STATE OF RHODE ISLAND

COLUMBARIUM PLAZA EXPANSION
CW-4 PROJECT – PHASE 1

AT THE

RHODE ISLAND VETERANS MEMORIAL CEMETERY
301 SOUTH COUNTY TRAIL
EXETER, RHODE ISLAND 02818

FOR THE

RHODE ISLAND DEPARTMENT OF HUMAN SERVICES
COURTNEY E. HAWKINS, DIRECTOR

RI OFFICE OF VETERANS SERVICES
KASIM YARN, DIRECTOR
JAMES BESSEL, CEMETERY DIRECTOR

FEDERAL PROJECT NO.: RI-19-10

PREPARED BY

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LINCOLN, RHODE ISLAND 02865
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A/E PROJECT NUMBER: BAI# 219094

MARCH, 2020

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RHODE ISLAND
OFFICE OF VETERANS SERVICES
RHODE ISLAND VETERANS MEMORIAL CEMETERY
COLUMBARIUM PLAZA EXPANSION
CW-4 PROJECT – PHASE I
FAI # RI-19-10

TABLE OF CONTENTS
Section 00 01 10

	DIVISION 00 - SPECIAL SECTIONS	**DATE**
00 01 15	List of Drawing	03/2020
00 03 50	Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions Form VA 40-895-12	03/2020
00 04 30	Bid Bond Form	03/2020
00 05 20	Agreement Form	03/2020
00 06 10	Performance Bond; Payment Bond	03/2020
00 07 00	General Conditions	03/2020
00 08 19	Contractor’s Qualification Statement	03/2020
00 08 20	Prevailing Wage Rates	03/2020
00 09 00	Addenda and Modifications	03/2020
00 12 00	As-Built Drawings	03/2020
	DIVISION 01 - GENERAL REQUIREMENTS	
01 00 00	General Requirements	03/2020
01 10 00	Summary of Work	03/2020
01 31 10	Construction Meetings	03/2020
01 33 23	Shop Drawings, Product Data, and Samples	03/2020
01 35 26	Safety Requirements	03/2020
01 40 00	Quality Control	03/2020
01 40 50	Sampling & Testing	03/2020
01 45 29	Testing Laboratory Services	03/2020
01 57 00	Temporary Facilities and Controls	03/2020
01 57 19	Temporary Environmental Controls	03/2020
01 74 19	Construction Waste Management	03/2020
01 89 00	Site Construction Performance Requirements	03/2020
01 90 00	RIDOT Standard Specification Sections	03/2020
	DIVISION 02 – EXISTING CONDITIONS	
02 41 00	Demolition	03/2020
	DIVISION 03 – CONCRETE	
03 30 53	(Short-Form) Cast-in-Place Concrete	03/2020
03 48 24	Precast Concrete Columbarium Units	03/2020

	DIVISION 04 – MASONRY	
04 43 00	Natural Stone Veneer	03/2020
04 73 00	Columbarium Niche Covers	03/2020
	DIVISION 07 - THERMAL AND MOISTURE PROTECTION	
07 92 00	Joint Sealants	03/2020
	DIVISION 26 - ELECTRICAL	
26 05 11	Requirements for Electrical Installations	03/2020
26 05 19	Low-Voltage Electrical Power Conductors	03/2020
26 05 26	Grounding and Bonding for Electrical Systems	03/2020
26 05 33	Raceway and Boxes for Electrical Systems	03/2020
	DIVISION 31 – EARTHWORK	
31 20 00	Earthworks	03/2020
31 23 12	Subgrade Preparations in Planting Area	03/2020
31 25 50	Mud and Other Soil Debris	03/2020
	DIVISION 32 – EXTERIOR IMPROVEMENTS	
32 05 23	Cement and Concrete for Exterior Improvements	03/2020
32 08 00	Commissioning of Planting Irrigation Systems	03/2020
32 33 00	Site Furnishings	03/2020
32 84 00	Planting Irrigation	03/2020
32 90 00	Planting	03/2020
32 91 13	Planting Soils	03/2020
32 91 19	Landscape Grading	03/2020
	DIVISION 33 – UTILITIES	
33 10 00	Water Mains and Appurtenances	03/2020
	REFERENCES	
Reference A	GZA GeoEnvironmental, Inc. entitled “Geotechnical Evaluation Report, Rhode Island Veterans Memorial Cemetery Columbarium Project, Exeter, Rhode Island” dated January 2020, File No. 34428.01	03/2020
Reference B	Hager-Richter Geoscience, Inc. entitled “Utility Location Survey, RIVMC – Columbarium Project, 301 South County Trail, Exeter, Rhode Island” dated December, 2019, File 19J44.	03/2020

End – Table of Contents

SECTION 00 01 15
LIST OF DRAWING

The drawings listed below accompanying this specification form a part of the contract.

Drawing No.	Title
C0-0	Cover Sheet
	SITE PLANNING
SV1-1	Existing Conditions Plan
LD1-0	Site Preparation and Demolition Plan
L1-1	Materials Plan
L1-2	Grading and Planting Plan
C1-1	Civil-Site Plan
C1-2	Water Relocation Plan
C1-3	Soil Erosion and Sediment Control Plan (SESC)
L4-1	Columbarium Niche Wall Elevations
L4-2	Columbarium Niche Wall Sections
L4-3	Columbarium Details
L5-1	Site Details
L5-2	Site Details
C2-1	Civil-Site Details
C2-2	Civil-Site Details
S-001	Structural Notes
S-101	Foundation Plan and Elevation
S-301	Sections and Details
G1-1	Geotechnical Logs
E1-1	Electrical Site Plan
E2-1	Electrical Details
IR101	Irrigation Plan
IR201	Irrigation Details
IR202	Irrigation Details

END OF SECTION

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SECTION 00 03 50
CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELEGIBILTY AND VOLUNTARY EXCLUSION – LOWER TIER COVERED TRANSACTIONS
FORM VA 40-895-12

- Must be submitted with bid.

END OF SECTION

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OMB NUMBER: 2900-0559
Respondent Burden: 15 minutes

Department of Veterans Affairs

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION - LOWER TIER COVERED TRANSACTIONS *(Contractor)*

Respondent Burden: Public reporting burden for this collection of information is estimated to average 15 minutes. Statutory authority for a State Cemetery Grant is 38 U.S.C. 2408. The information requested is necessary to ensure that the contractor has not been debarred, suspended or is ineligible to participate in the VA grant process and receive Federal funds. VA may not conduct or sponsor and you are not required to respond to this collection of information unless it displays a valid OMB number. Respond to this collection is voluntary. Send comments regarding the burden estimate or any other aspects of this collection of information, including suggestions for reducing the burden to VA Clearance Officer (005R1B), 810 Vermont Avenue NW, Washington, DC 20420. SEND COMMENTS ONLY. Please do not send applications for a grant to this address.

AUTHORITY: This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, Title 2 Part 180, Participants' Responsibilities. The regulations were published as Part VII of the May 26, 1988, Federal Register (pages 19160 - 19211). Copies of the regulations may be obtained by contacting the person to whom this proposal is submitted.

CERTIFICATION: The authorized representative certifies, by submission of this form, that neither the representative nor principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

INSTRUCTIONS:

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

2. The certification in this clause is a material representation of act upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "participant," "person," "primary covered transaction," "principle," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to whom this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion-Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

NAME AND ADDRESS OF COMPANY:	PROJECT FAI *(Federal Application Identifier)* NO.
NAME OF LOWER TIER PARTICIPANT	TITLE OF LOWER TIER PARTICIPANT
SIGNATURE OF LOWER TIER PARTICIPANT	DATE SIGNED *(mm/dd/yyyy)*

SECTION 00 04 30
BID BOND FORM

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned **_____

as Principal, and ***_____as Surety, are hereby held and firmly bound unto the Owner hereinafter referred to as the Owner, in the penal sum of

_____

_____($_____).

for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators and successors and assigns.

Signed this_____day of_____, 2020.

The Condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain bid, attached hereto and hereby made a part hereof, to enter into a contract in writing for the

_____

. NOW, THEREFORE,

1. If said Bid shall be rejected, or in the alternate
2. If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a Bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in other respects perform the agreement created by the acceptance of said Bid,

then his obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of the obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations for said Surety and its Bond shall be in no way impaired or affected by the extension of the time within which the Principal may accept such Bid and said Surety does hereby waive notice of any such extension.

** Insert Bidder's Name.

*** Insert Name of Surety.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

S E A L _____(L.S.)

_____

BY _____

ACKNOWLEDGEMENT OF PRINCIPAL (IF CORPORATION)

State of_____)

)s
s: County of_____)

On this_____day of_____, 2020

before me personally came and appeared_____, to me known, who, being by me duly sworn, did depose and say that he resides at _____: tha

_____, the Corporation described in and which executed the foregoing instrument; that he knows that seal of said corporation; that one of the impressions affixed to said instrument is an impression of said seal; that it was so affixed by order of the directors of said Corporation, and that he signed his name thereto by like order.

S E A L

_____

ACKNOWLEDGEMENT OF PRINCIPAL (IF PARTNERSHIP)

State of_____)

)
ss: County of_____)

On this_____day of_____, 2020

before me personally came and appeared_____, to me known and known by me to be one of the members of the firm of_____, described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said Firm.

S E A L

_____

ACKNOWLEDGEMENT OF PRINCIPAL (IF AN INDIVIDUAL)

State of_____)

)
ss: County of_____)

On this_____day of_____, 2020

before me personally came and appeared_____, to me known and known by me to be the person described in and who executed the foregoing instrument; and he acknowledged that he executed same.

S E A L

_____

ACKNOWLEDGEMENT OF SURETY

State of_____)

)
ss: County of_____)

On this_____day of_____, 2020

before me personally came and appeared_____, to me known, who, being by me duly sworn, did depose and say that he resides at_____: that he i affixed to said instrument is such seal; that it was so affixed by order of the directors of said Corporation, and that he signed his name thereto by like order.

S E A L

_____

END OF SECTION

SECTION 00 05 20
AGREEMENT FORM

AIA Document A101, Standard Form of Agreement Between Owner and Contractor where basis of payment is a Stipulated Sum – 2017 Edition, and as amended, forms the basis of Contract between the Owner and Contractor, and is included, following this page, as an integral part of the Bid Documents. Provisions which are not amended or supplemental remain in full force and effect.

END OF SECTION

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AIA® Document A101™ – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address, telephone and facsimile numbers, and website)

State of Rhode Island, acting by and through the Department of Administration, Division of Purchases, on behalf of the User AgencyOne Capitol Hill, Second Floor Providence, Rhode Island 02908-5855
401.578.8100 (telephone); 401.574.8387 (facsimile)
www.ridop.ri.gov

on behalf of the User Agency:
(Name, legal status, address, telephone and facsimile numbers, and website)

RI Office of Veterans Services
560 Jefferson Boulevard
Warwick, RI 02886
401-921-2119 (telephone)

and the Contractor:
(Name, legal status, address, telephone and facsimile numbers, and website)

for the following Project:
(Name, location and detailed description)

Rhode Island Veterans Memorial Cemetery Columbarium Plaza Expansion CW-4 Project Phase I. Exeter, RI

The Design Agent:
(Name, legal status, address, telephone and facsimile numbers, and website)

Bryant Associates, Inc.
Consulting Engineers 640 George Washington Highway
Building C, Suite 100
Lincoln, RI 02865
(401) 722-7660 (telephone)
www.bryant-engrs.com

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.
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User Notes:

(3B9ADA42)

The Owner and Contractor agree as follows.

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User Notes:

(3B9ADA42)

(Paragraph Deleted)

The Owner and Contractor agree as follows.

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General Conditions, Supplementary Conditions (if any), and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. No part of the Work shall be performed by Subcontractors without the Owner's prior written consent.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall
be the later of: (i) the issuance of the Purchase Order by the Owner; and (ii) the
(Paragraph Deleted)

date set forth in a notice to proceed issued by the User Agency.

(Paragraphs Deleted)

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

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[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. Subject to additions and deductions as provided in the Contract Documents, the Contract Sum shall be: $_____.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, are specified in the Bid Proposal Form and are included in the Contract Sum.

(Paragraph Deleted)

(Table Deleted)

§ 4.4 Unit prices, if
any, are specified in the Bid Proposal Form and include all costs, including without limitation, labor, materials, services, regulatory compliance, overhead, and profit necessary for the completion of the Work. Unit prices shall be used for both additions to, and deletions from the Work.

(Table Deleted)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

.1 In the event that there is one date for Substantial Completion of the Work, the Contractor shall pay the Owner the sum stipulated in this Section 4.5.1 as liquidated damages, and not as a penalty, for each calendar day of delay until the Work is substantially complete: ($1,200.00) one thousand two hundred dollars ____.

.2 In the event that the Project is scheduled to be completed in phases, and there is more than one date for Substantial Completion of the Work, the Contractor shall pay the Owner an aggregate amount equal to the sums stipulated in this Section 4.5.2 as liquidated damages, and not as a penalty, for each calendar day of delay until the Work for each phase is substantially complete:

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Phase	Liquidated Damages Sum

.3 The Owner and the Contractor have reasonably determined the sums set forth in this Section 4.5 to be a fair estimate of the Owner' actual damages which are difficult to ascertain in the event of delay.

§ 4.6 Other:
(Paragraph Deleted)

The Owner shall not be liable to the Contractor or any Subcontractor for claims or damages of any nature caused by or arising out of any delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Design Agent by the Contractor and Certificates for Payment issued by the Design Agent and approved by the Owner in writing, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 The Owner shall make payment of the certified amount, less retainage, to the Contractor not later than the 30 th working day following written approval by the Owner.

(Paragraph Deleted)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor and approved by the Design Agent and the Owner in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Design Agent and the Owner may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2007, General Conditions of the Contract for Construction as modified by the Owner, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Design Agent determines, in the Design Agent's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Design Agent has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2007 as modified by the Owner;

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User Notes:

.3 For Work performed or defects discovered since the last payment application, any amount for which the Design Agent may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2007 as modified by the Owner; and

.4 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due: five (5%) percent.

(Paragraph Deleted)

§ 5.1.7.1.1 Deleted.

(Paragraph Deleted)

§ 5.1.7.2 Deleted.

(Paragraph Deleted)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Paragraph Deleted)

The amount of five (5%) percent shall be retained by the Owner through the date of Substantial Completion of the Work and then after the date of Substantial Completion of the Work in accordance with R.I. Gen. Laws § 37-12-10.1.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2007 as modified by the Owner.

§ 5.1.9 Except with the Owner's prior written approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.10 Within 10 working days of receipt of any progress payment from the Owner, the Contractor must pay its Subcontractors the full amount included for each such Subcontractor within the Contractor's Application for Payment in accordance with the provisions of AIA A201 – 2007, General Conditions of the Contract for Construction as modified by the
Owner.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, less the amount withheld pursuant to § 5.1.7.3, shall be made by the Owner to the Contractor when:

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2007 as modified by the Owner, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Design Agent and approved in writing by the Owner;

.3 the Contractor has submitted its final release and final releases from all of its Subcontractors and suppliers in a form acceptable to the Owner; and

4 the Contractor has submitted to the Owner all close-out documents, including without limitation, all as-built plans, warranties, manuals, and other materials set forth in the Contract Documents.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 working days after the issuance of the Design Agent's final Certificate for Payment and written approval by the Owner.

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§ 5.3 Interest
Payments due and unpaid under the Contract shall bear interest from the date payment is due in accordance with the provisions of "Prompt Payment by Department of Administration," R.I. Gen. Laws §§ 42-11.1-1 **et seq.**

§ 5.4 Owner's Rights
§ 5.4.1 The Owner shall have the right to deduct from any payments due to the Contractor the amount of any unpaid obligations owed to the State of Rhode Island by the Contractor, including without limitation, any and all unpaid taxes, the amount of any claim against the Contractor arising out of this Agreement, or any amount on account of any other reason permitted by applicable law.

§ 5.5 Pursuant to R.I. Gen. Laws § 44-1-6, the Owner shall withhold payment from the Contractor if the Contractor does not maintain a regular place of business in Rhode Island in the amount of three (3%) percent of the Contract Sum until 30 calendar days after Final Completion and compliance by the Contractor with the requirements of such section. The three (3%) percent withheld pursuant to R.I. Gen. Laws § 44-1-6 is not considered retainage which is held pursuant to § 5.1.7.

(Paragraph Deleted)

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 Initial Decision Maker
Claims shall be referred to the Initial Decision Maker for initial decision. The Purchasing Agent appointed pursuant to the provisions of the "State Purchases Act," R.I. Gen. Laws § 37-2-1 et seq., will serve as the Initial Decision *Maker in accordance with the provisions of the State Purchases Act, State of Rhode Island Procurement Regulations, and this Section 6.1. An initial decision shall be required as a condition precedent to binding dispute resolution pursuant to Section 6.3 of any Claim arising prior to the date final payment is due.*

§ 6.2 Mediation
For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 6.1, and prior to the implementation of the binding dispute resolution procedures set forth in Section 6.3, the Contractor shall *have the*
option to pursue mediation, exercisable by written notice to the Owner within 30 calendar days of an Initial Decision. In the event of the exercise of
such option by the Contractor, the Owner and the Contractor shall attempt to select a mediator, and in the event that the Owner and the Contractor cannot agree on a mediator, either party may apply in writing to the Presiding Justice of the Providence County Superior Court, with a copy to the other, with a request for the court to appoint a mediator, and the costs of the mediator shall be borne equally by both parties.

(Paragraph Deleted)

§ 6.3 Binding Dispute Resolution
For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 6.1, or mediation at the option of the Contractor pursuant to Section 6.2, the method of binding dispute resolution shall be determined in accordance with the provisions of the "Public Works Arbitration Act," R.I. Gen. Laws §§ 37-16-1 **et seq.**

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007, as modified by the Owner. The Contract may also be terminated by the Owner: (i) in the event of the unavailability of appropriated funds; (ii) in the absence of a determination of continued need; or (iii) as *otherwise provided in the State of Rhode Island Procurement Regulations General Conditions of Purchase or other applicable law.*

§ 7.1.1 Deleted.

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§ 7.2 The Work may be suspended by the Owner as provided in: (i) the State of Rhode Island General Conditions of Purchase Regulation or other applicable law; or (ii) Article 14 of AIA Document A201–2007 as modified by the Owner.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to: (i) the AIA Document A201 – 2007 or other Contract Document as modified by the Owner; and (ii) that provision in the AIA Document A201 – 2007 as modified by the Owner or other Contract Document as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Representatives for the Owner

§ 8.2.1 The Owner's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

Lisa Lawless, Project Manager II
DOA DCAMM
One Capitol Hill
Providence, RI 02908
PH: (401) 479-0669

§ 8.2.2 The User Agency's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

James Bessel, Cemetery Director RIVMC
301 South County Trail
Exeter, RI 02822
PH: (401) 268-3088

§ 8.2.3 The Design Agent's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

Teresa M. Capuano, Project Manager, Bryant Associates, Inc.
640 George Washington Highway
Building C, Suite 100
Lincoln, RI 02865
PH: (401)
722-7660

§ 8.3 The Contractor's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

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§ 8.4 Neither the Owner's nor the Contractor's representative nor the Design Agent's representative shall be changed without 10 working days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in the Solicitation and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in the Solicitation and elsewhere in the Contract Documents.

§ 8.6 Deleted.

§ 8.7 Other provisions:

§ 8.7.1 The Contractor represents and warrants to the Owner, in addition to any other representations and warranties of the Contractor elsewhere in the Contract Documents:

.1 The Contractor and its Subcontractors are each financially solvent, able to pay their debts as they mature, and possess sufficient working capital to perform their obligations under the Contract Documents.

.2 The Contractor and its Subcontractors are each able to furnish the tools, materials, equipment, and labor required to complete the Project as required under the Contract Documents.

.3 *The Contractor and each Subcontractor are authorized to do business in the State of Rhode Island and are properly licensed by all necessary governmental authorities having jurisdiction over them and over the Work and the Project.*

.4 The execution of this Agreement and its performance is within its duly authorized powers.

.5 The Contractor has visited the site of the Project, familiarized itself with the local and special conditions under which the Work is to be performed, and correlated its observations with the requirements of the Contract Documents.

.6 The Contractor possesses the requisite level of experience and expertise in the business administration, construction, and superintendence of projects of the size, complexity, and nature of the Project, and it will perform the Work with the care, skill, and diligence of a contractor possessing such experience and expertise.

§ 8.7.2 The representations and warranties of the Contractor in this Section 8.7 and elsewhere in the Contract Documents will survive the execution and delivery of this Agreement, any termination of this Agreement, and the final completion of the Work.

§ 8.7.3 Any Change Orders or other Modifications must be approved in writing by the Owner.

§ 8.7.4 The Owner is the State of Rhode Island, acting by and through its Department of Administration, Division of Purchases, and therefore, pursuant to the provisions of R.I. Gen. Laws § 34-28-31, mechanics liens may not be placed against the Project.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, as modified by the Owner

.2 Deleted.

.3 AIA Document A201™–2007, General Conditions of the Contract for Construction, as *modified by the* Owner.

.4 Deleted.

.5 Drawings

(Table Deleted)

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The Drawings are included in the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

.6 Specifications

(Table Deleted)

The Specifications are included in the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

.7 Addenda, if

(Table Deleted)

any, issued pursuant to the Solicitation form a part of the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

.8

Supplementary and other Conditions of the Contract, including without limitation, the State of Rhode Island General Conditions of Purchase Regulation.

.9 Other documents listed below:

(Paragraph Deleted)

.1 The Solicitation, issued by the Owner, including without limitation, the Invitation to Bid, the Instructions to Bidders, the Specifications and Drawings, any Addenda, and the Bid Checklist.

(Paragraph Deleted)

.2 The Bid Proposal, including without limitation, the Bid Form and the Bidder Certification Cover Form.

(Table Deleted)

.3 The Purchase Order issued by the Owner.

§ 9.2 This Agreement and the Contract Documents are subject to, and governed by, the laws of the State of Rhode Island, including all procurement statutes and regulations (available at www.ridop.ri.gov), and applicable federal and local law, all of which are fully incorporated into this Agreement by this reference.

(Table Deleted)

(Paragraph Deleted)

§ 9.3 *In the event of any conflict between or among the Contract Documents, or any Contract Documents and any provision of the State of Rhode Island Procurement Regulations and/or any other provision of the Rhode Island General Laws, the State of Rhode Island Procurement Regulations and the Rhode Island General Laws shall control.*

ARTICLE 10 BENEFITS OF AGREEMENT

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§ 10.1 The User Agency is a disclosed third-party beneficiary of this Agreement and shall have all of the rights and benefits hereunder to which such a party is entitled. Nothing contained in this Agreement shall create a contractual relationship with, or a cause of action in favor of, any other third party against the Owner or the User Agency.

§ 10.2 This Agreement shall be binding on the Contractor and its successors and assigns; provided, however, that the Contractor may not assign its rights nor delegate its responsibilities under this Agreement without the Owner's prior written consent.

This Agreement is entered into as of the day and year first written above; provided, however, that this Agreement shall not become a valid, binding, and enforceable contract unless and until the Owner shall have issued a Purchase Order.

THE STATE OF RHODE ISLAND, acting by and through its Department of Administration, Division of Purchases

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

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Additions and Deletions Report for
AIA® Document A101™ – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 12:24:39 ET on 04/29/2020.

PAGE 1

(Name, legal status, ~~address and other information)~~address, telephone and facsimile numbers, and website)

...

State of Rhode Island, acting by and through the Department of Administration, Division of Purchases, on behalf of the User AgencyOne Capitol Hill, Second Floor
Providence, Rhode Island 02908-5855
401.578.8100 (telephone); 401.574.8387 (facsimile)
www.ridop.ri.gov

...

on behalf of the User Agency:

...

(Name, legal status, address, telephone and facsimile numbers, and website)

...

RI Office of Veterans Services
560 Jefferson Boulevard
Warwick, RI 02886
401-921-2119 (telephone)

...

(Name, legal status, ~~address and other information)~~address, telephone and facsimile numbers, and website)

...

Rhode Island Veterans Memorial Cemetery Columbarium Plaza Expansion CW-4 Project Phase I. Exeter, RI

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...

The ~~Architect:~~Design Agent:

...

(Name, legal status, ~~address and other information)~~address, telephone and facsimile numbers, and website)

...

Bryant Associates, Inc.
Consulting Engineers 640 George Washington Highway
Building C, Suite 100
Lincoln, RI 02865
(401) 722-7660 (telephone)
www.bryant-engrs.com

PAGE 3

The Owner and Contractor agree as follows.

...

The Contract Documents consist of this Agreement, Conditions of the Contract ~~(General, Supplementary,~~ (General Conditions, Supplementary Conditions (if any), and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

...

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. No part of the Work shall be performed by Subcontractors without the Owner's prior written consent.

...

§ 3.1 The date of commencement of the Work shall ~~be:~~

...

~~(Check one of the following boxes.)~~be the later of: (i) the issuance of the Purchase Order by the Owner; and (ii) the

...

~~[ ] The date of this Agreement.~~

...

~~[ ] A~~ date set forth in a notice to proceed issued by the ~~Owner.~~User Agency.

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...

~~[ ] Established as follows:~~

...

~~*(Insert a date or a means to determine the date of commencement of the Work.)*~~

...

~~If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.~~

PAGE 4

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. ~~The Contract Sum shall be ($), subject~~ Subject to additions and deductions as provided in the Contract ~~Documents.~~Documents, the Contract Sum shall be: $_____.

...

§ 4.3 Allowances, if any, ~~included in the Contract Sum:~~are specified in the Bid Proposal Form and are included in the Contract Sum.

...

~~*(Identify each allowance.)*~~

...

~~Item~~	~~Price~~

...

§ 4.4 Unit prices, if ~~any:~~

...

~~*(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*~~*any, are specified in the Bid Proposal Form and include all costs, including without limitation, labor, materials, services, regulatory compliance, overhead, and profit necessary for the completion of the Work. Unit prices shall be used for both additions to, and deletions from the Work.*

...

~~Item~~	~~Units and Limitations~~	~~Price per Unit ($0.00)~~

...

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.1 In the event that there is one date for Substantial Completion of the Work, the Contractor shall pay the Owner the sum stipulated in this Section 4.5.1 as liquidated damages, and not as a penalty, for each calendar day of delay until the Work is substantially complete: ($1,200.00) one thousand two hundred dollars ____.

.2 In the event that the Project is scheduled to be completed in phases, and there is more than one date for Substantial Completion of the Work, the Contractor shall pay the Owner an aggregate amount equal to the sums stipulated in this Section 4.5.2 as liquidated damages, and not as a penalty, for each calendar day of delay until the Work for each phase is substantially complete:

Phase **Liquidated Damages Sum**

.3 The Owner and the Contractor have reasonably determined the sums set forth in this Section 4.5 to be a fair estimate of the Owner' actual damages which are difficult to ascertain in the event of delay.

PAGE 5

~~*(Insert provisions*~~

...

~~for bonus or other incentives, if any, that might result in a change to the Contract Sum.)~~The Owner shall not be liable to the Contractor or any Subcontractor for claims or damages of any nature caused by or arising out of any delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work.

...

§ 5.1.1 Based upon Applications for Payment submitted to the ~~Architect~~ Design Agent by the Contractor and Certificates for Payment issued by the ~~Architect,~~ Design Agent and approved by the Owner in writing, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

...

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the ~~month, or as follows:~~month.

...

§ 5.1.3 ~~Provided that an Application for Payment is received by the Architect not later than the day of a month, the~~ The Owner shall make payment of the ~~amount~~ certified amount, less retainage, to the Contractor not later than the ~~day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.~~30th working day following written approval by the Owner.

...

~~*(Federal, state or local laws may require payment within a certain period of time.)*~~

...

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor and approved by the Design Agent and the Owner in accordance with the Contract Documents. The

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schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the ~~Architect~~ Design Agent and the Owner may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

...

§ 5.1.6 In accordance with AIA Document ~~A201™–2017,~~ A201™–2007, General Conditions of the Contract for ~~Construction,~~ Construction as modified by the Owner, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

...

.3 That portion of Construction Change Directives that the ~~Architect determines, in the Architect's~~ Design Agent determines, in the Design Agent's professional judgment, to be reasonably justified.

...

.2 The amount, if any, for Work that remains uncorrected and for which the ~~Architect~~ Design Agent has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document ~~A201–2017;~~

...

~~.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;~~A201–2007 as modified by the Owner;

PAGE 6

~~.4~~ .3 For Work performed or defects discovered since the last payment application, any amount for which the ~~Architect~~ Design Agent may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document ~~A201–2017;~~ A201–2007 as modified by the Owner; and

...

~~.5~~ .4 Retainage withheld pursuant to Section 5.1.7.

...

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due: five (5%) percent.

...

~~*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*~~

...

§ 5.1.7.1.1 ~~The following items are not subject to retainage:~~**Deleted.**

...

~~*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*~~

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...

§ 5.1.7.2 ~~Reduction or limitation of retainage, if any, shall be as follows:~~**Deleted.**

...

~~*(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)*~~

...

~~*(Insert any other conditions for release*~~

...

~~of retainage upon Substantial Completion.)~~The amount of five (5%) percent shall be retained by the Owner through the date of Substantial Completion of the Work and then after the date of Substantial Completion of the Work in accordance with R.I. Gen. Laws § 37-12-10.1.

...

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document ~~A201–2017.~~A201–2007 as modified by the Owner.

...

§ 5.1.9 Except with the Owner's prior written approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

...

§ 5.1.10 Within 10 working days of receipt of any progress payment from the Owner, the Contractor must pay its Subcontractors the full amount included for each such Subcontractor within the Contractor's Application for Payment in accordance with the provisions of AIA A201 – 2007, General Conditions of the Contract for Construction as modified by the

...

~~§~~ Owner.

...

§ 5.2 Final Payment

...

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, less the amount withheld pursuant to § 5.1.7.3, shall be made by the Owner to the Contractor ~~when~~when:

...

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.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document ~~A201–2017,~~ A201–2007 as modified by the Owner, and to satisfy other requirements, if any, which extend beyond final payment; and

...

.2 a final Certificate for Payment has been issued by the ~~Architect.~~Design Agent and approved in writing by the Owner;

...

.3 the Contractor has submitted its final release and final releases from all of its Subcontractors and suppliers in a form acceptable to the Owner; and

...

4 the Contractor has submitted to the Owner all close-out documents, including without limitation, all as-built plans, warranties, manuals, and other materials set forth in the Contract Documents.

...

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 working days after the issuance of the ~~Architect's final Certificate for Payment, or as follows:~~Design Agent's final Certificate for Payment and written approval by the Owner.

PAGE 7

Payments due and unpaid under the Contract shall bear interest from the date payment is due ~~at the rate stated below, or in the absence thereof, at~~ in accordance with the provisions of "Prompt Payment by Department of Administration," R.I. Gen. Laws §§ 42-11.1-1 **et seq.**

...

§ 5.4 Owner's Rights

...

~~the legal rate prevailing from time~~ **§ 5.4.1** The Owner shall have the right to deduct from any payments due to the Contractor the amount of any unpaid obligations owed to the State of Rhode Island by the Contractor, including without limitation, any and all unpaid taxes, the amount of any claim against the Contractor arising out of this Agreement, or any amount on account of any other reason permitted by applicable law.

...

~~to time at the place where the Project is located.~~ **§ 5.5** Pursuant to R.I. Gen. Laws § 44-1-6, the Owner shall withhold payment from the Contractor if the Contractor does not maintain a regular place of business in Rhode Island in the amount of three (3%) percent of the Contract Sum until 30 calendar days after Final Completion and compliance by the Contractor with the requirements of such section. The three (3%) percent withheld pursuant to R.I. Gen. Laws § 44-1-6 is not considered retainage which is held pursuant to § 5.1.7.

...

~~*(Insert rate of interest agreed upon, if any.)*~~

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...

§ 6.1 Initial Decision Maker

...

~~The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.~~Claims shall be referred to the Initial Decision Maker for initial decision. The Purchasing Agent appointed pursuant to the provisions of the "State Purchases Act," R.I. Gen. Laws § 37-2-1 et seq., will serve as the Initial Decision

...

~~*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*~~*Maker in accordance with the provisions of the State Purchases Act, State of Rhode Island Procurement Regulations, and this Section 6.1. An initial decision shall be required as a condition precedent to binding dispute resolution pursuant to Section 6.3 of any Claim arising prior to the date final payment is due.*

...

§ 6.2 ~~Binding Dispute Resolution~~Mediation

...

For any Claim ~~subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:~~not resolved by the Initial Decision Maker procedures set forth in Section 6.1, and prior to the implementation of the binding dispute resolution procedures set forth in Section 6.3, the Contractor shall

...

~~*(Check the appropriate box.)*~~*have the*

...

~~[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017~~option to pursue mediation, exercisable by written notice to the Owner within 30 calendar days of an Initial Decision. In the event of the exercise of

...

~~[ ] Litigation in a court of competent jurisdiction~~such option by the Contractor, the Owner and the Contractor shall attempt to select a mediator, and in the event that the Owner and the Contractor cannot agree on a mediator, either party may apply in writing to the Presiding Justice of the Providence County Superior Court, with a copy to the other, with a request for the court to appoint a mediator, and the costs of the mediator shall be borne equally by both parties.

...

~~[ ] Other *(Specify)*~~

...

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§ 6.3 Binding Dispute Resolution

...

~~If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.~~For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 6.1, or mediation at the option of the Contractor pursuant to Section 6.2, the method of binding dispute resolution shall be determined in accordance with the provisions of the "Public Works Arbitration Act," R.I. Gen. Laws §§ 37-16-1 **et seq.**

...

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document ~~A201–2017.~~

...

~~**§ 7.1.1** If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:~~A201–2007, as modified by the Owner. The Contract may also be terminated by the Owner: (i) in the event of the unavailability of appropriated funds; (ii) in the absence of a determination of continued need; or (iii) as

...

~~*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)*~~*otherwise provided in the State of Rhode Island Procurement Regulations General Conditions of Purchase or other applicable law.*

...

§ 7.1.1 Deleted.

PAGE 8

§ 7.2 The Work may be suspended by the Owner as provided ~~in Article 14 of AIA Document A201–2017.~~in: (i) the State of Rhode Island General Conditions of Purchase Regulation or other applicable law; or (ii) Article 14 of AIA Document A201–2007 as modified by the Owner.

...

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document ~~A201–2017~~ A201–2007 or another Contract Document, the reference refers ~~to that provision~~ to: (i) the AIA Document A201 – 2007 or other Contract Document as modified by the Owner; and (ii) that provision in the AIA Document A201 – 2007 as modified by the Owner or other Contract Document as amended or supplemented by other provisions of the Contract Documents.

...

§ 8.2 Representatives for the Owner

...

§ 8.2.1 The Owner's representative:

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...

(Name, title, address, email address, and other ~~information)~~information for the preferred methods of contact)

...

Lisa Lawless, Project Manager II
DOA DCAMM
One Capitol Hill
Providence, RI 02908
PH: (401) 479-0669

...

§ 8.2.2 The User Agency's representative:

...

(Name, title, address, email address, and other information for the preferred methods of contact)

...

James Bessel, Cemetery Director RIVMC
301 South County Trail
Exeter, RI 02822
PH: (401) 268-3088

...

§ 8.2.3 The Design Agent's representative:

...

(Name, title, address, email address, and other information for the preferred methods of contact)

...

Teresa M. Capuano, Project Manager, Bryant Associates, Inc.
640 George Washington Highway
Building C, Suite 100
Lincoln, RI 02865
PH: (401)
~~§~~ 722-7660

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...

§ 8.3 The Contractor's representative:

...

(Name, title, address, email address, and other ~~information)~~information for the preferred methods of contact)

PAGE 9

§ 8.4 Neither the Owner's nor the Contractor's representative nor the Design Agent's representative shall be changed without ~~ten~~ 10 working days' prior notice to the other party.

...

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in ~~AIA Document A101™ – 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds,~~ the Solicitation and elsewhere in the Contract Documents.

...

§ 8.5.2 The Contractor shall provide bonds as set forth in ~~AIA Document A101™ – 2017 Exhibit A,~~ the Solicitation and elsewhere in the Contract Documents.

...

§ 8.6 ~~Notice~~ **Deleted.**

...

§ 8.7 Other provisions:

...

~~in electronic format, pursuant to Article 1 of AIA Document A201 – 2017, may be given in accordance with AIA Document E203™ – 2013, Building Information Modeling~~ **§ 8.7.1 The Contractor represents and warrants to the Owner, in addition to any other representations and warranties of the Contractor elsewhere in the Contract Documents:**

...

.1 The Contractor and its Subcontractors are each financially solvent, able to pay their debts as they mature, and possess sufficient working capital to perform their obligations under the Contract Documents.

...

~~and Digital Data Exhibit, if completed, or as otherwise set forth below:~~ **.2** The Contractor and its Subcontractors are each able to furnish the tools, materials, equipment, and labor required to complete the Project as required under the Contract Documents.

...

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~~(If other than in accordance~~ .3 The Contractor and each Subcontractor are authorized to do business in the State of Rhode Island and are properly licensed by all necessary governmental authorities having jurisdiction over them and over the Work and the Project.

...

.4 The execution of this Agreement and its performance is within its duly authorized powers.

...

~~with AIA Document E203–2013, insert requirements for delivering notice~~ .5 The Contractor has visited the site of the Project, familiarized itself with the local and special conditions under which the Work is to be performed, and correlated its observations with the requirements of the Contract Documents.

...

~~in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)~~ .6 The Contractor possesses the requisite level of experience and expertise in the business administration, construction, and superintendence of projects of the size, complexity, and nature of the Project, and it will perform the Work with the care, skill, and diligence of a contractor possessing such experience and expertise.

...

§ 8.7.2 The representations and warranties of the Contractor in this Section 8.7 and elsewhere in the Contract Documents will survive the execution and delivery of this Agreement, any termination of this Agreement, and the final completion of the Work.

...

§ ~~8.7 Other provisions:~~8.7.3 Any Change Orders or other Modifications must be approved in writing by the Owner.

...

§ 8.7.4 The Owner is the State of Rhode Island, acting by and through its Department of Administration, Division of Purchases, and therefore, pursuant to the provisions of R.I. Gen. Laws § 34-28-31, mechanics liens may not be placed against the Project.

...

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and ~~Contractor~~Contractor, as modified by the Owner

...

.2 ~~AIA Document A101™–2017, Exhibit A, Insurance and Bonds~~ **Deleted.**

...

.3 AIA Document ~~A201™–2017,~~ A201™–2007, General Conditions of the Contract for ~~Construction~~

...

~~.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:~~Construction, as

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...

~~*(Insert the date of the E203-2013 incorporated into this Agreement.)*~~*modified by the*

...

Owner.

...

.4 Deleted.

...

~~**Number**~~ ~~**Title**~~ ~~**Date**~~

PAGE 10

The Drawings are included in the Solicitation and are available on the Division of Purchases website at

...

www.ridop.ri.gov.

...

~~**Section**~~ ~~**Title**~~ ~~**Date**~~ ~~**Pages**~~

...

The Specifications are included in the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

...

.7 Addenda, if ~~any:~~

...

~~**Number**~~ ~~**Date**~~ ~~**Pages**~~

...

~~Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.~~any, issued pursuant to the Solicitation form a part of the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

...

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.8 ~~Other Exhibits:~~

...

