stored off the ground on blocking or pallets and shall be covered for protection from vandalism and weather damage.

B. Materials and equipment shall be stored, tested, and cleaned prior to use, in accordance with the Specification and all specific manufacturers' requirements. Damaged or nonconforming items shall be removed immediately to a separated storage area for expeditious removal from site.

C. The Contractor shall provide a secure outside storage area in the vicinity of the site.

3.32 SUBSTITUTIONS

A. Substitutions will be considered only when a product becomes unavailable due to no fault of the Contractor or when deemed appropriate by the Owner's Representative.

B. Document each request with complete data substantiating the compliance of the proposed substitution with the Contract Documents.

C. The requested substation proposed constitutes a representation that the Contractor:
   1. Has investigated the proposed product and determined that it meets or exceeds, in all respects, the specified product.
   2. Will provide the same warranty for substitution as for the specified product.
   3. Will coordinate installation and make other changes which may be required for the Work to be complete in all respects.
   4. Waives claims for additional costs which may subsequently become apparent.

D. Substitutions will be considered when they are indicated or implied on shop drawings or product data submittals without separate written request, or when acceptance will require substantial revision of the Contract Documents.

E. The Owner's Representative will determine acceptability of the proposed substitution, and will notify the Contractor of acceptance or rejection in writing within a reasonable time. Only one request for the substitution will be considered for each product. When substitution is not accepted, the Contractor shall provide the specified product.

3.33 REJECTED MATERIALS AND DEFECTIVE WORK

A. Materials furnished by the Contractor and rejected by the Owner's Representative as unsuitable or not in conformity with the specifications shall forthwith be removed from the job-site and work area by the Contractor, and shall not be made use of elsewhere in the work.

B. Any errors, defects, or omissions in the execution of work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Owner or Owner's Representative.

C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect error, omission or act of the Contractor or his employees, as determined by the Owner's Representative, occurring previous to the final payment.

3.34 PROJECT CLOSEOUT

A. DESCRIPTION.
   1. This Section specifies administrative and procedural requirements for the project closeout including, but not limited to:
      a. Project record document (As-Built drawings) submittal. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

b. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Upon completion of work, submit record drawings to the Owner's Representative.

2. Record Specifications.
   a. Maintain one complete copy of the Project Manual, including addenda. Mark these documents to show substantial variations in actual Work performed in comparison with the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data. Upon completion of the Work, submit record Specifications.
3. Test Results.
   a. Not Applicable this project.
4. REMOVAL OF PROTECTION.
   a. Remove temporary protection and facilities installed for protection of the Work during construction. Fencing and erosion and sediment control measures and best management practices can be removed after permanent measures have been established.

3.35 WARRANTIES

A. DESCRIPTION.
1. This Section specifies general administration and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.
   a. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials;
   b. General closeout requirements are included in Section "Project Closeout"; and.
   c. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the specifications and Drawings.
2. Disclaimers and Limitations.
   a. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

B. DEFINITIONS.
1. Standard Warranties.
   a. Standard product warranties are pre-printed written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
2. Special Warranties.
   a. Special warranties are written required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

C. WARRANTY REQUIREMENTS.
1. Related Damages and Losses.
   a. When correcting warranted Work that has failed, remove and replace other Work

that has been damaged as a result of such failure or that must be removed and replaced to provide access for corrections of warranted Work.

2. Reinstatement of Warranty.
   a. When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
3. Replacement Cost.
   a. Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner's Representative has benefited from use of the Work through a portion of its anticipated useful service life.
4. Owner's Recourse.
   a. Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights and remedies.
5. Rejection of Warranties.
   a. The Owner's Representative reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents. The Owner's Representative reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to counter sign such commitments are willing to do so.
   b. All warranties shall be submitted to the Owner in accordance with conditions of the Contract and the Submittals.

D. WARRANTY PERIOD.
1. All warranties required by the Contract documents shall commence on the date of Final Acceptance.
2. Warranty period is one (1) year from date of Final Acceptance unless otherwise specified.

END OF SECTION

SECTION 015639

TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

1.2 SUMMARY

A. Work Results:

B. Principal Products:

C. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

D. Related Requirements:
1. Section 312000 - Earth Moving.
2. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that the requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.
3. ANSI A 300 (Part 5) - Standard Practices for Tree, Shrub and other Woody Plant Maintenance, most current edition.
4. Pruning practices shall conform with recommendations “Structural Pruning: A Guide For The Green Industry”; Published by Urban Tree Foundation, Visalia, California, most current edition.
5. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign Illinois, most current edition.

1.3 DEFINITIONS

A. (DBH): Diameter breast height; diameter of a trunk as measured by the average of the smallest and largest diameters at a height 54 inches above the ground line for trees with caliper of 8 inches or greater as measured at a height of 12 inches above the ground.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PRE- CONSTRUCTION MEETINGS

A. Pre-construction Conference: Conduct conference at Project site.
   1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
      a. Tree-service firm's personnel, and equipment needed to make progress and avoid delays.
      b. Arborist's responsibilities.
      c. Coordination of Work and equipment movement with the locations of protection zones.
      d. Trenching by hand or with air spade within protection zones.
      e. Field quality control and maintenance.
      f. Coordination by Parks Department City Forester and Forestry crews.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.6 QUALITY ASSURANCE

A. Arborist Qualifications: Licensed arborist in jurisdiction where Project is located.

1.7 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Moving or parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Stockpiled soil mixed with planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
   1. Mixture: Well-blended mix of two parts stockpiled soil to one part planting soil.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
   1. Type:.Ground or shredded bark.
   2. Size Range: 3 inches maximum, 1/2 inch minimum.
   3. Color: Natural. - no orange or dyed mulch.

C. Protection-Zone Fencing: Fencing fixed in position and meetingthe following requirements:
   1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart.
      a. Height: 72 inches.
      b. Color: High-visibility orange, nonfading.
   2. Tree Trunk Protection: 2"x3" or 2"x4" softwood lumber wrapped around tree with wire ties or strapping.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

B. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
   1. Apply 2-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

3.2 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected areas except by entrance gates.

Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

B. Maintain protection zones free of trash.

C. Maintain protection-zone fencing in good condition as acceptable by Owner's Representative and remove when construction operations are complete and equipment has been removed from the site.
   1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
   2. Temporary access is permitted subject to preapproval in writing by Owner's Representative if a root buffer effective against soil compaction is constructed as directed by Owner's Representative. Maintain root buffer so long as access is permitted.

3.3 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving" unless otherwise indicated.

B. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

C. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover and wrap with dampened burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil or as directed by Owner's Representative.

3.4 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:
   1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
   2. No roots larger than two (2) inches in diameter may be cut without permission of the City Forester. Cuts must be made with hand-pruner, handsaws, or chainsaws.
   3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
   4. Cover exposed roots with burlap and water regularly.
   5. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving."

B. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by

hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.5 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by Owner's Representative unless otherwise indicated.
   1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

D. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

E. WATERING.

F. The Contractor shall be fully responsible to ensure that adequate water is provided to all trees withing root protection zone to be preserved during the entire construction period. Adequate water is defined to be maintaining soil moisture above the permanent wilt point to a depth of 8 inches or greater.

3.6 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Owner's Representative.
   1. Submit details of proposed pruning and repairs.
   2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
   3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Owner's Representative. Replacement trees to be equal to the total diameter of mature tree by multiple equal diameter specimens.

B. Trees: Remove and replace trees damaged during construction operations that Owner's Representative determines are incapable of restoring to normal growth pattern.
   1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 4" or smaller in caliper size.
   2. Large Trees: Provide multiple trees of 2-1/2" - 3" caliper size to equal total diameter of tree being replaced.
      a. Species: As determined by Owner's Representative.
   3. Plant and maintain new trees as specified in Section 329300 "Plants."

C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain.

D. Soil Aeration: Where directed by Owner's Representative, aerate surface soil compacted during construction. Aerate to loosen soil10 feet beyond drip line and no closer than 36" to tree trunk with air spade.

3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 024100

SELECTIVE SITE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

1.2 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Demolition and removal of selected site elements.
2. Salvage of existing items to be reused or recycled.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner, ready for reuse or store on a per project basis.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
   1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PRE-CONSTRUCTION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structures.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site uses are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Coordination of Owner's continuing use of portions of existing site and of Owner's partial use of completed Work.

C. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of the site immediately adjacent to selective demolition area. Conduct selective demolition so Owner's use will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
   1. Before selective demolition, Owner will remove the items specifically indicated on the drawings.

C. Notify Owner's Representative of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work.
   2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
   3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

F. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection.

G. Storage or sale of removed items or materials on-site is not permitted.

H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.

B. Notify Owner on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.9 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's use.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
   1. Contact Dig Safe-Provide Dig Safe number to Owner prior to mobilization.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
   1. Meet with Owner's Representative to identify local utilities prior to mobilization.

C. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs. measured drawings.
   1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Notify Owner of damaged items.
   2. Before selective demolition or removal of existing elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of the site.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01000 "General Requirements."

B. Remove temporary barricades and protections where hazards no longer exist.

3.3 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
   4. Maintain adequate ventilation when using cutting torches.
   5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   6. Dispose of demolished items and materials promptly and legally off site.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling."

D. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Protect items from damage during transport and storage.

E. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse.
   2. Protect items from damage during transport and storage.
   3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner's Representative, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of legally.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.5 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 031100

CONCRETE FORMING

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

1.2 DESCRIPTION:

A. Provide formwork and accessories for construction of cast-in-place concrete work.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 032000-Concrete Reinforcement.

B. Section 033000-Cast-in-Place Concrete.

C. Section 055213-Pipe & Tube Railings.

1.4 QUALITY ASSURANCE:

A. Design Criteria: Conform to ACI 347, Chapter I.

B. Allowable Tolerances: Conform to ACI 347, 2.4.

1.5 STORAGE OF MATERIALS:

A. Store materials on and under protective sheeting.

1.6 COORDINATION:

A. Notify responsible trades of schedules of concrete pours to allow time for installation and coordination.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Forms:
1. Flatwork: Nominal 2" thick No. 2 Common Southern Yellow Pine or steel forms.

B. Form Oil: Non staining, paraffin-base oil having a specific gravity of between 0.8 and 0.9.

C. Form Ties: Bolts, rods, or patented devices having tensile strength of 3000 lbs., adjustable length, free of lugs which would leave a hole larger than 5/8" diameter and having a full one-inch depth of break-back.

PART 3 EXECUTION

3.1 CONSTRUCTION AND ERECTION:

A. Construct forms in accordance with ACI 347.

B. Build forms to shapes, lines and dimensions of detailed members of concrete construction. Set to line and grade, brace and secure to withstand placing of concrete and maintain their shape and position.

C. Construct forms with care to produce concrete surfaces without unsightly or objectionable form marks in exposed concrete surfaces.

D. Thoroughly clean surfaces of form material and remove nails before reuse. Do not reuse damaged or worn forms. Coat contact surfaces of forms with non-staining form oil prior to placing metal reinforcement.

E. Immediately before placing concrete, clean forms of chips, sawdust, and debris. Immediately after removal of forms, remove form ties, wires, and defects and patch.

3.2 INSERTS AND ACCESSORIES:

A. Make provisions for required installation of accessories, bolts, hangers, sleeves, anchor slots and inserts cast in concrete. Obtain suitable templates or instructions for installation of items. Place expansion joints where detailed and required.

3.3 REMOVAL OF FORMS AND SHORING:

A. Remove forms and shores in accordance with ACI 347.

3.4 CLEANUP:

A. Remove debris and trash.

END OF SECTION

SECTION 032000

CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

1.2 DESCRIPTION:

A. Provide steel reinforcement for cast-in-place concrete.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 03 11 00-Concrete Formwork.

B. Section 03 30 00-Cast-in-Place Concrete.

1.4 DELIVERY AND STORAGE:

A. Stack reinforcing steel in tiers. Mark each length, size, shape and location. Maintain reinforcement free of dirt, mud, paint or rust.

1.5 REFERENCE STANDARDS:

A. American Concrete Institute (ACI):
   1. ACI SP-66-04, ACI Detailing Manual.
   2. ACI 301-20, Specifications for Concrete Construction.
   3. ACI 315R-18, Guide to Presenting Reinforcing Steel Design Details.
   4. ACI 318, Building Code Requirements for Structural Concrete and Commentary.

B. American Society for Testing and Materials (ASTM - latest editions):
   1. ASTM A185, Standards Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
   2. ASTM A251, Specification for Carbon and Low-Alloy Steel Rods for Oxyfuel Gas Welding.
   3. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   4. ASTM A706, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

5. ASTM A767, Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
6. ASTM A1094, Standard Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement.

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

D. Concrete Reinforcing Steel Institute (CRSI): Manual of Standard Practice, latest edition.

E. American Welding Society (AWS): Reinforcing Steel Welding Code, D12.1, including latest revisions.

1.6 SUBMITTALS:

A. Submit the following:

B. Mill test reports for each shipment of reinforcement. Identify reports with specific lots in shipments and submit prior to use of reinforcement in work.

C. Chemical composition of reinforcing steel. Ladle analysis to identify percentage of carbon, phosphorous, manganese and sulfur present in steel.

D. Welder's certification in accordance with AWS D1.4 prior to welding, when welding is indicated or specified.

E. Shop and placement drawings to the Engineer for review prior to fabrication, which show:

F. All construction and expansion joints.

G. Reinforcement detailed in conformance with ACI SP-6.

H. Support bars and details of bar supports including type, size and spacing.

I. Marking for each reinforcement item.

J. Materials Certificates from manufacturer for: Fiber Reinforcement.

PART 2 PRODUCTS

2.1 MATERIALS:

A. All reinforcing steel shall be newly rolled deformed bars, free from rust, and comply with ASTM A-615 or A706, grade 60. Minimum 75% Recycled Product.
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.

B. Provide mill bent reinforcing bars, bent cold to the dimensions indicated and conforming to the requirements of ACI SP-66.

C. All concrete walkways shall be Glass Fiber Reinforced Porous Concrete mix and reinforced with synthetic fibers. Fibers to be fibrillated polypropylene, engineered and designed for use in concrete paving complying with ASTM C 1116/C 116M,Type III, 1/2 to 1-1/2 inches long.

D. Welded Steel Reinforcement: 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. The carbon content not exceeding 0.30% and manganese content not exceeding 0.60%. Identify and tag with manufacturer's heat identification number.

E. Bar support and accessories shall be galvanized or plastic coated and shall conform to ACI 315. Provide minimum size number 5 support bars.

F. 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.

2.2 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.

2.3 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.

D. Adjacent splices shall be staggered whenever possible.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS:

A. Inspection:

B. 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.

C. Verify that reinforcing steel may be installed in strict accordance with all pertinent codes and regulations, the approved Shop Drawings, and the original design.

D. Discrepancies:

E. In the event of discrepancy, immediately notify the Engineer.

F. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 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.

B. Do not bend or straighten steel in a manner that will damage the material.

3.3 PLACING:

A. General:

B. 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.

C. Splicing:

D. Horizontal Bars:
1. Place bars in horizontal members with minimum laps at splices sufficient to develop the strength of the bars in accordance with ACI 318.
2. Bars may be wired together at laps except at points of support of the member, at which points preserve the clear space described above.

E. Wherever possible, stagger the splices of adjacent bars.
1. Other Splices: Make only those other splices that are indicated on the approved Shop Drawings or specifically approved by the Engineer.
2. 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.
3. 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.
4. Use precast concrete bar support blocks for foundation mats. Blocks shall be made of 4,000 psi (un-reinforced) concrete.

3.4 WELDING REINFORCEMENT:

A. Weld deformed steel reinforcement bars in strict accordance with AWS 12.1, using recommended pre-heat temperature and electrode for type of steel being welded.

B. Do not weld steel reinforcement bars without proper heat identification of bars.

3.5 MINIMUM COVER

A. Unless otherwise shown, provide the following minimum cover:
   1. Formed Concrete Exposed to Earth or Water 3” Minimum Cover.
   2. Cast Concrete Exposed to Earth 4” Minimum Cover.

3.6 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.

C. Remove debris and trash resulting from specified work.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:
   1. Section 03 11 00 Concrete Forming.
   2. Section 03 20 00 Concrete Reinforcing.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PRE-CONSTRUCTION MEETINGS

A. Pre-construction Conference: Conduct conference at Project site.
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Concrete Subcontractor.
   2. Review concrete repair procedures, and concrete protection.

1.5 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 40F, when above 80F, 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.

1.6 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.
1) Certifications by the concrete supplier that ingredients conform to the specified requirements.
2) 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.
3) Coarse aggregate gradation, specific gravity, and dry rodded unit weight.
4) Identify admixtures, and planned dosage rate.
5) Manufacturer signed certificates for the following:
a) Admixtures.
b) Form materials and form-release agents.
c) Fiber reinforcement.
d) Joint-filler strips.
c. Location of construction joints is subject to approval of Landscape Architect.
5. Compression test results.
6. 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.

1.7 QUALITY ASSURANCE

A. Mockups: Cast concrete formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.
1. Build panel approximately 100 sq. ft. for formed surface in the location indicated or, if not indicated, as directed by the Landscape Architect.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 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.

1.9 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 40F or when temperatures are expected to fall below 40F within 72 hours after placing concrete.
1. Comply with ACI 306 in cold weather.
2. Maintain concrete temperature of at least 60F.
3. Reinforcement, forms and ground in contact with concrete shall be free of frost.
4. Maintain a temperature of at least 50F, for reinforcement, forms and ground in contact with concrete prior to placement.
5. Keep concrete and formwork at least 50F 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 50F.
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 85F. 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 80F.

PART 2 PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301.
2. ACI 117.

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. Structural 1, B-B or better; mill oiled and edge sealed.
      b. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
   3. Overlaid Finnish birch plywood.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

E. 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.

F. 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.

G. 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.

H. 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.

I. 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.

J. 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.

K. Prohibited Admixtures: Calcium chloride thyocyanates or admixtures containing more than 0.1% chloride ions are not permitted.

2.3 CONCRETE MATERIALS

A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

B. Cementitious Materials:
1. Portland Cement: ASTM C 150/C 150M, Type II for all work unless otherwise specified.

C. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 1N coarse aggregate or better, graded. Provide aggregates from a single source.
1. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Lightweight Aggregate: ASTM C 330/C 330M, 3/4-inch nominal maximum aggregate size.

E. Water: ASTM C 94/C 94M, clean, potable, and free from foreign materials in amounts harmful to concrete and embedded steel.

2.4 CURING 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”; Adrex Engineered Cements.
      b. “Silflo 200”; Silpro Masonry Systems.
      c. “Ultra/lPlan”; 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:
         1) J-40 Bonding Agent; Dayton Superior Corp.
         2) Everbond;L&M Construction Chemicals.
         3) Hornweld ; A.C. Horn, Inc.
         4) Daraweld Cl; W. R. Grace.

2.5 CONCRETE MIXTURES, GENERAL

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

** Minimum: Increase as necessary to meet all other stated requirements.
* Maximum: Decrease if possible.

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.

2.6 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 85F (30 C) and 90F (32 C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90F (32C), 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 EXECUTION

3.1 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.

3.2 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.

3.3 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.
    g. Before placing concrete, and if agreed upon by the Engineer of Record, water may be added at the Project site, subject to the limitations of ACI 301.
    h. Do not add water to concrete after adding high-range water-reducing admixtures.
7. Prepare top and sides of existing walls to remain in accordance with Section 3.03E. Engineer shall be notified at least 48 hours in advance of pouring new concrete on existing to observe prepared surface.

B. Consolidating:
    1. Consolidate concrete with suitable mechanical vibrators operating within concrete. When necessary, vibrating shall be supplemented by hand spading with suitable tools to assure proper and adequate consolidation. Vibrators shall be manipulated so as to work the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. The vibration at any joint shall be of sufficient duration to accomplish consolidation but shall not be prolonged to the point where segregation occurs.

2. Employ as many vibrators and tampers as necessary to secure the desired results. For every two vibrators required for the job, an additional standby vibrator shall be kept on the site. Do not place subsequent layers of concrete until the previous layer has been consolidated as specified. Internal vibrators shall have a minimum frequency of 8000 vibrations per minute when immersed in concrete and shall have sufficient amplitude to effectively consolidate the concrete.
3. Prevent the following practices:
    a. Pushing of concrete with vibrator.
    b. External vibration of forms.
    c. Allowing vibrator to vibrate against reinforcing steel where steel projects into green concrete.
    d. Allowing vibrator to vibrate against the contact faces of forms.

C. Cold Weather: Do not place concrete when the ambient temperature is below 40F, unless specifically authorized by the Engineer. Conform to the requirements of ACI 306R during cold weather.

D. Hot Weather: Do not place concrete with a mix temperature exceeding 90F, unless specifically authorized by the Engineer. Conform to the requirements of ACI 305R during hot weather.

E. Construction Joints:
1. When the placing of concrete is suspended, necessary provisions shall be made for joining future work before the placed concrete takes its initial set. For the proper bonding of old and new concrete, such provisions shall be made for grooves, steps, keys, dovetails, reinforcing bars or other devices as may be prescribed. Before depositing new concrete against existing concrete or concrete which has hardened, the surface of the hardened concrete shall be cleaned by a heavy steel broom, roughened slightly (approximately ¼-inch) amplitude), wetted, and covered with a neat coating of cement paste or grout. Install joint sealant where shown on the Drawings, in accordance with manufacturer's instructions.
2. Joints shall be perpendicular to the main reinforcement.

F. Defective Work:
1. All defective work disclosed after the forms have been removed shall be immediately removed and replaced. If dimensions are deficient, or if the surface of the concrete is bulged, uneven, or shows honeycomb, which in the opinion of the Engineer cannot be 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.

3.4 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 brushed 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.
         1) Use a fiber bristle broom.
         2) Frequently clean broom to avoid deep brooming.
   5. As-Cast Finish:
      a. Rough form finish: tie holes and defects shall be patched.
         1) Fins exceeding ¼ Inch in height shall be chipped off or rubbed off.
         2) Otherwise, surfaces shall be left with the texture imparted by the forms.
      b. Smooth form finish: the form facing material shall produce a smooth, hard, uniform texture on concrete.
         1) The arrangement of the facing material shall be orderly and symmetrical, and the number of seams kept to the practical minimum.
         2) Forms shall be supported by studs or other backing capable of preventing excessive deflection.
      c. 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.

3.5 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 50F, 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 50F, 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.

3.6 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 ¾” 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 050500

- MISCELLANEOUS METALS

PART 1 GENERAL

1.1 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.

1.2 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 manufacturer; 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.

1.3 REFERENCES

A. The following standards (latest edition) shall apply to the work of this Section.
   1. American Society of Testing Materials (ASTM)
      A36/A36A Carbon Structural Steel
      A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
      A153 Zinc Coating (Hot -Dip) on Iron adn Steel Hardware
      A307 Low-Carbon Steel Externally and Internally Threaded Standard Fasteners
      A563 Carbon and Alloy Steel Nuts
      F3125 High Strength Structural Bolts
      A316 Corrosion Resistant Stainless Steel.

1.4 REGULATORY REQUIREMENTS

A. All work performed shall conform to the Rhode Island State Building Code.

1.5 TESTS

A. Tests of threaded connections will be performed to ensure conformance with requirements stated herein under provisions of the General Conditions.

PART 2 PRODUCTS

2.1 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.

2.2 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.

2.3 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 EXECUTION

3.1 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.