~~*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*~~*Supplementary and other Conditions of the Contract, including without limitation, the State of Rhode Island General Conditions of Purchase Regulation.*

...

~~[ ] AIA Document E204™ 2017, Sustainable Projects Exhibit, dated as indicated~~ .9 Other documents listed below:

...

~~(Insert the date of the E204-2017 incorporated into this Agreement.)~~

...

.1 The Solicitation, issued by the Owner, including without limitation, the Invitation to Bid, the Instructions to Bidders, the Specifications and Drawings, any Addenda, and the Bid Checklist.

...

~~[ ] The Sustainability Plan:~~

...

.2 The Bid Proposal, including without limitation, the Bid Form and the Bidder Certification Cover Form.

...

~~Title~~	~~Date~~	~~Pages~~

...

.3 The Purchase Order issued by the Owner.

...

~~[ ] Supplementary and other Conditions of the Contract:~~§ 9.2 This Agreement and the Contract Documents are subject to, and governed by, the laws of the State of Rhode Island, including all procurement statutes and regulations (available at www.ridop.ri.gov), and applicable federal and local law, all of which are fully incorporated into this Agreement by this reference.

...

~~Document~~	~~Title~~	~~Date~~	~~Pages~~

...

~~.9 Other documents, if any, listed below:~~

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...

~~*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation*~~ *§ 9.3 In the event of any conflict between or among the Contract Documents, or any Contract Documents and any provision of the State of Rhode Island Procurement Regulations and/or any other provision of the Rhode Island General Laws, the State of Rhode Island Procurement Regulations and the Rhode Island General Laws shall control.*

...

ARTICLE 10 BENEFITS OF AGREEMENT

PAGE 11

~~of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)~~**§ 10.1** The User Agency is a disclosed third-party beneficiary of this Agreement and shall have all of the rights and benefits hereunder to which such a party is entitled. Nothing contained in this Agreement shall create a contractual relationship with, or a cause of action in favor of, any other third party against the Owner or the User Agency.

...

§ 10.2 This Agreement shall be binding on the Contractor and its successors and assigns; provided, however, that the Contractor may not assign its rights nor delegate its responsibilities under this Agreement without the Owner's prior written consent.

...

This Agreement is entered into as of the day and year first written ~~above.~~above; provided, however, that this Agreement shall not become a valid, binding, and enforceable contract unless and until the Owner shall have issued a Purchase Order.

...

THE STATE OF RHODE ISLAND, acting by and through its Department of Administration, Division of Purchases

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Certification of Document's Authenticity

AIA® Document D401 ™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:24:39 ET on 04/29/2020 under Order No. 9542044531 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ - 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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SECTION 00 06 10
PERFORMANCE BOND; PAYMENT BOND

1. PERFORMANCE BOND

   AIA Document A312, Performance Bond – 2010 Edition is included, following this page, as an integral part of the Bid Documents, and issues of this form, signed and executed by the successful Bidder and Surety, shall be bound into the executed Contract copies of the Project Manual.

2. PAYMENT BOND

   AIA Document A312, Payment Bond – 2010 Edition is included, following this page, as an integral part of the Bid Documents, and issues of this form, signed and executed by the successful Bidder and Surety, shall be bound into the executed Contract copies of the Project Manual.

END OF SECTION

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DRAFT

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

« »« »
« »

SURETY:
(Name, legal status and principal place of business)

« »« »
« »

OWNER:
(Name, legal status and address)

« »« »
« »

CONSTRUCTION CONTRACT
Date: « »
Amount: $ « »
Description:
(Name and location)

« »
« »

BOND
Date:
(Not earlier than Construction Contract Date)
« »
Amount: $ « »
Modifications to this Bond: « » None « » See Section 16

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

Signature: _____
Name and Title: « »« »

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title: « »« »

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

« »
« »
« »

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

« »
« »
« »
« »
« »
« »

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the

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Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

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§ 16 Modifications to this bond are as follows:

« »

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	« »« »	Name and Title:	« »« »
Address:	« »	Address:	« »

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Payment Bond

CONTRACTOR:
(Name, legal status and address)

« »« »
« »

SURETY:
(Name, legal status and principal place of business)

« »« »
« »

OWNER:
(Name, legal status and address)

« »« »
« »

CONSTRUCTION CONTRACT
Date: « »
Amount: $ « »
Description:
(Name and location)

« »
« »

BOND
Date:
(Not earlier than Construction Contract Date)
« »
Amount: $ « »
Modifications to this Bond: « » None « » See Section 18

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

Signature: _____
Name and Title: « »« »

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title: « »« »

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

« »
« »
« »

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

« »
« »
« »
« »
« »
« »

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

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§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

.1 the name of the Claimant;
.2 the name of the person for whom the labor was done, or materials or equipment furnished;
.3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
.4 a brief description of the labor, materials or equipment furnished;
.5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
.6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
.7 the total amount of previous payments received by the Claimant; and
.8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

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§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

« »

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	« »« »	Name and Title:	« »« »
Address:	« »	Address:	« »

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SECTION 00 07 00
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

AIA Document A201, General Conditions of the Contract for Construction – 2007 Edition is included, following this page, as an integral part of the Bid Documents. Provisions which are not amended or supplemental remain in full force and effect.

END OF SECTION

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AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
Rhode Island Veterans Memorial Cemetery Columbarium Plaza Expansion CW-4 Project Phase I
301 South County Trail
Exeter, RI

THE OWNER:
(Name, legal status and address)
The State of Rhode Island, acting by and through the Department of Administration
Division of Purchases, on behalf of the User Agency
One Capitol Hill, Second Floor
Providence, Rhode Island 02908-5855
(401) 574-8100 (telephone)
(401 574-8387 (facsimile)
www.ridop.ri.gov

THE USER AGENCY

(Name, address, telephone and facsimile numbers, and web address)

RI Office of Veterans Services
560 Jefferson Boulevard
Warwick, RI 02886
401-921-2119 (telephone)

THE Design Agent:
(Name, legal status, address, telephone and facsimile numbers, and web address)
Bryant Associates, Inc.
Consulting Engineers
640 George Washington Highway
Building C, Suite 100
Lincoln, RI 02865
(401) 722-7660 (telephone)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 OWNER

3 CONTRACTOR

4 DESIGN AGENT

5 SUBCONTRACTORS

6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

Init.
/

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7 CHANGES IN THE WORK

8 TIME

9 PAYMENTS AND COMPLETION

10 PROTECTION OF PERSONS AND PROPERTY

11 INSURANCE AND BONDS

12 UNCOVERING AND CORRECTION OF WORK

13 MISCELLANEOUS PROVISIONS

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES

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(Paragraphs deleted)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (the Agreement) and consist of the Agreement (and the documents enumerated therein), Conditions of the Contract (General Conditions, Supplementary Conditions, if any, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Design Agent.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Design Agent or the Design Agent's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Design Agent or the Design Agent's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Design Agent shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Design Agent's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Design Agent and the Design Agent's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items and services necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; the Contractor shall perform all work reasonably inferable from the Contract Documents as being necessary to produce the indicated results.

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§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 In the event of any conflicts or discrepancies among the Contract Documents, the provisions of the Contract Documents will be interpreted in in the order of priority set forth in Rhode Island Procurement Regulation 220-RICR-30-00-13.4(B).

§ 1.2.5 In the event of any conflicts or discrepancies between the Contract Documents and the State of Rhode Island Procurement Regulations or any provision of the Rhode Island General Laws, the State of Rhode Island Procurement Regulations and the Rhode Island General Laws will control.

§ 1.2.6 In the event of any inconsistency between the Drawings and Specifications, the better quality or greater quantity of Work shall be provided.

§ 1.2.7 The Owner will be the final decision maker for any and all interpretations.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Owner and the User Agency shall have a perpetual license to utilize the Drawings, Specifications, and other documents, including electronic or digital documents, prepared by the Design Agent and the Design Agent's consultants, for the execution of the Project and shall have and retain all rights to use them and reproduce them for the production and maintenance of the Work described therein. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Design Agent's or Design Agent's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Design Agent and the Design Agent's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Design Agent does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

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§ 2.1.2 Deleted.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Deleted.

§ 2.2.2 The Contractor shall secure and pay for permits and fees, necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 If required for the Work in the discretion of the Owner, the Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of any information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Deleted.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a 10 working-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Design Agent's additional services made necessary by such default, neglect, or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Design Agent. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR
§ 3.1 GENERAL
§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Design Agent, or by tests, inspections, or approvals required or performed by persons or entities other than the Contractor.

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§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Owner and the Design Agent any errors, inconsistencies, or omissions discovered by or made known to the Contractor or additional Drawings, Specifications, or instructions required to define the Work in greater detail to permit the proper progress of the Work as a request for information in such form as the Design Agent may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Design Agent and the Owner any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Design Agent or Owner may require.

§ 3.2.3.1 Omissions from the Drawings and Specifications of items obviously needed to perform the Work properly, such as attachments, bolts, hangers, and other fastening devices, shall not relieve the Contractor from the obligation to furnish and install such items.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Design Agent issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2, 3.2.3, or 3.2.3.1, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Design Agent for damages resulting from errors, inconsistencies, or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.2.4.1 The Contractor shall not make any changes without prior written authorization from the Design Agent and the Owner.

§ 3.2.5 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Design Agent and shall not proceed with that portion of the Work without further written instructions from the Design Agent. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without

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acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Whenever the Contractor has an obligation to provide labor and materials under the Agreement, the Contractor, at a minimum, shall provide the labor for, and furnish and install and place in operation all items, including without limitation, all proper connections.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Design Agent in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Design Agent and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and the Design Agent that materials and equipment furnished under the Contract will be of first quality, prime manufacture, and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including substitutions not properly authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Design Agent, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.2 The State of Rhode Island is exempt from payment of any federal or state excise, transportation, or sales tax. The Rhode Island Department of Administration Division of Purchases will furnish Exemption Certificates upon request.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections required by the Rhode Island State Building Code necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall be responsible for obtaining the Certificate of Occupancy from the appropriate governmental authorities.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

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§ 3.7.3 The Contractor shall promptly notify the Design Agent and the Owner if the Contractor becomes aware that the Contract Documents are not in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Design Agent before conditions are disturbed and in no event later than 21 working days after first observance of the conditions. The Design Agent will promptly investigate such conditions and, if the Design Agent determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Design Agent determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Design Agent shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Design Agent's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Design Agent. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Design Agent the name and qualifications of a proposed superintendent. The Design Agent may reply within 14 working days to the Contractor in writing stating (1) whether the Owner or the Design Agent has reasonable objection to the proposed superintendent or (2) that the Design Agent requires additional time to review. Failure of the Design Agent to reply within the 14 working-day period shall constitute notice of no reasonable objection.

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§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, within 20 working days after the issuance of the Purchase Order, shall prepare and submit for the Owner's and Design Agent's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals, not less frequently than monthly, as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor shall certify on the initial schedule and all revised schedules that they comply with the Contract Documents.

§ 3.10.2 The Contractor shall prepare a submittal schedule, within 20 working days after the issuance of the Purchase Order, and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Owner's and the Design Agent's approval. The Owner's and the Design Agent's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Owner and the Design Agent reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Design Agent.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Design Agent and shall be delivered to the Design Agent for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Design Agent is subject to the limitations of Section 4.2.7. Informational submittals upon which the Design Agent is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Design Agent without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Design Agent Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Owner and the Design Agent or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Design Agent that the Contractor has (1) reviewed and approved them, (2) determined and verified

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materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Design Agent.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Design Agent's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Design Agent in writing of such deviation at the time of submittal and (1) the Design Agent has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Design Agent's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Design Agent on previous submittals. In the absence of such written notice, the Design Agent's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Design Agent will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Design Agent. The Owner and the Design Agent shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Design Agent have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Design Agent will review, approve, or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.11 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Design Agent for evaluation of resubmittals.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, and any restrictions imposed by the User Agency or the Owner, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably

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withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Design Agent access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Design Agent harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Design Agent. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Design Agent and the Owner.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, the User Agency and the State of Rhode Island in accordance with Rhode Island Procurement Regulation 220-RICR-30-00-13.21.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

§ 3.18.3 Without limiting the generality of the foregoing, the defense and indemnity set forth in this Section 3.18 includes, without limitation, all liabilities, damages, losses, claims, demands, and actions on account of bodily injury, death, or property loss to a person or entity indemnified hereunder or any other persons or entities, whether based upon statutory (including, without limitation, workers compensation), contractual, tort, or other liability of any person or entity so indemnified.

§ 3.18.4 The remedies set forth herein shall not deprive any person indemnified hereunder of any other indemnity action, right, or remedy otherwise available to any such person or entity at common law or otherwise.

§ 3.18.5 The Contractor will include the indemnity set forth in this Section 3.18, without modification, in each Subcontract with any Subcontractor.

§ 3.18.6 Notwithstanding any other language in the Contract Documents to the contrary, the indemnity hereunder shall survive Final Completion of the Work and final payment under the Agreement and shall survive any termination of the Agreement.

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ARTICLE 4 DESIGN AGENT

§ 4.1 GENERAL

§ 4.1.1 The Design Agent is the person lawfully licensed to practice his or her profession in the State of Rhode Island or an entity lawfully practicing its profession in the State of Rhode Island and identified in the Contract Documents as the Design Agent. The term "Design Agent" means the Design Agent or the Design Agent's authorized representative.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Design Agent as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Design Agent. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Design Agent is terminated, the Owner shall employ a successor Design Agent as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Design Agent.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Owner with assistance from the Design Agent will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction through the date the Design Agent issues the final Certificate for Payment and continuing until the expiration of the one-year period following Final Completion. The Design Agent will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Design Agent will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Design Agent will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Design Agent will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.

§ 4.2.3 On the basis of the site visits, the Design Agent will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Design Agent will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Design Agent will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Design Agent about matters arising out of or relating to the Contract. Communications by and with the Design Agent's consultants shall be through the Design Agent. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Design Agent's evaluations of the Contractor's Applications for Payment, the Design Agent will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Design Agent has authority to reject Work that does not conform to the Contract Documents. Whenever the Design Agent considers it necessary or advisable, the Design Agent will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Design Agent nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Design Agent to the Contractor,

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Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Design Agent will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Design Agent's action will be taken in accordance with the submittal schedule approved by the Design Agent or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Design Agent's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Design Agent's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Design Agent's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Design Agent, of any construction means, methods, techniques, sequences or procedures. The Design Agent's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Design Agent will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Design Agent will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Design Agent will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Design Agent agree, the Design Agent will provide one or more project representatives to assist in carrying out the Design Agent's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Design Agent will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Design Agent's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Design Agent will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Design Agent will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Design Agent's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents and approved by the Owner.

§ 4.2.14 The Design Agent will review and respond to requests for information about the Contract Documents. The Design Agent's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Design Agent will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

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§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner and the Design Agent the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each portion of the Work. The Owner may reply within 14 working days to the Contractor in writing stating (1) whether the Owner or the Design Agent has reasonable objection to any such proposed person or entity or (2) that the Owner or Design Agent requires additional time for review.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Design Agent has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Agent has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Design Agent makes reasonable objection to such substitution.

§ 5.2.5 MANUFACTURERS AND FABRICATORS

§ 5.2.5.1 Not later than 10 working days after the date of commencement of the Work, the Contractor shall furnish in writing to the Owner and the Design Agent the names of the manufacturers or fabricators for certain products, equipment, and systems identified in the Specifications and, where applicable, the name of the installing Subcontractor. The Owner may reply within 14 working days to the Contractor in writing, stating: (i) whether the Owner or the Design Agent has reasonable objection to any such proposed person manufacturer or fabricator; or (ii) whether the Owner or Design Agent requires additional time to review.

§ 5.2.5.2 The Contractor shall not contract with a proposed manufacturer, fabricator, or Subcontractor to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5.3 If the Owner or Design Agent has an objection to a manufacturer, fabricator, or Subcontractor proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Agent has no objection.

§ 5.2.5.4 The Contractor shall not substitute a manufacturer, fabricator, or Subcontractor previously selected if the Owner or Design Agent makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Design Agent. Upon the request of the User Agency and/or the Owner, the Contractor shall provide the User Agency and/or the Owner with copies of each subcontract agreement. Each subcontract agreement shall preserve and protect the rights of the Owner and Design Agent under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor

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shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

(Paragraph deleted)

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 working days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Design Agent apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

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§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement between the Owner and the Contractor; a Construction Change Directive requires agreement by the Owner and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Design Agent alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Contractor and signed by the Owner, Contractor and Design Agent stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Subsequent to the approval of a Change Order as provided in § 7.1.2, whether such Change Order changes the Contract Sum or Contract Time or both, no additional claim related to such Change Order will be considered by the Owner. Any change, once incorporated into a Change Order, is all inclusive, and includes all factors that could have been considered at the time of the Change Order such as Project impact or schedule "ripple" effect.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Design Agent and signed by the Owner, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;

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.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

§ 7.3.4 Deleted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Design Agent of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Design Agent shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.3.1. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Design Agent may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of delivery;

.3 Rental costs of machinery and equipment, exclusive of hand tools; or

.4 Costs of premiums for all bonds and insurance and permit fees related to the Work..

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Design Agent. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Design Agent will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Design Agent determines, in the Design Agent's professional judgment, to be reasonably justified. The Design Agent's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Design Agent concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Contractor will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:

.1 For the Contractor, for work performed by the Contractor's own forces, an amount not to exceed ten (10%) percent of the cost.

.2 For the Contractor, for work performed by the Contractor's Subcontractors, an amount not to exceed five (5%) of the amount due to the Subcontractors.

.3 For each Subcontractor, for work performed by the Subcontractor's own forces, an amount not to exceed ten (10%) percent of the cost.

.4 Where the Work represents both additions and deletions and results in a net increase, the allowable overhead and profit shall be in accordance with this Section 7.3.11, but in no event shall the amount exceed fifteen (15%) percent of the net increase in the cost of the Work.

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§ 7.3.12 All proposals with an aggregate cost equal to or in excess of $500.00 shall be accompanied by a detailed itemization of costs, including labor, materials (quantities and prices), and Subcontracts, in a form acceptable to the Owner. In no event will a change order request reflecting an aggregate cost equal to or in excess of $500.00 be approved without such itemization.

§ 7.4 MINOR CHANGES IN THE WORK

The Design Agent with the prior written approval of the Owner has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be affected by written order signed by the Design Agent and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

The date of commencement of the Work is the date established in Section 3.1 of the Agreement..

(Paragraph deleted)

§ 8.1.3 The date of Substantial Completion is the date certified by the Design Agent in accordance with Section 9.8.

§ 8.1.4 Deleted.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Design Agent, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, then the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

(Paragraph deleted)

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Within 20 working days of the issuance of the Purchase Order, and promptly if revision is necessary from time to time as a result of a Change Order, the Contractor shall submit to the Owner, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Design Agent and the Owner may require. This schedule,

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if and when approved by the Design Agent and the Owner in writing, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least 10 working days before the date established for each progress payment, the Contractor shall submit to the Design Agent and the Owner for approval an itemized Application for Payment prepared in accordance with the schedule of values for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or the Design Agent may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 All Applications for Payment for Change Orders must be accompanied by a Notice of Change in Purchase Order issued by the Owner, and if directed by the Owner, by the User Agency.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 The form of Application for Payment shall be AIA Document G702, Application and Certification for Payment, supported by AIA Document G702A, Continuation Sheet.

§ 9.3.1.4 Until Substantial Completion, the Owner shall pay ninety-five (95%) percent of the amount due the Contract on account of progress payments.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work. The Contractor shall immediately satisfy any lien, claim, or encumbrance against the site where the Project is located and indemnify the Owner from and against all resulting costs and expenses, including without limitation, attorneys' fees.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Design Agent will, within 7 working days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Design Agent determines is properly due, or notify the Contractor and Owner in writing of the Design Agent's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Design Agent to the Owner, based on the Design Agent's evaluation of the Work and the data comprising the Application for Payment, that, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Design Agent. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Design Agent has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of

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requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.4.3 The Contractor must submit all product literature, material and color samples with each Application for Payment, or as otherwise required by the Owner.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Design Agent will withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Design Agent's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Design Agent is unable to certify payment in the amount of the Application, the Design Agent will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Design Agent cannot agree on a revised amount, the Design Agent will promptly issue a Certificate for Payment for the amount for which the Design Agent is able to make such representations to the Owner. The Design Agent may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Design Agent's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of:

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- **.7** failure to carry out the Work in accordance with the Contract Documents; or
- **.8** any other failure to comply with the obligations of the Contractor under the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 The Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Design Agent and the Design Agent will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Design Agent has issued a Certificate for Payment and the Owner has approved the Certificate for Payment in writing, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Design Agent.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than 10 working days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Design Agent will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Design Agent and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within 7 working days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. The Owner shall have the right to withhold payment(s) to the Contractor in the event that any Subcontractors or material and equipment suppliers have not been

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properly paid. Neither the Owner nor Design Agent shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Design Agent does not issue a Certificate for Payment, through no fault of the Contractor, within 7 working days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within 7 working days after the date established in the Contract Documents the amount certified by the Design Agent or awarded by binding dispute resolution, then the Contractor may, upon 7 additional working days' written notice to the Owner and Design Agent, make a claim for payment as provided under the provisions of applicable law.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Design Agent a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Design Agent will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Design Agent's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Design Agent. In such case, the Contractor shall then submit a request for another inspection by the Design Agent to determine Substantial Completion. The Design Agent will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for any additional inspections.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Design Agent will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment less the amount of five (5%) percent to be retained by the Owner in accordance with R.I. Gen. Laws § 37-12-10.1. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

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§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Design Agent as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Design Agent.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Design Agent shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Design Agent will promptly make such inspection and, when the Design Agent finds the Work acceptable under the Contract Documents and the Contract fully performed, the Design Agent will promptly issue a final Certificate for Payment stating that to the best of the Design Agent's knowledge, information and belief, and on the basis of the Design Agent's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Design Agent's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. The Design Agent will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for any additional inspections.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Design Agent (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 working days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, and (6) all other close-out documents required by the Owner, including without limitation, all as-built plans, warranties, manuals, and other materials set forth in the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, Final Completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting Final Completion, and the Design Agent so confirms, the Owner shall, upon application by the Contractor and certification by the Design Agent, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work

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fully completed and accepted shall be submitted by the Contractor to the Design Agent prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 claims permitted under the State of Rhode Island General Conditions of Purchase Regulation.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

§ 9.11 The Contractor and the Contractor's surety shall be liable for and shall pay the Owner as liquidated damages the sums specified in the Solicitation and Bid Form, or if completed, the amount set forth in Section 3.4 of the Agreement.

§ 9.12 Warranties required by the Contract Documents shall commence on the date of Final Completion of the Work.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel and in consultation with the appropriate governmental authorities.

§ 10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give the User Agency and the Owner reasonable advance notice.

§ 10.2.4.2 If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in

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whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Design Agent or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Design Agent.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Design Agent in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Design Agent the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Design Agent will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Design Agent has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Design Agent have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the extent permitted by the provisions of R.I. Gen. Laws §§ 9-31-1 **et seq.**, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Design Agent, Design Agent's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

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§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as is specified in the Solicitation and as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- **.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- **.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- **.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- **.4** Claims for damages insured by usual personal injury liability coverage;
- **.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- **.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- **.7** Claims for bodily injury or property damage arising out of completed operations; and
- **.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.1.2 The Contractor's liability insurance shall include all major coverages and be on a comprehensive general liability basis.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance as specified in the Solicitation and as otherwise acceptable to the Owner shall be filed with the Owner and the User Agency prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 working days' prior written notice has been given to the Owner and the User Agency. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

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§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the User Agency, and their elected and appointed officials, members, employees, and agents, the Design Agent and the Design Agent's consultants as additional insureds for claims caused in whole or in part by the Contractor's acts or omissions during the Contractor's operations; and (2) the Owner, the User Agency, and their elected and appointed officials, members, employees, and agents, as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.1.5 The Contractor shall be responsible for the prompt payment to the Owner of any deductible amounts under any insurance policies required under the Contract Documents for claims made pursuant to such policies.

§ 11.2 OWNER'S LIABILITY INSURANCE.

§ 11.2.1 The Contractor shall furnish the Owner and the User Agency, through the Design Agent, an insurance certificate providing Owner's Protective Liability extended to include the interests of the Design Agent, and to protect the Owner, User Agency, and Design Agent from any liability which might be incurred against any of them as a result of any operation of the Contractor or Subcontractors or their employees or anyone for whom either the Contractor or Subcontractors are responsible. Such insurance shall be written for the same limits as the Contractor's commercial general liability insurance and shall include the same coverage.

§ 11.2.2 If the Owner engages separate contractors to perform work for, or in or around, the Project, it shall require in its contracts with each separate contractor that Contractor and its officers, directors, partners, members, employees, and agents shall be: (i) named as additional insureds on a primary, noncontributory basis to any commercial general liability, pollution liability, and excess liability insurance policies; and (ii) provided a waiver of subrogation on all workers compensation and professional liability insurance policies.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the state of Rhode Island, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the User Agency, the Contractor, Subcontractors and Sub-subcontractors in the Project. If the Owner and/or the User Agency incur any damages by failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable cost resulting from such failure.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Design Agent's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 Deleted.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Contractor shall take reasonable steps to obtain consent of the insurance company or companies and

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shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 Deleted.

§ 11.3.3 Deleted.

§ 11.3.4 Deleted.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Contractor shall file with the Owner a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 working days' prior written notice has been given to the Owner and the User Agency.

§ 11.3.7 WAIVERS OF SUBROGATION

The Contractor waives all rights against the Owner and the User Agency and any of their subcontractors, sub-subcontractors, agents and employees, and (2) the Design Agent, Design Agent's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Design Agent, Design Agent's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under this property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Contractor shall deposit in a separate account proceeds so received, which the Contractor shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Contractor as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within 5 working days after occurrence of loss to the Contractor's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement.

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§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in the Solicitation.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Design Agent's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Design Agent, be uncovered for the Design Agent's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Design Agent has not specifically requested to examine prior to its being covered, the Design Agent may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Design Agent or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Design Agent's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Final Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time after receipt of notice from the Owner or Design Agent, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.2.4 Upon request by the Owner and prior to the expiration of one year from the date of Final Completion, the Design Agent will conduct and the Contractor shall attend 2 meetings with the Owner to review the facility operations and performance.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

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§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the State of Rhode Island.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to any executive, legislative, judicial, regulatory, or administrative body of the state, or any political subdivision thereof, including without limitation, any department, division, agency, commission, board, office, bureau, authority, school, water, or fire district, or other agency of Rhode Island state or local government that exercises governmental functions, any other governmental authority, and any quasi-public corporation and/or body corporate and politic. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice, or when received, if manually delivered or transmitted by electronic mail or facsimile to the last such address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Design Agent or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Design Agent timely notice of when and where tests and inspections are to be made so that the Design Agent may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

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§ 13.5.2 If the Design Agent, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Design Agent will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Design Agent of when and where tests and inspections are to be made so that the Design Agent may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Design Agent's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Design Agent.

§ 13.5.5 If the Design Agent is to observe tests, inspections or approvals required by the Contract Documents, the Design Agent will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

No interest shall be due or payable on account of any payment due or unpaid under the Contract Documents except in accordance with the provisions of "Prompt Payment by Department of Administration," R.I. Gen. Laws §§ 42-11.1-1 **et seq.**

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 calendar days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency that requires all Work to be stopped; or
- **.3** Because the Design Agent has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1

§ 14.1.2 Deleted.

§ 14.1.3 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon 7 working days' written notice to the Owner and Design Agent, terminate the Contract and recover from the Owner payment for Work executed.

§ 14.1.4 If the Work is stopped for a period of 60 calendar days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon 7 additional days' written notice to the Owner and the Design Agent, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

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§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

- .1 refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 disregards or fails to comply with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- .4 otherwise is guilty of breach of a provision of the Contract Documents; or
- .5 cancels or the Contractor or the Owner receives notice of cancellation or nonrenewal of any insurance required under the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, 7 working days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Design Agent's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The

(Paragraphs deleted)

Owner shall not be liable to the Contractor or any Subcontractor for claims or damages of any nature caused by or arising out of any delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work in accordance with the provisions of Section 8.3.1.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination.

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ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party. Such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly serviced if delivered in person, by mail, by courier, or by electronic transmission. Claims by either party must be initiated within 21 working days after occurrence of the event giving rise to such Claim or within 21 working days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Design Agent will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.5.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

§ 15.1.5.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

§ 15.1.6 The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this

(Paragraphs deleted)

Contract. This waiver includes damages incurred by the Contractor for principal office expenses, including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit. This waiver is applicable, without limitation, to all consequential damages due to the Contractor's termination in accordance with Article 14. Nothing in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

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§ 15.2 INITIAL DECISION

§ 15.2.1 Claims shall be referred to the Initial Decision Maker for initial decision. The Purchasing Agent appointed pursuant to the provisions of the "State Purchases Act," R.I. Gen. Laws § 37-2-1 **et seq.**, will serve as the Initial Decision Maker in accordance with the provisions of the State Purchases Act, State of Rhode Island Procurement Regulations, and this Section 15.2.1. An initial decision shall be required as a condition precedent to binding dispute resolution pursuant to Section 15.3.1 of any Claim arising prior to the date final payment is due.

§ 15.2.2 Deleted.

§ 15.2.3 Deleted.

§ 15.2.4 Deleted.

§ 15.2.5 Deleted.

§ 15.2.6 Deleted.

§ 15.2.6.1 Deleted.

§ 15.2.7 Deleted.

§ 15.2.8 Deleted.

§ 15.3 MEDIATION

§ 15.3.1 For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 15.2.1, and prior to the implementation of the binding dispute resolution procedures set forth in Section 15.4.1, the Contractor or the Design Agent shall have the option to pursue mediation, exercisable by written notice to the Owner within 30 calendar days of an Initial Decision. In the event of the exercise of such option by the Contractor or the Design Agent, the Owner and the Contractor or the Design Agent shall attempt to select a mediator, and in the event that the Owner and the Contractor or the Design Agent cannot agree on a mediator, either party may apply in writing to the Presiding Justice of the Providence County Superior Court, with a copy to the other, with a request for the court to appoint a mediator, and the costs of the mediator shall be borne equally by both parties.

§ 15.3.2 Deleted.

§ 15.3.3 Deleted.

§ 15.4 BINDING DISPUTE RESOLUTION

§ 15.4.1 For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 15.2.1, or mediation at the option of the Contractor pursuant to Section 15.3.1, the method of binding dispute resolution shall be determined in accordance with the provisions of the "Public Works Arbitration Act," R.I. Gen. Laws §§ 37-16-1 **et seq.**

(Paragraphs deleted)

§ 15.4.4 Deleted.

§ 15.4.4.1 Deleted.

§ 15.4.4.2 Deleted.

§ 15.4.4.3 Deleted.

§ 16 COMPLIANCE WITH APPLICABLE LAW

The Contractor and its Subcontractors shall comply with all applicable federal, state, and local laws.

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PAGE 1

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301 South County Trail
Exeter, RI

...

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THE Design Agent:
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...

4 ~~ARCHITECT~~DESIGN AGENT
PAGE 3

~~INDEX~~
~~(Topics and numbers in bold are section headings.)~~

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~~**Acceptance of Nonconforming Work**~~
~~9.6.6, 9.9.3, **12.3**~~
~~Acceptance of Work~~
~~9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3~~
~~**Access to Work**~~
~~**3.16**, 6.2.1, 12.1~~
~~Accident Prevention~~
~~10~~
~~Acts and Omissions~~
~~3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.4.2, 13.7, 14.1, 15.2~~
~~Addenda~~
~~1.1.1, 3.11~~
~~Additional Costs, Claims for~~
~~3.7.4, 3.7.5, 6.1.1, 7.3.7.5, 10.3, 15.1.4~~
~~**Additional Inspections and Testing**~~
~~9.4.2, 9.8.3, 12.2.1, **13.5**~~
~~Additional Insured~~
~~11.1.4~~
~~**Additional Time, Claims for**~~
~~3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.5**~~
~~**Administration of the Contract**~~
~~3.1.3, **4.2**, 9.4, 9.5~~
~~Advertisement or Invitation to Bid~~
~~1.1.1~~
~~Aesthetic Effect~~
~~4.2.13~~
~~**Allowances**~~
~~**3.8**, 7.3.8~~
~~All-risk Insurance~~
~~11.3.1, 11.3.1.1~~
~~**Applications for Payment**~~
~~4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.6.3, 9.7, 9.10, 11.1.3~~
~~Approvals~~
~~2.1.1, 2.2.2, 2.4, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10, 4.2.7, 9.3.2, 13.5.1~~
~~**Arbitration**~~
~~8.3.1, 11.3.10, 13.1, 15.3.2, **15.4**~~
~~**ARCHITECT**~~
~~**4**~~
~~**Architect**, Definition of~~
~~**4.1.1**~~
~~Architect, Extent of Authority~~
~~2.4, 3.12.7, 4.1, 4.2, 5.2, 6.3, 7.1.2, 7.3.7, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.5.1, 13.5.2, 14.2.2, 14.2.4, 15.1.3, 15.2.1~~
~~Architect, Limitations of Authority and Responsibility~~
~~2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.3, 9.6.4, 15.1.3, 15.2~~
~~Architect's Additional Services and Expenses~~
~~2.4, 11.3.1.1, 12.2.1, 13.5.2, 13.5.3, 14.2.4~~
~~Architect's Administration of the Contract~~
~~3.1.3, 4.2, 3.7.4, 15.2, 9.4.1, 9.5~~
~~Architect's Approvals~~
~~2.4, 3.1.3, 3.5, 3.10.2, 4.2.7~~
~~Architect's Authority to Reject Work~~
~~3.5, 4.2.6, 12.1.2, 12.2.1~~

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~~1.1.7, 1.5~~
~~Architect's Decisions~~
~~3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.5.2, 15.2, 15.3~~
~~Architect's Inspections~~
~~3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.5~~
~~Architect's Instructions~~
~~3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.5.2~~
~~Architect's Interpretations~~
~~4.2.11, 4.2.12~~
~~Architect's Project Representative~~
~~4.2.10~~
~~Architect's Relationship with Contractor~~
~~1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.4.2, 13.5, 15.2~~
~~Architect's Relationship with Subcontractors~~
~~1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3.7~~
~~Architect's Representations~~
~~9.4.2, 9.5.1, 9.10.1~~
~~Architect's Site Visits~~
~~3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5~~
~~Asbestos~~
~~10.3.1~~
~~Attorneys' Fees~~
~~3.18.1, 9.10.2, 10.3.3~~
~~Award of Separate Contracts~~
~~6.1.1, 6.1.2~~
~~**Award of Subcontracts and Other Contracts for Portions of the Work**~~
~~**5.2**~~
~~**Basic Definitions**~~
~~**1.1**~~
~~Bidding Requirements~~
~~1.1.1, 5.2.1, 11.4.1~~
~~Binding Dispute Resolution~~
~~9.7, 11.3.9, 11.3.10, 13.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.4.1~~
~~**Boiler and Machinery Insurance**~~
~~**11.3.2**~~
~~Bonds, Lien~~
~~7.3.7.4, 9.10.2, 9.10.3~~
~~**Bonds, Performance, and Payment**~~
~~7.3.7.4, 9.6.7, 9.10.3, 11.3.9, **11.4**~~
~~Building Permit~~
~~3.7.1~~
~~**Capitalization**~~
~~**1.3**~~
~~Certificate of Substantial Completion~~
~~9.8.3, 9.8.4, 9.8.5~~
~~**Certificates for Payment**~~
~~4.2.1, 4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.3~~
~~Certificates of Inspection, Testing or Approval~~
~~13.5.4~~
~~Certificates of Insurance~~
~~9.10.2, 11.1.3~~
~~**Change Orders**~~
~~1.1.1, 2.4, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, **7.2**, 7.3.2, 7.3.6, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.3.1.2, 11.3.4, 11.3.9, 12.1.2, 15.1.3~~

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User Notes: (1987596597)

~~**Change Orders**, Definition of~~
~~**7.2.1**~~
~~**CHANGES IN THE WORK**~~
~~2.2.1, 3.11, 4.2.8, **7**, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.3.9~~
~~**Claims**, Definition of~~
~~**15.1.1**~~
~~**CLAIMS AND DISPUTES**~~
~~3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, **15**, 15.4~~
~~Claims and Timely Assertion of Claims~~
~~15.4.1~~
~~**Claims for Additional Cost**~~
~~3.2.4, 3.7.4, 6.1.1, 7.3.9, 10.3.2, **15.1.4**~~
~~**Claims for Additional Time**~~
~~3.2.4, 3.7.4, 6.1.1, 8.3.2, 10.3.2, **15.1.5**~~
~~**Concealed or Unknown Conditions, Claims for**~~
~~**3.7.4**~~
~~Claims for Damages~~
~~3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6~~
~~Claims Subject to Arbitration~~
~~15.3.1, 15.4.1~~
~~**Cleaning Up**~~
~~**3.15**, 6.3~~
~~Commencement of the Work, Conditions Relating to~~
~~2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.3.1, 11.3.6, 11.4.1, 15.1.4~~
~~**Commencement of the Work**, Definition of~~
~~**8.1.2**~~
~~**Communications Facilitating Contract Administration**~~
~~3.9.1, **4.2.4**~~
~~Completion, Conditions Relating to~~
~~3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 13.7, 14.1.2~~
~~**COMPLETION, PAYMENTS AND**~~
~~**9**~~
~~Completion, Substantial~~
~~4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 13.7~~
~~Compliance with Laws~~
~~1.6, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 10.2.2, 11.1, 11.3, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3~~
~~Concealed or Unknown Conditions~~
~~3.7.4, 4.2.8, 8.3.1, 10.3~~
~~Conditions of the Contract~~
~~1.1.1, 6.1.1, 6.1.4~~
~~Consent, Written~~
~~3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 11.3.1, 13.2, 13.4.2, 15.4.4.2~~
~~**Consolidation or Joinder**~~
~~**15.4.4**~~
~~**CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**~~
~~1.1.4, **6**~~
~~**Construction Change Directive**, Definition of~~
~~**7.3.1**~~
~~**Construction Change Directives**~~
~~1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, **7.3**, 9.3.1.1~~
~~Construction Schedules, Contractor's~~
~~3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2~~
~~**Contingent Assignment of Subcontracts**~~
~~**5.4**, 14.2.2.2~~
~~**Continuing Contract Performance**~~
~~**15.1.3**~~

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User Notes: (1987596597)

~~**Contract**, Definition of~~
~~**1.1.2**~~
~~**CONTRACT, TERMINATION OR SUSPENSION OF THE**~~
~~5.4.1.1, 11.3.9, **14**~~
~~Contract Administration~~
~~3.1.3, 4, 9.4, 9.5~~
~~Contract Award and Execution, Conditions Relating to~~
~~3.7.1, 3.10, 5.2, 6.1, 11.1.3, 11.3.6, 11.4.1~~
~~Contract Documents, Copies Furnished and Use of~~
~~1.5.2, 2.2.5, 5.3~~
~~**Contract Documents**, Definition of~~
~~**1.1.1**~~
~~**Contract Sum**~~
~~3.7.4, 3.8, 5.2.3, 7.2, 7.3, 7.4, **9.1**, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.3.1, 14.2.4, 14.3.2, 15.1.4, 15.2.5~~
~~**Contract Sum**, Definition of~~
~~**9.1**~~
~~Contract Time~~
~~3.7.4, 3.7.5, 3.10.2, 5.2.3, 7.2.1.3, 7.3.1, 7.3.5, 7.4, 8.1.1, 8.2.1, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 14.3.2, 15.1.5.1, 15.2.5~~
~~**Contract Time**, Definition of~~
~~**8.1.1**~~
~~**CONTRACTOR**~~
~~**3**~~
~~**Contractor**, Definition of~~
~~**3.1, 6.1.2**~~
~~**Contractor's Construction Schedules**~~
~~**3.10**, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2~~
~~Contractor's Employees~~
~~3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1~~
~~**Contractor's Liability Insurance**~~
~~**11.1**~~
~~Contractor's Relationship with Separate Contractors and Owner's Forces~~
~~3.12.5, 3.14.2, 4.2.4, 6, 11.3.7, 12.1.2, 12.2.4~~
~~Contractor's Relationship with Subcontractors~~
~~1.2.2, 3.3.2, 3.18.1, 3.18.2, 5, 9.6.2, 9.6.7, 9.10.2, 11.3.1.2, 11.3.7, 11.3.8~~
~~Contractor's Relationship with the Architect~~
~~1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.5, 15.1.2, 15.2.1~~
~~Contractor's Representations~~
~~3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2~~
~~Contractor's Responsibility for Those Performing the Work~~
~~3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8~~
~~Contractor's Review of Contract Documents~~
~~3.2~~
~~Contractor's Right to Stop the Work~~
~~9.7~~
~~Contractor's Right to Terminate the Contract~~
~~14.1, 15.1.6~~
~~Contractor's Submittals~~
~~3.10, 3.11, 3.12.4, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3, 11.1.3, 11.4.2~~
~~Contractor's Superintendent~~
~~3.9, 10.2.6~~
~~Contractor's Supervision and Construction Procedures~~
~~1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.5, 7.3.7, 8.2, 10, 12, 14, 15.1.3~~
~~Contractual Liability Insurance~~
~~11.1.1.8, 11.2~~
~~Coordination and Correlation~~
~~1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1~~

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User Notes: (1987596597)

~~Copies Furnished of Drawings and Specifications~~
~~1.5, 2.2.5, 3.11~~
~~Copyrights~~
~~1.5, **3.17**~~
~~Correction of Work~~
~~2.3, 2.4, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, **12.2**~~
~~**Correlation and Intent of the Contract Documents**~~
~~**1.2**~~
~~**Cost**, Definition of~~
~~**7.3.7**~~
~~Costs~~
~~2.4, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.7, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.3, 12.1.2, 12.2.1, 12.2.4, 13.5, 14~~
~~**Cutting and Patching**~~
~~**3.14**, 6.2.5~~
~~Damage to Construction of Owner or Separate Contractors~~
~~3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 11.1.1, 11.3, 12.2.4~~
~~Damage to the Work~~
~~3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 11.3.1, 12.2.4~~
~~Damages, Claims for~~
~~3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6~~
~~Damages for Delay~~
~~6.1.1, 8.3.3, 9.5.1.6, 9.7, 10.3.2~~
~~**Date of Commencement of the Work**, Definition of~~
~~**8.1.2**~~
~~**Date of Substantial Completion**, Definition of~~
~~**8.1.3**~~
~~**Day**, Definition of~~
~~**8.1.4**~~
~~Decisions of the Architect~~
~~3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 15.2, 6.3, 7.3.7, 7.3.9, 8.1.3, **8**.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.5.2, 14.2.2, 14.2.4, 15.1, 15.2~~
~~**Decisions to Withhold Certification**~~
~~9.4.1, **9.5**, 9.7, 14.1.1.3~~
~~Defective or Nonconforming Work, Acceptance, Rejection and Correction of~~
~~2.3, 2.4, 3.5, 4.2.6, 6.2.5, 9.5.1, 9.5.2, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1~~
~~Definitions~~
~~1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 15.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, **8**.1, 9.1, 9.8.1~~
~~**Delays and Extensions of Time**~~
~~3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.5, 15.2.5~~
~~Disputes~~
~~6.3, 7.3.9, 15.1, 15.2~~
~~**Documents and Samples at the Site**~~
~~**3.11**~~
~~**Drawings**, Definition of~~
~~**1.1.5**~~
~~Drawings and Specifications, Use and Ownership of~~
~~3.11~~
~~Effective Date of Insurance~~
~~8.2.2, 11.1.2~~
~~**Emergencies**~~
~~**10.4**, 14.1.1.2, 15.1.4~~
~~Employees, Contractor's~~
~~3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1~~
~~Equipment, Labor, Materials or~~
~~1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2~~

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User Notes:

(1987596597)

~~Execution and Progress of the Work~~
~~1.1.3, 1.2.1, 1.2.2, 2.2.3, 2.2.5, 3.1, 3.3.1, 3.4.1, 3.5, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.5, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.2, 14.2, 14.3.1, 15.1.3~~
~~Extensions of Time~~
~~3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.5, 15.2.5~~
~~**Failure of Payment**~~
~~9.5.1.3, **9.7**, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2~~
~~Faulty Work~~
~~(See Defective or Nonconforming Work)~~
~~**Final Completion and Final Payment**~~
~~4.2.1, 4.2.9, 9.8.2, **9.10**, 11.1.2, 11.1.3, 11.3.1, 11.3.5, 12.3, 14.2.4, 14.4.3~~
~~Financial Arrangements, Owner's~~
~~2.2.1, 13.2.2, 14.1.1.4~~
~~Fire and Extended Coverage Insurance~~
~~11.3.1.1~~
~~**GENERAL PROVISIONS**~~
~~**1**~~
~~**Governing Law**~~
~~**13.1**~~
~~Guarantees (See Warranty)~~
~~**Hazardous Materials**~~
~~10.2.4, **10.3**~~
~~Identification of Subcontractors and Suppliers~~
~~5.2.1~~
~~**Indemnification**~~
~~3.17, **3.18**, 9.10.2, 10.3.3, 10.3.5, 10.3.6, 11.3.1.2, 11.3.7~~
~~**Information and Services Required of the Owner**~~
~~2.1.2, **2.2**, 3.2.2, 3.12.4, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.4, 13.5.1, 13.5.2, 14.1.1.4, 14.1.4, 15.1.3~~
~~**Initial Decision**~~
~~**15.2**~~
~~**Initial Decision Maker, Definition of**~~
~~1.1.8~~
~~Initial Decision Maker, Decisions~~
~~14.2.2, 14.2.4, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5~~
~~Initial Decision Maker, Extent of Authority~~
~~14.2.2, 14.2.4, 15.1.3, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5~~
~~**Injury or Damage to Person or Property**~~
~~**10.2.8**, 10.4~~
~~Inspections~~
~~3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 12.2.1, 13.5~~
~~Instructions to Bidders~~
~~1.1.1~~
~~Instructions to the Contractor~~
~~3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.5.2~~
~~**Instruments of Service**, Definition of~~
~~**1.1.7**~~
~~Insurance~~
~~3.18.1, 6.1.1, 7.3.7, 9.3.2, 9.8.4, 9.9.1, 9.10.2, **11**~~
~~**Insurance, Boiler and Machinery**~~
~~**11.3.2**~~
~~**Insurance, Contractor's Liability**~~
~~**11.1**~~
~~Insurance, Effective Date of~~
~~8.2.2, 11.1.2~~
~~**Insurance, Loss of Use**~~
~~**11.3.3**~~

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User Notes: (1987596597)

~~**Insurance, Owner's Liability**~~
~~**11.2**~~
~~**Insurance, Property**~~
~~10.2.5, **11.3**~~
~~Insurance, Stored Materials~~
~~9.3.2~~
~~**INSURANCE AND BONDS**~~
~~**11**~~
~~Insurance Companies, Consent to Partial Occupancy~~
~~9.9.1~~
~~Intent of the Contract Documents~~
~~1.2.1, 4.2.7, 4.2.12, 4.2.13, 7.4~~
~~**Interest**~~
~~**13.6**~~
~~**Interpretation**~~
~~1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1~~
~~Interpretations, Written~~
~~4.2.11, 4.2.12, 15.1.4~~
~~Judgment on Final Award~~
~~15.4.2~~
~~**Labor and Materials, Equipment**~~
~~1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2~~
~~Labor Disputes~~
~~8.3.1~~
~~Laws and Regulations~~
~~1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 9.9.1, 10.2.2, 11.1.1, 11.3, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14, 15.2.8, 15.4~~
~~Liens~~
~~2.1.2, 9.3.3, 9.10.2, 9.10.4, 15.2.8~~
~~Limitations, Statutes of~~
~~12.2.5, 13.7, 15.4.1.1~~
~~Limitations of Liability~~
~~2.3, 3.2.2, 3.5, 3.12.10, 3.17, 3.18.1, 4.2.6, 4.2.7, 4.2.12, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 10.2.5, 10.3.3, 11.1.2, 11.2, 11.3.7, 12.2.5, 13.4.2~~
~~Limitations of Time~~
~~2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 11.3.1.5, 11.3.6, 11.3.10, 12.2, 13.5, 13.7, 14, 15~~
~~**Loss of Use Insurance**~~
~~**11.3.3**~~
~~Material Suppliers~~
~~1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.6, 9.10.5~~
~~**Materials, Hazardous**~~
~~10.2.4, **10.3**~~
~~Materials, Labor, Equipment and~~
~~1.1.3, 1.1.6, 1.5.1, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2~~
~~Means, Methods, Techniques, Sequences and Procedures of Construction~~
~~3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2~~
~~Mechanic's Lien~~
~~2.1.2, 15.2.8~~
~~**Mediation**~~
~~8.3.1, 10.3.5, 10.3.6, 15.2.1, 15.2.5, 15.2.6, **15.3**, 15.4.1~~
~~**Minor Changes in the Work**~~
~~1.1.1, 3.12.8, 4.2.8, 7.1, **7.4**~~
~~**MISCELLANEOUS PROVISIONS**~~
~~**13**~~

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User Notes: (1987596597)

~~**Modifications**, Definition of~~
~~**1.1.1**~~
~~Modifications to the Contract~~
~~1.1.1, 1.1.2, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2, 11.3.1~~
~~**Mutual Responsibility**~~
~~**6.2**~~
~~**Nonconforming Work, Acceptance of**~~
~~9.6.6, 9.9.3, **12.3**~~
~~Nonconforming Work, Rejection and Correction of~~
~~2.3, 2.4, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2.1~~
~~Notice~~
~~2.2.1, 2.3, 2.4, 3.2.4, 3.3.1, 3.7.2, 3.12.9, 5.2.1, 9.7, 9.10, 10.2.2, 11.1.3, 12.2.2.1, 13.3, 13.5.1, 13.5.2, 14.1, 14.2, 15.2.8, 15.4.1~~
~~**Notice, Written**~~
~~2.3, 2.4, 3.3.1, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 11.3.6, 12.2.2.1, **13.3**, 14, 15.2.8, 15.4.1~~
~~**Notice of Claims**~~
~~3.7.4, 10.2.8, **15.1.2**, 15.4~~
~~Notice of Testing and Inspections~~
~~13.5.1, 13.5.2~~
~~Observations, Contractor's~~
~~3.2, 3.7.4~~
~~Occupancy~~
~~2.2.2, 9.6.6, 9.8, 11.3.1.5~~
~~Orders, Written~~
~~1.1.1, 2.3, 3.9.2, 7, 8.2.2, 11.3.9, 12.1, 12.2.2.1, 13.5.2, 14.3.1~~
~~**OWNER**~~
~~**2**~~
~~**Owner**, Definition of~~
~~**2.1.1**~~
~~**Owner, Information and Services Required of the**~~
~~2.1.2, **2.2**, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.3, 13.5.1, 13.5.2, 14.1.1.4, 14.1.4, 15.1.3~~
~~Owner's Authority~~
~~1.5, 2.1.1, 2.3, 2.4, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.1.3, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.1.3, 11.3.3, 11.3.10, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7~~
~~Owner's Financial Capability~~
~~2.2.1, 13.2.2, 14.1.1.4~~
~~**Owner's Liability Insurance**~~
~~**11.2**~~
~~Owner's Relationship with Subcontractors~~
~~1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2~~
~~**Owner's Right to Carry Out the Work**~~
~~**2.4**, 14.2.2~~
~~**Owner's Right to Clean Up**~~
~~**6.3**~~
~~**Owner's Right to Perform Construction and to Award Separate Contracts**~~
~~**6.1**~~
~~**Owner's Right to Stop the Work**~~
~~**2.3**~~
~~Owner's Right to Suspend the Work~~
~~14.3~~
~~Owner's Right to Terminate the Contract~~
~~14.2~~
~~**Ownership and Use of Drawings, Specifications and Other Instruments of Service**~~
~~1.1.1, 1.1.6, 1.1.7, **1.5**, 2.2.5, 3.2.2, 3.11, 3.17, 4.2.12, 5.3~~
~~**Partial Occupancy or Use**~~
~~9.6.6, **9.9**, 11.3.1.5~~

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User Notes: (1987596597)

~~**Patching, Cutting and**~~
~~**3.14**, 6.2.5~~
~~Patents~~
~~3.17~~
~~**Payment, Applications for**~~
~~4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3~~
~~**Payment, Certificates for**~~
~~4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 13.7, 14.1.1.3, 14.2.4~~
~~**Payment, Failure of**~~
~~9.5.1.3, **9.7**, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2~~
~~Payment, Final~~
~~4.2.1, 4.2.9, 9.8.2, 9.10, 11.1.2, 11.1.3, 11.4.1, 12.3, 13.7, 14.2.4, 14.4.3~~
~~**Payment Bond, Performance Bond and**~~
~~7.3.7.4, 9.6.7, 9.10.3, **11.4**~~
~~**Payments, Progress**~~
~~9.3, **9.6**, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3~~
~~**PAYMENTS AND COMPLETION**~~
~~**9**~~
~~Payments to Subcontractors~~
~~5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2~~
~~PCB~~
~~10.3.1~~
~~**Performance Bond and Payment Bond**~~
~~7.3.7.4, 9.6.7, 9.10.3, **11.4**~~
~~**Permits, Fees, Notices and Compliance with Laws**~~
~~2.2.2, **3.7**, 3.13, 7.3.7.4, 10.2.2~~
~~**PERSONS AND PROPERTY, PROTECTION OF**~~
~~**10**~~
~~Polychlorinated Biphenyl~~
~~10.3.1~~
~~**Product Data**, Definition of~~
~~**3.12.2**~~
~~**Product Data and Samples, Shop Drawings**~~
~~3.11, **3.12**, 4.2.7~~
~~**Progress and Completion**~~
~~4.2.2, **8.2**, 9.8, 9.9.1, 14.1.4, 15.1.3~~
~~**Progress Payments**~~
~~9.3, **9.6**, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3~~
~~**Project**, Definition of~~
~~**1.1.4**~~
~~Project Representatives~~
~~4.2.10~~
~~**Property Insurance**~~
~~10.2.5, **11.3**~~
~~**PROTECTION OF PERSONS AND PROPERTY**~~
~~**10**~~
~~Regulations and Laws~~
~~1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 9.9.1, 10.2.2, 11.1, 11.4, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14, 15.2.8, 15.4~~
~~Rejection of Work~~
~~3.5, 4.2.6, 12.2.1~~
~~Releases and Waivers of Liens~~
~~9.10.2~~
~~Representations~~
~~3.2.1, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.8.2, 9.10.1~~
~~Representatives~~
~~2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.1, 4.2.2, 4.2.10, 5.1.1, 5.1.2, 13.2.1~~

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User Notes: (1987596597)

~~Responsibility for Those Performing the Work~~
~~3.3.2, 3.18, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10~~
~~Retainage~~
~~9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3~~
~~**Review of Contract Documents and Field Conditions by Contractor**~~
~~**3.2**, 3.12.7, 6.1.3~~
~~Review of Contractor's Submittals by Owner and Architect~~
~~3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2~~
~~Review of Shop Drawings, Product Data and Samples by Contractor~~
~~3.12~~
~~**Rights and Remedies**~~
~~1.1.2, 2.3, 2.4, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.2, 12.2.4, **13.4**, 14, 15.4~~
~~**Royalties, Patents and Copyrights**~~
~~**3.17**~~
~~Rules and Notices for Arbitration~~
~~15.4.1~~
~~**Safety of Persons and Property**~~
~~**10.2**, 10.4~~
~~**Safety Precautions and Programs**~~
~~3.3.1, 4.2.2, 4.2.7, 5.3, **10.1**, 10.2, 10.4~~
~~**Samples**, Definition of~~
~~**3.12.3**~~
~~**Samples, Shop Drawings, Product Data and**~~
~~3.11, **3.12**, 4.2.7~~
~~**Samples at the Site, Documents and**~~
~~**3.11**~~
~~**Schedule of Values**~~
~~**9.2**, 9.3.1~~
~~Schedules, Construction~~
~~3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2~~
~~Separate Contracts and Contractors~~
~~1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2~~
~~**Shop Drawings**, Definition of~~
~~**3.12.1**~~
~~**Shop Drawings, Product Data and Samples**~~
~~3.11, **3.12**, 4.2.7~~
~~**Site, Use of**~~
~~**3.13**, 6.1.1, 6.2.1~~
~~Site Inspections~~
~~3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.4.2, 9.10.1, 13.5~~
~~Site Visits, Architect's~~
~~3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5~~
~~Special Inspections and Testing~~
~~4.2.6, 12.2.1, 13.5~~
~~**Specifications**, Definition of~~
~~**1.1.6**~~
~~**Specifications**~~
~~1.1.1, **1.1.6**, 1.2.2, 1.5, 3.11, 3.12.10, 3.17, 4.2.14~~
~~Statute of Limitations~~
~~13.7, 15.4.1.1~~
~~Stopping the Work~~
~~2.3, 9.7, 10.3, 14.1~~
~~Stored Materials~~
~~6.2.1, 9.3.2, 10.2.1.2, 10.2.4~~
~~**Subcontractor**, Definition of~~
~~**5.1.1**~~

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User Notes: (1987596597)

~~**SUBCONTRACTORS**~~
~~**5**~~
~~Subcontractors, Work by~~
~~1.2.2, 3.3.2, 3.12.1, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7~~
~~**Subcontractual Relations**~~
~~**5.3**, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1~~
~~Submittals~~
~~3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.7, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3, 11.1.3~~
~~Submittal Schedule~~
~~3.10.2, 3.12.5, 4.2.7~~
~~**Subrogation, Waivers of**~~
~~6.1.1, **11.3.7**~~
~~**Substantial Completion**~~
~~4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, **9.8**, 9.9.1, 9.10.3, 12.2, 13.7~~
~~**Substantial Completion**, Definition of~~
~~**9.8.1**~~
~~Substitution of Subcontractors~~
~~5.2.3, 5.2.4~~
~~Substitution of Architect~~
~~4.1.3~~
~~Substitutions of Materials~~
~~3.4.2, 3.5, 7.3.8~~
~~**Sub-subcontractor**, Definition of~~
~~**5.1.2**~~
~~Subsurface Conditions~~
~~3.7.4~~
~~**Successors and Assigns**~~
~~**13.2**~~
~~**Superintendent**~~
~~**3.9**, 10.2.6~~
~~**Supervision and Construction Procedures**~~
~~1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.7, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.3~~
~~Surety~~
~~5.4.1.2, 9.8.5, 9.10.2, 9.10.3, 14.2.2, 15.2.7~~
~~Surety, Consent of~~
~~9.10.2, 9.10.3~~
~~Surveys~~
~~2.2.3~~
~~**Suspension by the Owner for Convenience**~~
~~**14.3**~~
~~Suspension of the Work~~
~~5.4.2, 14.3~~
~~Suspension or Termination of the Contract~~
~~5.4.1.1, 14~~
~~**Taxes**~~
~~3.6, 3.8.2.1, 7.3.7.4~~
~~**Termination by the Contractor**~~
~~**14.1**, 15.1.6~~
~~**Termination by the Owner for Cause**~~
~~5.4.1.1, **14.2**, 15.1.6~~
~~**Termination by the Owner for Convenience**~~
~~**14.4**~~
~~Termination of the Architect~~
~~4.1.3~~
~~Termination of the Contractor~~
~~14.2.2~~

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User Notes: (1987596597)

~~**TERMINATION OR SUSPENSION OF THE CONTRACT**~~
~~**14**~~
~~**Tests and Inspections**~~
~~3.1.3, 3.3.3, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 11.4.1, 12.2.1, **13.5**~~
~~**TIME**~~
~~**8**~~
~~**Time, Delays and Extensions of**~~
~~3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.5, 15.2.5~~
~~Time Limits~~
~~2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 12.2, 13.5, 13.7, 14, 15.1.2, 15.4~~
~~**Time Limits on Claims**~~
~~3.7.4, 10.2.8, **13.7**, 15.1.2~~
~~Title to Work~~
~~9.3.2, 9.3.3~~
~~**Transmission of Data in Digital Form**~~
~~**1.6**~~
~~**UNCOVERING AND CORRECTION OF WORK**~~
~~**12**~~
~~**Uncovering of Work**~~
~~**12.1**~~
~~Unforeseen Conditions, Concealed or Unknown~~
~~3.7.4, 8.3.1, 10.3~~
~~Unit Prices~~
~~7.3.3.2, 7.3.4~~
~~Use of Documents~~
~~1.1.1, 1.5, 2.2.5, 3.12.6, 5.3~~
~~**Use of Site**~~
~~**3.13**, 6.1.1, 6.2.1~~
~~**Values, Schedule of**~~
~~**9.2**, 9.3.1~~
~~Waiver of Claims by the Architect~~
~~13.4.2~~
~~Waiver of Claims by the Contractor~~
~~9.10.5, 13.4.2, 15.1.6~~
~~Waiver of Claims by the Owner~~
~~9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.4.2, 14.2.4, 15.1.6~~
~~Waiver of Consequential Damages~~
~~14.2.4, 15.1.6~~
~~Waiver of Liens~~
~~9.10.2, 9.10.4~~
~~**Waivers of Subrogation**~~
~~6.1.1, **11.3.7**~~
~~**Warranty**~~
~~3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.4, 12.2.2, 13.7~~
~~Weather Delays~~
~~15.1.5.2~~
~~**Work**, Definition of~~
~~**1.1.3**~~
~~Written Consent~~
~~1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 11.4.1, 13.2, 13.4.2, 15.4.4.2~~
~~Written Interpretations~~
~~4.2.11, 4.2.12~~
~~Written Notice~~
~~2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 8.2.2, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 12.2.2, 12.2.4, **13.3**, 14, 15.4.1~~
~~Written Orders~~
~~1.1.1, 2.3, 3.9, 7, 8.2.2, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2~~

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...

The Contract Documents are enumerated in the Agreement between the Owner and Contractor ~~(hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary~~ (the Agreement) and consist of the Agreement (and the documents enumerated therein), Conditions of the Contract (General Conditions, Supplementary Conditions, if any, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the ~~Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.~~Design Agent.

...

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the ~~Architect~~ Design Agent or the ~~Architect's~~ Design Agent's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the ~~Architect~~ Design Agent or the ~~Architect's~~ Design Agent's consultants or (4) between any persons or entities other than the Owner and the Contractor. The ~~Architect~~ Design Agent shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the ~~Architect's~~ Design Agent's duties.

...

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, ~~location~~ location, and dimensions of the Work, generally including plans, elevations, sections, details, ~~schedules~~ schedules, and diagrams.

...

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the ~~Architect~~ Design Agent and the ~~Architect's~~ Design Agent's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

...

§ 1.2.1 The intent of the Contract Documents is to include all items and services necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; ~~performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them~~ the Contractor shall perform all work reasonably inferable from the Contract Documents as being necessary to produce the indicated results.
PAGE 4

§ 1.2.4 In the event of any conflicts or discrepancies among the Contract Documents, the provisions of the Contract Documents will be interpreted in in the order of priority set forth in Rhode Island Procurement Regulation 220-RICR-30-00-13.4(B).

§ 1.2.5 In the event of any conflicts or discrepancies between the Contract Documents and the State of Rhode Island Procurement Regulations or any provision of the Rhode Island General Laws, the State of Rhode Island Procurement Regulations and the Rhode Island General Laws will control.

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§ 1.2.6 In the event of any inconsistency between the Drawings and Specifications, the better quality or greater quantity of Work shall be provided.

§ 1.2.7 The Owner will be the final decision maker for any and all interpretations.

...

§ 1.5.1 The ~~Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights.~~ Owner and the User Agency shall have a perpetual license to utilize the Drawings, Specifications, and other documents, including electronic or digital documents, prepared by the Design Agent and the Design Agent's consultants, for the execution of the Project and shall have and retain all rights to use them and reproduce them for the production and maintenance of the Work described therein. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the ~~Architect's or Architect's~~ Design Agent's or Design Agent's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, ~~Architect~~ Design Agent and the ~~Architect's~~ Design Agent's consultants.

...

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the ~~Architect~~ Design Agent does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 ~~The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.~~ **Deleted.**

PAGE 5

§ 2.2.1 ~~Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~ **Deleted.**

§ 2.2.2 ~~Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for~~ The Contractor shall secure and pay for permits and fees, necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 ~~The~~ If required for the Work in the discretion of the Owner, the Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the

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site. The Contractor shall be entitled to rely on the accuracy of any information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

...

§ 2.2.5 ~~Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.~~**Deleted.**

...

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ~~ten-day~~ 10 working-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the ~~Architect's~~ Design Agent's additional services made necessary by such default, ~~neglect~~ neglect, or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the ~~Architect.~~ Design Agent. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

...

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully ~~licensed, if required in the jurisdiction where the Project is located.~~ licensed. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

...

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the ~~Architect in the Architect's administration of the Contract, or by tests, inspections~~ Design Agent, or by tests, inspections, or approvals required or performed by persons or entities other than the Contractor.
PAGE 6

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the ~~Architect any errors, inconsistencies~~ Owner and the Design Agent any errors, inconsistencies, or omissions discovered by or made known to the Contractor or additional Drawings, Specifications, or instructions required to define the Work in greater detail to permit the proper progress of the Work as a request for information in such form as the ~~Architect~~ Design Agent may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the ~~Architect~~ Design Agent and the Owner any nonconformity discovered by or made known to the Contractor as a request for information in such form as the ~~Architect may require.~~ Design Agent or Owner may require.

§ 3.2.3.1 Omissions from the Drawings and Specifications of items obviously needed to perform the Work properly, such as attachments, bolts, hangers, and other fastening devices, shall not relieve the Contractor from the obligation to furnish and install such items.

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§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the ~~Architect~~ Design Agent issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections ~~3.2.2 or 3.2.3,~~ 3.2.2, 3.2.3, or 3.2.3.1, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or ~~Architect~~ Design Agent for damages resulting from errors, ~~inconsistencies~~ inconsistencies, or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.2.4.1 The Contractor shall not make any changes without prior written authorization from the Design Agent and the Owner.

§ 3.2.5 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

...

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and ~~Architect~~ Design Agent and shall not proceed with that portion of the Work without further written instructions from the ~~Architect.~~ Design Agent. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.
PAGE 7

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Whenever the Contractor has an obligation to provide labor and materials under the Agreement, the Contractor, at a minimum, shall provide the labor for, and furnish and install and place in operation all items, including without limitation, all proper connections.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the ~~Architect~~ Design Agent in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the ~~Architect~~ Design Agent and in accordance with a Change Order or Construction Change Directive.

...

The Contractor warrants to the Owner and ~~Architect~~ the Design Agent that materials and equipment furnished under the Contract will be of ~~good quality~~ first quality, prime manufacture, and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these ~~requirements~~ requirements, including substitutions not properly authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient

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maintenance, improper operation, or normal wear and tear and normal usage. If required by the ~~Architect,~~ Design Agent, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

...

~~The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.~~

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.2 The State of Rhode Island is exempt from payment of any federal or state excise, transportation, or sales tax. The Rhode Island Department of Administration Division of Purchases will furnish Exemption Certificates upon request.

...

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections ~~by government agencies~~ required by the Rhode Island State Building Code necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall be responsible for obtaining the Certificate of Occupancy from the appropriate governmental authorities.

PAGE 8

§ 3.7.3 The Contractor shall promptly notify the Design Agent and the Owner if the Contractor becomes aware that the Contract Documents are not in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the ~~Architect~~ Design Agent before conditions are disturbed and in no event later than 21 working days after first observance of the conditions. The ~~Architect~~ Design Agent will promptly investigate such conditions and, if the ~~Architect~~ Design Agent determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the ~~Architect~~ Design Agent determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the ~~Architect~~ Design Agent shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the ~~Architect's~~ Design Agent's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and ~~Architect.~~ Design Agent. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

...

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§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the ~~Architect~~ Design Agent the name and qualifications of a proposed superintendent. The ~~Architect~~ Design Agent may reply within 14 working days to the Contractor in writing stating (1) whether the Owner or the ~~Architect~~ Design Agent has reasonable objection to the proposed superintendent or (2) that the ~~Architect~~ Design Agent requires additional time to review. Failure of the ~~Architect~~ Design Agent to reply within the 14 ~~day~~ working-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or ~~Architect~~ Design Agent has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

PAGE 9

§ 3.10.1 The Contractor, ~~promptly after being awarded the Contract,~~ within 20 working days after the issuance of the Purchase Order, shall prepare and submit for the Owner's and ~~Architect's~~ Design Agent's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate ~~intervals~~ intervals, not less frequently than monthly, as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor shall certify on the initial schedule and all revised schedules that they comply with the Contract Documents.

§ 3.10.2 The Contractor shall prepare a submittal schedule, ~~promptly after being awarded the Contract~~ within 20 working days after the issuance of the Purchase Order, and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for ~~the Architect's approval. The Architect's~~ the Owner's and the Design Agent's approval. The Owner's and the Design Agent's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow ~~the Architect~~ the Owner and the Design Agent reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and ~~Architect.~~ Design Agent.

...

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the ~~Architect~~ Design Agent and shall be delivered to the ~~Architect~~ Design Agent for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

...

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the ~~Architect~~ Design Agent is subject to the limitations of Section 4.2.7. Informational submittals upon which the ~~Architect~~ Design Agent is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the ~~Architect~~ Design Agent without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the ~~Architect~~ Design Agent Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the ~~Architect~~ Owner and the Design Agent or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

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§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and ~~Architect~~ Design Agent that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the ~~Architect.~~Design Agent.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the ~~Architect's~~ Design Agent's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the ~~Architect~~ Design Agent in writing of such deviation at the time of submittal and (1) the ~~Architect~~ Design Agent has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the ~~Architect's~~ Design Agent's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the ~~Architect~~ Design Agent on previous submittals. In the absence of such written notice, the ~~Architect's~~ Design Agent's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the ~~Architect~~ Design Agent will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the ~~Architect.~~ Design Agent. The Owner and the ~~Architect~~ Design Agent shall be entitled to rely upon the adequacy, accuracy and completeness of the services, ~~certifications~~ certifications, and approvals performed or provided by such design professionals, provided the Owner and ~~Architect~~ Design Agent have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the ~~Architect~~ Design Agent will review, ~~approve~~ approve, or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.11 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Design Agent for evaluation of resubmittals.

PAGE 10

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public ~~authorities~~ authorities, and any restrictions imposed by the User Agency or the Owner, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

PAGE 11

The Contractor shall provide the Owner and ~~Architect~~ Design Agent access to the Work in preparation and progress wherever located.

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The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and ~~Architect~~ Design Agent harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or ~~Architect.~~ Design Agent. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the ~~Architect.~~Design Agent and the Owner.

...

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, ~~Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.~~the User Agency and the State of Rhode Island in accordance with Rhode Island Procurement Regulation 220-RICR-30-00-13.21.

...

~~ARTICLE 4 ARCHITECT~~

§ 3.18.3 Without limiting the generality of the foregoing, the defense and indemnity set forth in this Section 3.18 includes, without limitation, all liabilities, damages, losses, claims, demands, and actions on account of bodily injury, death, or property loss to a person or entity indemnified hereunder or any other persons or entities, whether based upon statutory (including, without limitation, workers compensation), contractual, tort, or other liability of any person or entity so indemnified.

§ 3.18.4 The remedies set forth herein shall not deprive any person indemnified hereunder of any other indemnity action, right, or remedy otherwise available to any such person or entity at common law or otherwise.

§ 3.18.5 The Contractor will include the indemnity set forth in this Section 3.18, without modification, in each Subcontract with any Subcontractor.

§ 3.18.6 Notwithstanding any other language in the Contract Documents to the contrary, the indemnity hereunder shall survive Final Completion of the Work and final payment under the Agreement and shall survive any termination of the Agreement.

ARTICLE 4 DESIGN AGENT

§ 4.1.1 The ~~Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.~~ Design Agent is the person lawfully licensed to practice his or her profession in the State of Rhode Island or an entity lawfully practicing its profession in the State of Rhode Island and identified in the Contract Documents as the Design Agent. The term "Design Agent" means the Design Agent or the Design Agent's authorized representative.

§ 4.1.2 Duties, responsibilities and limitations of authority of the ~~Architect~~ Design Agent as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and ~~Architect.~~ Design Agent. Consent shall not be unreasonably withheld.

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§ 4.1.3 If the employment of the ~~Architect~~ Design Agent is terminated, the Owner shall employ a successor ~~architect~~ Design Agent as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the ~~Architect.~~ Design Agent.

PAGE 12

§ 4.2.1 The ~~Architect~~ Owner with assistance from the Design Agent will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction ~~until the date the Architect issues the final Certificate for Payment. The Architect~~ through the date the Design Agent issues the final Certificate for Payment and continuing until the expiration of the one-year period following Final Completion. The Design Agent will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The ~~Architect~~ Design Agent will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the ~~Architect~~ Design Agent will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The ~~Architect~~ Design Agent will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.

§ 4.2.3 On the basis of the site visits, the ~~Architect~~ Design Agent will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The ~~Architect~~ Design Agent will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The ~~Architect~~ Design Agent will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

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Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the ~~Architect~~ Design Agent about matters arising out of or relating to the Contract. Communications by and with the ~~Architect's~~ Design Agent's consultants shall be through the ~~Architect.~~ Design Agent. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the ~~Architect's~~ Design Agent's evaluations of the Contractor's Applications for Payment, the ~~Architect~~ Design Agent will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The ~~Architect~~ Design Agent has authority to reject Work that does not conform to the Contract Documents. Whenever the ~~Architect~~ Design Agent considers it necessary or advisable, the ~~Architect~~ Design Agent will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the ~~Architect~~ Design Agent nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the ~~Architect~~ Design Agent to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The ~~Architect~~ Design Agent will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The ~~Architect's~~ Design Agent's action will be taken in accordance with the submittal schedule approved by the ~~Architect~~ Design

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Agent or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the ~~Architect's~~ Design Agent's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The ~~Architect's~~ Design Agent's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The ~~Architect's~~ Design Agent's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the ~~Architect,~~ Design Agent, of any construction means, methods, techniques, sequences or procedures. The ~~Architect's~~ Design Agent's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The ~~Architect~~ Design Agent will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The ~~Architect~~ Design Agent will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The ~~Architect~~ Design Agent will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and ~~Architect~~ Design Agent agree, the ~~Architect~~ Design Agent will provide one or more project representatives to assist in carrying out the ~~Architect's~~ Design Agent's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The ~~Architect~~ Design Agent will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The ~~Architect's~~ Design Agent's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the ~~Architect~~ Design Agent will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the ~~Architect~~ Design Agent will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The ~~Architect's~~ Design Agent's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract ~~Documents.~~Documents and approved by the Owner.

§ 4.2.14 The ~~Architect~~ Design Agent will review and respond to requests for information about the Contract Documents. The ~~Architect's~~ Design Agent's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the ~~Architect~~ Design Agent will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

PAGE 14

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner ~~through the Architect~~ and the Design Agent the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each ~~principal~~ portion of the Work. The ~~Architect~~ Owner may reply within 14 working days to the Contractor in writing stating (1) whether the Owner or the ~~Architect~~ Design Agent has reasonable objection to any such proposed person or entity or (2) that the ~~Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.~~Owner or Design Agent requires additional time for review.

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§ **5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner or ~~Architect~~ Design Agent has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ **5.2.3** If the Owner or ~~Architect~~ Design Agent has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or ~~Architect~~ Design Agent has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ **5.2.4** The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or ~~Architect~~ Design Agent makes reasonable objection to such substitution.

§ 5.2.5 MANUFACTURERS AND FABRICATORS

§ 5.2.5.1 Not later than 10 working days after the date of commencement of the Work, the Contractor shall furnish in writing to the Owner and the Design Agent the names of the manufacturers or fabricators for certain products, equipment, and systems identified in the Specifications and, where applicable, the name of the installing Subcontractor. The Owner may reply within 14 working days to the Contractor in writing, stating: (i) whether the Owner or the Design Agent has reasonable objection to any such proposed person manufacturer or fabricator; or (ii) whether the Owner or Design Agent requires additional time to review.

§ 5.2.5.2 The Contractor shall not contract with a proposed manufacturer, fabricator, or Subcontractor to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5.3 If the Owner or Design Agent has an objection to a manufacturer, fabricator, or Subcontractor proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Agent has no objection.

§ 5.2.5.4 The Contractor shall not substitute a manufacturer, fabricator, or Subcontractor previously selected if the Owner or Design Agent makes reasonable objection to such substitution.

...

By appropriate ~~agreement, written where legally required for validity,~~ written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and ~~Architect.~~ Design Agent. Upon the request of the User Agency and/or the Owner, the Contractor shall provide the User Agency and/or the Owner with copies of each subcontract agreement. Each subcontract agreement shall preserve and protect the rights of the Owner and ~~Architect~~ Design Agent under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

PAGE 15

~~When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.~~

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§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 working days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. ~~If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.~~

...

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation.~~If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.~~

...

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the ~~Architect~~ Design Agent apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

PAGE 16

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and ~~the Architect will~~ allocate the cost among those responsible.

...

§ 7.1.2 A Change Order shall be based upon agreement ~~among the Owner, Contractor and Architect;~~ between the Owner and the Contractor; a Construction Change Directive requires agreement by the Owner ~~and Architect~~ and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the ~~Architect~~ Design Agent alone.

...

§ 7.2.1 A Change Order is a written instrument prepared by the ~~Architect~~ Contractor and signed by the Owner, Contractor and ~~Architect~~ Design Agent stating their agreement upon all of the following:

...

.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Subsequent to the approval of a Change Order as provided in § 7.1.2, whether such Change Order changes the Contract Sum or Contract Time or both, no additional claim related to such Change Order will be considered by the Owner. Any change, once incorporated into a Change Order, is all inclusive, and includes all factors that could have been considered at the time of the Change Order such as Project impact or schedule "ripple" effect.

...

§ 7.3.1 A Construction Change Directive is a written order prepared by the ~~Architect~~ Design Agent and signed by the ~~Owner and Architect,~~ Owner, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract,

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order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.
PAGE 17

§ 7.3.4 ~~If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.~~**Deleted.**

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the ~~Architect~~ Design Agent of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

...

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the ~~Architect~~ Design Agent shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in ~~the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount.~~ Section 7.3.1. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the ~~Architect~~ Design Agent may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

...

.2 Costs of materials, supplies and equipment, including cost of ~~transportation, whether incorporated or consumed;~~delivery;

.3 Rental costs of machinery and equipment, exclusive of hand ~~tools, whether rented from the Contractor or others;~~tools; or

.4 Costs of premiums for all bonds and ~~insurance, permit fees, and sales, use or similar taxes related to the Work; and~~

~~**.5** Additional costs of supervision and field office personnel directly attributable to the change.~~insurance and permit fees related to the Work..