3.2 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

SECTION 057300

DECORATIVE METAL RAILINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Stainless-steel decorative railings with stainless-steel cable infill panels.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry."
   2. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking for anchoring railings.
   3. Section 092216 "Non-Structural Metal Framing" for metal backing for anchoring railings.

1.3 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas and for pedestrian guidance and support, visual separation, or wall protection.

1.4 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not meet structural performance requirements.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Cunliff Boardwalk Project Site.

1.6 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Manufacturer's product lines of stainless steel railings assembled from standard components.
   2. Stainless Steel Cable and Cable Fittings.
   3. Fasteners.
   4. Metal Finishes.
   5. Grout, anchoring cement, and paint products.

B. Sustainable Design Submittals:
   1. Product Data: For recycled content, indicating postconsumer and pre-consumer recycled content and cost.

C. Shop Drawings: Include plans, elevations, sections, and attachment det ails.
   1. Contractor shall provide full shop drawings for full railing system showing all connections and mounting, including analysis data signed and sealed by a licensed structural engineer in the state of Rhode Island.

D. Samples for Initial Selection: Submit metal samples of cable and rail finish for approval.

E. Samples for Verification: For each type of exposed finish required.
   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
   2. Fittings and brackets.
   3. Welded connections.
   4. Brazed connections.
   5. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.

F. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For structural engineer responsible for designing and stamping shop drawings and testing agency.

B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

C. Welding certificates.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

E. Preconstruction test reports.

F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.8 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
   3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Build mockups as shown on Drawings.
   2. Build mockups for each form and finish of railing consisting of two posts, top rail, infill area, and anchorage system components that are full height and are not less than 24 inches in length.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Shop Drawings.
   1. shop drawings shall be provided of the entire rail system showing, layout, and all post, cable and railing connections and anchoring devices. Shops drawings shall be stamped by a RI licensed structural engineer.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on laboratory mockups. Payment for these services will be made by Contractor. Retesting of products that fail to meet specified requirements shall be done at Contractor's expense.
   1. Build laboratory mockups at testing agency facility; use personnel, materials, and methods of construction that will be used at Project site.
   2. Test railings according to ASTM E 894 and ASTM E 935.
   3. Notify Landscape Architect seven days in advance of the dates and times when laboratory mockups will be tested.

1.10 POST CONSTRUCTION TESTING

A. Post construction Testing Service: Engage a qualified testing agency to perform post construction testing on the installed railing system. Payment for these services will be made by Contractor. Retesting of products that fail to meet specified requirements shall be done at Contractor's expense.
   1. Installed railing system shall be tested in according to ASTM E 894 and ASTM E 935 and to meet structural design requirements.
   2. Test results shall be provided to the architect.

1.11 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Stainless-steel cable infill panels:
   1. Basis-of-Design Product: VIVA Railings, LLC; CIRCA Railing System with Cable Infill.
   2. R & B Wagner, Inc (Wagner Companies) Round Cable Railing System.
   3. Approved Equivalent.

B. Source Limitations: Obtain each type of railing from single source from single manufacturer.

C. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods, including structural analysis, preconstruction testing, field testing, and in-service performance.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of railings and are based on the specific system indicated. See Section 016000 "Product Requirements."
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
   1. Stainless Steel: 60 percent of minimum yield strength.
   2. Steel: 72 percent of minimum yield strength.

C. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Uniform load of 50 lbf/ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Infill of Guards:
      a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
      b. Infill load and other loads need not be assumed to act concurrently.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior railings by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.
   1. Provide cast-metal brackets with flange tapped for concealed anchorage to threaded hanger bolt.
   2. Provide either formed- or cast-metal brackets with predrilled hole for exposed bolt anchorage.
   3. Provide formed-steel brackets with predrilled hole for bolted anchorage and with snap-on cover that matches rail finish and conceals bracket base and bolt head.
   4. Provide extruded-aluminum brackets with interlocking pieces that conceal anchorage. Locate set screws on bottom of bracket.

2.4 STAINLESS STEEL

A. Tubing: ASTM A 554, Grade MT 304 with a brushed finish.

B. Pipe: ASTM A 312/A 312M, Grade TP 304 with a brushed finish.

C. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.

D. Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304.

E. Bars and Shapes: ASTM A 276, Type 304.

F. Steel Bars: Hot-rolled, carbon steel complying with ASTM A29/A29M, Grade 1010.

G. Wire Rope and Fittings:
1. Cable: 1-by-19 wire cable made from wire complying with ASTM A492, Type 316.
2. Cable Diameter: 3/16 inch (5 mm).
3. Cable Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

H. Posts: Tube made from stainless steel.
1. Post top caps to be fully-welded to posts and ground smooth, leaving no seam marks.
2. Post top cap shall be 1 -1/2” dia round.

2.5 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:
1. Stainless-Steel Components: Type 304 stainless-steel fasteners.
2. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and design loads noted in Section 2.2.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless exposed fasteners are unavoidable.
1. Provide Phillips tamper-resistant [square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1] stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.6 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than 4'that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Make up wire-cable assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.

D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

E. Form work true to line and level with accurate angles and surfaces.

F. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.

G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

H. Connections: Fabricate railings with welded connections unless otherwise indicated by the manufacturer.

I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   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 flux immediately.
   4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds; no evidence of a welded joint.

J. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
   1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

K. Form changes in direction as follows:
   1. As detailed or by bending to smallest radius that will not result in distortion of railing member.

L. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

M. Close exposed ends of hollow railing members with prefabricated end fittings.

N. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch or less.

O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
   1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.

P. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

Q. If applicable For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

R. at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.8 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.9 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1. Run grain of directional finishes with long dimension of each piece.

C. Directional Satin Finish: ASTM A 480/A 480M, No. 4.

D. Dull Satin Finish: ASTM A 480/A 480M, No. 6.

E. Satin, Reflective, Directional Polish: ASTM A 480/A 480M, No. 7.

F. Mirrorlike Reflective, Nondirectional Polish: ASTM A 480/A 480M, No. 8.

G. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

H. Sputter-Coated Finish: Titanium nitride coating deposited by magnetic sputter-coating process over indicated mechanical finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
   1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
   2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
   3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
   1. Coat concealed surfaces of aluminum and copper alloys that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, attached to post with set screws.

D. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

E. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
   1. For aluminum railings, attach posts as indicated using fittings designed and engineered for this purpose.
   2. For copper-alloy railings, attach posts as indicated using fittings designed and engineered for this purpose.
   3. For stainless-steel railings, weld flanges to posts and bolt to metal-supporting surfaces.
   4. For steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections and to prepare test reports.

B. Extent and Testing Methodology: Testing agency will randomly select completed railing assemblies for testing that are representative of different railing designs and conditions in the completed Work. Test railings according to ASTM E 894 and ASTM E 935 for compliance with performance requirements.

C. Remove and replace railings where test results indicate that they do not comply with specified requirements unless they can be repaired in a manner satisfactory to Architect and comply with specified requirements.

D. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work with specified requirements.

3.6 CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint shall be as indicated by the manufacturer.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

SECTION 061300

– HEAVY TIMBER CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

1.2 WORK INCLUDED

A. The work under this Section shall include the installation of new timber split pile caps, stringers, and foot railing and other timber members associated with the construction of the board at Cunliff Lake.

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:

1.3 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 Protection Association (AWPA).
   1. C1 - All Timber Products - Preservative Treatment by Pressure Processes.
   2. C2 - Lumber, Timbers, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Process.
   3. C18 - Standard for Pressure Treated Material in Marine Construction.
   4. M4 - Care 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).

H. Section 06 73 00 COMPOSITE DECKING.

I. Section 06 73 00 COMPOSITE DECKING.

J. Section 05 05 00 METAL FASTENINGS.

1.4 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

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

PART 2 PRODUCTS

2.1 MATERIAL

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

B. Pile Caps, Stringers, and other timber members: Southern Yellow Pine No. 1.
   1. Split pile Caps and stringers shall be S2E.

C. Timber shall have pressure treatment in conformance with AWPA use category UC4B Ground Contact. The UC4B use category pertains to a heavy duty ground contact/fresh water condition where critical components have a high decay potential and/or difficult replacement. Timber pile caps and stringers shall be treated with chromated copper arensate with a minimum retention of 0.6 pounds per cubic foot. The presence of the AWPB quality mark MLP shall be accepted as evidence of conformance to this specification.

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 AWPA M4 and P8.

2.2 ACCESSORIES

A. Connectors: 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.

2.3 FABRICATION

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

2.4 FINISHES

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

2.5 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 AWPA Standard M4.

PART 3 EXECUTION

3.1 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 AWPA 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.

3.2 DEMOLITION AND COORDINATION

A. Demolition and legal disposal of existing and/or waste timber members and hardware shall be in accordance with Sections 02100 - DEMOLITION AND REMOVAL.

B. Coordinate boardwalk pile, pile caps, stringers, rails, and decking work so that no undue stresses are placed on individual members during pier installation.

3.3 MEASUREMENT AND PAYMENT

A. HEAVY TIMBER CONSTRUCTION shall be measured per lump sum installed in place to the lines and elevations shown on the Drawings, as measured by the Engineer, and as specified herein.

3.4 PAYMENT

A. HEAVY TIMBER CONSTRUCTION shall include the furnishing of all labor, materials, equipment, and tools; preparation; and all other incidental work necessary to complete the erection of timber pile caps, stringers, and other work under this item as shown on the Drawings, as specified herein, and as approved by the Engineer.

END OF SECTION

SECTION 067300

- COMPOSITE WOOD DECKING

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

1.2 DESCRIPTION

A. The work included under this section consists of furnishing and installing the wood-free composite lumber decking and its fasteners as indicated on the Drawings and in these specifications.

B. Provide all materials, equipment, and labor necessary to complete the work as indicated on the Drawings or as specified herein.

C. Related Sections:
   1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
   2. Technical Specifications:

D. The following is a list of standards that may be referenced in this section:
   1. American Society for Testing and Materials (ASTM):
      a. D1761 - Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials.
      b. D2394 - Standard Test Methods for Simulated Service Testing of Wood and Wood-Based Finish Flooring.
      c. D6109 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products.
      d. D7032 - Standard Specifications for Establishing Performance Ratings for Wood-Plastic Composite and Plastic Lumber Deck Boards, Stair Treads, Guards, and Handrails.
      e. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   2. American Wood Preservers Association (AWPA).
      a. E1 - Laboratory Methods for Evaluating the Termite Resistance of Wood-Based Materials: Choice and No-Choice Tests.

1.3 QUALITY ASSURANCE

A. Use a contractor who is fully experienced and qualified in such work.

1.4 SUBMITTALS

A. Product Data: Indicate sizes, profiles, surface finishes, and performance characteristics.

B. Samples: The contractor shall provide twelve (12) 6-inch long decking samples illustrating size, profile, color, and surface finish.

C. Maintenance Data: Manufacturer's instructions on care and cleaning of composite wood products.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle composite wood in accordance with manufacturer's instructions.

B. Store composite wood level and flat, off ground or floor, with supports at each end and maximum 24-inches on center.

C. Do not stack composite wood over 12 feet high.

D. Cover composite wood with waterproof covering, vented to prevent moisture buildup.

1.6 WARRANTIES

A. Furnish manufacturer's 25-year warranty providing coverage against checking, splitting, splintering, rotting, structural damage from termites, and fungal decay of composite wood.

1.7 MATERIALS

A. Composite Wood: Weardeck by Owens Corning or approved equal. Composition: Wood-free plastic lumber with integral coloring; free from toxic chemicals and preservatives.

B. Board Size: Nominally 2 x 6 inches.

C. Surface Texture: Surfaces of deck boards shall not be smooth. Wood-grain texture must be approved by the Owner.

D. Color: The color of the composite decking shall be chosen by the Owner. No material shall be ordered by the contractor prior to approval of the Owner.