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the ~~Architect.~~ Design Agent. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The ~~Architect~~ Design Agent will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the ~~Architect~~ Design Agent determines, in the ~~Architect's~~ Design Agent's professional judgment, to be reasonably justified. The ~~Architect's~~ Design Agent's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the ~~Architect~~ Design Agent concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the ~~Architect~~ Contractor will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:

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.1 For the Contractor, for work performed by the Contractor's own forces, an amount not to exceed ten (10%) percent of the cost.

.2 For the Contractor, for work performed by the Contractor's Subcontractors, an amount not to exceed five (5%) of the amount due to the Subcontractors.

.3 For each Subcontractor, for work performed by the Subcontractor's own forces, an amount not to exceed ten (10%) percent of the cost.

.4 Where the Work represents both additions and deletions and results in a net increase, the allowable overhead and profit shall be in accordance with this Section 7.3.11, but in no event shall the amount exceed fifteen (15%) percent of the net increase in the cost of the Work.

§ 7.3.12 All proposals with an aggregate cost equal to or in excess of $500.00 shall be accompanied by a detailed itemization of costs, including labor, materials (quantities and prices), and Subcontracts, in a form acceptable to the Owner. In no event will a change order request reflecting an aggregate cost equal to or in excess of $500.00 be approved without such itemization.

PAGE 18

The ~~Architect~~ Design Agent with the prior written approval of the Owner has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be ~~effected~~ affected by written order signed by the ~~Architect~~ Design Agent and shall be binding on the Owner and Contractor.

...

The date of commencement of the Work is the date established in Section 3.1 of the Agreement..

~~**§ 8.1.2** The date of commencement of the Work is the date established in the Agreement.~~

§ 8.1.3 The date of Substantial Completion is the date certified by the ~~Architect~~ Design Agent in accordance with Section 9.8.

§ 8.1.4 ~~The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.~~ **Deleted.**

...

§ 8.2.2 The Contractor shall not ~~knowingly,~~ except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

...

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or ~~Architect,~~ Design Agent, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's ~~control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay,~~ control, then the Contract Time shall be extended by Change Order for such reasonable time as the ~~Architect~~ Owner may determine.

...

~~**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.~~

...

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~~Where the Contract is based on a stipulated sum or Guaranteed Maximum Price,~~ Within 20 working days of the issuance of the Purchase Order, and promptly if revision is necessary from time to time as a result of a Change Order, the Contractor shall submit to the ~~Architect,~~ Owner, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the ~~Architect may require. This schedule, unless objected to by the Architect,~~ Design Agent and the Owner may require. This schedule, if and when approved by the Design Agent and the Owner in writing, shall be used as a basis for reviewing the Contractor's Applications for Payment.

PAGE 19

§ 9.3.1 At least ~~ten~~ 10 working days before the date established for each progress payment, the Contractor shall submit to the ~~Architect~~ Design Agent and the Owner for approval an itemized Application for Payment prepared in accordance with the schedule of ~~values, if required under Section 9.2,~~ values for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or ~~Architect~~ the Design Agent may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 ~~As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.~~All Applications for Payment for Change Orders must be accompanied by a Notice of Change in Purchase Order issued by the Owner, and if directed by the Owner, by the User Agency.

...

§ 9.3.1.3 The form of Application for Payment shall be AIA Document G702, Application and Certification for Payment, supported by AIA Document G702A, Continuation Sheet.

§ 9.3.1.4 Until Substantial Completion, the Owner shall pay ninety-five (95%) percent of the amount due the Contract on account of progress payments.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner ~~shall, to the best of the Contractor's knowledge, information and belief,~~ shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work. The Contractor shall immediately satisfy any lien, claim, or encumbrance against the site where the Project is located and indemnify the Owner from and against all resulting costs and expenses, including without limitation, attorneys' fees.

...

§ 9.4.1 The ~~Architect~~ Design Agent will, within ~~seven~~ 7 working days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the ~~Architect~~ Design Agent determines is properly due, or notify the Contractor and Owner in writing of the ~~Architect's~~ Design Agent's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the ~~Architect~~ Design Agent to the Owner, based on the ~~Architect's~~ Design Agent's evaluation of the Work and the data comprising the Application for Payment, that, ~~to the best of the Architect's knowledge, information and belief,~~ the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the ~~Architect.~~ Design Agent. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the

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~~Architect~~ Design Agent has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.4.3 The Contractor must submit all product literature, material and color samples with each Application for Payment, or as otherwise required by the Owner.

PAGE 20

§ 9.5.1 The ~~Architect may~~ Design Agent will withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the ~~Architect's~~ Design Agent's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the ~~Architect~~ Design Agent is unable to certify payment in the amount of the Application, the ~~Architect~~ Design Agent will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and ~~Architect~~ Design Agent cannot agree on a revised amount, the ~~Architect~~ Design Agent will promptly issue a Certificate for Payment for the amount for which the ~~Architect~~ Design Agent is able to make such representations to the Owner. The ~~Architect~~ Design Agent may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the ~~Architect's~~ Design Agent's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because ~~of~~of:

...

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; ~~or~~

.7 ~~repeated~~ failure to carry out the Work in accordance with the Contract Documents; or

.8 any other failure to comply with the obligations of the Contractor under the Contract Documents.

...

§ 9.5.3 ~~If the Architect withholds certification for payment under Section 9.5.1.3, the~~ The Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the ~~Architect~~ Design Agent and the ~~Architect~~ Design Agent will reflect such payment on the next Certificate for Payment.

...

§ 9.6.1 After the ~~Architect has issued a Certificate for Payment,~~ Design Agent has issued a Certificate for Payment and the Owner has approved the Certificate for Payment in writing, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the ~~Architect.~~Design Agent.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than ~~seven~~ 10 working days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The ~~Architect~~ Design Agent will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the ~~Architect~~ Design Agent and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within ~~seven~~ 7 working days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. The Owner shall have the right to withhold

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payment(s) to the Contractor in the event that any Subcontractors or material and equipment suppliers have not been properly paid. Neither the Owner nor ~~Architect~~ Design Agent shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

PAGE 21

If the ~~Architect~~ Design Agent does not issue a Certificate for Payment, through no fault of the Contractor, within ~~seven~~ 7 working days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within ~~seven~~ 7 working days after the date established in the Contract Documents the amount certified by the ~~Architect~~ Design Agent or awarded by binding dispute resolution, then the Contractor may, upon ~~seven additional~~ 7 additional working days' written notice to the Owner and ~~Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.~~Design Agent, make a claim for payment as provided under the provisions of applicable law.

...

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the ~~Architect~~ Design Agent a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the ~~Architect~~ Design Agent will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the ~~Architect's~~ Design Agent's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the ~~Architect.~~ Design Agent. In such case, the Contractor shall then submit a request for another inspection by the ~~Architect to determine Substantial Completion.~~Design Agent to determine Substantial Completion. The Design Agent will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for any additional inspections.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the ~~Architect~~ Design Agent will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. ~~Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.~~

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment ~~of retainage applying to such Work or designated portion thereof.~~ less the amount of five (5%) percent to be retained by the Owner in accordance with R.I. Gen. Laws § 37-12-10.1. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

PAGE 22

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the ~~Architect~~ Design Agent as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or

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use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the ~~Architect.~~Design Agent.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and ~~Architect~~ Design Agent shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

...

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the ~~Architect~~ Design Agent will promptly make such inspection and, when the ~~Architect~~ Design Agent finds the Work acceptable under the Contract Documents and the Contract fully performed, the ~~Architect~~ Design Agent will promptly issue a final Certificate for Payment stating that to the best of the ~~Architect's~~ Design Agent's knowledge, information and belief, and on the basis of the ~~Architect's~~ Design Agent's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The ~~Architect's~~ Design Agent's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. The Design Agent will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for any additional inspections.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the ~~Architect~~ Design Agent (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 working days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final ~~payment and~~ payment, (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated ~~by the Owner.~~ by the Owner, and (6) all other close-out documents required by the Owner, including without limitation, all as-built plans, warranties, manuals, and other materials set forth in the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, ~~final completion~~ Final Completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting ~~final completion, and the Architect~~ Final Completion, and the Design Agent so confirms, the Owner shall, upon application by the Contractor and certification by the ~~Architect,~~ Design Agent, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the ~~Architect~~ Design Agent prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising ~~from~~from:

- **.1** liens, Claims, security ~~interests~~ interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;~~or~~
- **.3** terms of special warranties required by the Contract ~~Documents.~~Documents; or
- **.4** claims permitted under the State of Rhode Island General Conditions of Purchase Regulation.

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§ 9.11 The Contractor and the Contractor's surety shall be liable for and shall pay the Owner as liquidated damages the sums specified in the Solicitation and Bid Form, or if completed, the amount set forth in Section 3.4 of the Agreement.

§ 9.12 Warranties required by the Contract Documents shall commence on the date of Final Completion of the Work.

...

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss ~~to~~to:

...

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified ~~personnel.~~personnel and in consultation with the appropriate governmental authorities.

§ 10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give the User Agency and the Owner reasonable advance notice.

§ 10.2.4.2 If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or ~~Architect~~ Design Agent or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and ~~Architect.~~Design Agent.

PAGE 24

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable ~~time not exceeding 21 days after discovery.~~ time. The notice shall provide sufficient detail to enable the other party to investigate the matter.

...

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and ~~Architect~~ Design Agent in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract

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Documents, the Owner shall furnish in writing to the Contractor and ~~Architect~~ Design Agent the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the ~~Architect~~ Design Agent will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or ~~Architect~~ Design Agent has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the ~~Architect~~ Design Agent have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the ~~fullest extent permitted by law,~~ extent permitted by the provisions of R.I. Gen. Laws §§ 9-31-1 **et seq.**, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, ~~Architect, Architect's~~ Design Agent, Design Agent's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.
PAGE 25

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as is specified in the Solicitation and as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

...

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.1.2 The Contractor's liability insurance shall include all major coverages and be on a comprehensive general liability basis.

...

§ 11.1.3 Certificates of insurance as specified in the Solicitation and as otherwise acceptable to the Owner shall be filed with the Owner and the User Agency prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 working days' prior written notice has been given to the ~~Owner.~~ Owner and the User Agency. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the ~~Architect and the Architect's~~ User Agency, and their elected and appointed officials, members, employees, and agents, the Design Agent and the Design Agent's consultants as additional insureds for claims caused in whole or in part by the Contractor's ~~negligent~~ acts or omissions during the Contractor's operations; and (2) ~~the Owner as an additional insured~~ the Owner, the User Agency, and their elected and appointed officials, members, employees, and agents, as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

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§ 11.1.5 The Contractor shall be responsible for the prompt payment to the Owner of any deductible amounts under any insurance policies required under the Contract Documents for claims made pursuant to such policies.

§ 11.2 ~~OWNER'S LIABILITY INSURANCE~~**OWNER'S LIABILITY INSURANCE.**

§ 11.2.1 The Contractor shall furnish the Owner and the User Agency, through the Design Agent, an insurance certificate providing Owner's Protective Liability extended to include the interests of the Design Agent, and to protect the Owner, User Agency, and Design Agent from any liability which might be incurred against any of them as a result of any operation of the Contractor or Subcontractors or their employees or anyone for whom either the Contractor or Subcontractors are responsible. Such insurance shall be written for the same limits as the Contractor's commercial general liability insurance and shall include the same coverage.
~~The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.~~§ 11.2.2 If the Owner engages separate contractors to perform work for, or in or around, the Project, it shall require in its contracts with each separate contractor that Contractor and its officers, directors, partners, members, employees, and agents shall be: (i) named as additional insureds on a primary, noncontributory basis to any commercial general liability, pollution liability, and excess liability insurance policies; and (ii) provided a waiver of subrogation on all workers compensation and professional liability insurance policies.
PAGE 26

§ 11.3.1 ~~Unless otherwise provided, the Owner~~ The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the ~~jurisdiction in which the Project is located,~~ state of Rhode Island, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the User Agency, the Contractor, Subcontractors and Sub-subcontractors in the Project. If the Owner and/or the User Agency incur any damages by failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable cost resulting from such failure.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for ~~Architect's~~ Design Agent's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 ~~If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.~~**Deleted.**

...

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The ~~Owner and the~~ Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

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§ 11.3.2 ~~BOILER AND MACHINERY INSURANCE~~
~~The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.~~**Deleted.**

§ 11.3.3 ~~LOSS OF USE INSURANCE~~
~~The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.~~**Deleted.**

§ 11.3.4 ~~If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.~~**Deleted.**
PAGE 27

§ 11.3.6 Before an exposure to loss may occur, the ~~Owner~~ Contractor shall file with the ~~Contractor~~ Owner a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 working days' prior written notice has been given to the ~~Contractor.~~Owner and the User Agency.

...

The ~~Owner and Contractor waive all rights against (1) each other~~ Contractor waives all rights against the Owner and the User Agency and any of their subcontractors, sub-subcontractors, agents and employees, ~~each of the other,~~ and (2) the ~~Architect, Architect's~~ Design Agent, Design Agent's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the ~~Architect, Architect's~~ Design Agent, Design Agent's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under ~~the Owner's~~ this property insurance shall be adjusted by the ~~Owner~~ Contractor as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the ~~Owner's~~ Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The ~~Owner~~ Contractor shall deposit in a separate account proceeds so received, which the ~~Owner~~ Contractor shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The ~~Owner~~ Contractor as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within ~~five~~ 5 working days after occurrence of loss to the ~~Owner's~~

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Contractor's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. ~~If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.~~

PAGE 28

§ 11.4.1 The ~~Owner shall have the right to require the Contractor to~~ Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in ~~bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.~~the Solicitation.

...

§ 12.1.1 If a portion of the Work is covered contrary to the ~~Architect's~~ Design Agent's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the ~~Architect,~~ Design Agent, be uncovered for the ~~Architect's~~ Design Agent's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the ~~Architect~~ Design Agent has not specifically requested to examine prior to its being covered, the ~~Architect~~ Design Agent may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

...

The Contractor shall promptly correct Work rejected by the ~~Architect~~ Design Agent or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the ~~Architect's~~ Design Agent's services and expenses made necessary thereby, shall be at the Contractor's expense.

...

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of ~~Substantial~~ Final Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. ~~During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty.~~ If the Contractor fails to correct nonconforming Work within a reasonable time ~~during that period~~ after receipt of notice from the Owner or ~~Architect,~~ Design Agent, the Owner may correct it in accordance with Section 2.4.

...

§ 12.2.2.4 Upon request by the Owner and prior to the expiration of one year from the date of Final Completion, the Design Agent will conduct and the Contractor shall attend 2 meetings with the Owner to review the facility operations and performance.

PAGE 29

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The Contract shall be governed by the law of the ~~place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~State of Rhode Island.

...

§ 13.2.1 The Owner and Contractor respectively bind themselves, their ~~partners,~~ successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to ~~a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents.~~ any executive, legislative, judicial, regulatory, or administrative body of the state, or any political subdivision thereof, including without limitation, any department, division, agency, commission, board, office, bureau, authority, school, water, or fire district, or other agency of Rhode Island state or local government that exercises governmental functions, any other governmental authority, and any quasi-public corporation and/or body corporate and politic. The Contractor shall execute all consents reasonably required to facilitate such assignment.

...

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice, or when received, if manually delivered or transmitted by electronic mail or facsimile to the last such address known to the party giving notice.

...

§ 13.4.2 No action or failure to act by the Owner, ~~Architect~~ Design Agent or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

...

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the ~~Architect~~ Design Agent timely notice of when and where tests and inspections are to be made so that the ~~Architect~~ Design Agent may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the ~~Architect,~~ Design Agent, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the ~~Architect~~ Design Agent will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the ~~Architect~~ Design Agent of when and where tests and inspections are to be made so that the ~~Architect~~ Design Agent may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the ~~Architect's~~ Design Agent's services and expenses shall be at the Contractor's expense.

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§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the ~~Architect.~~Design Agent.

§ 13.5.5 If the ~~Architect~~ Design Agent is to observe tests, inspections or approvals required by the Contract Documents, the ~~Architect~~ Design Agent will do so promptly and, where practicable, at the normal place of testing.
PAGE 30

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~No interest shall be due or payable on account of any payment due or unpaid under the Contract Documents except in accordance with the provisions of "Prompt Payment by Department of Administration," R.I. Gen. Laws §§ 42-11.1-1 **et seq.**

...

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable ~~law, but in any case not more than 10 years after the date of Substantial Completion of the Work.~~ law. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

...

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 ~~consecutive~~ calendar days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

...

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped; or

.3 Because the ~~Architect~~ Design Agent has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section ~~9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or~~

~~.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.~~9.4.1

§ 14.1.2 ~~The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.~~**Deleted.**

§ 14.1.3 If one of the reasons described in Section 14.1.1 ~~or 14.1.2~~ exists, the Contractor may, upon ~~seven~~ 7 working days' written notice to the Owner and ~~Architect,~~ Design Agent, terminate the Contract and recover from the Owner payment for Work ~~executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.~~ executed.

§ 14.1.4 If the Work is stopped for a period of 60 ~~consecutive~~ calendar days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon ~~seven~~ 7 additional days' written notice to the Owner and the ~~Architect,~~ Design Agent, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

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§ 14.2.1 The Owner may terminate the Contract if the ~~Contractor~~Contractor:

.1 ~~repeatedly~~ refuses or fails to supply enough properly skilled workers or proper materials;

...

.3 ~~repeatedly disregards~~ disregards or fails to comply with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;~~or~~

.4 otherwise is guilty of ~~substantial breach of a provision of~~ breach of a provision of the Contract Documents; or

.5 cancels or the Contractor or the Owner receives notice of cancellation or nonrenewal of any insurance required under the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, ~~seven~~ 7 working days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

...

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the ~~Architect's~~ Design Agent's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

...

§ 14.3.2 The ~~Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent~~

~~.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or~~

~~.2 that an equitable adjustment is made or denied under another provision of the Contract.~~Owner shall not be liable to the Contractor or any Subcontractor for claims or damages of any nature caused by or arising out of any delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work in accordance with the provisions of Section 8.3.1.

...

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor ~~shall~~shall:

...

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such ~~termination, along with reasonable overhead and profit on the Work not executed.~~termination.

Claims by either the Owner or Contractor must be initiated by written notice to the other ~~party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker.~~ party. Such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly serviced if delivered in person, by mail, by courier, or by electronic transmission. Claims by either party must be initiated within 21 working days after occurrence of the event giving rise

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to such Claim or within 21 working days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

...

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The ~~Architect~~ Design Agent will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

...

§ 15.1.5.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

§ 15.1.5.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

§ 15.1.6 ~~CLAIMS FOR CONSEQUENTIAL DAMAGES~~

~~The Contractor and Owner waive Claims against each other~~ The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this ~~Contract. This mutual waiver includes~~

- ~~.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and~~
- ~~.2 damages incurred by the Contractor for principal office expenses~~ Contract. This waiver includes damages incurred by the Contractor for principal office expenses, including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of ~~profit except anticipated profit arising directly from the Work.~~

~~This mutual~~ profit. This waiver is applicable, without limitation, to all consequential damages due to ~~either party's~~ the Contractor's termination in accordance with Article ~~14. Nothing contained~~ 14. Nothing in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

PAGE 33

§ 15.2.1 ~~Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10,~~ Claims shall be referred to the Initial Decision Maker for initial decision. The ~~Architect~~ Purchasing Agent appointed pursuant to the provisions of the "State Purchases Act," R.I. Gen. Laws § 37-2-1 **et seq.**, will serve as the Initial Decision ~~Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an~~ Maker in accordance with the provisions of the State Purchases Act, State of Rhode Island Procurement Regulations, and this Section 15.2.1. An initial decision shall be required as a condition precedent ~~to mediation~~ to binding dispute resolution pursuant to Section 15.3.1 of any Claim arising prior to the date final payment is ~~due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.~~due.

§ 15.2.2 ~~The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial~~

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~~Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.~~ **Deleted.**

§ 15.2.3 ~~In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.~~ **Deleted.**

§ 15.2.4 ~~If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.~~ **Deleted.**

§ 15.2.5 ~~The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.~~ **Deleted.**

§ 15.2.6 ~~Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.~~ **Deleted.**

§ 15.2.6.1 ~~Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~ **Deleted.**

§ 15.2.7 ~~In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.~~ **Deleted.**

§ 15.2.8 ~~If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.~~ **Deleted.**

...

§ 15.3.1 ~~Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.~~ For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 15.2.1, and prior to the implementation of the binding dispute resolution procedures set forth in Section 15.4.1, the Contractor or the Design Agent shall have the option to pursue mediation, exercisable by written notice to the Owner within 30 calendar days of an Initial Decision. In the event of the exercise of such option by the Contractor or the Design Agent, the Owner and the Contractor or the Design Agent shall attempt to select a mediator, and in the event that the Owner and the Contractor or the Design Agent cannot agree on a mediator, either party may apply in writing to the Presiding Justice of the Providence County Superior Court, with a copy to the other, with a request for the court to appoint a mediator, and the costs of the mediator shall be borne equally by both parties.

§ 15.3.2 ~~The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties~~

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~~or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~**Deleted.**

§ 15.3.3 ~~The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.~~**Deleted.**

§ 15.4 ~~ARBITRATION~~**BINDING DISPUTE RESOLUTION**

§ 15.4.1 ~~If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~ For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 15.2.1, or mediation at the option of the Contractor pursuant to Section 15.3.1, the method of binding dispute resolution shall be determined in accordance with the provisions of the "Public Works Arbitration Act," R.I. Gen. Laws §§ 37-16-1 **et seq.**

~~**§ 15.4.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.~~

~~**§ 15.4.2** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

~~**§ 15.4.3** The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

§ 15.4.4 ~~CONSOLIDATION OR JOINDER~~**Deleted.**

§ 15.4.4.1 ~~Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).~~ **Deleted.**

§ 15.4.4.2 ~~Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~**Deleted.**

§ 15.4.4.3 ~~The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.~~**Deleted.**

§ 16 COMPLIANCE WITH APPLICABLE LAW

The Contractor and its Subcontractors shall comply with all applicable federal, state, and local laws.

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Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:28:58 ET on 04/29/2020 under Order No. 9542044531 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2007, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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SECTION 00 08 19
CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS

AIA Document G706A, Contractor's Affidavit of Release of Liens – 1994 Edition is included, following this page.

END OF SECTION

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DRAFT

AIA® Document A305™ – 1986

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO: « »

ADDRESS: « »

SUBMITTED BY: « »

NAME: « »

ADDRESS: « »

PRINCIPAL OFFICE: « »

[« »] Corporation

[« »] Partnership

[« »] Individual

[« »] Joint Venture

[« »] Other « »

NAME OF PROJECT: *(if applicable)* « »

TYPE OF WORK: *(file separate form for each Classification of Work)*

[« »] General Construction

[« »] HVAC

[« »] Electrical

[« »] Plumbing

[« »] Other: *(Specify)* « »

§ 1 ORGANIZATION

§ 1.1 How many years has your organization been in business as a Contractor? « »

§ 1.2 How many years has your organization been in business under its present business name? « »

§ 1.2.1 Under what other or former names has your organization operated?

« »

§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation: « »

§ 1.3.2 State of incorporation: « »

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.

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§ 1.3.3 President's name: « »
§ 1.3.4 Vice-president's name(s)

« »

§ 1.3.5 Secretary's name: « »
§ 1.3.6 Treasurer's name: « »

§ 1.4 If your organization is a partnership, answer the following:
§ 1.4.1 Date of organization: « »
§ 1.4.2 Type of partnership (if applicable): « »
§ 1.4.3 Name(s) of general partner(s)

« »

§ 1.5 If your organization is individually owned, answer the following:
§ 1.5.1 Date of organization: « »
§ 1.5.2 Name of owner:

« »

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

« »

§ 2 LICENSING
§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

« »

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

« »

§ 3 EXPERIENCE
§ 3.1 List the categories of work that your organization normally performs with its own forces.

« »

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)
§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

« »

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

« »

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

« »

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

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User Notes: (1966502964)

« »

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

« »

§ 3.4.1 State total worth of work in progress and under contract:

« »

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

« »

§ 3.5.1 State average annual amount of construction work performed during the past five years:

« »

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

« »

§ 4 REFERENCES

§ 4.1 Trade References:

« »

§ 4.2 Bank References:

« »

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

« »

§ 4.3.2 Name and address of agent:

« »

§ 5 FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

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Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

« »

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

« »

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

« »

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

« »

§ 6 SIGNATURE

§ 6.1 Dated at this « » day of « » « »

Name of Organization: « »

By: « »

Title: « »

§ 6.2

« »

M « » being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this « » day of « » « »

Notary Public: « »

My Commission Expires: « »

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SECTION 00 08 20
PREVAILING WAGE RATES (DAVIS-BACON ACT)

The State of Rhode Island Department of Labor and Training, Division of Professional Regulation General Decision Modification Document, current as of the "Bid Issuance Date" for this Project is as an integral part of the Bid Documents for use in fulfilling the Prevailing Wage Rate Requirements.

Prevailing Wages shall be paid in accordance with Chapter 37-13 et seq. of the General Laws of Rhode Island, as amended and in accordance with the Rules and Regulations of the Department of Labor. Violators are subject to and responsible for all penalties, fine and adjustments in wage and benefit payments as prescribed in Chapter 37-13 of the Rhode island General laws entitled "Labor and Payment of Debts by Contractors." This law shall be considered incorporated herein as if attached and written in full. Specific attention is called to Chapter 37-13-8 regarding the requirement that "*each contractor awarded a public works contact after July 1, 2007 shall contact the department of labor and training on or before July first of each year, for the duration of such contract to ascertain the prevailing wage rate of wages on an hourly basis and the amount of payment or contributions paid to payable on behalf of each mechanic, laborer or worker employed upon the work contacted to be done each year and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee every July first.*"

The wage rates as ascertained by the Department of Labor and Training shall apply. Information concerning wage rates prevailing in the construction industry in Rhode Island may be obtained from the Office of the State Department of Labor and Training, 1511 Pontiac Avenue, Cranston, Rhode Island and are also available by accessing the following web site: http://www.dlt.ri.gov/pw/. Under no condition shall the wages paid, be less than those designated in the general classification and the base bids shall be prepared taking into consideration the requirement for the annual adjustments.

The Contractor shall meet all the requirements prescribed by the State Labor Laws and regulation, issued by the Rhode Island Department of Labor and Training, pertaining to Public Works Projects General Laws of Rhode Island. The laws are hereby made part of this Project as if attached and written in full. These laws include, but are not limited to:

1. Weekly payment of employees;
2. Provisions applicable to Public Works Contracts;
3. Payment of Prevailing Wages (it is the contractor's responsibility to use the current prevailing wage table. The table may be obtained at the RI Division of Purchases Home Page at www.purchasing.ri.gov);
4. Posting of Prevailing Wage Rates and;
5. Overtime Compensation.

END OF SECTION

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DOCUMENT 00 09 00
ADDENDA AND MODIFICATIONS

ADDENDUM NO. 1, (Date) Month, 0, 201_

RE: Columbarium Plaza Expansion CW-4 Project – Phase 1
Rhode Island Veterans Memorial Cemetery
301 South County Trail, Exeter, Rhode Island 02822

FROM: Bryant Associates, Inc.
640 George Washington Highway
Building C, Suite 100,
Lincoln, Rhode Island 02865
Tel.: 401-722-7660 Fax: 401-722-7530

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated _ _ _ _ _ _ _ _ [and Addendum No. 1, dated _ _ _ _ _ _ _ (use with second addendum)] as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of _ _ _ page(s) and the attached drawing(s), Sheet _ _ _.

CHANGES TO PRIOR ADDENDA:

1. _ _ _ _ _.

CHANGES TO BIDDING REQUIREMENTS:

2. _ _ _ _ _.

CHANGES TO CONDITIONS OF THE CONTRACT:

3. _ _ _ _ _.

CHANGES TO SPECIFICATIONS:

4. _ _ _ _ _.

CHANGES TO DRAWINGS:

5. _ _ _ _ _.

END OF ADDENDUM

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SECTION 00 12 00
AS-BUILT DRAWINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The work under this Section shall include the transmittal to the Owner's Representative of all applicable data relative to as-built conditions as may be required by the Owner's Representative.

1.02 RELATED REQUIREMENTS

A. Section 01 90 00 RIDOT Standard Specification Sections.

B. Section 01 00 00 General Requirements.

C. Section 03 31 00 Water Mains and Appurtenances.

PART 2 PRODUCTS

2.01 As-Builts

A. As-built information as specified.

PART 3 EXECUTION

3.01 MARKED-UP PRINTS

A. The Resident Engineer shall provide the Contractor with an extra set of prints of the Contract Documents to be used for indicating the locations, elevations and other as-built conditions.

B. The marked-up prints shall be kept up to date daily and shall always be available for the Owner's inspection. Any inaccuracies or incomplete information shall be correct immediately.

C. They shall be kept in a safe location by the Contractor, or at the Contractor`s option, in the offices of the Owner.

D. All markings on the prints shall be done neatly with a red pencil.

E. After review of As-Builts by the Resident Engineer and the Owner's Representative and an approval is given, the Contractor shall transmit the revised plans to the Owner via AutoCAD drawing format.

END OF SECTION

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 SAFETY REQUIREMENTS

A. Refer to section 01 35 26, SAFETY REQUIREMENTS for safety and infection control requirements.

1.2 GENERAL INTENTION

A. Contractor shall completely prepare site for columbarium wall construction and associated site work, and furnish labor and materials and perform work for said work as required by drawings and specifications.

B. Offices of Bryant Associates, Inc., as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Owner and shall not be construed as expressing or implying a contractual act of the Owner without affirmations by Resident Engineer or his duly authorized representative.

C. Before placement and installation of work subject to tests by testing laboratory retained by Owner, the Contractor shall notify the Resident Engineer in sufficient time to enable testing laboratory personnel to be present at the site in time for proper taking and testing of specimens and field inspection. Such prior notice shall be not less than three work days unless otherwise designated by the Resident Engineer.

D. Coordinate the work of this Section with the requirements of Section 02 41 00 DEMOLITION, and all other Sections of the Specifications and Contract Documents

1.3 STATEMENT OF BID ITEM(S)

A. Columbarium Walls and Associated Site Work, including general construction, road way repairs, pedestrian walks, grading, drainage, water line relocation, columbarium wall construction, concrete foundations, earthwork, landscape grading, site furnishings and improvements, planting and turf establishment, irrigation, electrical, and certain other items.

1.4 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. Drawings and contract documents may be obtained from the website where the solicitation is posted. Additional copies will be at Contractor's expense.

1.5 CONSTRUCTION SECURITY REQUIREMENTS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.

2. The General Contractor is responsible for assuring that all sub-Contractors working on the project and their employees also comply with these regulations.

B. Security Procedures:

1. The Owner reserves the right to close down or shut down the project site and order General Contractor’s employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Resident Engineer.

C. Motor Vehicle Restrictions

1. Vehicular access to the Cemetery facility, including picking up and dropping off materials and supplies, Contractor and subcontractors employees, shall be from internal Cemetery roads accessible from Main Street. **DO NOT ENTER** the Project Site from the Main Gate on South County Trail.
2. When the necessities of the construction contract require large trucks and vehicles to enter the Project Site from Main Street, the Contractor shall notify the Resident Engineer and the Owner and seek authorization no less than 24 hours before the date and time of access. Access may be restricted based on burial ceremonies scheduled on the proposed date and/or time of large vehicle access.
3. Passenger vehicle parking and equipment storage required on this site for this Project shall be limited to the Project area defined by the Construction Fence.
4. Contractor shall restore all areas disturbed or damaged during the course of vehicle access

1.6 OPERATIONS AND STORAGE AREAS

A. The Contractor shall confine all operations (including storage of materials) on Owner premises to areas authorized or approved by the Resident Engineer as noted in this Section and as indicated. The Contractor shall hold and save the Owner, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Resident Engineer and shall be built with labor and materials furnished by the Contractor without expense to the Owner. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Resident Engineer, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the Resident Engineer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Resident Engineer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or

local law or regulation. When it is necessary to cross curbs, roadway edges or sidewalks, the Contractor shall protect the pavements and their edges from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads at no additional cost to the State.

D. Working space and space available for storing materials shall be as shown on the drawings, as described in this Section or as directed by the Resident Engineer.

E. Comportment: Workers are subject to rules of the Cemetery applicable to their conduct. The following activities are prohibited on Cemetery premises:

1. Failure to follow the instructions of Cemetery Security or Safety personnel.
2. Smoking anywhere on the premises.
3. Use of loud or profane language.
4. Use or possession of intoxicants or illegal drugs.
5. Threats or fighting.
6. Use of radios or headsets while working.
7. Unauthorized vehicle parking.
8. Use of machinery during a scheduled burial or memorial event.

F. When infractions of these regulations and all other Cemetery rules occur, the Owner reserves the right to evaluate each specific situation or circumstance and apply a suitable solution. If there is a violation of the above work rules, the Owner reserves the right to;

1. Have Contractor remove the violator from the Owner’s property immediately.
2. Have such person barred from all of the Owner’s properties permanently.
3. Restrict the entry of vehicles.
4. After proper consideration, and where warranted, suspend or revoke any project or contract between the violating Contractors and Cemetery.

G. It is the responsibility of Contractor and sub-contractors to enforce these regulations on a day-to-day basis. Contractors shall be sure that all Contractors’ employees, consultants, and sub-Contractors are aware of these Rules of Conduct and Security Requirements.

H. Execute work in such a manner as to interfere as little as possible with work being done by others. Keep roads clear of construction materials, debris, standing construction equipment and vehicles at all times.

I. Execute work so as to interfere as little as possible with normal functioning of the Cemetery as a whole, including funeral services, operations of utility services, fire protection systems and any existing equipment, and with work being done by others.

1. Coordinate interment services: The Contractor’s foreman shall meet daily with the Cemetery Administrator to review the Cemetery schedule for interment services and other operations. See requirements specified elsewhere in this Section 01 00 00.
2. Do not store materials and equipment in other than assigned areas.
3. Schedule delivery of materials and equipment to immediate construction working areas in quantities sufficient for not more than two work days. Provide unobstructed access to Cemetery areas required to remain in operation.
4. Where access by Cemetery personnel to the Cemetery grounds, maintenance areas and buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements. The Resident Engineer will be the sole judge of whether Contractor’s material and equipment can be stored for more than two days and where the storage will occur.

J. Utilities Services: As indicated on the Contract Documents and Specifications. While these Specifications and the Contract Document indicate limited reconstruction and replacement of specific utilities, these Specifications and Contract Documents do not anticipate alterations of other existing utility services. When the Resident Engineer determines it is necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where directed by Resident Engineer. All such actions shall be coordinated with the Utility Company involved:

1. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the State and not the Contractor.

K. Phasing:

1. The Cemetery must maintain its operation from dawn to dusk 7 days a week. Therefore, any interruption in service must be scheduled and coordinated with the Resident Engineer to ensure that no lapses in Cemetery operations occur. It is the Contractor’s responsibility to develop a work plan and schedule detailing, at a minimum, the procedures to be employed, the equipment and materials to be used, the interim life safety measure to be used during the work, and a schedule defining the duration of the work with milestone subtasks. The work to be outlined shall include, but not be limited to:
   a. Mobilization
   b. Site preparation
   c. Earthwork, excavations, soil stockpiling
   d. Cast-in-Place concrete work
   e. Masonry construction
   f. Pavement installation

g. Planting and turf establishment

h. Demobilization and site restoration

2. To ensure such executions, Contractor shall furnish the Resident Engineer with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site or portion thereof. In addition, Contractor shall notify the Resident Engineer two weeks in advance of the proposed date of starting work. Arrange such dates to ensure accomplishment of this work in successive phases mutually agreeable to Cemetery Administrator and Resident Engineer.

3. The Contractor shall provide a Three-week Look Ahead Schedule on each Friday before Close of Business to the Resident Engineer.

4. Contractor shall take all measures and provide all material necessary for protecting existing property in affected areas of construction against dust and debris, so that affected areas to be used in the Cemetery operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs' and the Owner's personnel through construction areas as directed by the Resident Engineer. As directed by the Resident Engineer, these routes whether access or egress shall be isolated from the construction area by temporary partitions and have walking surfaces, lighting etc. to facilitate Cemetery personnel access.

L. Construction Fence: Before construction operations begin, Contractor shall provide a galvanized steel chain link construction fence around the construction area indicated on the drawings or the Contractor's anticipated, full limit of disturbance as approved by the Resident Engineer.

1. Construction fencing for use at perimeter of work area shall be in accordance with the requirements of Section 02 41 00 DEMOLITION.

M. When the construction site is turned over to Contractor, Contractor shall accept entire responsibility including upkeep and maintenance therefore.

N. Utilities Services: Maintain existing utility services for the Cemetery at all times except as indicated or as directed. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where directed by Resident Engineer.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of Resident Engineer.

2. Contractor shall submit a request to interrupt any such services to the Resident Engineer, in writing, 7 days in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.

3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of the Cemetery. Interruption time approved by the Cemetery Administrator may occur at other than Contractor's normal working hours.

4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the Resident Engineer.

5. In case of a contract construction emergency, service will be interrupted on approval of Resident Engineer. Such approval will be confirmed in writing as soon as practical.

6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the State and not the Contractor.

O. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged at the main, branch or panel they originate from.

P. To minimize interference of construction activities with flow of Cemetery traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles. Wherever excavations cross existing roads, at least one vehicle width travel lane must be open to traffic at all times with approval. Construct temporary roadways and shoulders as necessary to achieve this outcome.

2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the Resident Engineer.

Q. Coordinate the work for this contract with other construction operations as directed by Resident Engineer. This includes the scheduling of traffic and the use of roadways, as specified in Article 1.15, USE OF ROADWAYS.

R. Coordination of Construction with Cemetery Administrator: The burial activities at a Rhode Island Veterans Military Cemetery shall take precedence over construction activities. The Contractor must cooperate and coordinate with the Cemetery Administrator, through the Resident Engineer, in arranging construction schedule to cause the least possible interference with cemetery activities in actual burial areas. Construction noise during the interment services shall not disturb the service. Trucks and workers shall not pass through the service area during this period:

1. The Contractor is required to discontinue his work sufficiently in advance of Easter Sunday, Mother's Day, Father's Day, weekend prior to Memorial Day, Memorial Day, Veteran's Day, the two weekends in December prior to and including Wreaths Across America Day, and/or

Federal holidays, to permit him to clean up all areas of operation adjacent to existing burial plots before these dates.

2. Clean up shall include the removal of all equipment, tools, materials and debris and leaving the areas in a clean, neat condition.

1.7 PROTECTIONS

A. Protection: Provide the following protective measures:

1. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.

2. Protection of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, all surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

1.8 DISPOSAL AND RETENTION

A. Materials and equipment accruing from work removed and from demolition of structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Owner are noted on drawings as items to be stored. Items that remain property of the Owner shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by Resident Engineer.

2. Items not reserved shall become property of the Contractor and be removed by Contractor from the Owner’s property.

1.9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workers, the Contractor shall trim those limbs or branches with a clean cut as directed by the Resident Engineer.

B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Resident

Engineer may have the necessary work performed and charge the cost to the Contractor.

C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

D. Refer to FAR clause 52.236-7, "Permits and Responsibilities," which is included in General Conditions. A Rhode Island Department of Environmental Management (RIDEM) “Stormwater Construction Permit and Water Quality Certification” is required for this project. (Reference WQC File No. 20-063 and RIPDES File No. RIR 1020230). The Contractor is considered an "operator" under the permit and has extensive responsibility for compliance with permit requirements. The RIVMC will make the permit application available at the Cemetery office. The apparent low bidder, Contractor and affected sub-Contractors shall furnish all information and certifications that are required to comply with the permit process and permit requirements. Many of the permit requirements will be satisfied by completing construction as shown and specified. Some requirements involve the Contractor's method of operations and operations planning and the Contractor is responsible for employing best management practices. The affected activities often include, but are not limited to the following:

- Designating areas for equipment maintenance and repair;
- Providing waste receptacles at convenient locations and provide regular collection of wastes;
- Locating equipment wash down areas on site, and provide appropriate control of wash-waters;
- Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and
- Providing adequately maintained sanitary facilities.

1.10 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the Resident Engineer before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work as determined by the Resident Engineer.

C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workers to existing piping and conduits, wires, cables, etc., of utility services

or of fire protection systems and communications systems (including telephone) which are not scheduled for discontinuance or abandonment.

D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.11 PHYSICAL DATA

A. Data and information furnished or referred to below is for the Contractor's information. The Owner will not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

1. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by GZA GeoEnvironmental, Inc. Providence, Rhode Island. The Geotechnical Evaluation Report for the Rhode Island Veterans Memorial Cemetery Columbarium Project, Exeter, Rhode Island, dated January 2020, is included at the end of the specifications in the REFERENCES section as REFERENCE A.

D. State does not guarantee that other materials will not be encountered, nor that proportions, conditions or character of several materials will not vary from those indicated by explorations. Bidders are expected to examine site of work and logs of borings; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to the Owner, bidders will be permitted to make subsurface explorations of their own at site.

1.12 PROFESSIONAL SURVEYING SERVICES

A. In accordance with the requirements of Section 01 89 00 SITE CONSTRUCTION PERFORMANCE REQUIREMENTS.

1.13 LAYOUT OF WORK

A. In accordance with the requirements of Section 01 89 00 SITE CONSTRUCTION PERFORMANCE REQUIREMENTS.

B. Benchmarks and Horizontal Survey Control Points: The Contractor shall create, maintain and/or reestablish benchmarks, horizontal survey control and survey monuments necessary for the work of these Contract Documents as are found to exist on the site to provide a base reference for the construction. Replace any which may become destroyed or disturbed. Provide temporary benchmarks and horizontal survey control as required. Provide minimum four (4) each of permanent benchmarks and horizontal survey control points at end of project. Record location and elevations of permanent benchmarks and horizontal survey control points on As-Built drawings.

F. The Contractor shall also be responsible for maintaining and preserving all benchmarks, horizontal survey control points, stakes and other marks established by the Resident Engineer until authorized to remove them. If such marks are destroyed by the Contractor or through

Contractor's negligence before their removal is authorized, the Resident Engineer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

G. Establish and plainly mark center lines and corners of columbarium walls, wall foundations, pavements and such other lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for each such structure and site improvement are in accordance with lines and elevations shown on the AutoCAD contract drawing files.

H. Following completion of general excavation and before any other permanent work is performed, establish and plainly mark sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but not be limited to, location of lines and grades of footings, pavement systems, planting soil beds, sleeves and miscellaneous other work required by the AutoCAD drawing files:

   1. Such additional survey control points or system of points thus established shall be laid out, checked and certified by a Registered Professional Land Surveyor or Registered Professional Civil Engineer. Furnish such certification to the Resident Engineer before any work (such as footings, pavement systems, utilities and other major controlling features) is placed.

I. During progress of work, and particularly as work progresses upward along the masonry faces of the columbarium walls, Contractor shall have line grades and plumbness of all masonry work checked and certified by a Registered Professional Land Surveyor or Registered Professional Civil Engineer as meeting requirements of contract AutoCAD drawing files. Furnish such certification to the Resident Engineer before any major items of concrete work are placed. In addition, Contractor shall also furnish to the Resident Engineer certificates from a Registered Professional Land Surveyor or Registered Professional Civil Engineer that the following work is complete in every respect as required by contract drawings.

   1. Horizontal lines of each columbarium wall.
   2. Elevations of tops and bottom of all footings and foundations.
   3. Lines and elevations of pedestrian walkways and roadway improvements.

J. Upon completion of the work, the Contractor shall furnish the Resident Engineer, with one electronic copy in AutoCAD and PDF format and reproducible Mylar drawings at the scale of the contract drawings, showing the finished grades at the corners of all columbarium walls, corners of all pedestrian pavements and 20-foot stationing along the edges of the new roadway pavement. These drawings shall bear the seal of the Registered Professional Land Surveyor or Registered Professional Civil Engineer.

K. The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article "Professional Surveying Services".

1.14 AS-BUILT DRAWINGS

A. The Contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications. These drawings may be in paper form and as updated AutoCAD files.

   1. The As-Built Drawings shall include all sub-surface and at-grade site improvements.

B. All variations shall be shown in the same general detail as used in the contract drawings and AutoCAD drawing files. To ensure compliance, as-built drawings shall be made available for the Resident Engineer's review, as often as requested.

C. Contractor shall deliver two approved completed sets of as-built drawings in the electronic version (scanned PDF of red-lined plans and prints from drawings) to the Resident Engineer within 15 calendar days after each completed phase and after the acceptance of the project by the Resident Engineer.

D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.15 WARRANTY MANAGEMENT

A. Warranty Management Plan: Develop a warranty management plan which contains information relevant to FAR 52.246-21 Warranty of Construction in at least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the State receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesman, or of engineering background, not necessarily familiar with this contract. The term “status” as indicated below must include due date and whether item has been submitted or was approved. Warranty information made available during the construction phase must be submitted to the Resident Engineer for approval prior to each monthly invoice for payment. Assemble approved information in a binder and saved onto an approved Flash Drive of adequate capacity in PDF format and turn over to the State upon acceptance of the work. The construction warranty period will begin on the date of the project acceptance and continue for the product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contactor and the Resident Engineer. Include in the warranty management plan, but not limited to, the following:

   1. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the company of the Contractor, sub-contractors, manufacturers or suppliers involved.

   2. Furnish with each warranty the name, address and telephone number of

   3. A list for each warranted equipment item, feature of construction or system indicating:

      a. Name of item.

b. Model and serial numbers.

c. Location where installed.

1. In sketch format

2. With supplemental photographs

d. Name and phone numbers of manufacturers and suppliers.

e. Names, addresses and phone numbers of sources of spare parts.

f. Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.

g. Starting point and duration of warranty period.

h. Summary of maintenance procedures required to continue the warranty in force.

i. Cross-reference to specific pertinent Operation and Maintenance manuals.

j. Organizations, names and phone numbers of persons to call for warranty service.

k. Typical response time and repair time expected for various warranted equipment.

4. The plans for attendance at the 4 and 9-month post construction warranty inspections conducted by the State.

5. Procedure and status of tagging of all equipment covered by extended warranties.

6. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

B. Performance Bond: The Performance Bond must remain effective throughout the construction period.

1. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Resident Engineer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Owner while performing the work, including, but not limited to administrative expenses.

2. In the event sufficient funds are not available to cover the construction warranty work performed by the Owner at the Contractor’s expenses, the Resident Engineer will have the right to recoup expenses from the bonding company.

3. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Resident Engineer to proceed against the Contractor.

C. Pre-Warranty Conference: Prior to contract completion, and at a time designated by the Resident Engineer, the Contractor shall meet with the Resident Engineer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Resident Engineer for the execution of the construction warranty will be established/ reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contract will be located within the local service area of the warranted construction, be continuously available and be responsive to State inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in conjunction with other portions of this provision.

D. Contractor's Response to Construction Warranty Service Requirements:

1. Following oral or written notification by the Resident Engineer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the State will perform the work and back charge the construction warranty payment item established.

   a. First Priority Code 1. Perform on-site inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

   b. Second Priority Code 2. Perform on-site inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

   c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

   d. The "Construction Warranty Service Priority List" is as follows:

Code 2- Columbarium Niche Covers and Attachment Mechanisms

a. Mounting brackets, rosettes, nuts, bolts, washers and mounting hardware.

Code 3

a. All work not listed above.

1.15 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Cemetery property as indicated and, when authorized by the Resident Engineer, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed and restoration performed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

1.16 RESIDENT ENGINEER'S FIELD OFFICE

A. The Contractor will not be required to provide temporary field office for the Resident Engineer.

1.17 TEMPORARY TOILETS

A. Provide where directed, (for use of all Contractor's workers) ample temporary, portable sanitary toilet accommodations. Keep the portable sanitary facilities pumped out and cleaned on a weekly basis. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

1.18 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Owner will make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Owner. The Contractor shall carefully conserve any utilities furnished without charge.

B. The Contractor, at Contractor's expense and in a workmanlike manner, in compliance with code and as satisfactory to the Resident Engineer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the State, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia and repair restore the infrastructure as required.

C. Contractor shall install meters at Contractor's expense and furnish the Cemetery a monthly record of the Contractor's usage of electricity as hereinafter specified.

D. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials.

E. Electricity (for Construction and Testing): Furnish all temporary electric services.

   1. Obtain electricity by connecting to the Cemetery electrical distribution system. The Contractor shall meter and pay for electricity required during the performance of the Construction Contract.

F. Water (for Construction and Testing): Furnish temporary water service.

1. Obtain water by connecting to the Cemetery water distribution system. Provide reduced pressure backflow preventer at each connection as per code. The Contractor shall meter and pay for all water required during the performance of the Construction Contract, including supplemental water required to establish turf and plant materials.

2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at Resident Engineer's discretion) of use of water from the Cemetery's system.

1.19 INSTRUCTIONS

A. Contractor shall furnish Maintenance and Operating manuals (hard copies and electronic) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

B. Manuals: Maintenance and operating manuals and one compact disc (four hard copies and one electronic copy each) for the niche cover mounting brackets, rosettes, nuts, bolts, washers and mounting hardware. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished.

1.20 OWNER-FURNISHED PROPERTY

A. The Owner will deliver to the Contractor, Owner-furnished niche covers shown on the drawings.

B. Niche covers furnished by State to be installed by Contractor will be furnished to Contractor at the Cemetery.

C. Contractor shall be prepared to receive these materials from the Owner and store or place such materials not less than 90 days before Completion Date of project.

D. Notify Resident Engineer in writing, 60 days in advance, of date on which Contractor will be prepared to receive equipment furnished by the Owner. Arrangements will then be made by the Owner for delivery of equipment.

1. Immediately upon delivery of materials, Contractor shall arrange for a joint inspection thereof with the Resident Engineer. At such time the Contractor shall acknowledge receipt of materials described, make notations, and immediately furnish the Resident Engineer with a written statement as to its condition or shortages.

2. Contractor thereafter is responsible for such material until such time as acceptance of contract work is made by the Owner.

E. Niche covers furnished by the Owner will be delivered as wrapped pallets in accordance with existing standard State and commercial practices, complete with all fittings, fastenings, and appliances necessary for connections to pre-cast concrete niches installed under

contract. All mounting brackets and associated fittings necessary to make the connection between the Owner furnished niche covers and the pre-cast concrete niches shall be furnished and installed by the Contractor at no additional cost to the Owner. Note requirements for attic stock as indicated in Section 03 48 24 PRECAST CONCRETE COLUMBARIUM UNITS and as indicated on the Drawings.

F. Completely assemble and install the Owner furnished material in place ready for proper operation in accordance with specifications and drawings.

1.21 CONSTRUCTION SIGN

A. Provide a Construction Sign where directed by the Resident Engineer. All wood members shall be of framing lumber. Cover sign frame with 24 gage galvanized sheet steel nailed securely around edges and on all bearings. Provide three 4 inch by 4 inch posts or equivalent round posts) set four feet into ground. Set bottom of sign level at three feet above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with two by four inch material as directed.

B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.

C. Maintain sign and remove it when directed by the Resident Engineer.

D. Detail Drawings of construction sign showing required legend and other characteristics of sign is shown on the drawings.

1.22 PHOTOGRAPHIC DOCUMENTATION

A. During the construction period through completion, provide photographic documentation of construction progress and at selected as per these specifications.

B. Photographic documentation elements:

1. Each digital image shall be taken with a camera with minimum size of 6 megapixels (MP) capable of producing 8 x 10 inch prints with a minimum of 2272 x 1704 pixels and 16 x 20 inch prints with a minimum 2592 x 1944 pixels.

2. Before construction, the columbarium plaza area, adjacent roadways, curbs, sidewalks, landscaping, adjacent utilities and adjacent structures surrounding the columbarium plaza site shall be documented. Overlapping photographic techniques shall be used to ensure maximum coverage. This documentation shall be required immediately before construction starts and at several pre-determined intervals before columbarium construction work commences.

3. Construction progress for all trades shall be tracked at pre-determined intervals, but not less than once every thirty (30) calendar days (“Progressions”). Progression documentation shall track construction of the columbarium walls, foundations, pavement systems and site utilities. Exterior Progressions shall track 360 degrees around the site and each building.

4. As-built condition of site utilities shall be documented prior to placing concrete and/or backfilling. This process shall include all utility runs in the immediate vicinity of the columbarium walls. Overlapping photographic techniques shall be used to ensure maximum coverage.
5. As-built conditions of exterior skin and elevations of the columbarium walls shall be documented with an increased concentration of digital photographs as directed by the Resident Engineer in order to capture pre-determined focal points, as determined by the Resident Engineer. Overlapping photographic techniques shall be used to ensure maximum coverage.
6. Miscellaneous events that occur during any Contractor site visit, or events captured by the Owner independently, shall be dated, labeled and inserted into a Section in the navigation structure entitled “Slideshows,” allowing this information to be stored in the same “place” as the formal scope.
7. Customizable project-specific digital photographic documentation of other details or milestones.
8. Monthly (29 minimum) exterior progressions (360 degrees around the project) and slideshows (all columbarium wall elevations).
9. Weekly (21 minimum) Site Progressions - Photographic documentation capturing the project at different stages of construction. These progressions shall capture excavation, grading, backfill, landscaping and road construction throughout the duration of the project.

C. Images must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.

D. Coordinate the timing of the photo shoots with the Resident Engineer. Contractor shall also attend construction team meetings as necessary. Contractor’s operations team shall provide regular updates regarding the status of the documentation, including photo shoots concluded, the availability of new Progressions or Exact-Builts viewable on-line and anticipated future shoot dates.

E. Contractor shall provide all on-line domain/web hosting, security measures, and redundant server back-up of the documentation.

F. Contractor shall provide technical support related to using the system or service.

G. Upon completion of the project, final copies of the documentation (the “Permanent Record”) shall be provided in an electronic media format, typically a CD/DVD or external hard-drive.

H. All photographs shall be free of shadows or reflections of the photographer or other objects.

1.23 FINAL ELEVATION DIGITAL IMAGES

A. A minimum of four (4) images of each elevation of the Columbarium Walls shall be taken with a minimum 6 MP camera, by a photographer using a camera with different settings to allow the Resident Engineer to select

the image to be printed. All images are provided to the Resident Engineer on a CD/DVD or external hard drive.

B. Photographs shall be taken upon completion, including landscaping. They shall be taken on a clear sunny day to obtain sufficient detail to show depth and to provide clear, sharp pictures. Pictures shall be 16 by 20 inches, printed on regular weight paper, matte finish archival grade photographic paper and produced by a RA4 process from the digital image with a minimum 300 PPI. Identifying data shall be carried on label affixed to back of photograph without damage to photograph and shall be similar to that provided for final construction photographs.

C. Furnish six (6) 16 by 20 inch color prints of the columbarium walls constructed under this project. Photographs shall be artistically composed showing full front elevations. All images shall become property of the State.

D. All photographs shall be free of shadows or reflections of photographer or other objects.

END OF SECTION

SECTION 01 10 00
SUMMARY OF WORK

PART 1 GENERAL

1.01 PROJECT DESCRIPTION

A. Rhode Island Department of Administration, Division of Capital Asset Management and Maintenance and Rhode Island Office of Veterans Services the Owner), located at One Capitol Hill, Providence, RI, is requesting the demolition, associated site preparation, and construction of Rhode Island Veterans Memorial Cemetery Columbarium Plaza Expansion CW-4 Project Phase 1 located at 301 South County Trail, Exeter, Rhode Island and within the cemetery the site is along the cemeteries ring road and access road to the maintenance facility north of the CW-1 area.

B. The CW-4 Phase 1 project is located at the Rhode Island Veterans' Memorial Cemetery (RIVMC) in Exeter, RI. The project site is situated along the northeast portion of the existing loop road, the outer ring of the iconic concentric roadway layout within the cemetery. It is flanked to the north and south by two existing columbarium wall plazas, titled CW-2 and CW-1 respectively. The plaza to the south, surrounds a central, octagonal shaped committal shelter. Immediately to the north is an existing maintenance drive which leads to the working cemetery maintenance yard, to the east. The CW-4 Phase 1 project site is pastoral in nature. Although largely free of trees, there are existing evergreen and deciduous trees bordering the CW-1 site along with a strong buffer of evergreens to the east, helping to visually shield the day to day bustle of the cemetery maintenance yard. The existing turf ground plane gently slopes away from the roadway edge at 3-4% and the site is relatively free-draining.

1.02 Scope of Work

A. The work covered by this Contract shall include the following activities, conducted in accordance to the contract bid documents and under the supervision of the Owner and the Owner's Representative

1. Demolition of Existing site structures including pavement, walls, walkway, vegetation, trees.
2. Removal, relocation, and Resetting of existing utilities and sidewalks,
3. Site Preparation, columbarium walls and foundations, grading, stormwater drainage system, water line relocation, planting, irrigation and associated electrical, and paving of the columbaria plaza, sidewalks, and off-road parking areas, including:
   a. Bituminous pavement
   b. Granite curb

c. Concrete sidewalk and plaza areas
d. Watering Stationing, Trash and Flower Vase Receptables
e. Accessible ramps and crosswalk

4. On-site stockpile in windrows of excavated topsoil for re-use

5. On-site disposal of excess soils not acceptable for re-use to be transported to the cemetery's soil storage area

B. Refer to the drawings for a detailed layout and scope of each aspect to the project.

C. In addition to the general construction activities described previously, the work encompassed by the subject contract shall include, but is not limited to the following documentation:

1. Coordination with the Owner and the Owners representatives.

2. Implementation of approved Soil Erosion and Sediment Control Plan, in accordance with the RIDEM "Stormwater Construction Permit and Water Quality Certification". (Reference WQC File No. 20-063 and RIPDES File No. RIR 1020230). Site inspections must be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of each storm event of 0.25 inch or greater in a 24-hour period during construction to ensure that the erosion controls are intact.

3. Payment and Performance Bonds as described under General Conditions.

4. Specific Insurance coverage as described under General Conditions.

5. Construction and maintenance of a temporary construction fence.

6. Mobilize all equipment to the job site that is needed to complete the work and then decontaminate and demobilize same upon completion.

7. Prepare for work by preparing and submitting for approval Health and Safety, Traffic Control, Storm Water Management / Erosion Control Plan, Shop drawings, as well as all other submittals required to complete the work.

8. Install erosion control systems per the drawings.

9. Provide all equipment and materials needed to control dust within the project limits as directed by the Owner's Representative.

10. Site clearing, grubbing and erosion control, including removal and disposal of all debris.

11. Earth excavation, soil handling, hauling, placement, compaction, grading and on-site disposal of excess soils.

12. Furnish, install and grade new clean fill barrier material.

13. Maintain the site and control erosion during the work until

such time that vegetative cover has been established and accepted by the Owner.

D. All work items listed above shall be completed in accordance with all Local, State, and Federal regulations and industry standard best practices as pertaining to each work item.

1.03 SPECIAL REQUIREMENTS

A. The Contractor will coordinate the construction schedule with the Owner's Representative to ensure that access to areas is permitted during the planned time.

B. The Contractor shall be responsible for removing and protecting any equipment that may interfere with the construction operations. Immediately upon completion of construction activities in a given area, the contractor shall be responsible for maintaining the site in a finished condition until accepted by the Owner.

C. The Contractor shall be responsible for verifying the existing and forecasted weather conditions to determine when the conditions are acceptable for work conditions and may be performed in full compliance with the construction storm water management plan.

D. The Contractor shall always be prepared to protect any uncompleted work from the rapid changes in the weather. If work continues during sudden rains the Contractor shall be responsible to protect the work area.

1.04 FORM OF SPECIFICATION

A. These specifications are written in imperative and abbreviated form. Imperative language of Specification sections is directed at Contractor, unless specifically noted otherwise. Incomplete sentences in Specifications shall be completed by inserting "shall," "Contractor shall," "shall be," and similar mandatory phrases by inference in same manner as they are applied to notes on Drawings. Words "shall be" shall be supplied by inference where colon (:) used within sentences or phrases. Except as worded to contrary, fulfill (perform) indicated requirements whether stated imperatively or otherwise.

B. Items of work are specified by section. Specifications or requirements of one or more sections may apply or be referenced in other sections.

C. The Contractor shall provide work described and comply with requirements stated in each Specification section and Drawings unless specifically assigned to other Contractors or Owner.

1.05 WORK BY OTHERS

A. The Contractor shall limit activities to the areas designated to not interfere with work by other on-site contractors or tenants.

1.06 MILESTONES

A. The Contractor shall adhere to the schedule items outlined in the specifications. The construction schedule shall be submitted to the Engineer for approval within seven (7) days of execution of the Contract. Limit activities to the areas designated to not interfere

with work by other on-site contractors or tenants. It is the intent of this contract to begin project work by late Summer / early Fall 2020 and to be substantially complete work by September 15, 2021 and fully complete work by December 20, 2021.

1.04 CONTRACTORS USE OF PREMISE

A. The Contractor shall limit use of premises for work and storage of materials to allow for the following.

1. Work by other contractors.
2. Owner / Tenant occupancy.

B. The Contractor shall conduct operations to ensure least inconvenience to the owner, facility tenants and other contractors.

C. The Contractor shall assume full responsibility for protection and safekeeping of site areas, Contractor's equipment and products, under this Contract.

D. The Contractor shall confine operations to areas within the contract limits indicated and shall not disturb portions of the site beyond areas in which Work is indicated.

E. The Contractor shall keep driveways, roads, and entrances serving premises clear, clean and available to Owner and public always except when approved by Owner's Representative and shall not use these areas for parking or storage of materials.

F. The Contractor shall not use any of the facilities of the tenants or neighbors at any time.

G. The Contractor shall schedule deliveries to minimize space and time requirement for storage of materials and equipment on Site.

H. The Contractor shall not use the Main Entrance of the cemetery for access to the site. Access shall be through the entrance near the cemetery's maintenance facility on Veterans Place off Main Street.

1.05 MISCELLANEOUS PROVISIONS

I. Background Screening.

1. The Rhode Island State Police require that the General Contractor as well as their employees, subcontractors and agents submit to and satisfactorily complete a criminal history check, performed through the Bureau of Criminal Identification (BCI). The General Contractors is required to furnish the Rhode Island State Police with a list of all persons who will be performing work under this Contract and shall designate which persons will be performing work at the project site. Such list shall include the full name and date of birth of each person listed. As deemed necessary, The Rhode Island State Police also reserves the right to request that any listed individuals provide a State issued Driver's License; State issued Identification Card or Passport. Further, the General Contractor shall provide The Rhode Island

State Police with updates to such list throughout the duration of the project to include any new contractors, subcontractors, employees or agents who will be performing work under this Contract. The Rhode Island State Police, in its discretion may decide that anyone with a criminal history will not be allowed to work at the project site.

2. Pursuant to the above, The General Contractor shall not utilize any employees who are not included on the above-referenced list. Further, The General Contractor shall immediately remove any employee, subcontractor, independent contractor or agent performing services under this Contract if it becomes known to the Contractor that such person may pose a potential security threat or danger. The General Contractor's failure to comply with the requirements set forth herein shall be considered a material breach of this Agreement upon where this Agreement may be terminated, at the sole discretion of the Owner or Rhode Island State Police, without any further compensation to Contractor

A.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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SECTION 01 31 10
CONSTRUCTION MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This Section specifies requirements for project meetings including but not limited to Pre-Construction Conference and Progress Meetings.

B. It shall be the responsibility of the Contractor to coordinate work between all subcontractors, sections, and trades required for the proper completion of the Work.

1.2 PRE-CONSTRUCTION CONFERENCE:

A. After the bids have been opened but prior to the start of the construction there will be a pre-construction conference to discuss the phasing and scheduling of the Project. The specific time and place of the conference shall be arranged by the Engineer after the Contract has been awarded.

B. This pre-construction conference is intended to establish lines of communication between the parties involved, review responsibilities and personnel assignments, establish project schedules, discuss proposed performance methods, and coordinate Work to be performed by subcontractors.

C. Authorized representatives of the Owner, Engineer and their consultants, the Contractor, its Superintendent and Site Foreman, and all others invited by the Contractor, shall attend the pre-construction conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

D. Discuss items of significance at the pre-construction conference that could affect progress including at least the following:

1. Tentative construction schedule
2. Critical Work sequencing
3. Designation of responsible personnel
4. Procedures for processing field decisions and Change Orders
5. Procedures for processing Applications for Payment
6. Review of Davis Bacon and another federal requirement
7. Distribution of Contract Documents
8. Submittal of Shop Drawings, Product Data and Samples
9. Preparation of record documents
10. Use of the premises
11. Office, work and storage, and laydown areas
12. Equipment deliveries
13. Construction safety procedures

14. Environmental health and safety procedures
15. First aid
16. Security
17. Housekeeping
18. Working hours
19. Traffic Control
20. Emergency Vehicle Access to and around work site
21. Environmental protection measures for construction site

1.3 PROGRESS MEETINGS:

A. During the course of the Project, the Contractor shall attend weekly progress meetings as scheduled by the Owner. The Owner, based on work progress and activities, may adjust the progress meetings to biweekly or other. The attendance of subcontractors may be required during the progress of the Work. The Contractor's delegate to the meeting shall be prepared and authorized to discuss the following items:

1. Progress of Work/Critical Work Sequencing in relation to Contract Schedule.
2. Proposed Work activities for forthcoming period.
3. Resources committed to Contract.
4. Coordination of Work with others.
5. Status of procurement of equipment and materials.
6. Status of Submittals.
7. Outstanding actions, decisions, or approvals that affect Work activities.
8. Site access and/or security issues
9. Hazards and risks
10. Housekeeping
11. Quality issues
12. Potential Claims
13. Change Orders
14. Costs, budget, and payment requests

B. The Contractor shall revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized and the revised schedule shall be submitted to the Engineer and Owner.

PART 2 - PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

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SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 – GENERAL

1.1 DESCRIPTION

A. This specification defines the general requirements and procedures for submittals. A submittal is information submitted for Owner's Representative review to establish compliance with the Contract Documents.

B. Detailed submittal requirements are found in the technical sections of the contract specifications. The Resident Engineer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective technical specifications at no additional cost to the government.

C. Owner's Representative approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.

1.2 DEFINITIONS

A. Preconstruction Submittals: Submittals which are required prior to issuing contract notice to proceed or starting construction. For example, Certificates of insurance; Surety bonds; Site-specific safety plan; Construction progress schedule; Schedule of values; Submittal register; List of proposed subcontractors.

B. Shop Drawings: Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be integrated and coordinated.

C. Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions, and brochures, which describe and illustrate size, physical appearance, and other characteristics of

materials, systems, or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.

D. Samples: Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed to establish standards by which the ensuing work can be judged.

E. Design Data: Calculations, mix designs, analyses, or other data pertaining to a part of work.

F. Test Reports: Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

G. Certificates: Document required of Contractor, or of a manufacturer, supplier, installer, or subcontractor through Contractor. The purpose is to document procedures, acceptability of methods, or personnel qualifications for a portion of the work.

H. Manufacturer's Instructions: Pre-printed material describing installation of a product, system, or material, including special notices and MSDS concerning impedances, hazards, and safety precautions.

I. Manufacturer's Field Reports: Documentation of the testing and verification actions taken by manufacturer's representative at the job site on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must indicate whether the material, product, or system has passed or failed the test.

J. Operation and Maintenance Data: Manufacturer data that is required to operate, maintain, troubleshoot, and repair equipment, including

manufacturer's help, parts list, and product line documentation. This data shall be incorporated in an operations and maintenance manual.

K. Closeout Submittals: Documentation necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a phase of construction on a multi-phase contract.

1.3 SUBMITTAL REGISTER

A. The submittal register will list items of equipment and materials for which submittals are required by the specifications. This list may not be all inclusive and additional submittals may be required by the specifications. The Contractor is not relieved from supplying submittals required by the Contract Documents but which have been omitted from the submittal register.

B. The submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period.

C. The Owner will provide the initial submittal register in electronic format. Thereafter, the Contractor shall track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Owner.

D. The Contractor shall update the submittal register as submittal actions occur and maintain the submittal register at the project site until final acceptance of all work by Resident Engineer.

E. The Contractor shall submit formal monthly updates to the submittal register in electronic format. Each monthly update shall document actual submission and approval dates for each submittal.

1.4 SUBMITTAL SCHEDULING

A. Submittals are to be scheduled, submitted, reviewed, and approved prior to the acquisition of the material or equipment.

B. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow time for potential resubmittal.

C. No delay costs or time extensions will be allowed for time lost in late submittals or resubmittals.

D. All submittals are required to be approved prior to the start of the specified work activity.

1.5 SUBMITTAL PREPARATION

A. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

B. Collect required data for each specific material, product, unit of work, or system into a single submittal. Prominently mark choices, options, and portions applicable to the submittal. Partial submittals will not be accepted for expedition of construction effort. Submittal will be returned without review if incomplete.

C. If available product data is incomplete, provide Contractor-prepared documentation to supplement product data and satisfy submittal requirements.

D. All irrelevant or unnecessary data shall be removed from the submittal to facilitate accuracy and timely processing. Submittals that contain the excessive amount of irrelevant or unnecessary data will be returned with review.

E. Provide a transmittal form for each submittal with the following information:

1. Project title, location and number.
2. Construction contract number.
3. Date of the drawings and revisions.
4. Name, address, and telephone number of subcontractor, supplier, manufacturer, and any other subcontractor associated with the submittal.
5. List paragraph number of the specification section and sheet number of the contract drawings by which the submittal is required.

6. When a resubmission, add alphabetic suffix on submittal description. For example, submittal 18 would become 18A, to indicate resubmission.
7. Product identification and location in project.

F. The Contractor is responsible for reviewing and certifying that all submittals are in compliance with contract requirements before submitting for Owner review. Proposed deviations from the contract requirements are to be clearly identified. All deviations submitted must include a side by side comparison of item being proposed against item specified. Failure to point out deviations will result in the Owner requiring removal and replacement of such work at the Contractor's expense.

G. Stamp, sign, and date each submittal transmittal form indicating action taken.

H. Stamp used by the Contractor on the submittal transmittal form to certify that the submittal meets contract requirements is to be similar to the following:

```
 ____________________________________________________________________
|                              CONTRACTOR                            |
|                                                                    |
|                              (Firm Name)                           |
|                                                                    |
|______Approved                                                      |
|                                                                    |
|                                                                    |
|______Approved with corrections as noted on submittal data and/or   |
| attached sheets(s)                                                 |
|                                                                    |
|                                                                    |
| SIGNATURE: ________________________________________________________|
|                                                                    |
| TITLE: _____________________________________________________________|
|                                                                    |
| DATE: ______________________________________________________________|
|                                                                    |
|____________________________________________________________________|
```

1.6 SUBMITTAL FORMAT AND TRANSMISSION

A. Provide submittals in electronic format, with the exception of material samples. Use PDF as the electronic format, unless otherwise specified or directed by the Resident Engineer.

B. Compile the electronic submittal file as a single, complete document. Name the electronic submittal file specifically according to its contents.

C. Electronic files must be of sufficient quality that all information is legible. Generate PDF files from original documents so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required.

D. E-mail electronic submittal documents smaller than 5MB in size to e-mail addresses as directed by the Resident Engineer.

E. Provide electronic documents over 5MB through an electronic FTP file sharing system. Confirm that the electronic FTP file sharing system can be accessed from the Owner computer network. The Contractor is responsible for setting up, providing, and maintaining the electronic FTP file sharing system for the construction contract period of performance.

F. Provide hard copies of submittals when requested by the Resident Engineer. Up to 3 additional hard copies of any submittal may be requested at the discretion of the Resident Engineer, at no additional cost to the Owner.

1.7 SAMPLES

A. Submit two sets of physical samples showing range of variation, for each required item.

B. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified.

C. When color, texture, or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

D. Before submitting samples, the Contractor is to ensure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

E. The Owner reserves the right to disapprove any material or equipment which previously has proven unsatisfactory in service.

F. Physical samples supplied maybe requested back for use in the project after reviewed and approved.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.

B. In the event the Contractor fails to deliver O&M Data within the time limits specified, the Resident Engineer may withhold from progress payments 50 percent of the price of the item with which such O&M Data are applicable.

1.9 TEST REPORTS

SRE may require specific test after work has been installed or completed which could require contractor to repair test area at no additional cost to contract.

1.10 OWNER REVIEW OF SUBMITTALS AND RFIS

A. The Owner will review all submittals for compliance with the technical requirements of the Contract Documents. The Architect-Engineer for this project will assist the Owner in reviewing all submittals and determining contractual compliance. Review will be only for conformance with the applicable codes, standards and contract requirements.

B. Period of review for submittals begins when the Owner receives submittal from the Contractor.

C. Period of review for each resubmittal is the same as for initial submittal.

D. Owner review period is 15 working days for submittals.

E. Owner review period is 10 working days for RFIs.

F. The Owner will return submittals to the Contractor with the following notations:

1. "Approved": authorizes the Contractor to proceed with the work covered.
2. "Approved as noted": authorizes the Contractor to proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections.
3. "Disapproved, revise and resubmit": indicates noncompliance with the contract requirements or that submittal is incomplete. Resubmit with appropriate changes and corrections. No work shall proceed for this item until resubmittal is approved.
4. "Not reviewed": indicates submittal does not have evidence of being reviewed and approved by Contractor or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals after taking appropriate action.

1.11 APPROVED SUBMITTALS

A. The Owner approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory.

B. Owner approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor’s expense.

C. After submittals have been approved, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

D. Retain a copy of all approved submittals at project site, including approved samples.

1.12 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

END OF SECTION

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SECTION 01 35 26
SAFETY REQUIREMENTS

TABLE OF CONTENTS

1.1 APPLICABLE PUBLICATIONS 3

1.2 DEFINITIONS 4

1.3 REGULATORY REQUIREMENTS 6

1.4 ACCIDENT PREVENTION PLAN (APP) 6

1.5 ACTIVITY HAZARD ANALYSES (AHAs) 11

1.6 PRECONSTRUCTION CONFERENCE 13

1.7 “SITE SAFETY AND HEALTH OFFICER” (SSHO) and “COMPETENT PERSON” (CP) .. 14

1.8 TRAINING 15

1.9 INSPECTIONS 16

1.10 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS 17

1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE) 17

1.12 FIRE SAFETY 18

1.13 ELECTRICAL 20

1.16 FALL PROTECTION 22

1.17 SCAFFOLDS AND OTHER WORK PLATFORMS 22

1.18 EXCAVATION AND TRENCHES 23

1.19 CRANES 25

1.20 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT) 26

1.21 CONFINED SPACE ENTRY 26

1.22 WELDING AND CUTTING 27

1.23 LADDERS 27

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SECTION 01 35 26
SAFETY REQUIREMENTS

1.1 APPLICABLE PUBLICATIONS:

A. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

B. American Society of Safety Engineers (ASSE):

A10.1-2011.....Pre-Project & Pre-Task Safety and Health Planning

A10.34-2012.....Protection of the Public on or Adjacent to Construction Sites

A10.38-2013.....Basic Elements of an Employer’s Program to Provide a Safe and Healthful Work Environment American National Standard Construction and Demolition Operations

C. American Society for Testing and Materials (ASTM):

E84-2013.....Surface Burning Characteristics of Building Materials

D. The Facilities Guidelines Institute (FGI):

FGI Guidelines-2010Guidelines for Design and Construction of Healthcare Facilities

E. National Fire Protection Association (NFPA):

10-2013.....Standard for Portable Fire Extinguishers

30-2012.....Flammable and Combustible Liquids Code

51B-2014.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work

70-2014.....National Electrical Code

70B-2013.....Recommended Practice for Electrical Equipment Maintenance

70E-2015 .....Standard for Electrical Safety in the Workplace

99-2012.....Health Care Facilities Code

241-2013.....Standard for Safeguarding Construction, Alteration, and Demolition Operations

F. The Joint Commission (TJC)

TJC Manual .....Comprehensive Accreditation and Certification Manual

G. U.S. Nuclear Regulatory Commission

10 CFR 20 .....Standards for Protection Against Radiation

H. U.S. Occupational Safety and Health Administration (OSHA):

29 CFR 1904 .....Reporting and Recording Injuries & Illnesses

29 CFR 1910 .....Safety and Health Regulations for General Industry

29 CFR 1926 .....Safety and Health Regulations for Construction Industry

CPL 2-0.124.....Multi-Employer Citation Policy

I. VHA Directive 2005-007

1.2 DEFINITIONS:

A. Critical Lift. A lift with the hoisted load exceeding 75% of the crane’s maximum capacity; lifts made out of the view of the operator (blind picks); lifts involving two or more cranes; personnel being hoisted; and special hazards such as lifts over occupied facilities, loads lifted close to power-lines, and lifts in high winds or where other adverse environmental conditions exist; and any lift which the crane operator believes is critical.

B. OSHA “Competent Person” (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).

C. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

D. High Visibility Accident. Any mishap which may generate publicity or high visibility.

E. Accident/Incident Criticality Categories:

No impact – near miss incidents that should be investigated but are not required to be reported to the Owner;

Minor incident/impact – incidents that require first aid or result in minor equipment damage (less than $5000). These incidents must be investigated but are not required to be reported to the Owner;

Moderate incident/impact – Any work-related injury or illness that results in:

1. Days away from work (any time lost after day of injury/illness onset);
2. Restricted work;
3. Transfer to another job;
4. Medical treatment beyond first aid;
5. Loss of consciousness;
6. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (5) above or,
7. any incident that leads to major equipment damage (greater than $5000).

These incidents must be investigated and are required to be reported to the Owner;

Major incident/impact – Any mishap that leads to fatalities, hospitalizations, amputations, and losses of an eye as a result of contractors' activities. Or any incident which leads to major property damage (greater than $20,000) and/or may generate publicity or high visibility. These incidents must be investigated and are required to be reported to the Owner as soon as practical, but not later than 2 hours after the incident.

E. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.3 REGULATORY REQUIREMENTS:

A. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, comply with 29 CFR 1910 as incorporated by reference within 29 CFR 1926, comply with ASSE A10.34, and all applicable federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern except with specific approval and acceptance by the Resident Engineer.

1.4 ACCIDENT PREVENTION PLAN (APP):

A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent

one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

B. The APP shall be prepared as follows:

1. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these Owner contract safety specifications.

2. Address both the Prime Contractors and the subcontractors work operations.

3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.