E. Characteristics: Composite decking shall conform closely to the following characteristics:
1. Abrasion resistance: 0.01inch wear per 1000 revolutions, tested to ASTM D2394.
2. Hardness: 1124 pounds, tested to ASTM D143.
3. Self-ignition temperature: 743 degrees F, tested to ASTM D1929.
4. Flash ignition temperature: 698 degrees F, tested to ASTM D1929.
5. Flame spread rating: 80, tested to ASTM E84.
6. Water absorption, 24 hour immersion, tested to ASTM D1037:
7. Sanded surface: 4.3 percent.
8. Unsanded surface: 1.7 percent.
9. Thermal expansion coefficient, 36-inch-long samples:

   a. Width: 35.2 x 10-6 to 42.7 x 10-6.
   b. Length: 16.1 x 10-6 to 19.2 x 10-6.
10. Fastener withdrawal, tested to ASTM D1761:
   a. Nail: 163 pounds per inch.
   b. Screw: 558 pounds per inch.
11. Static coefficient of friction:
   a. Dry: 0.53 to 0.55, tested to ASTM D2047.
   b. Dry: 0.59 to 0.70, tested to ASTM F1679.
   c. Wet: 0.70 to 0.75, tested to ASTM F1679.
12. Fungus resistance, white and brown rot: No decay, tested to ASTM D1413.
13. Termite resistance: 9.6 rating, tested to AWPA E-1.
14. Specific gravity: 0.91 to 0.95, tested to ASTM D2395.
15. Compression:
   a. Parallel: 1806 PSI ultimate, 550 PSI design, tested to ASTM D198.
   b. Perpendicular: 1944 PSI ultimate, 625 PSI design, tested to ASTM D143.
16. Tensile strength: 854 PSI ultimate, 250 PSI design, tested to ASTM D198.
17. Shear strength: 561 PSI ultimate, 200 PSI design, tested to ASTM D143.
18. Modulus of rupture: 1423 PSI ultimate, 250 PSI design, tested to ASTM D4761.
19. Modulus of elasticity: 175,000 PSI ultimate, 100,000 PSI design, tested to ASTM D4761.
20. Thermal conductivity: 1.57 BTU per inch per hour per square foot at 85 degrees F, tested to ASTM C177.

1.8 ACCESSORIES

A. Fasteners: Stainless steel composite deck screws or triple-coated exterior deck screws of minimum 2.5” length as recommended by composite wood manufacturer for profile being fastened.

1.9 INSTALLATION

A. Install composite wood decking in accordance with manufacturer’s instructions.

B. Cut, drill, and rout composite deck boards using carbide tipped blades.

C. Pre-drill fastener holes located closer than 1 inch from edges.

D. Cut ends square and true.

E. Do not use composite deck products as structural members.

F. Do not exceed maximum spans recommended by manufacturer.

G. Place boards perpendicular to supports.

H. Stagger end joints in adjacent rows at least one support.

I. Leave expansion spaces between abutting boards and between boards and adjacent construction:
   1. End gaps between boards: 1/8 inch at ambient temperatures of 60 degrees F and above and 3/16 inch at ambient temperatures below 60 degrees F.
   2. Side gaps between boards: 1/4 inch at ambient temperatures of 60 degrees F and above and 3/8 inch at ambient temperatures below 60 degrees F.
   3. Gaps between boards and adjacent construction: 1/4 inch at ambient temperatures of 60 degrees F and above and 1/2 inch at ambient temperatures below 60 degrees F.

J. Boards shall span all supports across the entire width of boardwalk. Place boards to span three or more supports in overlook area of boardwalk.

K. Fasten each board to each support with two fasteners.

1.10 CLEANING

A. Clean composite wood to remove stains:
   1. Mold, mildew, and berry and leaf stains: Clean surfaces with conventional deck wash containing detergent or sodium hypochlorite.
   2. Rust and ground-in dirt: Clean surfaces with cleaner containing oxalic or phosphoric acid.
   3. Oil and grease: Clean surfaces with detergent containing degreasing agent.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 311000

SITE CLEARING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Temporary erosion and sedimentation control.

B. Related Requirements:
1. Section 31 25 00 Erosion & Sedimentation Controls.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
   1. Use sufficiently detailed photographs or video recordings.
   2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Topsoil stripping and stockpiling program.

C. Rock stockpiling program.

D. Burning: not permitted.

1.7 QUALITY ASSURANCE

A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

B. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service Dig Safe System for area where Project is located before site clearing.

C. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

D. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 PRODUCTS

2.1 MATERIALS

PART 3 EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 015639 "Temporary Tree and Plant Protection."

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
   1. Arrange with utility companies to shut off indicated utilities.

B. Locate, identify, and disconnect utilities indicated to be abandoned in place.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Engineer not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Architect's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

3.4 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth indicated on Drawings in a manner to prevent intermingling with underlying subsoil or other waste materials.
   1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
   1. Limit height of topsoil stockpiles to 72 inches.
   2. Do not stockpile topsoil within protection zones.
   3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

3.5 STOCKPILING ROCK

A. Remove from construction area naturally formed rocks that measure more than 1 foot across in least dimension. Do not include excavated or crushed rock.
   1. Separate or wash off non-rock materials from rocks, including soil, clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

B. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.
   1. Limit height of rock stockpiles to 36 inches.
   2. Do not stockpile rock within protection zones.
   3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.
   4. Stockpile surplus rock to allow later use by the Owner.

3.6 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Burning tree, shrub, and other vegetation waste is permitted according to burning requirements and permitting of authorities having jurisdiction. Control such burning to produce the least smoke or air pollutants and minimum annoyance to surrounding properties. Burning of other waste and debris is prohibited.

END OF SECTION

SECTION 312213

ROUGH GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating topsoil.
2. Excavating subsoil.
3. Cutting, grading, filling, rough contouring, compacting, site for stonedust & chip-seal paths and concrete pads.

B. Related Sections:
1. Section 31 10 00 - Site Clearing.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Topsoil Fill Type S4 :
1. Basis of Measurement: By Cubic Yard.
2. Basis of Payment: Includes excavating existing soil, supplying soil materials, stockpiling, scarifying substrate surface, placing where required, and compacting.

B. Subsoil Fill Type S2 :
1. Basis of Measurement: By the cubic yard.
2. Basis of Payment: Includes excavating existing subsoil, supplying subsoil materials, stockpiling, scarifying substrate surface, placing where required, and compacting.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3).
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3).

1.4 SUBMITTALS

A. Materials Source: Submit name of imported materials suppliers.

1.5 CLOSEOUT SUBMITTALS

A. Section 01000 - General Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with RIDOT Standard Specifications for Road and Bridge Construction, latest edition.

B. Maintain one copy of each document on site.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Type S4 as specified in Section 310513.

B. Subsoil Fill: Type S2 as specified in Section 310513.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

A. Call Local Utility Line Information service at 1-888-DIG-SAFE not less than three (3) working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum.

C. Protect utilities indicated to remain from damage.

D. Protect plant life, lawns, structures, and other features remaining as portion of final landscaping.

E. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded,in marked areas, without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material and cover over with same material, until disposal.

D. Remove excess topsoil not intended for reuse, from site.

3.4 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, relandscaped, or regraded. marked areas.

B. Do not excavate wet subsoil.

C. When excavating through roots, perform Work by hand and do not remove any roots over 2" in diameter.

D. Stockpile excavated material in area designated on site in accordance with Section 310513.

E. Benching Slopes: Horizontally bench existing slopes greater than 1: 4 to key placed fill material to slope to provide firm bearing.

F. Stability: Replace damaged or displaced subsoil as specified for fill.

3.5 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

B. Place material in continuous layers as follows:
   1. Subsoil Fill: Maximum 8 inches compacted depth.
   2. Granular Fill: Maximum 6 inches compacted depth.

C. Maintain optimum moisture content of fill materials to attain required compaction density.

D. Make grade changes gradual. Blend slope into level areas.

E. Repair or replace items indicated to remain damaged by excavation or filling.

F. Install Work in accordance with RIDOT Standard Specifications for Road and Bridge Construction, latest edition.

3.6 TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

3.7 SCHEDULES

A. Subsoil Fill:
   1. Fill Type S2 : To subgrade elevation. 6" thick.
   2. Compact uniformly to minimum 95% percent of maximum density.

B. Topsoil Fill:
   1. Fill Type S4 : To subgrade elevation. 6" thick.
   2. Compact uniformly to minimum 90 % percent of maximum density.

END OF SECTION

SECTION 312500

EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

C. Furnish all labor, materials, equipment and incidentals required and perform all installation, maintenance, removal and area cleanup related to erosion and sedimentation control work required to meet Federal, State, and local permit requirements and as shown on the Drawings and as specified herein. The work shall include, but not necessarily be limited to; installation of temporary access ways and staging areas, compost filter socks, catch basin sediment filters (silt sack), sediment removal and disposal, device maintenance, removal of temporary devices, and final cleanup.

D. Related Sections:
   1. Section 32 91 19 - Landscape Grading.

1.2 REFERENCES

A. EPA document titled: "Stormwater Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices" document number EPA 832-R-92¬005, dated 1992, or most recent edition. State, County Conservation Districts or local Conservation Commission standards can be substituted for the EPA standard if the State, County or Local Conservation Commission standards is equal to, or more detailed than, the EPA standard.

B. State of Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, Current Edition with latest addenda.

1.3 SUBMITTALS

A. Submit, in accordance with Division 01 00 00 - General Requirements: Submittal Procedures ten (10) days after award of Contract, technical product literature for all commercial products to be used for erosion and sedimentation control.

B. If a NPDES General Permit is required, Contractor shall, prior to the start of construction:
   1. Prepare and submit the EPA NPDES Notice of Intent to Discharge to the applicable EPA office in accordance with EPA regulations. Submit one copy of the permit to Owner’s Representative for informational purposes only.
   2. Prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) in accordance with

the U.S. Environmental Protection Agency (EPA) National Pollution Discharge Elimination System (NPDES) General Permit for this work. Submit one copy of the permit to Owner's Representative for informational purposes only.

1.4 QUALITY ASSURANCE

A. Be responsible for the timely installation and maintenance of all erosion and sedimentation control devices necessary to prevent the movement of sediment from the construction site to off-site areas or into the stream system via surface runoff or underground drainage systems. Measures in addition to those shown on the Drawings necessary to prevent the movement of sediment off site shall be installed, maintained, removed, and cleaned up at the expense of the Contractor. No additional charges to the Owner will be considered.

B. Where Contractor's efforts to control erosion and sediment have been demonstrated to be ineffective or potentially ineffective in the opinion of the Owner's Representative, the Owner's Representative may order that additional measures be implemented and constructed at no additional cost to the Owner.

C. Perform Work according to Municipality of Department of Public Works standards.

PART 2 PRODUCTS

2.1 MATERIALS

A. When work is performed outside of normal seeding window straw mulch shall be utilized on all newly graded areas to protect areas against washouts and erosion. Straw mulch shall be comprised of threshed straw of oats, wheat, barley, or rye that is free from noxious weeds, mold or other objectionable material. The straw mulch shall contain at least 50 percent by weight of material to be 10-in or longer. Straw shall be in an air-dry condition and suitable for placement with blower equipment.

B. Compost Filter Sock.
1. Machine produced.
2. Straw filled tubes of compacted straw of rice, wheat or barley.
3. Compost filter sock to be certified as weed free.
4. Netting for tubes to be seamless, high density polyethylene with ultra violet inhibitors.
5. Roll length to be 10.0 feet to 25.0 feet.
6. Weight per linear foot, 12-inch: 2.5 lbs. minimum 9-inch: 1.5 lbs. minimum.
7. Stakes shall be wooden, 1 1/8-inch x 1 1/8-inch x 2.5 feet long, with lower ends tapered to facilitate driving into compacted soil. Rebar may be substituted for wooden stakes.

PART 3 EXECUTION

3.1 INSTALLATION

A. Staging areas and stabilized construction entrance shall be surfaced with a minimum depth of 6 inches of crushed stone (if so directed by the Landscape Architect. Stabilized construction

entrances shall be installed as shown on the Plans.