4. Address all the elements/sub-elements and in order as follows:

a. SIGNATURE SHEET. Title, signature, and phone number of the following:

1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);

2) Plan approver (company/corporate officers authorized to obligate the company);

3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).

b. BACKGROUND INFORMATION. List the following:

1) Contractor;

2) Contract number;

3) Project name;

4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).

c. STATEMENT OF SAFETY AND HEALTH POLICY. Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor’s written safety program goals, objectives, and accident experience goals for this contract should be provided.

d. RESPONSIBILITIES AND LINES OF AUTHORITIES. Provide the following:

1) A statement of the employer’s ultimate responsibility for the implementation of his SOH program;

2) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes.

3) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached.;

4) Requirements that no work shall be performed unless a designated competent person is present on the job site;

5) Requirements for pre-task Activity Hazard Analysis (AHAs);

6) Lines of authority;

7) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;

e. SUBCONTRACTORS AND SUPPLIERS. If applicable, provide procedures for coordinating SOH activities with other employers on the job site:

1) Identification of subcontractors and suppliers (if known);

2) Safety responsibilities of subcontractors and suppliers.

f. TRAINING.

1) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.

2) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc…) and any requirements for periodic retraining / recertification are required.

3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.

4) OSHA 10-hour training is required for all workers on site, including Owner, DCAMM, and consultant team members, and the OSHA 30-hour training is required for Trade Competent Persons (CPs).

g. SAFETY AND HEALTH INSPECTIONS.

1) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., “Site Safety and Health CP”), proof of inspector’s training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.

2) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT)

h. ACCIDENT/INCIDENT INVESTIGATION & REPORTING. The Contractor shall conduct mishap investigations of all Moderate and Major as well as all High Visibility Incidents. The APP shall include accident/incident investigation procedure and identify person(s) responsible to provide the following to the Resident Engineer:

1) Exposure data (man-hours worked);

2) Accident investigation reports;

3) Project site injury and illness logs.

i. PLANS (PROGRAMS, PROCEDURES) REQUIRED. Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational, patient, and public safety risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:

1) Emergency response;

2) Contingency for severe weather;

3) Fire Prevention;

4) Medical Support;

5) Posting of emergency telephone numbers;

6) Prevention of alcohol and drug abuse;

7) Site sanitation(housekeeping, drinking water, toilets);

8) Night operations and lighting;

9) Hazard communication program;

10) Welding/Cutting “Hot” work;

11) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);

12) General Electrical Safety;

13) Hazardous energy control (Machine LOTO);

14) Site-Specific Fall Protection & Prevention;

15) Excavation/trenching;

16) Asbestos abatement;

17) Lead abatement;

18) Crane Critical lift;

19) Respiratory protection;

20) Health hazard control program;

21) Radiation Safety Program;

22) Abrasive blasting;

23) Heat/Cold Stress Monitoring;

24) Crystalline Silica Monitoring (Assessment);

25) Demolition plan (to include engineering survey);

26) Formwork and shoring erection and removal;

27) PreCast Concrete;

28) Public (Mandatory compliance with ANSI/ASSE A10.34-2012).

C. Submit the APP to the Resident for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

D. Once accepted by the Resident Engineer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer in accordance with FAR Clause 52.236-13, *Accident Prevention*, until the matter has been rectified.

E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Resident Engineer, Project Manager, and project superintendent, project overall designated OSHA Competent Person, and facility Safety Manager. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public and the environment.

1.5 ACTIVITY HAZARD ANALYSES (AHAS):

A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to

perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site).

B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.

C. Work shall not begin until the AHA for the work activity has been accepted by the Resident Engineer and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.

2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).

   a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.

   b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.

3. Submit AHAs to the Resident for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS,

PRODUCT DATA AND SAMPLES for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to the Resident Engineer.

1.6 PRECONSTRUCTION CONFERENCE:

A. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.

B. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

C. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 days of submittal, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted.

1.7 “SITE SAFETY AND HEALTH OFFICER” (SSHO) AND “COMPETENT PERSON” (CP):

A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.

B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).

C. These Competent Persons can have collateral duties as the subcontractor’s superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations). However, the SSHO has be a separate qualified individual from the Prime Contractor’s Superintendent and/or Quality Control Manager with duties only as the SSHO.

D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.

E. The repeated presence of uncontrolled hazards during a contractor’s work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

1.8 TRAINING:

A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.

B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.

C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented “repeat” deficiencies in the execution of safety requirements will require retaking the requisite formal course.

D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.

E. Submit training records associated with the above training requirements to the Resident Engineer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance.

F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours,

locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the Resident Engineer that individuals have undergone contractor's safety briefing.

G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

1.9 INSPECTIONS:

A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the Contractors work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to Resident Engineer.

B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.

1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
2. The Resident Engineer will be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
4. A report of the inspection findings with status of abatement will be provided to the Resident Engineer within one week of the onsite inspection.

1.10 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS:

A. The prime contractor shall establish and maintain an accident reporting, recordkeeping, and analysis system to track and analyze all injuries and illnesses, high visibility incidents, and accidental property damage (both government and contractor) that occur on site. Notify the Resident Engineer as soon as practical, but no more than four hours after any accident meeting the definition of a Moderate or Major incidents, High Visibility Incidents, , or any weight handling and hoisting equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Resident Engineer determine whether a government investigation will be conducted.

B. Conduct an accident investigation for all Minor, Moderate and Major incidents as defined in paragraph DEFINITIONS, and property damage accidents resulting in at least $20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162 (or equivalent), and provide the report to the Resident Engineer within 5 calendar days of the accident. The Resident will provide copies of any required or special forms.

C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Resident Engineer monthly.

D. A summation of all Minor, Moderate, and Major incidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Resident Engineer monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Resident Engineer as requested.

1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE):

A. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on

electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.

B. Mandatory PPE includes:

1. Hard Hats – unless written authorization is given by the Resident Engineer in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.

2. Safety glasses - unless written authorization is given by the Resident Engineer in circumstances of no eye hazards, appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.

3. Appropriate Safety Shoes – based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Resident Engineer in circumstances of no foot hazards.

4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

1.12 FIRE SAFETY

A. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Resident Engineer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.

B. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Resident Engineer.

G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Resident Engineer.

H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

L. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Resident Engineer. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.

M. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Resident Engineer.

N. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer. Obtain permits from Resident Engineer at least 2 hours in advance. Designate

contractor's responsible project-site fire prevention program manager to permit hot work.

O. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Resident Engineer.

P. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

Q. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

1.13 ELECTRICAL

A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J – General Environmental Controls, 29 CFR Part 1910 Subpart S – Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.

B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.

C. All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition (refer to NFPA 70E for Work Involving Electrical Hazards, including Exemptions to Work Permit). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards, or is infeasible due to equipment design or operational limitations is energized work permitted. The Resident Engineer with approval of the Medical Center Director will make the determination if the circumstances would meet the exception outlined above. An AHA and permit specific to energized work activities

will be developed, reviewed, and accepted by the Owner prior to the start of that activity.

1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.

2. Verification of the absence of voltage after de-energization and lockout/tagout is considered “energized electrical work” (live work) under NFPA 70E, and shall only be performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.

3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the Resident Engineer.

D. Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alterative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity and permit for energized work has been reviewed and accepted by the Resident Engineer and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

E. Ground-fault circuit interrupters. GFCI protection shall be provided where an employee is operating or using cord- and plug-connected tools related to construction activity supplied by 125-volt, 15-, 20-, or 30-ampere circuits. Where employees operate or use equipment supplied by greater than 125-volt, 15-, 20-, or 30- ampere circuits, GFCI protection or an assured equipment grounding conductor program shall be

implemented in accordance with NFPA 70E - 2015, Chapter 1, Article 110.4(C)(2).

1.16 FALL PROTECTION

A. The fall protection (FP) threshold height requirement for ALL WORK, as specified in OSHA 29 CFR 1926 requirements.

1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
3. A Warning Line System (WLS) shall be erected around all sides of open work area (See 29 CFR 1926.502(f) for construction of WLS requirements).
4. Fall protection while using a ladder will be governed by the OSHA requirements.

1.17 SCAFFOLDS AND OTHER WORK PLATFORMS

A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.

B. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16.

C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.

1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
4. Emergency descent devices shall not be used as working platforms.

D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red

indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person's name and signature;
2. Dates of initial and last inspections.

E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

1.18 EXCAVATION AND TRENCHES

A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P. Excavations less than 2 feet in depth require evaluation by the contractor's "Competent Person" (CP) for determination of the necessity of an excavation protective system where kneeing, laying in, or stooping within the excavation is required.

B. All excavations and trenches 24 inches in depth or greater shall require a written trenching and excavation permit (NOTE – some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall have two sections, one section will be completed prior to digging or drilling and the other will be completed prior to personnel entering the excavations greater than 5 feet in depth. Each section of the permit shall be provided to the Resident Engineer prior to proceeding with digging or drilling and prior to proceeding with entering the excavation. After completion of the work and prior to opening a new section of an excavation, the permit shall be closed out and provided to the Resident Engineer. The permit shall be maintained onsite and the first section of the permit shall include the following:

1. Estimated start time & stop time
2. Specific location and nature of the work.
3. Indication of the contractor's "Competent Person" (CP) in excavation safety with qualifications and signature. Formal course in excavation safety is required by the contractor's CP.

4. Indication of whether soil or concrete removal to an offsite location is necessary.
5. Indication of whether soil samples are required to determined soil contamination.
6. Indication of coordination with local authority (i.e. “One Call”) or contractor’s effort to determine utility location with search and survey equipment.
7. Indication of review of site drawings for proximity of utilities to digging/drilling.

The second section of the permit for excavations greater than five feet in depth shall include the following:

1. Determination of OSHA classification of soil. Soil samples will be from freshly dug soil with samples taken from different soil type layers as necessary and placed at a safe distance from the excavation by the excavating equipment. A pocket penetronmeter will be utilized in determination of the unconfined compression strength of the soil for comparison against OSHA table (Less than 0.5 Tons/FT2 – Type C, 0.5 Tons/FT2 to 1.5 Tons/FT2 – Type B, greater than 1.5 Tons/FT2 – Type A without condition to reduce to Type B).
2. Indication of selected protective system (sloping/benching, shoring, shielding). When soil classification is identified as “Type A” or “Solid Rock”, only shoring or shielding or Professional Engineer designed systems can be used for protection. A Sloping/Benching system may only be used when classifying the soil as Type B or Type C. Refer to Appendix B of 29 CFR 1926, Subpart P for further information on protective systems designs.
3. Indication of the spoil pile being stored at least 2 feet from the edge of the excavation and safe access being provided within 25 feet of the workers.
4. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere

exists or could reasonably be expected to exist. Internal combustion engine equipment is not allowed in an excavation without providing force air ventilation to lower the concentration to below OSHA PELs, providing sufficient oxygen levels, and atmospheric testing as necessary to ensure safe levels are maintained.

C. As required by OSHA 29 CFR 1926.651(b)(1), the estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

1. The planned dig site will be outlined/marked in white prior to locating the utilities.
2. Used of the American Public Works Association Uniform Color Code is required for the marking of the proposed excavation and located utilities.
3. 811 will be called two business days before digging on all local or State lands and public Right-of Ways.
4. Digging will not commence until all known utilities are marked.
5. Utility markings will be maintained

D. Excavations will be hand dug or excavated by other similar safe and acceptable means as excavation operations approach within 3 to 5 feet of identified underground utilities. Exploratory bar or other detection equipment will be utilized as necessary to further identify the location of underground utilities.

E. Excavations greater than 20 feet in depth require a Professional Engineer designed excavation protective system.

1.19 CRANES

A. All crane work shall comply with 29 CFR 1926 Subpart CC.

B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no “Phase In” date.

C. A detailed lift plan for all lifts shall be submitted to the Resident Engineer 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing and all other elements of a critical lift plan where the lift meets the definition of a critical lift. Critical lifts require a more comprehensive lift plan to minimize the potential of crane failure and/or catastrophic loss. The plan must be reviewed and accepted by the General Contractor before being submitted to the Owner for review. The lift will not be allowed to proceed without prior acceptance of this document.

D. Crane operators shall not carry loads

1. over the general public or Owner personnel

2. over any occupied building unless

a. the top two floors are vacated

b. or overhead protection with a design live load of 300 psf is provided

1.20 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment [1926.702(j)], heavy machinery & equipment [1926.600(a)(3)(i)], and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with Section 1.15 to include NFPA 70E and other specific requirements discussed in the section.

1.21 CONFINED SPACE ENTRY

A. All confined space entry shall comply with 29 CFR 1926, Subpart AA except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches [1926.651(g)].

B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the Resident Engineer.

1.22 WELDING AND CUTTING

As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer. Obtain permits from Resident Engineer at least 2 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

1.23 LADDERS

A. All Ladder use shall comply with 29 CFR 1926 Subpart X.

B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.

C. Manufacturer safety labels shall be in place on ladders

D. Step Ladders shall not be used in the closed position

E. Top steps or cap of step ladders shall not be used as a step

F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.

1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.

2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.

G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

END OF SECTION

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SECTION 01 40 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents related to this section include, but are not limited to, General Conditions, Special Conditions, Bidding Documents, Technical Specifications and Drawings

1.2 QUALITY CONTROL

A. The Contractor shall be:

1. Acceptable to the Owner.
2. Acceptable and approved by the material manufacturers / suppliers.

B. Any deficiencies noted during construction inspection must be corrected by the contractor and approved by the Owner at no additional cost to the Owner.

1.3 FIELD QUALITY CONTROL

A. The existing dimensions shown on the plans are approximated and used to describe the scope of work. The contractor shall verify all existing dimensions.

B. Any discrepancies found must be submitted to the Owner’s Representative in writing.

1.4 RANDOM SAMPLING

A. During work, the Owner / Owner’s Representative may at their discretion secure samples of materials being used from containers at the job site and submit them to an independent laboratory for testing and comparison to specified materials.

B. If test results prove that a material is not functionally equal to specified material:

1. The Contractor shall pay for all testing.
2. All materials having failed testing that have been installed will be removed and replaced with specified materials at no additional expense to the Owner.
3. All materials having failed testing not installed will be removed from the job site and replaced with specified materials at no additional expense to the Owner.

PART 2 – PRODUCTS

2.1 GENERAL

A. Comply with quality control, references, specifications and manufacturer's data. Where a conflict exists, the more stringent requirements govern.

PART 3 – EXECUTION

3.1 SUBMITTALS

A. Provide property Owner/Engineer a letter from the material manufacturer indicating that the applicator is approved to install their products and will provide warranty for this installation.

END OF SECTION

SECTION 01 40 50
SAMPLING & TESTING

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. In the event that Owner testing discovers unsatisfactory work, the Contractor shall conduct any additional testing in accordance with this specification. The work under this Section shall consist of performing or ordering the work of collecting samples for testing, having tests performed by a Certified Testing Laboratory satisfactory to the Engineer, having all test results forwarded to the Engineer for approval, and paying all costs associated with the collection and sampling, transportation, shipping, postage, and testing, and the coordination of test results and approvals.

1.2 SUBMITTALS

A. In accordance with Section 01 30 23 of these Specifications, submit the names, addresses and certification of laboratories to be utilized for approval by the Engineer.

PART 2 – MATERIALS

2.1 CONTAINERS AND TOOLS

A. Utilize tools recommended by the laboratory to obtain samples, packaging or containers suitable to, or furnished by, the laboratory, and collect all samples in the proper number and quantity to permit tests to be conducted.

2.2 TESTS

A. Refer to Section specifications for test requirements and criteria for results; coordinate with the Resident Engineer.

B. All utilities, irrigation, pre-cast concrete, and any other components from the scope of work as requested by the Resident Engineer shall be tested to ensure complete compliance with manufacturer’s installation instructions and warrantee requirements.

PART 3 – EXECUTION

3.1 METHODOLOGY

A. Unless otherwise directed by the Section specifications, perform sampling and testing will be ordered by the Contractor and approved by the Resident Engineer. Locations, number and quantity of samples shall be submitted for approval as directed in accordance with the Specifications.

B. Sampling and Testing results must be provided to the Resident Engineer and Approved prior to the installation of any work potentially impacted by unacceptable test results.

END OF SECTION

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SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Contractor shall provide all temporary facilities enumerated herein or required for the proper completion of the work.

B. Temporary facilities shall include but not limited to:

1. Temporary Sanitary Facilities.
2. Lockable Trailer/Storage Container.
3. Temporary Electrical Power.
4. Temporary Construction Security Fence.
5. Temporary Water Service.

C. Construction Facilities:

1. Lockable Trailer/Storage Container.
2. Vehicular access.
3. Parking.
4. Progress cleaning and waste removal
5. Sanitation.
6. Temporary Project identification.
7. Traffic regulation.
8. Fire-prevention facilities.

D. Temporary Controls:

1. Barriers.
2. Enclosures and fencing.
3. Security.
4. Water control.
5. Dust control.
6. Soil erosion and sediment control.
7. Noise control.
8. Pest and rodent control.
9. Pollution control.
10. Maintenance and Protection of Traffic.

E. Removal of utilities, facilities, and controls.

PART 2 - FACILITIES

2.1 TEMPORARY SANITARY FACILITIES

A. Adequate sanitary conveniences for use of workman on the premises, properly secluded from public observance, shall be provided and maintained by the Contractor, in accordance with local and state health requirements, and in such a manner and at such points as shall be approved by these authorities, and their use shall be strictly enforced. Sanitary waste shall be treated and disposed of in a manner satisfactory to the Owner and the local and state authorities. Under no circumstances shall sanitary wastes be allowed to flow on the surface of the ground.

2.2 ELECTRICAL POWER

A. The Contractor shall provide all temporary electrical power required to operate equipment for the duration of the Contract.

B. The securing of all permits and approvals from the regulating utility companies shall be the responsibility of the Contractor. All unauthorized sources of power, such as from neighboring homes, shall be prohibited.

2.3 LOCKABLE TRAILER/STORAGE CONTAINER

A. The Contractor shall provide a lockable trailer/storage container to safely secure all new equipment and materials as required.

B. The Owner will designate the storage location.

C. Field Office: Weathertight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture as determined by the Contractor’s needs.

D. Provide space for Project meetings, with table and chairs to accommodate six persons.

E. Do not use existing facilities for field offices or for storage unless authorized and approved by the Owner.

2.4 TEMPORARY CONSTRUCTION FENCING

A. Temporary Construction Fencing is specified in Section 02 41 00 DEMOLITION.

2.5 TEMPORARY WATER SERVICES

A. The Contractor shall provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations. Exercise measures to conserve energy.

B. The Contractor shall not take the existing water supply out of service without notifying the Owner and coordination with the water authority.

2.6 REMOVALS

A. The Contractor shall remove and properly dispose of all temporary facilities at the satisfactory completion of the Contract.

B. All sites utilized for temporary facilities shall be restored to a condition satisfactory to the Owner

2.7 VEHICULAR ACCESS

A. Construct temporary seasonally appropriate access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes.

B. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Use designated existing on-site roads for construction traffic.

E. Designated Access Routes:

1. Access from the east: Route 2, South County Trail onto Main Street then Veterans Place to the gated, paved access road, then through to the construction area. Gate access limited to cemetery hours.
2. Access routes shall not remove or temporarily displace any existing roadside guardrail or fencing, unless otherwise approved.
3. Provide a sketch (or stake in the field) of intended access route(s) for approval.
4. Prior to any clearing/pruning, identify the existing trees to remain and to be felled along the access route from the public thoroughfares to construction area.

5. The limits of clearing within the access route shall be kept to a minimum.
6. Place plastic road or other suitable matting along access route to minimize impact to existing turf or soil.
7. Locate as approved by Owner.
8. **The main entrance and roadway to the Rhode Island Veterans Memorial Cemetery shall NOT be used for a construction access route**.
9. Access to the cemetery stored soil storage area on the western side of the cemetery beyond J field will be limited to the most direct route to and from the soil storage area and the construction site.
10. The Contractor shall coordinate access during off-hours with the Resident Engineer.

2.8 PARKING

A. The Contractor shall Provide and Construct temporary gravel surface parking areas to accommodate construction personnel.

B. Locate as within the Construction Area.

C. If Site space is not adequate, provide additional off-site parking.

D. Use of existing on-site streets and driveways used for construction traffic is **not** permitted. Tracked vehicles are not allowed on paved areas.

E. Use of existing parking facilities used by construction personnel is **not** permitted.

F. Do not allow heavy vehicles or construction equipment in parking areas.

G. Do not allow vehicle parking on existing pavement.

H. Designate **one** parking space for Resident Engineer.

I. Permanent Pavements and Parking Facilities:

1. Before Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.

2. Avoid traffic loading beyond paving design capacity. Tracked vehicles are not allowed.

J. Maintenance:

1. Maintain traffic and parking areas in sound condition **free of excavated material, construction equipment, products, mud, snow, ice, and the like**.

2. Maintain existing **and permanent** paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.

K. Removal, Repair:

1. Remove temporary materials and construction **when permanent paving is usable** and **at Substantial Completion**.

2. Remove underground Work and compacted materials to depth indicated on plans; fill and grade Site as indicated.

3. Repair **existing** and any unacceptable **permanent** facilities damaged by use, to original condition.

L. Mud from Site vehicles: Provide means of removing mud from vehicle wheels before entering streets.

2.9 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.

B. Collect and remove waste materials, debris, and rubbish from Site **weekly** and dispose of off-site.

2.10 TEMPORARY PROJECT IDENTIFICATION

A. Project Identification Sign:

1. DESCRIPTION:

a. No signs or advertisements will be allowed to be displayed on the premises, except those signs which are a part of the Contract.

b. Provide project identification sign to the size and detail as directed herein.

2. RELATED WORK:

a. Documents affecting work of this Section include, but are not necessarily limited to:
Section 01 00 00 General Conditions
Supplementary Conditions
Sections in Division 1 of these Specifications.

2.11 TRAFFIC REGULATION

A. Signs, Signals, and Devices:

1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.

2. Traffic Control Signals: As approved by local jurisdictions.

3. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.

4. Flag Person Equipment: As required by authorities having jurisdiction.

B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. Traffic Signs and Signals:

1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.

3. Relocate signs and signals as Work progresses, to maintain effective traffic control.

E. Removal:

1. Remove equipment and devices **when no longer required** and/or **at Substantial Completion**.

2. Repair damage caused by installation.

3. Remove post settings to depth of **2** feet.

2.12 FIRE-PREVENTION FACILITIES

A. Prohibit smoking within cemetery at **ALL TIMES**. This is a smoke-free / No Smoking site.

B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

2.13 ENCLOSURES AND FENCING

A. Construction fencing shall be in accordance with the requirements of Section 02 41 00 DEMOLITION.

B. Exterior Enclosures:

1. Provide temporary weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

2.14 SECURITY

A. Security Program:

1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

2. Initiate program in coordination with Owner's existing security system at Project mobilization.

3. Maintain program throughout construction period until Owner's acceptance precludes need for Contractor's security.

B. Entry Control:

1. Maintain log of workers and visitors and make available to Owner on request.

C. Personnel Identification:

1. Maintain list of accredited persons and submit copy to Owner on request.

D. Restrictions:

1. Do not allow cameras on Site or photographs taken except by written approval of Owner.

2. Do no work on days indicated in Owner-Contractor Agreement.

2.15 WATER CONTROL

A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.

B. Protect Site from puddles or running water. Provide water barriers as required to protect Site from Soil Erosion and Sediment Control Plan.

2.16 DUST CONTROL

A. Execute Work by methods that minimize raising dust from construction operations.

B. Provide positive means to prevent airborne dust from dispersing into atmosphere and into Owner-occupied areas.

2.17 SOIL EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent soil erosion and sedimentation.

B. Minimize surface area of bare soil exposed at one time.

C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.

E. Periodically inspect earthwork to detect evidence of soil erosion and sedimentation. Promptly apply corrective measures.

F. Comply with Soil Erosion and Sediment Control Plan indicated on Contract Documents.

2.18 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations.

2.19 PEST AND RODENT CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work.

B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

2.20 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

B. Comply with pollution and environmental control requirements of Federal, State, and local authorities having jurisdiction in Rhode Island.

2.21 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials before Substantial Completion inspection.

B. Remove underground installations to in entirety. Grade Site as indicated on Drawings.

C. Clean and repair damage caused by installation or use of temporary Work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 3 - PRODUCTS - Not Used

PART 4 - EXECUTION - Not Used

END OF SECTION

SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:

1. Adversely effect human health or welfare,
2. Unfavorably alter ecological balances of importance to human life,
3. Effect other species of importance to humankind, or;
4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

C. Definitions of Pollutants:

1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.

5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.

6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

7. Sanitary Wastes:

   a. Sewage: Domestic sanitary sewage and human and animal waste.

   b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2 QUALITY CONTROL

A. Establish and maintain quality control for the environmental protection of all items set forth herein.

B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. U.S. National Archives and Records Administration (NARA):

33 CFR 328.....Definitions

1.4 SUBMITTALS

A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:

1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after

the meeting, the Contractor shall prepare and submit to the Resident Engineer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.

g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.

h. Permits, licenses, and the location of the solid waste disposal area.

i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Soil Erosion and Sediment

Control Plan approved by the Rhode Island Department of Environmental Management.

j. Environmental Monitoring Plans for the job site including land, water, air, and noise.

k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Soil Erosion and Sediment Control Plan.

B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

1.5 PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Resident Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.

2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.

a. Box and protect from damage existing trees and shrubs to remain on the construction site.

b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.

c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.

3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.

4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.

a. Sediment Basins: Trap sediment from construction areas in temporary or permanent sediment basins that accommodate the runoff of a local 10-year (design year) storm. After each storm, pump the basins dry and remove the accumulated sediment. Control overflow/drainage with paved weirs or by vertical overflow pipes, draining from the surface.

b. Reuse or conserve the collected topsoil sediment as directed by the Resident Engineer. Topsoil use and requirements are specified in Section 31 20 00, EARTHWORK.

c. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.

5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features shown on the Soil Erosion and Sediment Control Plan.

Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.

6. Manage borrow areas on the property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.

7. Manage and control spoil areas on the property to limit spoil to areas shown on the Soil Erosion and Sediment Control Plan and prevent erosion of soil or sediment from entering nearby water courses or lakes.

8. Protect adjacent areas from despoilment by temporary excavations and embankments.

9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off the property and dispose of waste in compliance with Federal, State, and local requirements.

10. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.

11. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer.

C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.

1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.

2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.

D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.

E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Rhode Island and Rhode Island Department of Environmental Management, Office of Air Resources, Air Pollution Statue, Rule, or Regulation and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.

2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.

3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.

4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the Resident Engineer. Maintain noise-produced work at or below the decibel levels and within the time periods specified.

1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 4:00 p.m unless otherwise permitted by local ordinance or the Resident Engineer. Construction activities should be timed to be respectful and work coordinated with the Resident Engineer and cemetery when services are planned at the CW-1 Committal Chapel and CS-2 columbaria plaza both adjacent to the project site. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:

a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

EARTHMOVING		MATERIALS HANDLING	
FRONT LOADERS	75	CONCRETE MIXERS	75
BACKHOES	75	CONCRETE PUMPS	75
DOZERS	75	CRANES	75
TRACTORS	75	DERRICKS IMPACT	75
SCAPERS	80	PILE DRIVERS	95
GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS, STATIONARY	80	PNEUMATIC TOOLS	80
PUMPS	75	BLASTING	--
GENERATORS	75	SAWS	75
COMPRESSORS	75	VIBRATORS	75

b. Use shields or other physical barriers to restrict noise transmission.

c. Provide soundproof housings or enclosures for noise-producing machinery.

d. Use efficient silencers on equipment air intakes.

e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.

f. Line hoppers and storage bins with sound deadening material.

g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.

3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face. Submit the recorded information to the Resident Engineer noting any problems and the alternatives for mitigating actions.

G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Owner. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.

H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the Resident Engineer. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.

B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.

C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:

1. Waste Management Plan development and implementation.
2. Techniques to minimize waste generation.
3. Sorting and separating of waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling of materials that cannot be reused or sold.

D. At a minimum the following waste categories shall be diverted from landfills:

1. Soil.
2. Inerts (e.g., concrete, masonry and asphalt).
3. Clean dimensional wood and palette wood.
4. Green waste (biodegradable landscaping materials).
5. Engineered wood products (e.g., plywood, particle board and I-joists, etc).
6. Metal products (e.g., steel, wire, beverage containers, copper, etc).
7. Cardboard, paper and packaging.
8. Bitumen roofing materials.
9. Plastics (e.g., ABS, PVC).
10. Paint.

1.2 RELATED WORK

A. Section 02 41 00, DEMOLITION.

B. Section 01 00 00, GENERAL REQUIREMENTS.

1.3 QUALITY ASSURANCE

A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:

1. Excess or unusable construction materials.
2. Packaging used for construction products.
3. Poor planning and/or layout.
4. Construction error.
5. Over ordering.
6. Weather damage.
7. Contamination.
8. Mishandling.
9. Breakage.

B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.

C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.

D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.

E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website http://www.wbdg.org/tools/cwm.php

provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.

F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.

G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.

H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.

B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.

C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.

D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.

E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).

F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.

G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.

H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality

objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.

I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.

K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.

2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.

N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.

O. Return: To give back reusable items or unused products to vendors for credit.

P. Salvage: To remove waste materials from the site for resale or re-use by a third party.

Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.

R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.

S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

B. Prepare and submit to the Resident Engineer a written demolition debris management plan. The plan shall include, but not be limited to, the following information:

1. Procedures to be used for debris management.

2. Techniques to be used to minimize waste generation.

3. Analysis of the estimated job site waste to be generated:

a. List of each material and quantity to be salvaged, reused, recycled.

b. List of each material and quantity proposed to be taken to a landfill.

4. Detailed description of the Means/Methods to be used for material handling.

a. On site: Material separation, storage, protection where applicable.

b. Off site: Transportation means and destination. Include list of materials.

1) Description of materials to be site-separated and self-hauled to designated facilities.

2) Description of mixed materials to be collected by designated waste haulers and removed from the site.

c. The names and locations of mixed debris reuse and recycling facilities or sites.

d. The names and locations of trash disposal landfill facilities or sites.

e. Documentation that the facilities or sites are approved to receive the materials.

C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

1.6 APPLICABLE PUBLICATIONS

A Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.

B. U.S. Green Building Council (USGBC):

LEED Green Building Rating System for New Construction

1.7 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, reused.

B. List of each material and quantity proposed to be taken to a landfill.

C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.

B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

END OF SECTION

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SECTION 01 89 00
SITE CONSTRUCTION PERFORMANCE REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Provide on-site and office services of licensed Professional Land Surveyor to establish location, layout and elevations of all site improvements and features to be supplied, built and otherwise installed on this Project.

1.02 RELATED WORK UNDER OTHER SECTIONS

A. The requirements of this Section 01 89 00 shall apply to all Sections of this Specification.

1.03 REFERENCES

A. State of Rhode Island, Department of Business Regulation, licensure for Professional Land Surveyor.

1.04 SUBMITTALS

A. Submit name and contact information to Resident Engineer for Land Surveyor, including Rhode Island License Number, Type of License, Expiration Date, contact address and telephone number.

1.05 QUALITY CONTROL TESTING REQUIREMENTS

A. Contractor shall select and the Resident Engineer will approve a licensed Professional Land Surveyor to layout and establish the elevations of all site improvements and features. Professional Land Surveyor shall be paid directly by the Contractor.

1.06 QUALITY ASSURANCE

A. Unless specifically waved by the Resident Engineer, the Contractor shall employ and pay all costs for a Professional Land Surveyor who is licensed by the State of Rhode Island, to locate and lay out all site improvements and features from AutoCAD files of the Contract Drawings provided by the Resident Engineer.

B. Consulting Professional Land Surveyor shall establish all contours and spot grades in accordance with the Drawings and as directed by the Resident Engineer.

C. Contractor shall provide a dedicated computer on the Project site with all of the AutoCAD files, layout drawing files, and submittals downloaded and available during construction hours. Contractor shall employ a technician with sufficient AutoCAD skills and experience to provide assistance and direction for layout and grading of all site features during construction. Contractor shall provide technical

assistance to sub-contractors and material suppliers necessary to develop accurate and suitable shop drawings and submittals for review by the Resident Engineer in accordance with all submittal requirements described elsewhere in these Specifications and Contract Documents.

D. Pre-installation Conference: Conduct conference at Project site prior to the start of excavation and filling.

1. Before commencing work of this Contract, meet with the Resident Engineer to review layout and grading issues with the Professional Land Surveyor. Review layout procedures and responsibilities. Notify participants at least three working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.07 LAYOUT AND GRADES

A. Benchmarks and Horizontal Survey Control: The Contractor shall create, maintain and/or reestablish benchmarks, horizontal survey control and survey monuments necessary for the work of these Contract Documents as are found to exist on the site to provide a base reference for the construction. Replace any which may become destroyed or disturbed. Provide temporary benchmarks and horizontal survey control as required. Provide minimum four (4) each of permanent benchmarks and horizontal survey control points at end of project. Record location and elevations of permanent benchmarks and horizontal survey control points on As-Built drawings.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.01 GENERAL

A. Electronic files of all AutoCAD Drawings will be made available to the Contractor by the Resident Engineer prior to the start of work. Contractor shall utilize these AutoCAD files to locate all site improvements and features installed as Work of this Contract. Coordinate location of all site improvements with existing above and below grade features to remain. The Contractor shall report conflicts and discrepancies between new site improvements and existing conditions immediately to the Resident Engineer.

B. Contractor shall ensure the presence of the Professional Land Surveyor on the Project site as necessary to provide horizontal and vertical controls.

3.02 LAYOUT

A. Limit of Work line is noted on the Drawings. Contractor shall be responsible for locating all site improvements and features to avoid damage to operations and existing conditions inside the Limit of Work designated to remain and to avoid damage to operations and existing

conditions outside the Limit of Work. Restore to original conditions all existing conditions designed to be protected and retained that are damaged during the course of construction. Restoration shall be at no additional cost to the Owner. Resident Engineer will determine restoration standards and quality.

B. Professional Land Surveyor shall locate all site improvements and features in relation and proportion to one another and to existing conditions, site boundaries and legal bounds as shown on the AutoCAD files. Deviation from distances, angles, offsets and dimensions established by the AutoCAD files shall not be tolerated and any deviations found on the site shall be rectified and corrected by the Contractor at no additional cost to the Owner.

3.03 GRADES AND ELEVATIONS

A. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slopes between points for which finished grades are indicated or between such points and existing established grades. In the event the Drawings do not provide for positive drainage in all locations, notify the Resident Engineer immediately.

B. Establish and maintain suitable stakes over all areas to be graded as directed, specified or required. Maintain sufficient reference points at all times during construction to properly perform the contract installation.

END OF SECTION

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SECTION 01 90 00
RIDOT STANDARD SPECIFICATION SECTIONS

Refer to the following standard specification sections of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition, for the following work items but not limited to:

1. Section 201 Site Preparation
2. Section 202 Excavation and Embankment
3. Section 203 Structure Excavation and Backfill
4. Section 204 Trimming and Fine Grading
5. Section 205 Trench Excavation
6. Section 206 Perimeter Erosion Controls
7. Section 208 Temporary Dewatering Basins
8. Section 209 Storm Drain Protection
9. Section 211 Construction Accesses
10. Section 212 Maintenance and Cleaning of Erosion and Pollution Controls
11. Section 302 Gravel Borrow Subbase Courses
12. Section 401 Dense Graded Hot Mix Asphalt (HMA) Pavements
13. Section 601 Portland Cement Concrete
14. Section 701 Culverts and Storm Drains
15. Section 702 Manholes, Inlets and Catch Basins
16. Section 703 Underdrains and Combination Drains
17. Section 706 Plug and Cap Pipe - All Sizes
18. Section 711 Paved Waterways
19. Section 712 Water and Gas Gate Boxes

SECTION 01 90 00
RIDOT STANDARD SPECIFICATION SECTIONS

20. Section 905 Sidewalks and Driveways
21. Section 906 Curbing for Roadways
22. Section 907 Dust Control
23. Section 919 Test Pits
24. Section 920 Riprap
25. Section 931 Cleaning and Sweeping Pavement
26. Section 932 Cutting and Matching Pavement
27. Section 936 Mobilization and Demobilization
28. Section 942 Detectable Warning Panel
29. Section T.15 Directional, Regulatory and Warning Signs
30. Section T.20 Pavement Markings
31. Section L.04 Refertilization of Seeded, Sodded and Grassed Areas
32. Section L.09 Selective Clearing
33. Section M.01 Borrow and Aggregates
34. Section M.03 Bituminous Pavements
35. Section M.04 Drainage
36. Section M.09 Curbing
37. Section M.10 Dust Control, Riprap, Stone Walls, Cobblestones, Flagstones and Highway Bounds
38. Section M.16 Signs and Sign Supports
39. Section M.17 Pavement Markings

SECTION 01 90 00
RIDOT STANDARD SPECIFICATION SECTIONS

A. In all cases where a conflict between RIDOT Standard Specifications and Division 00 through 33 Sections are in conflict the Resident Engineer will determine which of the conflicting standards is more stringent and to the greater benefit of the Owner. The Contractor shall submit all conflicts for review and consideration by the Resident Engineer in accordance with the requirements of Section 01 33 23 SHOP DRAWINGS.

END OF SECTION

SECTION 01 90 00
RIDOT STANDARD SPECIFICATION SECTIONS

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SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SUMMARY:

A. This section specifies demolition and removal of buildings, portions of buildings, utilities, other structures and debris from trash dumps shown.

1.02 RELATED WORK:

A. Demolition and removal of trees and stumps, roads, walks, curbs, and on-grade slabs outside buildings to be demolished: Section 31 20 00, EARTHWORK.

B. Clearing and grubbing of existing turf and stockpiling of topsoil shall be in accordance with the requirements of section 31 20 00 EARTHWORK.

C. Safety Requirements: Section 01 35 26 Safety Requirements Article, ACCIDENT PREVENTION PLAN (APP).

D. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

E. Construction Waste Management: Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

1.03 PROTECTION:

A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations.

C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

D. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.

E. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Owner; any damaged items shall be repaired or replaced as approved by the Resident Engineer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required.

F. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

G. The work shall comply with the requirements of Section 01 35 26, SAFETY REQUIREMENTS.

1.04 UTILITY SERVICES:

A. Demolish and remove outside utility service lines shown to be removed.

B. Cap and leave in place outside utility service lines shown to be left in place.

C. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

PART 2 PRODUCTS

2.01 TREE PROTECTION FENCING

A. Posts for Fencing: ASTM F1083, High Strength Grade Schedule 40, minimum yield strength 50,000 psi, zinc-coated steel pipe. Posts shall be 3.500 inch outside diameter.

B. ASTM A392, #9-gauge wire woven in a 2-inch mesh. Top and bottom selvage shall have knuckled finish. Zinc-coating weight shall be 2.0 ounces per square foot. Comply with Chain Link Fence Manufacturers Institute (CLFMI) Product Manual. Furnish one-piece fabric widths all project chain link fencing. Wire size includes zinc or aluminum coating.

C. Tension Wire: Metallic Coated Steel Marcelled Tension Wire: 7gauge (0.177 inch) marcelled wire complying with ASTM A824, Type II Zinc-Coated, ASTM A817 Class 5 - 2.0 oz/ft^2

D. Tie Wire and Hog Rings: Galvanized minimum zinc coating 1.20 oz/ft^2, 9-gauge (0.148 inch) steel wire in compliance with ASTM F626. Vinyl coated to match fabric.

2.02 TEMPORARY CONSTRUCTION FENCING

A. Construction fencing shall be provided enclosing all work and storage areas or where indicated on the drawings. Unless otherwise shown or directed, all fencing shall be 8 feet high, accurately aligned and plumb, adequately braced, and complete with gates, locks, and hardware as required.

B. UNDER NO CONDITIONS SHALL FENCING BE ATTACHED OR ANCHORED TO EXISTING WALLS, CONSTRUCTION. PAVEMENTS, SITE FURNISHINGS OR TREES.

C. Fencing shall be as follows:

1.1 Construction fencing for use at perimeter of work area shall be equal to commonly available rent-a-fence products. Fencing shall be panels of chain link fence in new or near-new condition. Fabric shall be uniform, square mesh diagonal pattern measuring approximately 2 inches on its parallel sides. Provide

standard 12-foot panel sections, 8-foot height, with vertical and horizontal cross bars. Panels shall be free standing. Provide weights as required to prevent wind-blown failure. Panels shall be connected with approved corrosion resistant wire, ties, or similar attachment system.

D. Site access gates shall be provided as required of same material as site fence, complete with all operating hardware and security devices.

E. All gates shall be provided with latches and padlocks. All padlocks shall utilize a single master key. The same padlocks and master key system shall be utilized as the fence system is moved around the site. Provide no less than 3 copies of the master key to the Owner for their use.

F. Contractor shall submit drawings showing type, materials and construction of fencing to Owner’s Representative for approval before proceeding with installation.

G. Should fencing be required to be relocated during the course of the project, same shall be done at the total expense of the Contractor. At the completion of the project, the Contractor shall remove and dispose of the construction fencing.

H. The construction fence shall be maintained in good order by the Contractor throughout the life of the project.

I. All construction fencing shall include full height windscreen/privacy fabric, securely attached. Fence installation shall take into account resulting increased effect of wind load.

J. Remove and replace windscreen/privacy fabric within 3 working days of the fabric having been tagged by spray-applied graffiti paint or the appearance of tears, tatters, frays or rips.

PART 3 EXECUTION

3.01 DEMOLITION:

A. Completely demolish and remove designated site features, including all appurtenances related or connected thereto, as noted below:

1. As required for installation of new utility service lines.

B. Debris, including brick, concrete paving and foundations, stone, curbing, asphalt, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Cemetery Property to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Resident Engineer. Contractor shall dispose debris in compliance with applicable federal, state or local permits, rules and/or regulations.

C. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. All materials in the indicated trash dump areas, including above surrounding grade and extending to a depth of 1500mm (5

feet) below surrounding grade, shall be included as part of the lump sum compensation for the work of this section. Materials that are located beneath the surface of the surrounding ground more than 1500 mm (5 feet), or materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

D. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Resident Engineer. When Utility lines are encountered that are not indicated on the drawings, the Resident Engineer shall be notified prior to further work in that area.

3.02 SAW CUTTING EXISTING ASPHALT ROADWAY PAEMENT

A. At locations indicated saw cut existing asphalt pavement using masonry saws to create straight and well-defined transition between existing paving and new curbing and/or new asphalt pavement.

B. Saw cut as directed by the Resident Engineer.

3.03 REMOVE AND STOCKPILE FOR REUSE

A. As indicated, remove and stockpile existing directional signage for reuse and reinstallation as directed by the Resident Engineer.

3.04 CONSTRUCTION FENCING

A. Install temporary fencing in locations shown on the Contract Documents and as directed by the Resident Engineer. Install construction fencing with privacy fabric on the outside of the chain link fence fabric. Install tree protection fencing in locations shown on the Drawings.

B. Install all construction fencing and tree protection fencing prior to the start of any site preparation activities, including clearing and grubbing, earthwork, or similar operations.

C. Construct and maintain fences around exposed excavations as required for worker’s safety.

3.05 TREE PROTECTION FENCING

A. In locations indicated and as directed by the Resident Engineer install tree protection posts by direct burial methods to a depth sufficient to prevent wind throw.

B. Comply with Chain Link Fence Manufacturers Institute (CLFMI) Product Manual for installation requirements.

3.06 PROTECTION OF SITE FEATURES BEYOND THE LIMITS OF WORK

A. Protect and retain all site features, pavements, trees, curbing, signage and miscellaneous existing conditions beyond the Limit of Work line as indicated on the Drawings. Restore all elements beyond the Limit of Work line that have been damaged during the course of construction by contractors and subcontractors as directed by the Resident Engineer without additional cost to the Owner.

3.07 TREE REMOVAL

A. Remove trees as indicated on the Drawings in accordance with the following

B. Trees designated for removal on the plans shall be removed from the site. This work shall include the felling of the trees in such a way as to not injure trees to be saved, adjacent walls, utility lines and poles, buildings, planters, benches, lawns, plantings and pavement. Tree removal also shall include the satisfactory disposal off site of all tree trunks, branches, stumps, roots and vegetative debris produced through the tree removal operation.

C. Tree removal shall include removing the stumps to their full depth. Remove stumps from the site and dispose of stumps in a legal manner. Take care while removing stumps and roots of trees in in proximity to trees to be protected and retained to remove only those roots associated with the tree to be removed. Identify roots from adjacent trees and leave intact. Roll roots to be saved up in burlap and keep moist until new tree plantings have backfilled the existing roots.

D. Prior to the commencement of tree removal operations the Contractor shall review with the Resident Engineer those trees to be removed. Under no circumstances shall the tree removal operation commence without the written concurrence of the Resident Engineer.

E. Tree removal shall include root tracing as specified in this Section. Carefully lift and set aside tree roots of adjacent trees to be saved and protected. Do not damage the roots of adjacent trees during stump removal of trees designed for removal.

3.08 CLEAN-UP:

A. On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to Resident Engineer. Clean-up shall include off the Cemetery Property disposal of all items and materials not required to remain property of the Owner as well as all debris and rubbish resulting from demolition operations.

END OF SECTION

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SECTION 03 30 53
(SHORT-FORM) CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies cast-in-place structural concrete and material and mixes for other concrete.

1.2 RELATED WORK

A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.

B. Concrete roads, walks, and similar exterior site work: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

1.3 TOLERANCES

A. ACI 117.

B. Slab Finishes: ACI 117, F-number method in accordance with ASTM E1155.

1.4 REGULATORY REQUIREMENTS

A. ACI SP-66 - ACI Detailing Manual.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

1.5 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Concrete Mix Design.

C. Shop Drawings:

1. Submit Steel Reinforcement Shop Drawings and Product Data to include all information necessary for fabrication and placement of reinforcement.
2. Indicate grades of reinforcing steel.
3. Clearly indicate the splice length for every size and type of bar used.
4. Indicate the type, size and location of all accessories required for the proper assembly, placement and support of the reinforcement.
5. Provide layout drawings of all floor slabs and formed concrete indicating control and expansion joints.

D. Manufacturer's Certificates: Air-entraining admixture, chemical admixtures, curing compounds.

1.6 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

B. American Concrete Institute (ACI):

117-10	Tolerances for Concrete Construction and Materials and Commentary
211.1-91(R2009)	Selecting Proportions for Normal, Heavyweight, and Mass Concrete
211.2-98(R2004)	Selecting Proportions for Structural Lightweight Concrete
301-10	Structural Concrete
301-10	Specifications for Structural Concrete
305.1-06	Specification for Hot Weather Concreting
306.1-90(R2002)	Standard Specification for Cold Weather Concreting
SP-66-04	ACI Detailing Manual
318-11	Building Code Requirements for Structural Concrete and Commentary
347-04	Guide to Formwork for Concrete

C. American Society for Testing and Materials (ASTM):

A185/A185M-07	Steel Welded Wire Reinforcement, Plain, for Concrete
A615/A615M-12	Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
A996/A996M-09	Rail Steel and Axle Steel Deformed Bars for Concrete Reinforcement
C31/C31M-12	Making and Curing Concrete Test Specimens in the Field
C33/C33M-13	Concrete Aggregates
C39/C39M-12a	Compressive Strength of Cylindrical Concrete Specimens
C94/C94M-13	Ready Mixed Concrete
C143/C143M-12	Slump of Hydraulic Cement Concrete
C150/C150M-12	Portland Cement
C171-07	Sheet Materials for Curing Concrete
C172/C172M-10	Sampling Freshly Mixed Concrete
C173/C173M-12	Air Content of Freshly Mixed Concrete by the Volumetric Method

C192/C192M-12a	Making and Curing Concrete Test Specimens in the Laboratory
C231/C231M-10	Air Content of Freshly Mixed Concrete by the Pressure Method
C260/C260M-10a	Air-Entraining Admixtures for Concrete
C330/C330M-09	Lightweight Aggregates for Structural Concrete
C494/C494M-13	Chemical Admixtures for Concrete
C618-12a	Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
D1751-04(R2008)	Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
E1155-96(2008)	Determining FF Floor Flatness and FL Floor Levelness Numbers

PART 2 - PRODUCTS

2.1 FORMS

A. Wood, plywood, metal, or other materials, approved by RE/COR, of grade or type suitable to obtain type of finish specified.

2.2 MATERIALS

A. Portland Cement: ASTM C150, Type I or II.

B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalis, and loss on ignition (LOI) not to exceed 5 percent.

C. Coarse Aggregate: ASTM C33, Size 67. Size 467 may be used for footings and walls over 300 mm (12 inches) thick. Provide Size 7 coarse aggregate for applied topping and metal pan stair fill.

D. Fine Aggregate: ASTM C33.

E. Lightweight Aggregate for Structural Concrete: ASTM C330, Table 1

F. Mixing Water: Fresh, clean, and potable.

G. Air-Entraining Admixture: ASTM C260.

H. Chemical Admixtures: ASTM C494.

I. Reinforcing Steel: ASTM A615 or ASTM A996, deformed. See structural drawings for grade.

J. Welded Wire Fabric: ASTM A185.

K. Expansion Joint Filler: ASTM D1751.

L. Sheet Materials for Curing Concrete: ASTM C171.

M. Abrasive Aggregates: Aluminum oxide grains or emery grits.

N. Liquid Hardener and Dustproofer: Fluosilicate solution or magnesium fluosilicate or zinc fluosilicate. Magnesium and zinc may be used separately or in combination as recommended by manufacturer.

O. Liquid Densifier/Sealer: 100 percent active colorless aqueous siliconate solution.

P. Grout, Non-Shrinking: Premixed ferrous or non-ferrous, mixed and applied in accordance with manufacturer's recommendations. Grout cannot show settlement or vertical drying shrinkage at 3 days or thereafter based on initial measurement made at time of placement. Grout must produce a compressive strength of minimum 18 MPa (2500 psi) at 3 days and minimum 35 MPa (5000 psi) at 28 days.

Q. Integral Color Additives.

R. Concrete Rubbing Compound: Acrylic or approved equal.

2.3 CONCRETE MIXES

A. Design of concrete mixes using materials specified as set forth under Option C of ASTM C94.

B. Compressive strength at 28 days: as indicated.

C. Establish strength of concrete by testing prior to beginning concreting operation. Test consists of average of three cylinders made and cured in accordance with ASTM C192 and tested in accordance with ASTM C39.

D. Maximum slump for vibrated concrete is 100 mm (4 inches) tested in accordance with ASTM C143.

E. Cement and water factor (See Table I):

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete: Strength	Non-Air-Entrained		Air-Entrained	
Min. 28 Day Comp. Str. MPa (psi)	Min. Cement kg/m³ (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m³ (lbs/c. yd)	Max. Water Cement Ratio
30 (4000)[1,3]	325 (550)	0.55	340 (570)	0.50
25 (3000)[1,3]	280 (470)	0.65	290 (490)	0.55
25 (3000)[1,2]	300 (500)	*	310 (520)	*

1. If trial mixes are used, the proposed mix design must achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design must achieve a compressive strength 9.7 MPa (1400 psi) in excess of f’c.

2. Lightweight Structural Concrete. Pump mixes may require higher cement values.

3. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.

* Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

F. Air-entrainment is required for all exterior concrete and as required for Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS. Air content must conform with ACI 318 Table 4.4.1.

2.4 BATCHING AND MIXING

A. Store, batch, and mix materials as specified in ASTM C94.

1. Ready-Mixed: Comply with ASTM C94, except use of non-agitating equipment for transporting concrete to the site will not be permitted. With each load of concrete delivered to project, ready-mixed concrete producer must furnish, in duplicate, certification as required by ASTM C94.

PART 3 - EXECUTION

3.1 FORMWORK

A. Installation conforms to ACI 347. Sufficiently tight to hold concrete without leakage, sufficiently braced to withstand vibration of concrete, and to carry, without appreciable deflection while remaining within allowable construction tolerances, all dead and live loads to which they may be subjected.

B. Treating and Wetting: Treat or wet contact forms as follows:

1. Coat plywood and board forms with non-staining form sealer. In hot weather cool forms by wetting with cool water just before concrete is placed.

2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather, cool metal forms by thoroughly wetting with water just before placing concrete.

3. Use sealer on reused plywood forms as specified for new material.

C. Inserts, sleeves, and similar items: Flashing reglets, masonry ties, anchors, inserts, wires, hangers, sleeves, boxes for floor hinges and other items specified as furnished under this and other sections of specifications are required to be in their final position at time concrete is placed - properly located, accurately positioned, built into construction, and maintained securely in place.

D. Construction Tolerances:

1. Contractor is responsible for setting and maintaining concrete formwork to assure erection of completed work within tolerances specified to accommodate installation or other rough and finish materials. Remedial work necessary for correcting excessive tolerances is the responsibility of the Contractor. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Owner .

2. Permissible surface irregularities for various classes of materials are defined as "finishes" in Specification Sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.2 REINFORCEMENT

A. Details of concrete reinforcement, unless otherwise shown, in accordance with ACI 318 and ACI SP-66. Support and securely tie reinforcing steel to prevent displacement during placing of concrete.

3.3 PLACING CONCRETE

A. Remove water from excavations before concrete is placed. Remove hardened concrete, debris and other foreign materials from interior of forms, and from inside of mixing and conveying equipment. Obtain approval of RE/COR before placing concrete. Provide screeds at required elevations for concrete slabs.

B. Roughen and clean set concrete free from laitance, foreign matter, and loose particles, before placing new concrete on or against concrete which has set.

C. Convey concrete from mixer to final place of deposit by method which will prevent segregation or loss of ingredients. Do not deposit in work concrete that has attained its initial set or has contained its water or cement more than 1 1/2 hours. Do not allow concrete to drop freely more than 1500 mm (5 feet) in unexposed work nor more than 900 mm (3 feet) in exposed work. Place and consolidate concrete in horizontal layers not exceeding 300 mm (12 inches) in thickness. Consolidate concrete by spading, rodding, and mechanical vibrator. Do not secure vibrator to forms or reinforcement. Provide vibration continuously with placing of concrete.

D. Hot weather placing of concrete: Follow recommendations of ACI 305R to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete.

E. Cold weather placing of concrete: Follow recommendations of ACI 306R, to prevent freezing of thin sections less than 300 mm (12 inches) and to permit concrete to gain strength properly, except that use of calcium chloride cannot be used without written approval from RE/COR.

3.4 PROTECTION AND CURING

A. Protect exposed surfaces of concrete from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperature. Curing method is subject to approval by RE/COR.

3.5 FORM REMOVAL

A. Forms remain in place until concrete has a sufficient strength to carry its own weight and loads supported. Removal of forms at any time is the Contractor's sole responsibility.

3.6 SURFACE PREPARATION

A. Immediately remove loose materials, after forms have been removed and work has been examined and approved by RE/COR, and patch all stone pockets, surface honeycomb, or similar deficiencies with cement mortar made with 1 part portland cement and 2 to 3 parts sand.

B. For exposed surfaces of concrete for the columbarium and memorial walls and walls in their complexes, follow the procedures identified in Paragraph FINISHES for Exterior Exposed Areas (finished).

C. For columbarium and memorial walls and their complexes, immediately after forms are removed, take steps to prepare and smooth the exposed portions of the concrete. Remove the form marks, including joint marks, fins, burrs and similar projections to produce a smooth surface. Complete the surface finish to result in a uniform textured surface with homogeneous color, unless surface is to be otherwise treated. Work must be as approved during the review of the mock-up.

3.7 FINISHES

A. Vertical and Overhead Surface Finishes:

1. Unfinished Areas: Vertical and overhead concrete surfaces exposed in unfinished areas, above suspended ceilings in manholes, and other unfinished areas exposed or concealed will not require additional finishing.

2. Interior and Exterior Exposed Areas (to be painted): Fins, burrs and similar projections on surface must be knocked off flush by mechanical means approved by RE/COR and rubbed lightly with a fine abrasive stone or hone. Use an ample amount of water during rubbing without working up a lather of mortar or changing texture of concrete.

3. Interior and Exterior Exposed Areas (finished): Provide grout finish of uniform color and smooth finish treated as follows:

a. After concrete has hardened and laitance, fins and burrs have been removed, scrub concrete with wire brushes. Clean stained concrete surfaces by use of a hone or stone.

b. Apply grout composed of 1 part Portland cement and 1 part clean, fine sand (smaller than 600 micro-m (No. 30) sieve). Work grout into surface of concrete with cork floats or fiber brushes until all pits and honeycomb are filled.

c. After grout has hardened, but still plastic, remove surplus grout with a sponge rubber float and by rubbing with clean burlap.

d. In hot, dry weather use a fog spray to keep grout wet during setting period. Complete finish for any area in same day. Confine limits of finished areas to natural breaks in wall surface. Do not leave grout on concrete surface overnight.

B. Slab Finishes:

1. Steel Trowel Finish: Applied toppings, concrete surfaces to receive resilient floor covering or carpet, future floor roof and all monolithic concrete floor slabs exposed in finished work and for which no other finish is shown or specified must be steel troweled. Delay final steel troweling to secure a smooth, dense surface as long as possible, generally when the surface can no longer be dented with finger. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure on trowel to compact cement paste and form a dense, smooth surface. Finished surface must be free of trowel marks, uniform in texture and appearance.

2. Broom Finish: Finish all exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after the surfaces have been floated.
3. Finished slab flatness (FF) and levelness (FL) values must comply with the following minimum requirements:

Slab On Grade & Shored Suspended Slabs	
Specified overall value	F_F 25/F_L 20
Minimum local value	F_F 17/F_L 15

3.8 SURFACE TREATMENTS

A. Mix and apply surface treatments in accordance with manufacturer's printed instructions.

B. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non-slip abrasive aggregate to treads and platforms of all concrete steps and stairs, and to surfaces of exterior concrete ramps and platforms. Broadcast aggregate uniformly over concrete surface. Trowel concrete surface to smooth dense finish. After curing, rub the treated surface with abrasive brick and water sufficiently to slightly expose abrasive aggregate.

3.9 RETAINING WALLS

A. Provide concrete for retaining walls as shown and air-entrained.

B. Install and construct expansion and contraction joints, waterstops, weep holes, reinforcement and railing sleeves as shown.

C. Finish exposed surfaces to match adjacent concrete surfaces, new or existing.

D. Porous backfill shall be placed as shown.

3.10 PRECAST CONCRETE ITEMS

A. Cast precast concrete items, not specified elsewhere, using 25 MPa (3000 psi) air-entrained concrete to shapes and dimensions shown. Finish surfaces to match corresponding adjacent concrete surfaces. Reinforce with steel as necessary for safe handling and erection.

END OF SECTION

SECTION 03 48 24
PRECAST CONCRETE COLUMBARIUM UNITS

PART 1 GENERAL

1.01 SUMMARY

A. This section covers the manufacture and installation of precast concrete columbarium units, as shown on the drawings and specified herein, including but not limited to: the steel reinforcement, steel embedment plates, required sleeves, finished exposed surfaces, preparation of setting surface, adhesive, columbarium fasteners, and niche cover anchor clip assemblies.

B. Acceptable designs of the columbarium units' components are provided as shown on the Drawings. The Contractor may use this design for this Work or may propose alternate designs of the corresponding components as follows:

1. Design for alternate columbarium units shall comply with the design criteria as per Articles 1.3.F and shall comply with the functional tests as per Article 1.3.G of this Specification.

2. Unless indicated otherwise, all provisions of this Specification shall apply to the Contractor proposed design.

C. The State may accept or reject part or all of any design proposed by the Contractor.

D. This section includes preparation, cleaning and finishing of exposed faces of the columbarium units as indicated on drawings or described herein.

1.02 RELATED DOCUMENTS

A. Section 31 20 00 EARTHWORK

B. Section 03 30 53 (SHORT FORM) CAST-IN-PLCE CONCRETE

C. Section 04 43 00 NATURAL STONE VENEER, installation of stone veneer and wall caps.

D. Section 04 73 00 NICHE COVERS, installation of State supplied granite niche covers.

E. Section 07 92 00 JOINT SEALANTS, Materials and Workmanship for sealant application.

F. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1.03 QUALITY ASSURANCE

A. Manufacturer’s and Installer’s Qualifications: Prior to commencement of work, submit documentation regarding the experience of his precast concrete supplier and his precast concrete installer in the design, manufacture and installation of Precast Concrete structures and custom units.

B. Precast concrete manufacturer's qualified Registered Professional Structural Engineer to certify that precast reinforced concrete conforms to specified requirements.

C. Codes and regulations of the Federal, State and County authorities shall apply.

D. Fabricate to dimensions shown or approved. Replace or correct Columbarium Units that do not comply with the individual dimensions and tolerances.

E. Before starting production of Precast Concrete Columbarium Units, furnish at the site, two complete Precast Concrete Columbarium Units, to demonstrate quality of construction. Commence production of columbarium units only after written approval has been obtained from the Resident Engineer.

F. Design Criteria:

1. The Columbarium Units shall be of the following type, style, and size:

   a. Type: Precast concrete, reinforced.

   b. Size: Interior and exterior dimensions as indicated on plans.

2. Columbarium top shall be capable of structurally supporting imposed service live load of no less than 240 Kgs./Square Meter (50 lb./ft^2), and dead loads based on cap (coping) thickness and heights, including material composition and element section properties, mortar and grout, and dead loads based on concrete top element sectional properties.

3. Submit to the Resident Engineer for review and approval PDF files documenting the structural design of the complete Columbarium. This documentation shall include dimensions, methods of construction, and calculations. All design calculations and drawings shall be signed and sealed by qualified Registered Professional Structural Engineer.

G. Functional Load Tests: If required by the Resident Engineer, a functional load test will be made at the Contractor's expense to insure that the columbarium proposed by the Contractor, as furnished, will be capable of supporting loads stated in Article 1.3.F.2. The functional test will consist of the following loading conditions:

1. Unconfined Loading: The columbarium will be placed on a flat surface with no support against the sides. The entire top of the columbarium will be subjected to a simulated uniform load of live load of 240 Kgs./Square Meter (50 lb./ft^2) and required dead load simulating cap, mortar, and grout as they will be installed. The load will be maintained for no less than 72 hours. At end of the loading period, the maximum deflection of the Columbarium top elements shall be no more than 3 mm (1/8-inch). Upon removal of the load from the unit the residual deflection shall be no more than 1.5 mm (1/16-inch) and concrete elements shall be free of all structural distress.

1.04 MANUFACTURER AND INSTALLER QUALIFICATIONS

A. Precast concrete columbarium units shall be product of manufacturer who has a minimum of 3 years of experience in fabrication of the precast concrete columbarium units similar in material, design, and quantity to that indicated on the drawings and specified herein.

B. Precast concrete columbarium units installer shall have been regularly engaged for at least three years in installation of precast concrete similar to this project.

C. Supply and Installation of fastener system shall be by product manufacturers and installers, both whom have had a minimum of 3 years of experience in installation of similar design to that indicated on the drawing.

1.05 SUSTAINABILITY REQUIREMENTS

A. Blended Cement: It is the intent of this specification to reduce CO2 emissions and other environmentally detrimental effects resulting from the production of portland cement by requiring that all concrete mixes, in aggregate, utilize blended cement mixes to displace portland cement typically included in conventional construction. Provide the following submittals:

1. Copies of concrete design mixes for all installed concrete.
2. Copies of typical regional baseline concrete design mixes for all compressive strengths used on the Project.
3. Quantities in cubic yards of each installed concrete mix.

1.06 REGULATORY REQUIREMENTS FOR RECYCLED CONTENT

A. Products and Materials with Post-Consumer Content and Recovered Materials Content:

1. Contractor is obligated by contract to satisfy Federal mandates for procurement of products and materials meeting recommendations for post-consumer content and recovered materials content; the list of designated product categories with recommendations has been compiled by the EPA - refer to http://www.epa.gov/wastes/conserve/tools/cpg/products/
2. Materials or products specified by this section may be obligated to satisfy this Federal mandate and Comprehensive Procurement Guidelines program.
3. The EPA website also provides tools such as a Product Supplier Directory search engine and product resource guides.

1.07 ALLOWABLE TOLERANCES

A. In addition to tolerances of individual elements required by American Concrete Institute Publication 533.3R, erection tolerances shall be as follows:

1. Variation of anchors and fasteners from dimensions specified: 3 mm (1/8-inch)
2. Variation in overall dimensions of precast element (height and width): 3 mm (1/8-inch)
3. Maximum differential between adjacent units in erected position: 3 mm (1/8-inch)
4. Variation in thickness of precast panels and elements: 3 mm (1/8-inch)
5. Maximum vertical differential between adjacent columbarium units in installed position: 3 mm (1/8-inch)

1.08 SUBMITTALS

A. In accordance with Division 1 Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

1. Samples of all fastening systems, mounting hardware and exposed surface finishes including, but not limited to, the following:
   a. Stainless Steel Angle with threaded spring clip to receive the Tamper Proof Stainless Steel Bolt
   b. Stainless Steel Bolt, Nut and Washers
   c. Tamper Proof Stainless Steel Bolt
   d. Stainless Steel Rosette
   e. Stainless Steel Expansion Anchors, Bolts and pins
   f. Stainless Steel Ferrule loop insert.
   g. Shims
   h. Washers
2. Samples of two complete Precast Concrete Columbarium Units, to demonstrate quality of construction, delivered to the site to be approved prior to production…
3 Samples of adhesives and grouts.
4. Samples of concrete repair and/or patching materials.
5. Shop Drawings: Complete shop and erection drawings of all precast concrete columbarium units, showing:
   a. All dimensions and details of construction.
   b. Installation and relation to adjoining work.
      1) Show the individual units open ended against closed ended, where applicable and that web centerline distance is maintained across the joint between units.
      2) Show that the overall length of the wall, with multiple precast units is to be set with the indicated overall in place length, within the allowable tolerances (show the installation tolerances).

3) For back to back precast niche units show that the web centerlines for the back to back units will align, for the locations below the cap joints, within the allowable tolerances.

4) Detail where the precast niche units are to be set in the field so the centerline of niche webs will align with the centerline of cap joints above, within the allowable tolerances.

c. Reinforcements, anchorage, attachments, inserts, location of all pre-drilled sleeves and other items to be installed in the work of other trades.

d. Joint treatment, joint alignment coordinated with cap stone joints.

e. Any other work required for a complete installation.

f. Provide evidence that the Contractor to be installing the cast in place concrete foundations for the columbarium and pier units has been contacted prior to any work relating to the footings for the columbarium construction, and that the construction of the concrete support (foundations) work has been coordinated with the precast columbarium unit manufacturer and installer.

6. Production Drawings:

a. Elevation view of each structural element.

b. Planametric view of unit.

c. Sections and details to show quantities and position of reinforcing steel, anchors, inserts, and essential embedded and non-embedded hardware for fabrication, handling, transportation and installation.

d. Lifting and erection inserts.

e. Dimensions and finishes.

f. Method of transportation.

g. Method of erection and handling.

7. Erection Drawings:

a. Elevation view of each typical wall segment of interconnected precast niche units, with the overall in place length and position of the precast niche assembly.

b. Section view of the precast niche units, as they are to be installed, with the critical alignment elements and field placed dimensions indicated. For double sided units, as an example, the face of niche unit to face of backed up niche unit shall be indicated with the construction tolerances for the in place units indicated. Clearly indicate how the units are going to be set in the field to achieve the intended installed conditions.

c. Provide setting drawing(s) that indicate how the precast niche units are to be positioned on the foundations, to meet the design

drawings. The setting drawings shall be submitted based upon the field conditions for the foundations for the segments upon which the precast niche units are to be set. Any discrepancies that exist greater than 1/4-inch from the design drawings shall be clearly indicated as the foundations are to be constructed within this tolerance. The setting of the precast concrete niche units shall not begin until this information has been provided and approved by the Resident Engineer, or adjustments made to the foundations that are acceptable to the Resident Engineer.

d. Provide coordination drawings indicating the locations for the weld plates in the precast niche units as well as in the foundations, and coordinate this information so the weld plates are installed in the correct locations to align within allowable tolerances.

8. Manufacturer’s Literature and Data:

   a. Each type of Concrete Fastener, including adhesive and anchor devices.

   b. Instructions for final cleaning

   c. Concrete stain/coating, including color charts of manufacturers standard color palette.

   d. Written instructions of how the exposed concrete of the precast niche units is to be cleaned and prepared prior to application of the approved stain/coating indicated above.

9. Certificates: Manufacturer’s qualifications specifying precast concrete columbarium units meet the requirements of ACI 533.3R and as specified.

10. Certificates: Installer’s qualifications documenting the quality and quantity of experience of the precast concrete installer in the installation of Precast Concrete structures and custom units.

11. Certificates: Manufacturer of the precast niche units shall provide a written certification, prior to shipping the materials, that the products being shipped have been checked and that they meet the dimensional criteria as indicated, within the allowable tolerances for individual units, and that they can be assembled as part of the identified wall segments, within the allowable in place dimensions indicated, within the allowable tolerances indicated. The above manufacturing certifications shall be provided no later than immediately before the units are offloaded at the site. Units that do not meet these criteria shall either be returned or marked in such a manner that indicates they are not to be used for the project work. It is the Contractor's responsibility to ensure that all units that are installed in the project work have been certified by the manufacturer of the units. The Contractor shall be responsible for disposal of any units that are not acceptable for installation in the project work at no cost to the State.

1.09 DELIVERY, STORAGE

A. Ship precast concrete columbarium units to site with adequate protection to prevent chipping, breaking and other damage. Materials shall be marked giving proper identifications and location. Store materials in protected areas to prevent damage including vandalism, injurious effects of weather and inclusion of foreign matter.

B. Provide access to the units for field verification of the manufacturing dimensions and whether the units are within allowable tolerances.

1.10 COORDINATION

A. Coordinate the manufacture and erection of precast concrete columbarium units with related work of other sections of the Specifications. Provide templates for inserts and other devices for anchoring precast concrete columbarium units to the work of other trades, in sufficient time to be built into adjoining construction. Perform cutting, fitting and other related work in connection with erection of precast concrete columbarium unit work. See Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES for details regarding the coordination of work.

1.11 GUARANTEE

A. Guarantee precast concrete columbarium unit work, including anchorage, joint treatment and related components to be free from all defects in materials and workmanship, including cracking and spalling, and after erection, completed work will be subject to terms of “Guarantee” article in Division 1 Specification Sections except that guarantee period is one year.

1.12 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

B. Federal Specifications (Fed. Spec.):

QQ-S-766C (5)	Steel Plates, Sheets, and Strip-Corrosion Resisting
QQ-W-423B	Wire, Steel, Corrosive-Resisting
TT-S-00227E (3)	Sealing Compound Elastomeric Type, Multi-Component (For Caulking, Sealing, and Glazing In Building And Other Structures)
TT-S-00230C (2)	Sealing Compound: Elastomeric Type, Single Component (For Caulking, Sealing and Glazing In Building and Other Structures)

C. American Concrete Institute (ACI) Publications:

ACI 533.3R-70	Fabrication, Handling And Erection of Precast Concrete.

D. American Society for Testing Materials (ASTM) Standards:

A36/A36M-08	Structural Steel
ASTM A276-13	Stainless Steel Bars and Shapes
A615/A615M-12	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
A1064/A1064M-13	Standard Specifications for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
C33/C33M-12	Concrete Aggregates
C150/C150M-12	Portland Cement

E. American Welding Society (AWS) Publications:

AWS D1.1/D1.1M-12(e11)	Structural Welding Code
AWS D1.4/D1.4M-11	Welding Reinforcing Steel

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

A. Manufacturers that have previously completed at least one successful NCA columbarium project are deemed to be acceptable for processing their units through the procedures according to these specifications and the drawings.

B. Manufacturers that do not have previous successful experience for a NCA columbarium project may be selected by the Contractor for the project. Contractor is hereby notified that the submittal process for a manufacturer with no previous NCA experience with a successful columbarium project, typically takes longer to process.

2.02 COARSE AGGREGATE

A. Hard durable aggregate carefully graded from coarse to fine in proportions required to match approved samples of precast concrete columbarium units.

2.03 AGGREGATE FOR BACK-UP MIX (FINE AND COARSE AGGREGATE LIGHTWEIGHT):

A. ASTM C33. Limit gradation as required to produce the specified appearance and quality of concrete.

2.04 PORTLAND CEMENT

A. ASTM C150, Type I and Type II; Color as required.

2.05 STRUCTURAL STEEL

A. ASTM A36.

2.06 STEEL FABRIC REINFORCEMENT

A. ASTM A1064, galvanized.

2.07 STEEL WIRE REINFORCEMENT

A. ASTM A1064, cold drawn.

2.08 REINFORCING STEEL

A. ASTM A615, deformed, Grade 60.

2.09 MISCELLANEOUS GALVANIZED STEEL ITEMS

A. Bolts, nuts, washers, anchors, inserts, and the like for handling, erection, or use by trades.

2.10 NICHE COVER ATTACHMENT HARDWARE (ROSETTES)

A. VA National Cemetery Administration, standard stainless steel rosette, mounting brackets, and bolts for complete attachment of the niche covers to the precast columbarium units are to be as shown on drawings:

1. Rosettes

   a. ASTM Type 316 stainless steel sheet goods, 2.7 mm (0.100 inch) thick.

   b. Die stamp, producing an eight-petal flower pattern as shown on drawings, 25 mm (one-inch) diameter with slight convex; center hole of 5.5 mm (0.218-inch), concentric to outer edge, with shoulder recess of 10 mm(0.400-inch) in diameter and 1mm (0.035-inch) in depth.

   c. Luster finish.

2. Interior mounting and attachment elements:

   a. ASTM Type 304 or 316 stainless steel tamper-resistant bolts, nuts, washers, anchors, mounting brackets, inserts and the like.

3. Attic stock: in addition to the rosettes and interior mounting and attachment elements required for the two, double sided columbarium walls, provide 70 rosettes and accompanying interior mounting and attachment elements, including bolts, nuts, washers, anchors, mounting brackets, inserts, and the like.

2.11 BACK-UP MATERIAL

A. Closed cell neoprene, butyl, polyurethane, vinyl or polyethylene foam rod, diameter approximately 1-1/3 times the joint width.

2.12 BOND BREAKERS IF USED

A. Type and material recommended by sealant manufacturer.

2.13 SEALING COMPOUND IF USED

A. Fed. Spec. TT-S-00230 C, Type II, Class A, or ASTM C 920-11, Type S, Grade NS, Class 25.

2.14 FABRICATION

A. Precast concrete columbarium units shall NOT be: fabricated, delivered or incorporated in the work until samples have been approved. Precast concrete shall comply with ACI 533.3R, except as modified herein.

1. Concrete for precast columbarium units shall have minimum compressive strength of 35 MPa (5,000 psi) at 28 days.

2. Provide additional steel reinforcing as required for casting, handling and erection loads.

3. Back-up Mix: Porosity, strength, weight and gradation of coarse aggregate shall be as required to produce specified characteristics.

4. Columbarium units shall be cast in steel forms designed to suit shape and finish required and to withstand high frequency vibration. Concrete shall be deposited in oiled forms. Form oil shall be non-staining type. Vibrations, where required, shall be continuous during process of casting to attain through compaction, complete embedment of reinforcement and to assure concrete of uniform and maximum density without segregation of mix and full thickness of precast element is attained.

   a. Anchors, lifting devices, provisions for cutouts and openings, dovetail slots, notches, reglets, inserts and similar items required for the work of other trades shall be accurately positioned in forms before casting elements.

   b. Fastener location holes, including those for anchoring of units and attachment of niche covers, shall be cast into units. Drilling into precast concrete columbarium units, after fabrication, shall not be acceptable, except where pins are to be inserted through the tops of the units into the caps above, or where pins are to be inserted through the bottom of the precast niche units into the foundation below.

5. Cement, aggregate and water shall be obtained from single sources for facing mix of precast concrete work in order to assure regularity of appearance and uniformity of color.

6. Finish: Exposed faces shall have smooth natural concrete finish, unless otherwise noted. The face of the units shall be processed by the manufacturer, following removal from the forms to insure that the discoloration and blemishes on the niche faces are removed before shipping to the site.

a. Specified surface finish for the exposed back of the columbarium units shall be applied during the appropriate time of fabrication and curing. Seal coating of exposed back of units shall be applied as per manufacturer's recommendations.

7. Curing: Precast concrete shall be cured as required to develop specified structural characteristics and shall be stored in a manner that will permit all surfaces to cure equally and minimize warping, without staining the exposed faces.

2.15 STAIN AND FINISH EXPOSED EDGES

A. Finish for all exposed faces and edges of columbarium units shall be coated with a color coat suitable for cured concrete, which has been used successfully on at least one columbarium project for a National Veteran Cemetery. Color and texture to be approved by Resident Engineer prior to application of coating. Manufacturer's literature and color charts shall be submitted as part of the submittal process as well as the listing of previous project(s).Products shall be epoxy masonry paint equal to the following:

1. Benjamin Moore & Co: M40 100% Solids Epoxy Floor Coating
2. PPG Industries, Inc. AQUAPON® High Build Semi-Gloss Polyamide Epoxy Coatings
3. Sherwin Williams, Pro Industrial 113.12 High Performance Epoxy

PART 3 EXECUTION

3.01 HANDLING AND INSTALLATION

A. Before beginning installation, inspect work of other trades in-so-far as it affects the work of this Section. Install units by competent installation crews meeting the requirements of paragraph 1.4 B. Commencing installation of precast concrete columbarium units will be construed as acceptance, as suitable, of such work of other trades. Concrete base for the columbarium units shall be inspected and modified as required, grinding off high spots, to become an acceptable base upon which to install the units. Columbarium units shall be handled in a nearly vertical plane at all times and stacked vertically on wood supports of adequate strength, until erected. Cover and protect precast concrete columbarium units against staining and other damage. Reinstall, realign and otherwise correct improperly installed units.

1. Accurately place and securely anchor precast concrete columbarium units to adjoining construction in accordance with approved shop and erection drawings.

3.02 SETTING

A. Each precast element shall be set level and true to line with uniform joints as specified within the allowable tolerances, and as needed to result in the overall length of the wall assembly being the specified

dimension, within the allowable construction tolerances. Joints that are required to have sealants shall be kept free of dirt and other contaminants for at least the depth to the contact points of the backer rod. Precautions shall be taken to protect precast concrete work from being damaged and soiled during and after installation. Wedges, spacers or other appliances which are likely to cause staining shall be removed from joints.