3.2 MAINTENANCE AND INSPECTION

A. Inspections.
   1. Make a visual inspection of all erosion and sedimentation control devices once per week and promptly after every rainstorm. If such inspection reveals that additional measures are needed to prevent movement of sediment to offsite areas, promptly install additional devices as needed. Sediment controls in need of maintenance shall be repaired promptly.

3.3 REMOVAL AND FINAL CLEANUP

A. Once the site has been permanently stabilized against erosion, remove all sediment control devices and sediment. Dispose sediment and all waste materials in a proper manner.

B. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.

C. Do not damage structure or device during cleaning operations.

D. Clean channels when depth of sediment reaches approximately one half channel depth.

E. Clean channels when depth of sediment reaches approximately one half channel depth.

3.4 SITE STABILIZATION

A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.

B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.

C. Stockpile and waste pile heights shall not exceed 35 feet. Slope stockpile sides at 2: 1 or flatter.

D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 20 days.
   1. During non-germinating periods, apply mulch at recommended rates.
   2. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with Section 32 92 19 permanent seeding specifications.

E. Stabilize diversion channels, sediment traps, and stockpiles immediately.

END OF SECTION

SECTION 316223

COMPOSITE PILES

PART 1 GENERAL

1.1 SUMMARY

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.

1.2 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. Composite pipe piles driven to 15 - 30 feet below the top of pile caps (final pile length is location dependent). The composite piles have been designed to have an allowable vertical compressive capacity of 24 kips applied at the top of pile.
3. Prior to production pile installation, a static load test shall be performed on a production pile to determine verify the pile can support the anticipated loads. A verification load test shall occur on one (1) pile.
4. A vibratory hammer shall be utilized to continuously drive the pile, using fixed leads.
5. The Contractor shall submit for approval the proposed methods and equipment for installing production piles.
6. Pile splices shall not be allowed.
7. The Contractor may elect to perform near surface pre-excavation and/or probing or spudding through the entire fill thickness at pile locations.
8. The Contractor shall manage any soil, fill, drilling fluids or muds in accordance with Section.
9. Cutting-off of pile stick-ups to achieve the design cutoff elevation, following installation of piles to the bearing stratum and to the approved driving criteria, and removal from the site.
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 03 20 00 - Concrete Reinforcing.
   2. Section 03 30 00 - Cast-in-Place Concrete.

1.3 DEFINITIONS AND REFERENCE STANDARDS

A. Owner: City of Providence Parks Department.

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.

1.4 QUALITY ASSURANCE

A. Comply with all rules, regulations, laws and ordinances of the Rhode Island Department of Public Safety, City of Providence, 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.

1.5 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.
   3. Shop drawings showing proposed static pile load test setup including details of all equipment and apparatus to be used for the static load test.

C. Pile Driving and Static Load Test 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 pre-auguring, pre-excavation or spudding.
   3. If a static pile load test is required -.
      a. The static load test pressure gauge and hydraulic jack shall be calibrated within 30 days prior to the load test as a unit by an approved testing agency. A certificate of the calibration record shall be submitted to the Owner's Representative at least five days prior to the set-up of a load test.
      b. Calibration certificates shall be supplied for the dial gauges (or other measuring devices).

D. Pile Design:
   1. Pearson Pilings, 177 Riverside Avenue, Somerset, MA 02725 or approved equal composite pile manufacturer/supplier.
   2. With each delivery of composite piling, mill certificates containing results of material tests conducted by a certified laboratory. No piles will be accepted unless accompanied with delivery by mill certificates.

E. 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).

F. 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.

1.6 JOB CONDITIONS

A. Site and Subsurface Conditions.
1. Subsurface information representing surficial geology can be found in Appendix C of the most recent Specifications. 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.

1.7 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.

1.8 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.l 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.

1.9 MEASUREMENT

A. Piles will be measured for payment on the basis of length along the axis of the pile in place below the design cutoff elevation.

1.10 BASIS OF PAYMENT

A. Work included under this contract shall include the total price for installation of the estimated linear feet of piles. The work shall include obstruction removal, furnishing and driving the piles, splicing, and all work incidental thereto, and mobilization and demobilization, which shall include job setup, moving equipment including pile driving rigs on and off the project, establishing and dismantling the Contractor's field administration forces and equipment, and all other work incidental thereto.

B. Final payment shall be based upon the actual total aggregate footage of piles driven and accepted in accordance with this section, from pile tip to pile cut-off shown on Structural Drawings. If the total aggregate footage is over or under the base quantity, the additional footage shall be paid to the Contractor or the deducted footage shall be credited to the Owner on the basis of the unit prices quoted in the Bid Form. The "Add" unit price shall not be more than 20 percent greater than the unit price determined by dividing the base bid by the base footage. The "Deduct" unit price shall be at least 80 percent of the unit price determined by dividing the base bid by the base footage.

C. The total aggregate footage of foundation piles for payment shall be the sum of the lengths of piles below design cutoff grade actually driven, and accepted, whether or not the number of piles is more, equal to, or less than is shown on the Contract Drawings.

D. Piles rejected in accordance with the provisions of these Specifications will not be paid for. In such cases, the Contractor will be paid at the contract unit price per foot for one replacement pile installed and accepted, according to the provisions of these Specifications. If more than one replacement pile is required to compensate for a rejected pile, the Contractor will be paid at the contract unit price per foot for only the longer of the replacement piles. Additional piles

required to compensate for production piles or replacement piles driven out of design location will be installed at no additional cost to the Owner.

E. Whenever misalignment or rejection of a pile or piles necessitates structural redesign, the cost of such redesign shall be deducted from sums otherwise due to the Contractor under the contract. If the redesigned pile cap requires greater quantities of concrete and reinforcing steel, as compared with the quantities required for the pile cap for as originally designed, the additional cost for pile cap concrete, reinforcing steel and formwork shall also be deducted from the contract price.

F. No payment will be made for pile splices and pile buildups. Pile cutoffs less than or equal to 5 ft per pile will be paid at the contract unit price per foot.

G. Payment for the load tests and additional tests, should they be required, shall be made as a unit price per test. The pile load test unit price shall include constructing and supporting the test load or reaction system, driving and removing temporary piles and supports, furnishing and operating jacks and gauges and related equipment, tools, personnel, and incidentals necessary for the proper execution of the pile load test as specified. If an additional load test is necessary because of an unacceptable load test made to confirm a final pile driving resistance less than that specified, then the cost of the additional load test shall be paid by the Contractor.

H. Unit prices

Item	Unit Price Basis
Additional pile footage installed greater than base footage	Linear Foot
Deduct for length of pile installed less than base footage	Linear Foot
Pile Cutoff,	Linear Foot
Compression Pile Load Test on one pile (minimum 150 tons)	Per Test

PART 2 PRODUCTS

2.1 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.

2.2 COMPOSITE PILES

A. Fiber reinforced polymer (FRP) composite piles shall be manufactured by the vacuum infusion molding process (VARTM).
   1. The tolerance of the outside diameter shall be plus or minus 3/8".
   2. The exterior surface shall be Quantum EMC Polyurethane topcoat or equal, a hydrolytically stable, ultraviolet light resistant paint system.
   3. Materials:
      a. Crimp fabric - glass fibers shall be e-glass (electrical grade) with filament diameters between 18 and 26 microns. The glass fabric shall have a minimum dry weight of 123 oz. per square yard per ply. All layers in each ply shall be needled together with through-the-thickness glass fibers (z-axis) thus comprising a three-dimensional fiber architecture. Each ply shall consist of a minimum 50% axial glass fibers.
      b. Non-crimp fabric - The NCF fabric consists of one or more layers of long fibers, held in place by a secondary non-structural head. Filament diameters range from 17 to 25 microns. Each ply shall have a minimum areal weight of eighty-one point two five ounces per square yard (81.25 oz/CY).

B. Mechanical Properties - shall be characteristic values in accordance with ASTM D7290 and be established by full scale flexural testing per ASTM D6109.

12" O.D. x 0.375" WT			
Property	Test Method	Value	Tolerance
Bending Stiffness (EI) (psi)	ASTM 6109	1.06 x 109	±10%
Characteristic Bending Moment (ft-kips) (assuming a factory of safety = 2)	ASTM 6109	78	minimum

C. Dimensions & Tolerances

Design Dimensional Tolerances		
Measurement	Value	Tolerance
Outside Diameter (in.)	12.0	±3/8
Wall Thickness(in.)	0.375	±0.0625
Length (in.)	Per Contract Plans	±2.0
Weight (lbs/ft)	17	±5%

D. Composite pile sections shall be used as shown on the plans.

E. Deformations, defects, camber, sweep of piles placed in the leads of pile driving rigs shall be no more than allowed by ASTM A50.

F. Piles shall be furnished in sufficient lengths to meet specified driving requirements.

G. Once the piles have been driven to their required penetration depth corresponding to a predetermined ultimate capacity, sand shall be dumped into the pile up to a elevation corresponding to 5 ft below top of pile. The top 5 ft of the pile will be filled with concrete so pile caps can be fastened to the top of pile.

PART 3 EXECUTION

3.1 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's attention is initially directed to the requirements of the static load test program. No production piles, other than the test piles, will be driven until the testing is completed and evaluated with satisfactory results.

C. The Contractor shall coordinate his pile driving operations with other work on the project.

3.2 EQUIPMENT

A. Piles may initially be installed with a vibratory hammer to the bearing stratum. The proposed pile installation equipment and methods shall be subject to the approval of the Engineer and approval shall be secured before the start of installation.

B. Piles shall be driven to final driving resistance with a hydraulic hammer able to deliver a variable amount of energy to the top of the pile. When the determination of the final driving resistance is being made, the hammer shall be operated at its rated speed and capacity.

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.

3.3 INSTALLATION

A. Coatings.
   1. Application of pile coatings shall follow manufacturer recommendations.
   2. The coating shall be completely cured before driving operations.
   3. Sagging and fish eyeing of the coating will be grounds for rejection by the Engineer. The applicator shall take all precautions to apply an even, defect free coating.
   4. Once the coating has been applied, the Contractor shall not drag the piles on the ground during handling.

5. If during storage, hauling, handling, or driving, the coating is damaged or removed from the pilings in excess of 1 square foot or greater than 5 linear feet, the Contractor shall reapply the coating according to manufacturers' recommendations.

B. 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.

C. 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. Each pile shall be driven to bearing in compression.
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. 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.

D. 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.

3.4 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 the 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.

3.5 STATIC PILE LOAD TESTING

A. General.
1. A compression load test shall be conducted in accordance with the Rhode Island State Building Code.
2. One pile shall be successfully load tested before driving any production piles.
3. The Contractor shall provide all labor, materials and equipment required to set up the load test, and shall provide qualified personnel during the entire test, to operate the hydraulic jack and all equipment necessary to vary load increments on the test pile. The Geotechnical Engineer will provide personnel and special instrumentation required to monitor the pile performance.
4. The test pile shall be installed by the specified methods and equipment specified for production piles and shall be load tested to at least 130% of the ultimate compressive design capacity.
5. The load test will be conducted on a pile selected by the Geotechnical Engineer.
6. Load testing shall be completed and accepted before remaining piles are installed. The Contractor should anticipate a period of at least 7 days between the completion of the successful load test and receipt of notice to proceed with production pile installation.
7. Load testing shall conform to the requirements set forth in this Specification, the Code, and ASTM D1143 - Standard Test Method for Piles under Static Axial Compressive Load.

B. Pile Instrumentation.
1. The Contractor shall furnish the instrumentation to monitor load and settlement data. The Geotechnical Engineer will install the instrumentation and observe and record load and settlement data and will provide personnel for this purpose. The Contractor shall cooperate with the Engineer during set-up and monitoring of the load test.

C. Test Procedure.
   1. The Contractor is solely responsible for conducting the test(s) in accordance with these specifications.
   2. The load test shall begin no earlier than 10 working days after test pile installation.
   3. Load shall be applied to the test pile by means of a hydraulic jack which reacts against a system of hold-down piles, or against a loaded box or test platform, which is supported by cribbing or temporary piles. The cribbing or pile support shall not be closer than 10 ft to the test pile. The load box or platform shall be centered on the test pile and loaded with approved material.
   4. The hydraulic jack shall be of an approved make with a capacity of at least 1000-tons and a minimum travel distance of 6 in.
   5. The top of the test pile shall be level and capped with a ½-in. thick plate equal to the area of the pile and fully welded to the web and flanges in such a manner as to produce a plane horizontal bearing surface. A steel billet shall be set on top of the pile to distribute the test load over the entire cross-section area of the test pile.
   6. The hydraulic jack shall be interposed between the steel billet and the center of the underside of the reaction beam. The Contractor shall provide a total of 19 in. of clearance between the top of the ram and the underside of the reaction beam (or billet) for the placement of a load cell and "ball and socket" plate. A steel billet of suitable dimensions shall be centered on the load cell to distribute the load to the girder, or reaction beam. The connections of the girder to the load box and to the hydraulic jack shall be tight when the test load is applied.
   7. As necessary to permit measurements, Contractor shall provide a load transfer assembly for the test. Assembly shall have capacity to transfer the maximum (twice design) test load from jack to top of pile. Load transfer assembly shall have a minimum of 16-in. square bearing plates top and bottom. The assembly shall be accessible to permit micrometer measurements to be made by hand on telltale rods inserted in the pile, as required.
   8. The Contractor will furnish and install micrometer dial indicators, each having a minimum range of 2 in. and graduated to 0.001-in. divisions. They shall be spaced equally around the pile and at the telltale locations, and provisions shall be made for free vertical movement should it become necessary to reset the micrometer dials.
   9. Micrometer dials will be mounted by the Engineer to one or more steel reference beams provided by the Contractor. The beam(s) shall be rigid and supported by helical piles driven at least 10 ft below the bottom of any organic soils, and to such depths as may be required by the Engineer, at a distance of at least 10 ft from the center of the test pile and at least 6 ft from cribbing or temporary pile supports. The reference beams shall be fixed at one end and shall be free to move horizontally at the other end to allow for expansion and contraction of the reference beam without vertical deflection at points where dials are mounted. Wood or other materials subject to variations in moisture content shall not be used in reference beams, crossbeams, shims, or for any other means of dial support.
   10. The Engineer will also establish reference points on the pile and on each end, or at the center, of the reference beam supporting the micrometer dials. Elevations will be taken on these reference points by the Engineer using a level and rod, and a reliable benchmark installed on the site by the Owner.
   11. In addition to micrometer dials and level readings, settlement of the test pile shall be determined by the Engineer by means of a taut piano wire drawn across the face of a mirror-mounted graduated scale. The scale shall be 6 in. in length, machine divided to 1/50 (0.02) in. and mounted to a new mirror 3 in. by 6 in. with metal and glass bonding adhesive or plastic electric tape. The mirror shall be mounted directly upon the test pile where feasible, or upon the hydraulic jack, or ram by the Engineer, and oriented such that

the face is parallel with the reference wire and support cross beams. Space shall be provided such that the scale can be read on a horizontal line of sight. The piano wire shall be mounted between the ends of the micrometer dial support beam, fixed at one end and threaded over a smooth pulley at the other end with about a 5-pound weight to maintain uniform tension. The wire shall be level and within 3/4 in. of the mirror.

12. The Contractor shall protect the entire measuring apparatus against rain, wind, direct sunlight, frost and any other disturbances that may affect the reliability of the settlement observations. The Contractor shall provide suitable heaters, not emitting offensive exhausts, and suitable enclosures to maintain the temperature around the test apparatus at a minimum of 40 degrees Fahrenheit, and shall provide temporary electric lighting as necessary and required by the Engineer during the conduct of the test. Loading and unloading of the test pile shall not be performed except in the presence of the Engineer.

D. Load Acceptance Criteria.
   1. Pile acceptance criteria shall be per the latest edition of the Rhode Island State Building Code.
   2. Test piles that are approved for the design load are acceptable as production piles if all other acceptance criteria are met.

END OF SECTION

SECTION 321373

CONCRETE PAVING JOINT SEALANTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Cold-applied joint sealants.
2. Joint-sealant backer materials.
3. Primers.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For.

B. Product Certificates: For each type of joint sealant and accessory.

1.5 QUALITY ASSURANCE

1.6 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed

from joint substrates.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type SL.
1. <Click here to find, evaluate, and insert list of manufacturers and products.>

2.3 JOINT-SEALANT BACKER MATERIALS

A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.

B. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.

2.4 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions.

C. Install joint-sealant backings to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of joint-sealant backings.
   2. Do not stretch, twist, puncture, or tear joint-sealant backings.
   3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants immediately following backing installation, using proven techniques that comply with the following:
   1. Place joint sealants so they fully contact joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
   1. Remove excess joint sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING AND PROTECTION

A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.

B. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.5 PAVING-JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Joints within concrete paving.
   1. Joint Location:
      a. Expansion and isolation joints in concrete paving.
      b. Contraction joints in concrete paving.
      c. Other joints as indicated.
   2. Joint Sealant: Single-component, self-leveling, silicone joint sealant.
   3. Joint-Sealant Color:

END OF SECTION

SECTION 323300

SITE FURNISHINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Bench.
2. Curved Bench.
3. Solar Bollards.
4. Litter/Recycle Receptacles.

1.3 ACTION SUBMITTALS

A. Manufacturer's Literature: Submit copies of each of manufacturer's material descriptions, dimensions, details, and installation instructions for the following. Submit manufacturer's material descriptions for primer coat and finish coat.

1.4 INFORMATIONAL SUBMITTALS

A. Complete Shop Drawings for the installation of bench and Sub Bench without back.

B. Complete Shop Drawings for the installation of Litter/Recycle Receptacles with metal hood.

C. Complete Shop for the installation of the Solar Bollard.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For site furnishings to include in maintenance manuals.

B. The Contractor shall furnish and deliver standard written manufacturer's guarantee in Owner's name covering all materials and workmanship under this Section 323300, Site Furnishings, in addition to, and not in lieu of, guarantee requirements set forth under Section 010000,

GENERAL REQUIREMENTS, and other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

C. Supplier shall pay for repairs of any damage to any part of the project caused by defects in his work and for any repair to the materials or equipment caused by replacement. All repairs are to be done to the satisfaction of the Owner's Representative.

D. Any part of the work installed under this contract requiring excessive maintenance shall be considered as being defective, and shall be replaced by the Supplier during the one year guarantee period at no cost to the Owner.

PART 2 PRODUCTS

2.1 BENCH

A. 6' long backless bench, surface mount on concrete pad, Thermally Modified Red Oak slats with black supports, (model #64-203-6TMR/S-2) 6' Backless Bench with Thermally Modified Red Oak)as manufactured by Dumor, Inc P.O. Box 142 Mifflintown, PA 17059 or approved equal.

2.2 CURVED BENCH

A. Curved bench shall as manufactured by Streetlife or approved equal.

2.3 SOLAR LIGHT

A. Solar light shall be 3'-3" High by 6" wide. Bollard shall be surface mounted. Basis of design shall be the "Prague 7 Solar Bollard" With Integral Motion Sensor, 4w LED, Type III Distribution,3000K. Bollard shall include anchor bolts. Solar light shall be model # UPRA-10062-T3-W30-XX as manufactured by Ligman.

B. Solar light shall be equipped with a min of (1) remote solar charger programmer for solar bollards and poles. Programmer shall be applicable for selected lights and as directed by manufacturer.

2.4 TRASH RECEPTACLES

A. 26.5" x 36" (55 Gal) round black steel trash receptacle with dome lid (CN-2755), surface mount on concrete pad, Model # CN-R/R-55 as manufactured by Pilot Rock or approved equivalent. Color to be determined by owner.

2.5 FABRICATION

A. Factory Assembly: Factory assemble components to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.6 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. All metal inserts, anchor slots, anchors, anchor bolts, fastenings, and other fastening devices, for attachment of site improvement items to pavements, except as otherwise specified under other Sections of this Specification, shall be in specified, provided, delivered installed and paid for under the work of this Section 02800, Site Furnishings.

C. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

D. Free-standing site improvement items shall be set plumb and horizontal regardless of the pitch of the finished surrounding grade unless otherwise shown on the Contract Documents.

E. The Contractor shall be responsible for timing the delivery of site improvement items so as to minimize the on-site storage time prior to installation. All stored materials are the responsibility of the Contractor and shall be protected from weather, careless handling and vandalism.

F. Contractor shall be responsible for the correct location of site improvement items. Take particular care to maintain shapes, plumb and level during the pouring of concrete.

G. All Work shall be accurately set to established lines and elevations and rigidly set in place to supporting construction.

H. Install site furnishings level, plumb, true, and positioned at locations after final approval in the field by Owner's Representative.

I. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

END OF SECTION

SECTION 325200

DEWATERING, DIVERSION, CONTROL OF WATER

PART 1 GENERAL

1.1 SUMMARY

1.2 WORK INCLUDED

A. Work covered under this section consists of the control and diversion of water as required to construct the boat ramp out of articulated concrete blocks.perform the Work.

1.3 WATER LEVELS

A. The Contractor shall be responsible for protecting the Work from increased water levels from impounded waters and increases in the ground water elevation.

1.4 SUBMITTALS

A. Drawings:
   1. At least ten (10) calendar days prior to the start of dewatering or cofferdam erection, submit for review by the Engineer.
      a. Drawings.
      b. Sections.
      c. Details and other pertinent information.
      d. Construction Flood Contingency Plan: Plan detailing the Contractor's means and methods for stabilizing the work area and emergency notification procedures if the work area becomes subject to flooding as a result of a storm event or cofferdam failure.
   2. 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 31 25 00, EROSION AND SEDIMENT CONTROL.

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

3. The minimum factor of safety for each proposed cofferdam system shall be 1.50.

1.5 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.

1.6 COFFERDAM

A. General: It is expressly understood and agreed that whenever cofferdams and bracing 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 cofferdams and bracing.

B. Installation:
   1. Where cofferdams and bracing are used, they shall be installed ahead of other work activities.
   2. 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 cofferdams.
   3. If excessive leakage occurs behind the cofferdams, they shall be repaired and stabilized immediately to the satisfaction of the Engineer.

C. Removal:
   1. Cofferdams and bracing shall be removed in such a manner as to avoid any damage to the permanent structure or to other members of the cofferdam and bracing. Impact loading on the permanent structure or on members of cofferdam and bracing structure will not be allowed.
   2. Cofferdams and bracing shall be removed in such a manner as to avoid sediment migration into the downstream watercourses. All sediment accumulated behind coffer dams and diversion structures shall be fully removed prior to final removal of the cofferdam.

PART 2 PRODUCTS

2.1 AQUA BARRIER COFFERDAM

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 EXECUTION

3.1 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.

END OF SECTION

SECTION 329113

SOIL PREPARATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

1.2 SUMMARY

A. Section includes planting soils specified by composition of the mixes.

B. Related Requirements:
1. Section 329200 "Turf and Grasses" for placing planting soil for turf and grasses.
2. Section 329300 "Plants" for placing planting soil for plantings.

1.3 ALLOWANCES

A. and testing are part of testing and inspecting allowance.

1.4 UNIT PRICES

A. Work of this Section is affected by cubic yard.

1.5 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.

B. CEC: Cation exchange capacity.

C. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

D. Imported Soil: Soil that is transported to Project site for use.

E. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

F. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal

tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

G. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

H. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

I. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

J. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

K. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

L. USCC: U.S. Composting Council.

1.6 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Roger Williams Park- Cunliff Boardwalk Project.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include recommendations for application and use.
   2. Include test data substantiating that products comply with requirements.
   3. Include sieve analyses for aggregate materials.
   4. Material Certificates: For each type of soil amendment and fertilizer topsoil before delivery to the site, according to the following:
      a. Manufacturer's qualified testing agency's certified analysis of standard products.
      b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
      c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

1.8 INFORMATIONAL SUBMITTALS

1.9 QUALITY ASSURANCE

1.10 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Architect under the direction of the testing agency.
   1. Number and Location of Samples: Minimum of three representative soil samples from varied locations where directed by Architect for each soil to be used or amended for landscaping purposes.
   2. Procedures and Depth of Samples: as directed by testing laboratory.
   3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
   4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Do not move or handle materials when they are wet or frozen.
   4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 PRODUCTS

2.1 MATERIALS

2.2 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
   1. Reaction: pH of 5.5 to 8.
   2. Soluble-Salt Concentration: Less than 4 dS/m.
   3. Moisture Content: 35 to 55 percent by weight.
   4. Organic-Matter Content: 50 to 60 percent of dry weight.
   5. Particle Size: Minimum of 98 percent passing through a 1/2-inch sieve.

2.3 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

PART 3 EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Apply, add soil amendments, and mix approximately half the thickness of unamended soil over prepared, loosened subgrade according to "Mixing" Paragraph below. Mix thoroughly into top 2 inches 4 inches of subgrade. Spread remainder of planting soil.

C. Mixing: Spread unamended soil to total depth indicated on Drawings, but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
   1. Amendments: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.
      a. Mix with dry soil before mixing fertilizer.

b. Mix fertilizer with planting soil no more than seven days before planting.

2. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding 8 inches in loose depth for material compacted by compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698 and tested in-place except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.3 PROTECTION

A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."

B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds or structures.
6. Impoundment of water.
7. Excavation or other digging unless otherwise indicated.

C. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.4 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION

SECTION 329119

LANDSCAPE GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Final grade topsoil for finish landscaping.

D. Related Sections:
1. Section 329200 - Turf and Grasses.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Topsoil:
1. Basis of Measurement: By Cubic Yard (CY).
2. Basis of Payment: Includes excavating existing topsoil, supplying topsoil materials, stockpiling, preparing and scarifying substrate surface, placing where required, and rolling.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Samples: Submit, in air-tight containers, 1 cup sample of loam to testing laboratory.

C. Materials Source: Submit name of imported materials source.

1.4 QUALITY ASSURANCE

A. Furnish each topsoil material from single source throughout the Work.

B. Perform Work in accordance with RIDOT Standard Specifications for Road & Bridge Construction, latest edition.

PART 2 PRODUCTS

2.1 MATERIAL

A. Topsoil:
1. High quality loam, blended with compost and screened to be free of rocks and other debris with a 3/4 inch sieve.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 010000 - General Requirements: Verification of existing conditions before starting work.

B. Verify substrate base has been contoured and compacted.

3.2 PREPARATION

A. Protect landscaping and other features remaining as final Work.

B. Protect existing structures, sidewalks, utilities, paving, and curbs.

3.3 SUBSTRATE PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, loose roots, branches, stones, in excess of 1/2 inch in size. Remove contaminated subsoil.

C. Scarify surface to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.4 PLACING TOPSOIL

A. Place topsoil in areas where seeding, to thickness as scheduled. Place topsoil during dry weather.

B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

C. Remove roots, weeds, rocks, and foreign material while spreading.

D. Manually spread topsoil close to plant material, and path to prevent damage.

E. Roll placed topsoil.

F. Remove surplus subsoil and topsoil from site.

G. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.5 TOLERANCES

A. Section 01000 - General Requirements: Tolerances.

B. Top of Topsoil: Plus or minus 1/2 inch.

3.6 PROTECTION OF INSTALLED WORK

A. Section 010000 - General Requirements: Requirements for protecting finished Work.

B. Prohibit construction traffic over topsoil.

3.7 SCHEDULES

A. Compacted topsoil thicknesses:
   1. Seeded Grass: 6 inches.
   2. When meeting existing grade, gradually reduce depth of topsoil so that an even gradient is achieved.

END OF SECTION

SECTION 329200

TURF AND GRASSES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

1.2 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Seeding.

D. Related Requirements:
1. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Certification of Grass and Restoration Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

B. Product Certificates: For fertilizers, from manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf and meadows during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

1.8 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

1.9 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
   1. Spring: April 15th - June 1st.
   2. Fall: September 1st - October 15th.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 PRODUCTS

2.1 SEED MIXES

A. Use the following seed mix for Mowed areas:
   1. Endophyte Enhanced Mix (modified):
      a. 30% Improved Perennial Rye.
      b. 30% Turf Type Tall Fescue.
      c. 30% Chewings Fescue.
      d. 5% Creeping Red Fescue.
      e. 5% Miniature or Dutch White Clover.
   2. Available from:
      a. Allen's Seed Store - 693 S County Trail Exeter, RI 02822 Phone: 401-294-2722.
      b. Approved Equal.

B. Use the following for Restoration Seed Mix:

C. New England Wetmix (wetland seed mix). Percentages of species shall be per New England Wetland Plants specifications and rate of application shall be 1lb./2500 sq. ft. | 18 lbs./acre.
   1. Available from:
      a. New England Wetland Plants.
      b. Approved Equal.

2.2 FERTILIZERS

A. Dolomitic lime per detail.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: fertilizer to have a ratio of 18 Nitrogen (N) - 0 Phosphorous (P) - 12 Potassium (K).

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Section 32 91 19 - Landscape Grading.

B. Placing Planting Soil: Place and mix planting soil in place over exposed subgrade.
1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to

dry before planting. Do not create muddy soil.

3.5 TURF AND RESTORATION SEED MIX MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
   2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mowing/Cutting:
   1. Turf areas (seeded or sodded):
      a. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
         1) Mow Lawn Areas to a height of 3 to 4 inches.
         2) .
         3) Restoration Seed Mix Areas.
         4) Trimming: Seed Mixes shall be trimmed using a weed-eater set to a height of 6” to 8”. Trimming lower than 4” will kill many species in the mixes. Trimming shall occur either once in the fall after fall blooming has occurred or once in the spring before May 15th. Timing shall be reviewed with Landscape Architect's prior to being completed.
         5) Removal of Invasives.
         6) Invasive Plant Identification: There are a number of invasive species that may potentially colonize the new landscape areas and must be identified and removed. Some include Asiatic Bittersweet (Celastrus orbiculatus), Glossy Buckthorn (Rhamnus frangula), Japanese Barberry (Berberis thunbergii) and Multiflora Rose (Rosa multiflora), Autumn Olive (Elaeagnus umbellata), Common Reed (Phragmites australis), Japanese Knotweed (Polygonum cuspidatum), Purple Loosestrife (Lythrum salicaria), and Reed Canary Grass (Phalaris arundinacea), Tartarian Honeysuckle (Lonicera tatarica), Poison Ivy (Toxicodendron radicans). Any and all of these species pose at least a potential

threat to colonize the replication areas.

7) Weed and Invasive Removal: Problem weeds and invasives should be hand-pulled including root systems in all non-lawn areas beginning at the completion of seeding operations. Contractor shall inspect all seeded areas once per month after seeding operations are completed for each area through Provisional and Final Acceptance to remove weed and invasive plant growth while seed is establishing.

3.6 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Landscape Architect:
   1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
   2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
   3. Satisfactory Restoration Seed Mix- At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.7 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 329300

PLANTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Plants.

D. Related Requirements:
1. Section 329119 "Landscape Grading" for preparation of planting beds.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Finish Grade: Elevation of finished surface of planting soil.

D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

F. Planting Area: Areas to be planted.

G. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified

with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" for drawing designations for planting soils.

H. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

I. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

J. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

K. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
   1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
   2. Plant Photographs: Include color photographs in digital 3- by 5-inch print format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
   1. Manufacturer's certified analysis of standard products.
   2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Sample Warranty: For special warranty.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.
   1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
   2. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
   3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   4. Personnel Certifications: Installer's field supervisor or personnel assigned to the Work shall have certification in one or all of the following categories from the Professional Landcare Network:
      a. Landscape Industry Certified Technician - Exterior.
      b. Landscape Industry Certified Interior.
      c. Landscape Industry Certified Horticultural Technician.
   5. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
   1. Selection of plants purchased under allowances is made by Architect, who tags plants at their place of growth before they are prepared for transplanting.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
   1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
   2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
   1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

C. Deliver bare-root stock plants within 24 hours of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

G. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
   1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

I. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
   1. Heel-in bare-root stock. Soak roots that are in less than moist condition in water for two hours. Reject plants with dry roots.
   2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
   3. Do not remove container-grown stock from containers before time of planting.
   4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
   1. Spring Planting: March 15 - May 15.
   2. Fall Planting: Sep 1-Nov 15.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
      b. Structural failures including plantings falling or blowing over.
      c. Faulty performance of tree stabilization edgings and tree grates.
      d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   2. Warranty Periods: From date of planting completion.
      a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
   3. Include the following remedial actions as a minimum:
      a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
      b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
      c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
      d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
   1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
   2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
   1. Type: Ground or shredded bark Wood and bark chips.
   2. Size Range: 3 inches minimum.
   3. Color: Natural. No color dyed mulch.

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.
   2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

2.3 TREE-STABILIZATION MATERIALS - NIC

A. Trunk-Stabilization Materials:
   1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
   2. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.

2.4 TREE-WATERING DEVICES - NIC

A. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over one week; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.
   1. Manufacturers:
      a. Tree Gator.
      b. A.M. Leonard.
      c. Approved Equal.
   2. Color: As selected by Architect from manufacturer's full range dark chocolateorgreen or.

2.5 MISCELLANEOUS PRODUCTS

A. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

B. Tree Watering Bag: provide each tree with a ARBORRAIN TOWER TREE AND PLANT HYDRATOR by AM Leonard (or Approved Equal) following planting. Contractor is responsible for filling bag when it becomes empty for during active growing seasons for 1 year following substantial completion.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
   3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new

planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation." Section 329115 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Place and mix planting soil in-place over exposed subgrade Place manufactured planting soil over exposed subgrade Blend planting soil in place.

C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: At time directed by Landscape Architect, broadcast dry product uniformly over prepared soil at application rate according to manufacturer's written recommendations.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.
   1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
   2. Excavate approximately three times as wide as ball diameter for stock.
   3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
   4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
   5. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
   6. Maintain supervision of excavations during working hours.
   7. Keep excavations covered or otherwise protected overnight, after working hours, and when unattended by Installer's personnel.
   8. If drain tile is indicated on Drawings or required under planting areas, excavate to top of

porous backfill over tile.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
   1. Hardpan Layer: Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
   1. Backfill: Planting soil. For trees, use excavated soil for backfill.
   2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
   3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
   4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. and Stock: Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
   1. Backfill: Planting soil. For trees, use excavated soil for backfill.
   2. Carefully remove root ball from container without damaging root ball or plant.
   3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
   4. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Do not apply pruning paint to wounds.

3.7 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:
   1. Upright Staking and Tying: Stake trees with two stakes for trees up to high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
   2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.
   1. Proprietary Root-Ball Stabilization Device: Install root-ball stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.8 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.
   1. Trees and Treelike Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 12-inch radius around trunks or stems. Do not place mulch within 6 inches of trunks or stems.
   2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.
   3. Mineral Mulch in Planting Areas: Apply 3-inch average thickness of mineral mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.9 EDGING INSTALLATION

A. Shovel-Cut Edging: Separate mulched areas from turf areas, curbs, and paving with a 45-degree, 4- to 6-inch- deep, shovel-cut edge as indicated on Drawings.

3.10 INSTALLING SLOW-RELEASE WATERING DEVICE

A. Provide one device for each tree.

B. Place device on top of the mulch at base of tree stem and fill with water according to manufacturer's written instructions.

3.11 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Landscape Architect.
   1. Submit details of proposed pruning and repairs.
   2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
   3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

3.13 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

END OF SECTION

SECTION 347113

VEHICLE BARRIERS

PART 1 GENERAL

1.1 SUMMARY

A. Work Results:

B. Principal Products:

C. Section Includes:
1. Wood guard rail.
2. Wood posts.
3. Excavating for post bases.

D. Related Sections:

1.2 REFERENCES

A. ASTM International:
1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

B. American Wood-Preservers' Association:
1. AWPA C14 - Wood for Highway Construction - Preservative Treatment by Pressure Processes.

C. Forest Stewardship Council:
1. FSC Guidelines - Forest Stewardship Council Guidelines.

D. American Association of State Highway and Transportation Officials.
1. AASHTO M168; Standard Specifications for Wood Products.

1.3 SYSTEM DESCRIPTION

A. Guard Rail Height: As indicated on Drawings.

B. Post Spacing: At intervals not exceeding 8 feet.

C. Post Foundation Depth: minimum 40" below finish grade.

D. Post Foundation Diameter: 16 inches.

1.4 SUBMITTALS

A. Section 01 00 00 - General Requirements.

B. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, anchorage, and schedule of components.

C. Product Data: Submit data on rail, posts, accessories, hardware and structural capabilities of rail section.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with RIDOT Standard Specifications for Road & Bridge Construction.

1.6 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on drawings.

PART 2 PRODUCTS

2.1 MATERIALS

A. Furnish materials in accordance with RIDOT Standard Specifications for Road & Bridge Construction.

B. Guard Rail: pressure-treated sawn structural lumber, either southern yellow pine or Douglas fir.
   1. Size: 4" x 10" (nominal), length varies.

C. Wood Posts: pressure-treated sawn structural lumber, either southern yellow pine or Douglas fir.
   1. Size: 8" x 8" (nominal) x 76" L.

2.2 ACCESSORIES

A. Hardware: Steel, bolts, nuts and washers to suit rail profile per notes.

2.3 FINISHES

A. Galvanizing for Nuts, Bolts and Washers: ASTM A153/A153M, 2.0 oz/sq ft coating.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify location of underground utilities and adjust location of posts to avoid damaging utilities.

3.2 INSTALLATION

A. Wooden Guardrail.
   1. Set posts plumb in post-holes to correct elevations, properly spaced and to line and grade as indicated on Drawings.
   2. Pack processed gravel in around posts to within 6" of finished grade to stabilize.
   3. Set posts plumb in post-holes to correct elevations, properly spaced and to line and grade as indicated on Drawings.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Posts - Maximum Variation From Plumb: 1/8 inch.

C. Rail - Maximum Offset From Indicated Position: 1 inch.

D. Rail - Maximum Variation From Indicated Height: 1/2 inch.

END OF SECTION

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
508-543-1755

BORING NUMBER B24-1

CLIENT Providence Parks Department
PROJECT NAME RWP Cunliff Lake Boardwalk
PROJECT NUMBER 24023.00
PROJECT LOCATION Providence, RI
DATE STARTED 4/11/2024 **COMPLETED** 4/11/2024
GROUND ELEVATION 29.5 ft NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR Geologic, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Wash & Drive / Automatic Hammer
AT TIME OF DRILLING 4.0 ft / Elev 25.5 ft Below Ground Surface
LOGGED BY KAD **CHECKED BY**
AT END OF DRILLING ---
BORING LOCATION SEE SUBSURFACE EXPLORATION PLAN **N:** **E:**

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	29.5		S-1	13 / 24	0 - 2	7-5-4-7 (9)			Moist, loose, brown, fine to coarse SAND, trace fine Gravel.	3" TOPSOIL
			S-2	13 / 24	2 - 4	8-9-5-5 (14)			Wet, medium dense, brown to gray, fine to coarse SAND, little fine to coarse Gravel, trace Silt.	FILL
5	24.5		S-3	7 / 24	4 - 6	3-1-WOH-WOH			Wet, very loose, light gray, fine to medium SAND, some Silt, trace fine to coarse Gravel.	
			S-4	9 / 24	6 - 8	1-1-8-9 (9)			Wet, loose, gray, fine to medium SAND, trace fine to coarse Gravel.	
10	19.5		S-5	14 / 24	8 - 10	6-12-12-11 (24)			Wet, medium dense, gray, fine to coarse SAND.	
15	14.5		S-6	16 / 24	14 - 16	7-8-8-8 (16)			Wet, medium dense, gray, fine to medium SAND, trace Silt.	GLACIAL OUTWASH
20	9.5		S-7	9 / 24	19 - 21	4-4-6-5 (10)			Wet, loose to medium dense, gray, fine to coarse SAND.	
25	4.5		S-8	12 / 24	24 - 26	3-3-4-3 (7)			Wet, loose, gray, fine to coarse SAND.	
30	-0.5		S-9	11 / 24	29 - 31	4-4-6-6 (10)			Wet, loose to medium dense, gray, fine to coarse SAND.	
35									Bottom of borehole at 31.0 feet.	

GRANULAR SOILS

BLOWS/FT	DENSITY
0 - 4	V. LOOSE
4 -10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSIST.
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

REMARKS:
1.S-4: WOH for 4".

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

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
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508-543-1755

BORING NUMBER B24-2

CLIENT Providence Parks Department
PROJECT NAME RWP Cunliff Lake Boardwalk
PROJECT NUMBER 24023.00
PROJECT LOCATION Providence, RI
DATE STARTED 4/11/2024 **COMPLETED** 4/11/2024
GROUND ELEVATION 29.8 ft NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR Geologic, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Wash & Drive / Automatic Hammer
AT TIME OF DRILLING 4.0 ft / Elev 25.8 ft Below Ground Surface
LOGGED BY KAD **CHECKED BY**
AT END OF DRILLING ---
BORING LOCATION SEE SUBSURFACE EXPLORATION PLAN **N:** **E:**

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	29.8									
			S-1	11 / 12	1 - 2	3-3			Moist, loose, brown to gray, fine to coarse SAND, little Gravel, trace Root, trace Fabric.	6" TOPSOIL
			S-2	8 / 24	2 - 4	3-2-10-5 (12)			Wet, medium dense, gray to brown, fine to coarse SAND, trace fine to coarse Gravel, trace Silt.	
5	24.8		S-3	8 / 24	4 - 6	5-3-10-4 (13)			Wet, medium dense, gray, fine to coarse SAND, trace fine Gravel, trace Silt.	FILL
			S-4	13 / 24	6 - 8	2-1-6-6 (7)			Wet, loose, gray, fine to coarse SAND, trace Silt.	
			S-5	13 / 24	8 - 10	5-2-1-1 (3)			5A: (Top 6") Wet, loose, gray, fine to coarse SAND, little Silt. 5B: (Bottom 7") Wet, very soft, dark brown HEMIC PEAT recovered as organic silty SAND.	PEAT
10	19.8		S-6	10 / 24	10 - 12	1-8-14-13 (22)			Wet, medium dense, gray, fine to medium SAND.	
15	14.8		S-7	15 / 24	14 - 16	6-5-7-6 (12)			Wet, medium dense, gray, fine SAND, trace Silt.	
20	9.8		S-8	12 / 24	19 - 21	4-5-5-6 (10)			Wet, loose to medium dense, gray, fine to coarse SAND.	GLACIAL OUTWASH
25	4.8		S-9	14 / 24	24 - 26	3-3-3-2 (6)			Wet, loose, gray, fine to medium SAND.	
30	-0.2		S-10	7 / 24	29 - 31	5-7-3-4 (10)			Wet, loose to medium dense, gray, fine to coarse SAND, some fine to coarse Gravel.	
			S-11	22 / 24	31 - 33	5-4-6-12 (10)			Wet, loose to medium dense, gray, fine to coarse SAND, little fine to coarse Gravel.	
35	-5.2									

GRANULAR SOILS

BLOWS/FT	DENSITY
0 - 4	V. LOOSE
4 -10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSIST.
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

REMARKS:
1.Used shovel to dig down 1' to probe for drainage swale PVC pipe.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

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.

(Continued Next Page)

Pare Corporation
10 Lincoln Road, Suite 210
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508-543-1755

BORING NUMBER B24-2

CLIENT Providence Parks Department **PROJECT NAME** RWP Cunliff Lake Boardwalk

PROJECT NUMBER 24023.00 **PROJECT LOCATION** Providence, RI

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
35	-5.2		S-12	8 / 24	34 - 36	12-9-18-6 (27)			Wet, medium dense, gray, fine to coarse SAND and fine to coarse GRAVEL. *(continued)*	
			S-13	13 / 24	36 - 38	6-5-8-5 (13)			Wet, medium dense, gray, fine to coarse SAND, trace fine to coarse Gravel.	GLACIAL OUTWASH
									Bottom of borehole at 38.0 feet.	
40										
45										
50										
55										
60										
65										
70										
75										

Pare Corporation
10 Lincoln Road, Suite 210
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508-543-1755

BORING NUMBER B24-3

CLIENT Providence Parks Department
PROJECT NAME RWP Cunliff Lake Boardwalk
PROJECT NUMBER 24023.00
PROJECT LOCATION Providence, RI
DATE STARTED 4/15/2024 **COMPLETED** 4/15/2024
GROUND ELEVATION 29.4 ft NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR Geologic, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Wash & Drive / Automatic Hammer
▽ **AT TIME OF DRILLING** 4.0 ft / Elev 25.4 ft Below Ground Surface
LOGGED BY KAD **CHECKED BY**
AT END OF DRILLING ---
BORING LOCATION SEE SUBSURFACE EXPLORATION PLAN **N:** **E:**

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	29.4		S-1	10 / 24	0 - 2	3-4-5-7 (9)			Moist, loose, brown, fine to coarse SAND, little fine to coarse Gravel.	6" TOPSOIL
			S-2	8 / 24	2 - 4	10-11-7-3 (18)			Moist, medium dense, brown to gray, fine to coarse SAND, some fine to coarse Gravel.	
5	24.4		S-3	10 / 24	4 - 6	9-6-6-12 (12)			Wet, medium dense, gray, fine to coarse SAND, little fine to coarse Gravel.	
			S-4	17 / 24	6 - 8	11-8-6-9 (14)			Wet, medium dense, gray, fine to coarse SAND, trace fine to coarse Gravel, trace Silt.	FILL
10	19.4		S-5	0 / 24	8 - 10	8-5-3-2 (8)			No Recovery	
15	14.4		S-6	10 / 24	14 - 16	4-1-WOH-1			Wet, very soft, brown to gray HEMIC PEAT recovered as organic silty SAND.	PEAT
20	9.4		S-7	17 / 24	19 - 21	2-1-3-9 (4)			Wet, very loose to loose, gray, fine SAND.	GLACIAL OUTWASH
25	4.4		S-8	16 / 24	24 - 26	13-9-11-8 (20)			Wet, medium dense, gray, fine SAND, little Silt.	
30	-0.6		S-9	14 / 24	29 - 31	7-8-11-7 (19)			Wet, medium dense, gray, fine to coarse SAND, some fine to coarse Gravel, trace Silt.	
35	-5.6								Wet, medium dense, gray, fine to medium SAND.	

GRANULAR SOILS

BLOWS/FT	DENSITY
0 - 4	V. LOOSE
4 -10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSIST.
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

REMARKS:
1.S-5: Coarse gravel stuck in spoon tip.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

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.

(Continued Next Page)

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BORING NUMBER B24-3

CLIENT Providence Parks Department **PROJECT NAME** RWP Cunliff Lake Boardwalk

PROJECT NUMBER 24023.00 **PROJECT LOCATION** Providence, RI

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
35	-5.6		S-10	8 / 24	34 - 36	4-5-8-9 (13)			Wet, medium dense, gray, fine to medium SAND. *(continued)*	GLACIAL OUTWASH
									Bottom of borehole at 36.0 feet.	
40										
45										
50										
55										
60										
65										
70										
75										