B. Setting of the precast niche units is intended to meet the design drawings within the allowable construction tolerances indicated. There are certain visual relationships that are most critical in the final installation to achieve the design intent. Generally, the consistency of the cap overhang in front of the precast niches, as well as the symmetry of the overhang distance are critical. For double sided columbarium units, as an example, the distance from the face of niche unit to the face of niche units, when installed back to back, is a critical dimension when setting the units. Maintaining this dimension in setting the units, especially at the top of the precast niche units, will allow that the caps be manufactured the same width, and the placement should produce the correct overhang and be symmetrical. The distance from the center of vertical webs on adjoining units, especially across the joints between precast niche units where open and closed end units are joined, are critical as maintaining these allows the proper setting of the niche covers.

C. Where shown, joints shall be filled with sealant. Surfaces and other joints for precast concrete columbarium units shall be cleaned of all dust, dirt and other foreign matter.

3.03 SEALING OF JOINTS

A. Where shown and/or wherever required to make the work watertight, joints between precast concrete columbarium units and between other precast elements and adjoining masonry, concrete and other materials shall be filled with back-up material for depth extending as required to form joint of depth as shown or recommended by sealant manufacturer. Provide bond breakers, at base of sealant where space for back-up does not exist and to prevent sealant from bonding to material at base of joint.

1. Workmanship shall be in accordance with Division 1 Specification Sections and Section 07 92 00, JOINT SEALANTS.

3.04 CLEANING

A. After erection is complete, clean precast columbarium units using materials, equipment and methods recommended by manufacturer.

3.05 REPLACEMENT AND REPAIR

A. Precast concrete columbarium units which are damaged, cracked, stained, improperly fabricated or otherwise defective shall be removed and be replaced. Precast units having minor defects not affecting

serviceability or appearance may be repaired when approved by the Resident Engineer. Repaired work shall be sound, permanent, flush with adjacent surfaces and of color and texture matching similar adjoining surfaces and shall show no line of demarcation between original and patched surfaces. Replacement and repairs shall be done at no additional cost to the State.

3.06 FINISHING OF EXPOSED EDGES

A. Apply coating to complete, cleaned exposed-to-view concrete edges as per manufacturer’s standard specifications and recommendations.

3.07 INSTALLATION OF NICHE COVERS

A. Install government supplied niche covers plumb and level as shown so that exposed faces of niche covers lie in the same plane and that rows of niche covers align both horizontally and vertically. Tighten fasteners to achieve snug fit but do not over tighten to the point where they may crack or break niche covers. Coordinate the installation procedures with the Resident Engineer and establish the critical visual line for which the best alignment is to be established.

END OF SECTION

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SECTION 04 43 00
NATURAL STONE VENEER

PART 1 GENERAL

1.01 DESCRIPTION

A. This section specifies requirements for construction of granite veneer and capstones for the columbarium walls and for the granite post at the flower watering stations.

1.02 RELATED WORK

A. Installation of Columbarium Units: Section 03 48 24 PRECAST CONCRETE COLUMBARIUM UNITS.

B. Sealants and sealant installation: Section 07 92 00, JOINT SEALANTS.

C. Placement of pea stone grave at base of wall: Section 31 20 00 EARTHWORK.

D. Flower watering stations: Section 32 33 00 SITE FURNISHINGS

1.03 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Samples:

1. Stone Veneer, sample, 200 mm by 400 mm (8 inches by 16 inches,) showing full color range and texture of stone, bond, and proposed mortar joints.

2. Surface finish submittals for Columbarium Niche Covers (specified in Section 04 73 00), Granite Veneer, Veneer Frame and Cap Stones for Columbarium Walls shall consist of six 12-inch x 12-inch x 1-inch tiles of specified granite showing manufacturer’s standard polished finish and Diamond 10 finish. Provide three tiles of each finish for review and acceptance by the Owner and the Landscape Architect.

3. Incised lettering and numbering submittals. Based upon final acceptance of surface finish, provide samples showing alphanumeric labels as indicated and as follows:

a. Provide incised letters and numbers in polished sample tiles and Diamond 10 sample tiles. Samples of the following shall be submitted:

Item	Quantity and Size
Polished Tiles	Six 12-inch x 12-inch x 2-inch tiles showing engraved lettering, include upper case letters J, K, L, M, N and O respectively, full size, one on each panel. Letters shall be 5-inches high. Font shall be Times New Roman
Diamond 10 Tiles	Six 12-inches x 12-inches x 2-inches,

showing engraved numbers 1, 5, 10, and capital letters A, C, E. Numbers shall be 2-inches high. Letters shall be 3-inches high. Font for both numbers and letters shall be Times New Roman.

Lithichrome Paint — For Diamond 10 tiles, provide a different color paint on incised letters and numbers as selected from manufacturer’s standard color selection.

Granite Post at Flower Watering Station: one full sized post

Stone samples shall fully demonstrate color, shade, veining, texture, range, and finish.

3. Anchors, and ties, one.

4 Rainscreen and weeps for columbarium walls.

C. Certificates:

1. Certificates signed by manufacturer, including name and address of contractor, project location, and the quantity, and date or dates of shipment of delivery to which certificate applies.

2. Indicating that the following items meet specification requirements:

a. Stone veneer.

b. Lithichrome paint.

D. Manufacturer's Literature and Data:

1. Anchors, ties, and reinforcement.

2. Rainscreen and weeps for columbarium walls.

3. Non-shrink grout material

4. Lithichrome paint for incised letters and numbers, including range of standard colors.

5. Polymer fortified mortar setting bed for setting base toe kick.

E. Shop Drawings

1. Anchorage and veneer ties for granite veneer stones at Columbarium Walls, showing proposed manufacturer and methods of attaching stone to concrete core.

1.04 SAMPLE PANEL FOR COLUMBARIUM WALLS

A. A single sample panel will be required and will serve as basis of acceptance for Columbarium Walls.

B. Before work of laying up granite veneer stones on the columbarium wall, lay up a sample panel as follows:

1. As if building the end of a columbarium wall, including; granite base, veneer frame pieces full height of wall, veneer stones and wall cap and aligning niche covers on one face of wall.

2. Use stone units from random pallets of units delivered on site.
3. Include reinforcing, ties, and anchors.
4. Provide a 1.2m x 1.8m (4 feet x 5 feet) panel
5. Show accurate mortar jointing and sealants and full installation of all pieces.

C. Use sample panel approved by Resident Engineer for standard of workmanship of new columbarium masonry work.

D. Use sample panel to test cleaning methods.

E. Sample panel may remain in place in permanent location if approved by Resident Engineer. Remove and replace should any defect or damage be observed or detected by the Resident Engineer.

1.05 WARRANTY

A. Warrant exterior masonry walls against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five years.

1.06 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

A82/A82M-07.....Standard Specification for Steel Wire, for Concrete Reinforcement.

A153/A153M-09.....Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

A167.....Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

A193.....Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

A951-11.....Steel Wire for Masonry Joint Reinforcement

C119-08.....Standard Terminology Relating to Dimension Stone

C476-10 .....Grout for Masonry

C615-03.....Standard Specification for Granite Dimension Stone

C1242-05.....Standard Guide for Selection, Design, and Installation of Dimension Stone Anchoring Systems

C1515-01.....Standard Guide to Cleaning of Exterior Dimension Stone, Vertical and Horizontal Surfaces, New or Existing

C1528-09.....Standard Guide for Selection of Dimension Stone for Exterior Use

D1056-07.....Standard Specification for Flexible Cellular Materials – Sponge Expanded Rubber

C. Masonry Industry Council:

Hot and Cold Weather Masonry Construction Manual, 1999

All Weather Masonry Construction Manual, 2000.

D. Federal Specifications (FS):

FF-S-107C-00 Screws, Tapping and Drive

E. International Masonry Industry All Weather Council (IMIAC): Recommended Practices and Guide Specification for Cold Weather Masonry Construction

PART 2 PRODUCTS

2.01 ACCEPTABLE STONE PRODUCTS

A. Granite Veneer: Meet ASTM C615.

1. Face Size: As indicated on the Construction Drawings.

B. Granite for Columbarium Walls and Granite Post at Flower Watering Station:

1. Granite shall be:

a. Mesabi Black as supplied by Coldspring USA, http://coldspringusa.com

b. Granite for niche covers shall be as specified under Section 04 73 00 NICHE COVERS.

2. Finish: Manufacturer’s standard polished finish and standard Diamond 10 finish. The submittal process may require multiple rounds and requests for alternative finishes. It is the intent of the design process that the granite specified under this section shall be sawn all sides. Faces and surfaces hidden from view shall remain sawn. Faces and surfaces exposed to view may be polished and finished Diamond 10, but additional finishes may be required and the number of submittals increased to accommodate the review and acceptance process, depending on the side-by-side comparison of the stones during review. Selection of finish shall add no additional cost to the Owner.

2.02 REINFORCEMENT AND ANCHORAGES

A. Materials: Provide anchors specified in subsequent paragraphs that are made from materials that comply paragraphs below, unless otherwise indicated.

1. For Columbarium Anchorage: Stainless steel shall be Type 304 austenitic stainless steel per ASTM A167 and A193, Identification Symbol B8 or B8A.

   a. Stainless steel anchors shall be product designed specifically and exclusively for connecting stone veneer masonry to concrete backing walls. Anchors shall be designed for insertion into kerf cut slots in edges of each veneer stone.

   b Split tail design shall be acceptable to anchor upper and lower stones with single anchor. Use Type 304 hardware to attach anchors to concrete wall.

2.03 ACCESSORIES

A. Joint Sealant: Refer to Section 07 92 00.

B. Nailing Strips: Western softwood, preservative treated, sized to masonry joints.

C. Masonry weeps for Columbarium Walls shall be product designed for stone cladding construction to facilitate rapid drainage of cavity water, promote ventilation, and prevent insect penetration. Weeps shall be UV stabilized polypropylene or approved equal with wide color selection to match granite veneer of columbarium walls. Weeps shall conform to the dimensional requirements of the Detailed Drawings. Masonry weeps shall be a system component of a rainscreen technology or fully compatible with such. Rainscreen and masonry weeps shall be designed and fabricated to prevent clogging by mortar and grout.

D. Rainscreen shall be a corrugated mat system of rigid synthetic designed to readily allow water to flow from cavity to weeps without clogging.

E. Mortar:

   1. Setting bed mortar shall conform to ASTM C 270, Type M, except that latex polymer additive shall be mixed with the cementitious materials and aggregate in lieu of water.

   2. Cement: Shall be an American Portland cement conforming to ASTM C150, Type I or II, except Type III may be used for cold-weather construction, as selected by the Owner’s Representative and shall exhibit no efflorescence when cast into 2 inch x 7 inch x ½ inch slabs comprising the mortar under test.

   3. Water: clean, fresh and potable, from public water system.

   4. Sand: clean, washed, uniformly well-graded, conforming to ASTM C144 with 100 percent passing No. 8 sieve, and not more than 35 percent passing No. 50 sieve with a fineness modulus maintained at 2.25 plus or minus 0.10.

   5. White-Mortar Aggregates: Natural, white sand or ground, white stone.

   6. Colored-Mortar Aggregates: Natural, colored sand or ground marble, stone, or other sound stone; as required to match Architect's sample.

7. Hydrated Lime: provide plastic hydrate, conforming to ASTM C207, Type "S" as approved by the Owner’s Representative.
8. Integral waterproofing: for all mortar use Master Builder's "Omicron Mortar-proofing", Sonneborn "Hydrocide", Pardee "Drycrete", or equal.
9. Mortar Pigments: shall be pure, non-fading mineral pigmented mortar cement equal to Medusa, Flamingo or Hydroment as approved by the Owner’s Representative. Use only pigments with record of satisfactory performance in masonry mortars. Color materials shall not exceed 2 percent of weight of cement used. Color shall be as selected by the Owner’s Representative.
10. Anti-freeze admixtures and accelerators shall not be used in mortar.

F. Expansion Joint Fillers: ASTM D1056 Class RE-11.

2.04 EPOXY MODIFIED GROUT

A. Grout to anchor granite capstones in place shall be an expansive, non-staining, non-shrink cement grout conforming to ASTM C-827. Grout shall contain no metals. Grout shall manufactured by U.S. Grout Corporation; Sika Corporation; A.H. Harris & Sons, Inc. or approved equal product line.

2.05 FONT FOR LETTERING AND NUMBERING

A. For Text Font on all vertical surfaces: ‘Times New Roman’

B. For size of Text: Submitted text heights are approved as follows: Columbarium Walls: long faces, capstone numbers shall be 2-inches tall. Letters on vertical veneer frame shall be 3-inches tall

C. Columbarium Wall: end faces, section identifier letters and wall numbers shall be 5 inches tall

2.06 LITHICHROME PAINT FOR INCISED LETTERS AND NUMBERS

A. Lithichrome paint for surface coating of incised numbers and letters of Columbarium Walls shall be a durable paint coating that is resistant to weather. Paint shall be resistant to deterioration of solvent, binder and pigment due to exposure to ultra-violet light. Lithichorme paint shall be formulated for memorial stone application.

1. Lithichrome paint shall be manufactured using various components to include but not limited to the following: color pigments, acrylic resin, Methyl Isobutyl Ketone, Ethyl Acetate, Acetone, Propane, Isobutane and N-Butane.
2. Color shall be N4 or lower as judge against the Munsell Value Scale, Matte (31-step scale) and shall be equal to one of at least six standard colors, as manufactured by Cleveland Lithichrome, Fort Scott, KS 66701 316-223-3210, or approved alternative.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify items provided by other Sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Verify items provided by other Sections of work are properly sized and located.

B. Establish lines, levels, and coursing. Protect from disturbance.

C. Provide temporary bracing during erection of masonry work. Maintain in place until building structure provides permanent bracing.

D. Scaffolding: Provide, erect, maintain, move, and finally remove scaffolding and staging required for masonry installation. Construct and maintain scaffolding in compliance with applicable ordinances, laws, rules and regulations. Scaffolding shall be sufficiently substantial to support workmen, and necessary materials and equipment. Provide adequate guard rails for protection of property, workmen, and passerby.

3.03 COURSING

A. Place masonry to lines and level indicated.

B. Arrange and trim stones for adequate fit in a range ashlar Pattern with course heights as indicated, random lengths, uniform joint widths with offset between vertical joints as indicated.

3.04 PLACING AND BONDING

A. Where indicated, lay masonry in full bed of mortar (backing, horizontal and vertical), properly jointed with other work. Buttering corners of joints and deep or excessive furrowing of mortar joints is not permitted.

B. Fully bond intersections, and external and internal corners as shown on the Detailed Drawings. For base (toe kick) and granite base stones of Columbarium Walls use polymer modified mortar as specified in this Section.

C. Install specified weeps and rainscreens in base courses of granite for Columbarium Walls. Provide mortar back up as shown on the Detailed Drawings. Set weeps in base stones at grades as required herein

D. Above the base stones and kick stones all other vertical and horizontal joints in Columbarium Walls shall be soft joints of backer rod and sealants, specified in Section 07 92 00.

D. Do not shift, or tap masonry units after mortar has taken initial set. Where adjustment must be made, remove mortar and replace.

E. Remove excess mortar on surface and in cavities.

F. Perform job site saw cutting with proper tools to provide straight unchipped edges. Take care to prevent breaking masonry unit corners or edges.

G. Where indicated mortar joints shall be concave in cross section.

3.05 TOLERANCES

A. Alignment of Columns: Maximum of 1.5 mm (1/16 inch) from true line.

B. Variation from Unit to Adjacent Unit: 0.8 mm (1/32 inch) maximum.

C. Variation from Plane of Wall: 3 mm (1/8 inch) in 3 m (10 feet) and 12 mm (1/2 inch) in 6 m (20 feet) or more.

D. Variation from Plumb: 3 mm (1/8 inch) per story non-cumulative, 12 mm (1/2 inch) in two stories or more.

E. Variation of Joint Thickness: 3 mm (1/8 inch) in 1 m (3 feet).

F. Maximum variation from Cross Sectional Thickness of Walls: Plus or minus 3 mm (1/8 inch).

3.06 REINFORCEMENT AND ANCHORAGES

A. Anchorage at Columbarium Walls:

1. Install stainless steel anchors to prevent stones from moving in any direction, including forward away form the concrete core wall, inward toward the concrete wall and laterally toward adjacent veneer stones. Provide minimum 4 anchors per veneer stone.

3.07 WEEPS AND VENTS

A. Weep holes and rainscreens at Columbarium Walls:

1. In accordance herein and as follows:

2. Installation of rainscreens and weeps shall be accordance with manufacturer’s recommendations, as directed by the Resident Engineer and as noted herein.

3. Install rainscreens and weeps in granite veneer base courses at columbarium walls in locations shown on the Detailed Drawings. Set bottom of weeps at elevation of adjacent pavement. Contractor to

note the base course granite veneer pieces are set below adjacent pavement grades. Set elevation of weeps such that the bottom of the weeps are 1/2-inch above adjacent pavements and fully supported by the specified latex modified mortar setting bed and vertical pointed joint.

4. Install weeps, rainscreens and latex modified mortar backing as an integrated system. Before proceeding with installation of successive courses of granite veneer, demonstrate to the Resident Engineer the rainscreen and weep system drains quickly and effectively. Test weep holes with a 5 gallon pour of water to demonstrate all weep holes drain without clogging and with water backing up behind the veneer system.

3.08 CUTTING AND FITTING

A. Obtain approval prior to cutting or fitting any area not indicated or where appearance or strength of masonry work may be impaired.

B. Holes, cut-outs, sinkages, openings, anchors, cramps, dowels, supports, and lifting devices, shall be accurately cut or drilled to required dimensions, as shown on the approved Shop Drawings, and as necessary to secure granite in place to insure correct location and accurate fit of all fixtures.

3.09 LITHICHROME PAINT APPLICATION

A. Apply lithichrome to incised letters and numbers in climate controlled shop setting, in accordance with manufacturer’s written instructions. Apply to prepared surfaces that are dry, free of grease, oil, dust or other contaminant that will inhibit adhesion.

B. Note that when paint coatings with high solvent to pigment ratio become thicker the solvent vehicle is likely to be evaporating and should be replaced with manufacturer’s clear solvent.

C. Following application of minimum two coats of lithichrome stone paint coat the surface of paint with a clear coating by same.

3.10 CLEANING

A. Remove excess mortar and smears.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with non-acidic solution which will not harm masonry or adjacent materials. Consult masonry manufacturer for acceptable cleaners. Leave surfaces thoroughly clean and free of all mortar and other soiling.

D. Use non-metallic tools in cleaning operations.

E. ASTM C1515 and D7089.

3.11 GRANITE POST AT FLOWER WATERING STATIONS

A. As specified under Section 32 33 00 SITE FURNISHINGS

3.12 PROTECTION

A. Maintain protective boards at exposed external corners which may be damaged by construction activities.

B. Provide protection without damaging completed work.

C. Keep expansion joint voids clear of mortar.

END OF SECTION

SECTION 04 73 00
COLUMBARIUM NICHE COVERS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide labor and materials necessary to complete the work of this Section, including but not limited to the following:

1. The Department of Veterans Affairs (VA) shall furnish niche covers for all of the new Columbarium Niches being installed by the Contractor. This specification section is for all work necessary for the Contractor to accept, handle, store, move and install one, Owner approved and provided, blank columbarium niche cover for each of the new precast niches created in the new columbarium walls. The Owner shall also provide, as part of the niche cover products manufactured for this project, a predetermined minimum number of approved blank niche covers to act as spares. The spare niche covers are to be used to replace niche covers should any damage occur, or for re-inscription necessitated by additional interment at a specific niche location.

2. The number of approved, Owner provided spare columbarium niche covers for this project to be accepted, offloaded and stored at the designated location is indicated on the drawings.

1.02 INSTALLER QUALIFICATIONS

A. Installation of columbarium niche covers will be performed by those companies who, through an approved certification process, have demonstrated previous experience in installation of similar design as indicated in the drawings and specified herein.

1.03 RELATED WORK

A. The following items are not included in this Section and will be performed under the designated Sections:

1. Section 03 48 24: PRECAST CONCRETE COLUMBARIUM UNITS, the precast concrete niche units with: niche cover mounting hardware assemblies (installed); and niche cover attachment hardware assemblies (provided for use to attach the Owner-provided niche covers). Four each of the niche cover mounting hardware assemblies shall be furnished and installed for each precast concrete niche opening. Four each of the niche cover attachment hardware assemblies shall be provided for each precast niche opening, to be used to mount the approved Owner-provided niche covers as indicated and on the drawings.

2. Section 04 43 00 NATURAL STONE VENEER.

PART 2 PRODUCTS - Not USED

PART 3 EXECUTION

3.01 NICHE COVERS (OWNER PROVIDED) - CONTRACTOR ACCEPTANCE

A. Government-supplied, contractor installed niche covers that have been inspected and accepted as being in compliance with manufacturing tolerances for size, hole size and placement, perpendicularity, finish, and product stone quality shall be furnished by the Owner and delivered to the site on pallets. They shall be of size, type, manufacturing, finish and quantities required for this project. The covers shall be delivered to the site Freight on Board (FOB) and the Contractor shall be responsible to offload and secure them at the job site. The general quantity and condition shall be observed and an adequate count to cover all the installed columbarium units, plus required spares shall be verified by the Contractor prior to accepting the units and performing the offloading operations. Note any shipping damage and reject any damaged covers before the delivery truck leaves the site. Once satisfied, take ownership of the acceptable covers, as all being approved as meeting the Owner specifications and being suitable for installation at this project. Once the niche covers are accepted at the site, they shall become the Contractors responsibility until installed and the installation is accepted by the Resident Engineer.

3.02 INSPECTION

A. All materials shall be inspected prior to installation to insure compliance with the contract documents and to insure there is no damage. Should conditions be different from those indicated on the contract documents, contractor should immediately notify the RESIDENT ENGINEER.

3.03 NICHE COVER ATTACHMENT HARDWARE

A. Each of the four niche cover attachment hardware assemblies provided, for each new precast concrete niche opening, as part of Section 03 48 24, PRECAST CONCRETE COLUMBARIUM UNITS, consists of: the stainless steel rosette, stainless steel tamperproof screw and the white or clear washer beneath the rosette, that is to bear against the niche cover when rosette is snugged up causing the cover to stay in place against the face of the niche opening due to friction. All of the niche cover hardware (mounting and attachment assemblies) shall be as submitted and approved as part of the work in Section 03 48 24, PRECAST CONCRETE COLUMBARIUM UNITS.

B. The Contractor performing the installation of the niche covers shall maintain control of the niche cover attachment hardware assemblies from delivery to the site through acceptance of the installation of the Owner-provided niche covers.

3.04 INSTALLATION

A. Installation of the Owner provided niche covers shall include all materials, manpower, tools and equipment required to receive the approved Owner provided niche covers from the manufacturer, and handle them as necessary and perform whatever work is needed to result in the successful installation of one niche cover for every precast concrete niche space created for this project.

B. The niche covers shall be installed so as to create a visual straight line along the top of the row of covers agreed to by the Resident Engineer as the primary visual vertical reference line in the installation. The covers shall be spaced achieve, as close as possible, the intended design spacing, taking into consideration the allowable fluctuations in the manufacturing tolerances for the Owner provided niche covers.

C. The niche cover attachment assemblies shall be installed so that the threaded end of the tamperproof screw is inserted into the threads of the spring clip on the mounted angle bracket behind each of the mounting holes in the niche covers. This should result in the head of the screw being parallel with the face of the niche cover. The threaded hole in the spring clip shall be fully visible when looking through the mounting hole in the niche cover to the respective spring clip behind the hole. The position of the spring clip shall be adjusted so the threaded tamperproof screw will enter the threaded hole in the spring clip and that the attachment assembly can be tightened to secure the cover in the intended position. To achieve this installation, the angle brackets shall be adjusted to be the correct height from the niche wall so the hole in the spring clip can have the respective tamper proof screw inserted and tightened. To achieve the proper positioning of the spring clips, the angle brackets shall be adjusted in their position, or the hole in the angle bracket through which the tamper proof screw passes when tightened into the spring clip, shall be enlarged as necessary to allow the adjustment of the spring clip to align with the hole in the niche cover so the tamper proof screws through the individual rosettes can each be inserted and tightened using the threaded spring clip. Only correct installations of the tamperproof screws, inserted into the threads of the spring clip and being tightened are acceptable. The head of the tamperproof screw shall be snugged up tight against the rosette, and shall be seated against the rosette, which occurs when the tamperproof screw is approximately perpendicular to the face of the niche cover.

3.05 CLEANING AND PROTECTION

A. Columbarium niche covers shall be shop cleaned at the time of fabrication. After installation, carefully clean the markers, removing all dirt stains, and all other incident defacements.

1. Stiff bristle fiber brushes may be used, but the use of wire brushes or acid-type cleaning agents and other solutions which may cause discoloration is expressly prohibited. Fabricator should be contacted regarding the use of any cleaners and must approve of them before use.

2. Protection of Finished Work: All covers that are installed as part of the work in progress shall be protected at all times during construction by use of a suitable strong, impervious film or fabric securely held in place.

B. Clean up area of excess material and debris. Clean visible portions of all covers.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 DESCRIPTION:

A. This section covers interior and exterior sealant and their application, wherever required for complete installation of building materials or systems.

1.02 RELATED WORK (INCLUDING BUT NOT LIMITED TO THE FOLLOWING):

A. Sealing of Site Work Concrete Paving: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

B. Masonry Control and Expansion Joint: Section 04 43 00 NATURAL STONE VENEER

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.

B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.

C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.

2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.

3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Lab Tests: Submit samples of materials that will be in contact or affect joint sealants to joint sealant manufacturers for tests as follows:

1. Adhesion Testing: Before installing elastomeric sealants, test their adhesion to protect joint substrates according to the method in ASTM C794 to determine if primer or other specific joint preparation techniques are required.

2. Compatibility Testing: Before installing elastomeric sealants, determine compatibility when in contact with glazing and gasket materials.

3. Stain Testing: Perform testing per ASTM C1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work is to start until results of these tests have been submitted to the Resident Engineer has given written approval to proceed with the work.

E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

1. Locate test joints where indicated in construction documents or, if not indicated, as directed by Resident Engineer

2. Conduct field tests for each application indicated below:

a. Each type of elastomeric sealant and joint substrate indicated.

b. Each type of non-elastomeric sealant and joint substrate indicated.

3. Notify Resident Engineer seven (7) days in advance of dates and times when test joints will be erected.

F. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies that are indicated to receive elastomeric joint sealants.

1.04 CERTIFICATION:

A. Contractor is to submit to the Resident Engineer written certification that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight seals, and that materials supplied meet specified performance requirements.

1.05 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Sustainable Design Submittals, as described below:

1. Volatile organic compounds per volume as specified in PART 2 - PRODUCTS.

C. Installer qualifications.

D. Contractor certification.

E. Manufacturer's installation instructions for each product used.

F. Cured samples of exposed sealants for approved manufacturer’s standard colors.

G. Manufacturer's Literature and Data:

1. Primers

2. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

H. Manufacturer warranty.

I. Coordinate samples for sealant colors with the mockup requirements of Section 04 43 00 NATURAL STONE VENEER.

1.06 PROJECT CONDITIONS:

A. Environmental Limitations:

1. Do not proceed with installation of joint sealants under following conditions:

a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C (40 degrees F).

b. When joint substrates are wet.

B. Joint-Width Conditions:

1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.07 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures exceeding 32 degrees C (90 degrees F) or less than 5 degrees C (40 degrees F).

1.08 DEFINITIONS:

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Backing Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

1.09 WARRANTY:

A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".

B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of five (5) years from the date of installation and final acceptance by the State. Submit manufacturer warranty.

1.10 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. ASTM International (ASTM):

C509-06	Elastomeric Cellular Preformed Gasket and Sealing Material
C612-14	Mineral Fiber Block and Board Thermal Insulation
C717-14a	Standard Terminology of Building Seals and Sealants
C734-06(R2012)	Test Method for Low-Temperature Flexibility of Latex Sealants after Artificial Weathering
C794-10	Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
C919-12.	Use of Sealants in Acoustical Applications.
C920-14a	Elastomeric Joint Sealants.
C1021-08(R2014)	Laboratories Engaged in Testing of Building Sealants
C1193-13	Standard Guide for Use of Joint Sealants.
C1248-08(R2012)	Test Method for Staining of Porous Substrate by Joint Sealants
C1330-02(R2013)	Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants
C1521-13	Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints
D217-10	Test Methods for Cone Penetration of Lubricating Grease
D1056-14	Specification for Flexible Cellular Materials—Sponge or Expanded Rubber
E84-09	Surface Burning Characteristics of Building Materials

C. Sealant, Waterproofing and Restoration Institute (SWRI).

The Professionals’ Guide

D. Environmental Protection Agency (EPA):

40 CFR 59(2014)	National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

PART 2 PRODUCTS

2.01 SEALANTS:

A. Exterior Sealants:

1. S-1 Vertical surfaces, provide non-staining ASTM C920, Type M, Grade NS, Class 25, Use NT.
2. S-2 Horizontal surfaces, provide non-staining ASTM C920, Type M, Grade P, Class 25, Use T
3. Provide location(s) of exterior sealant as follows:
   a. Masonry to masonry or stone.
   b. Stone to stone.
   c. Cast stone to cast stone.
   d. Masonry expansion and control joints.

2.02 COLOR:

A. Sealants used with exposed masonry shall a standard color of the approved manufacturer. All exposed to view joints above the kick plate at the bottom of the columbarium wall shall be sealant joints. Color selection will be an essential aspect of the contract. Provide multiple sample boards of standard colors to aid the Owner and landscape architect in color selection of sealant.

B. Sealants used with unpainted concrete are to match color of adjacent concrete.

C. Color of sealants for other locations to be light gray or aluminum, unless otherwise indicated in construction documents.

2.03 JOINT SEALANT BACKING:

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056 or synthetic rubber (ASTM C509), nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32 degrees C (minus 26 degrees F). Provide

products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.04 FILLER:

A. Mineral fiberboard: ASTM C612, Class 1.

B. Thickness same as joint width.

C. Depth to fill void completely behind back-up rod.

2.05 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.

B. Stain free type.

2.06 CLEANERS-NON POROUS SURFACES:

A. Chemical cleaners compatible with sealant and acceptable to manufacturer of sealants and sealant backing material. Cleaners to be free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 EXECUTION

3.01 INSPECTION:

A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.

B. Coordinate for repair and resolution of unsound substrate materials.

C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.02 PREPARATIONS:

A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals’ Guide).

B. Clean surfaces of joint to receive sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.

1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include but are not limited to the following:
   a. Concrete.
   b. Masonry.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

C. Do not cut or damage joint edges.

D. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
   1. Apply primer prior to installation of back-up rod or bond breaker tape.
   2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

3.03 BACKING INSTALLATION:

A. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.

B. Where deep joints occur, install filler to fill space behind the backing rod and position the rod at proper depth.

C. Cut fillers installed by others to proper depth for installation of backing rod and sealants.

D. Install backing rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.

E. Where space for backing rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

3.04 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.

B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.05 INSTALLATION:

A. General:

1. Apply sealants and caulking only when ambient temperature is between

5 degrees C and 38 degrees C (40 degrees and 100 degrees F).

2. Do not install polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.

3. Do not install sealant type listed by manufacture as not suitable for use in locations specified.

4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.

5. Avoid dropping or smearing compound on adjacent surfaces.

6. Fill joints solidly with compound and finish compound smooth.

7. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to “skin” over. Remove any excess sealant from adjacent surfaces of joint, leaving the working in a clean finished condition.

8. Finish paving joints flush unless joint is otherwise detailed.

9. Apply compounds with nozzle size to fit joint width.

10. Test sealants for compatibility with each other and substrate. Use only compatible sealant. Submit test reports.

11. Replace sealant which is damaged during construction process.

B. Weeps: Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, at all flashing, and as indicated on construction documents.

1. Coordinate with the requirements of Section 04 43 00.

C. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.

3.06 FIELD QUALITY CONTROL:

A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

1. Extent of Testing: Test completed elastomeric sealant joints as follows:

a. Perform 10 tests for first 305 m (1000 feet) of joint length for each type of elastomeric sealant and joint substrate.

b. Perform one test for each 305 m (1000 feet) of joint length thereafter or one test per each floor per elevation.

B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.

C. Inspect tested joints and report on following:

1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.

2. Compare these results to determine if adhesion passes sealant manufacturer’s field-adhesion hand-pull test criteria.

3. Whether sealants filled joint cavities and are free from voids.

4. Whether sealant dimensions and configurations comply with specified requirements.

D. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

E. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.

F. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.07 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by manufacturer

of the adjacent material or if not otherwise indicated by the caulking or sealant manufacturer.

B. Leave adjacent surfaces in a clean and unstained condition.

END OF SECTION

SECTION 26 05 11
REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section applies to all sections of Division 26.

B. Furnish and install electrical systems, materials, equipment, and accessories in accordance with the specifications and drawings. Capacities and ratings of motors, transformers, conductors and cable, switchboards, switchgear, panelboards, motor control centers, generators, automatic transfer switches, and other items and arrangements for the specified items are shown on the drawings.

C. Conductor ampacities specified or shown on the drawings are based on copper conductors, with the conduit and raceways sized per NEC. Aluminum conductors are prohibited.

1.2 MINIMUM REQUIREMENTS

A. The latest International Building Code (IBC), Underwriters Laboratories, Inc. (UL), Institute of Electrical and Electronics Engineers (IEEE), and National Fire Protection Association (NFPA) codes and standards are the minimum requirements for materials and installation.

B. The drawings and specifications shall govern in those instances where requirements are greater than those stated in the above codes and standards.

1.3 TEST STANDARDS

A. All materials and equipment shall be listed, labeled, or certified by a Nationally Recognized Testing Laboratory (NRTL) to meet Underwriters Laboratories, Inc. (UL), standards where test standards have been established. Materials and equipment which are not covered by UL standards will be accepted, providing that materials and equipment are listed, labeled, certified or otherwise determined to meet the safety requirements of a NRTL. Materials and equipment which no NRTL accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as ANSI, NEMA, and NETA. Evidence of compliance shall include certified test reports and definitive shop drawings.

B. Definitions:

1. Listed: Materials and equipment included in a list published by an organization that is acceptable to the Authority Having Jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production or listed materials and equipment or periodic evaluation of services, and whose listing states that the materials and equipment either meets

appropriate designated standards or has been tested and found suitable for a specified purpose.

2. Labeled: Materials and equipment to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled materials and equipment, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.
3. Certified: Materials and equipment which:
   a. Have been tested and found by a NRTL to meet nationally recognized standards or to be safe for use in a specified manner.
   b. Are periodically inspected by a NRTL.
   c. Bear a label, tag, or other record of certification.
4. Nationally Recognized Testing Laboratory: Testing laboratory which is recognized and approved by the Secretary of Labor in accordance with OSHA regulations.

1.4 QUALIFICATIONS (PRODUCTS AND SERVICES)

A. Manufacturer’s Qualifications: The manufacturer shall regularly and currently produce, as one of the manufacturer's principal products, the materials and equipment specified for this project, and shall have manufactured the materials and equipment for at least three years.

B. Product Qualification:
   1. Manufacturer's materials and equipment shall have been in satisfactory operation, on three installations of similar size and type as this project, for at least three years.
   2. The Owner reserves the right to require the Contractor to submit a list of installations where the materials and equipment have been in operation before approval.

C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of notification that service is needed. Submit name and address of service organizations.

1.5 APPLICABLE PUBLICATIONS

A. Applicable publications listed in all Sections of Division 26 shall be the latest issue, unless otherwise noted.

B. Products specified in all sections of Division 26 shall comply with the applicable publications listed in each section.

1.6 MANUFACTURED PRODUCTS

A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, and for which replacement parts shall be available. Materials and equipment furnished shall be new, and shall have superior quality and freshness.

B. When more than one unit of the same class or type of materials and equipment is required, such units shall be the product of a single manufacturer.

C. Equipment Assemblies and Components:

1. Components of an assembled unit need not be products of the same manufacturer.

2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.

3. Components shall be compatible with each other and with the total assembly for the intended service.

4. Constituent parts which are similar shall be the product of a single manufacturer.

D. Factory wiring and terminals shall be identified on the equipment being furnished and on all wiring diagrams.

E. When Factory Tests are specified, Factory Tests shall be performed in the factory by the equipment manufacturer, and witnessed by the contractor. In addition, the following requirements shall be complied with:

1. The Owner shall have the option of witnessing factory tests. The Contractor shall notify the Owner through the Resident Engineer a minimum of thirty (30) days prior to the manufacturer’s performing of the factory tests.

2. When factory tests are successful, contractor shall furnish four (4) copies of the equipment manufacturer’s certified test reports to the Resident Engineer fourteen (14) days prior to shipment of the equipment, and not more than ninety (90) days after completion of the factory tests.

3. When factory tests are not successful, factory tests shall be repeated in the factory by the equipment manufacturer, and witnessed by the Contractor. The Contractor shall be liable for all additional expenses for the Owner to witness factory re-testing.

1.7 VARIATIONS FROM CONTRACT REQUIREMENTS

A. Where the Owner or the Contractor requests variations from the contract requirements, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

1.8 MATERIALS AND EQUIPMENT PROTECTION

A. Materials and equipment shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.

1. Store materials and equipment indoors in clean dry space with uniform temperature to prevent condensation.
2. During installation, equipment shall be protected against entry of foreign matter, and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
3. Damaged equipment shall be repaired or replaced, as determined by the Resident Engineer.
4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
5. Damaged paint on equipment shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.9 WORK PERFORMANCE

A. All electrical work shall comply with requirements of the latest NFPA 70 (NEC), NFPA 70B, NFPA 70E, NFPA 99, NFPA 110, OSHA Part 1910 subpart J – General Environmental Controls, OSHA Part 1910 subpart K – Medical and First Aid, and OSHA Part 1910 subpart S – Electrical, in addition to other references required by contract.

B. Job site safety and worker safety is the responsibility of the Contractor.

C. Electrical work shall be accomplished with all affected circuits or equipment de-energized. However, energized electrical work may be performed only for the non-destructive and non-invasive diagnostic testing(s), or when scheduled outage poses an imminent hazard to patient care, safety, or physical security. In such case, all aspects of energized electrical work, such as the availability of appropriate/correct personal protective equipment (PPE) and the use of PPE, shall comply with the latest NFPA 70E, as well as the following requirements:

1. Only Qualified Person(s) shall perform energized electrical work. Supervisor of Qualified Person(s) shall witness the work of its entirety to ensure compliance with safety requirements and approved work plan.
2. At least two weeks before initiating any energized electrical work, the Contractor and the Qualified Person(s) who is designated to perform the work shall visually inspect, verify and confirm that the work area and electrical equipment can safely accommodate the work involved.
3. At least two weeks before initiating any energized electrical work, the Contractor shall develop and submit a job specific work plan,

and energized electrical work request to the Resident Engineer. At the minimum, the work plan must include relevant information such as proposed work schedule, area of work, description of work, name(s) of Supervisor and Qualified Person(s) performing the work, equipment to be used, procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used, and exit pathways.

4. Energized electrical work shall begin only after the Contractor has obtained written approval of the work plan, and the energized electrical work request from the Resident Engineer. The Contractor shall make these approved documents present and available at the time and place of energized electrical work.

D. For work that affects existing electrical systems, arrange, phase and perform work to assure minimal interference with normal functioning of the facility.

E. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions.

F. Coordinate location of equipment and conduit with other trades to minimize interference.

1.10 EQUIPMENT INSTALLATION AND REQUIREMENTS

A. Equipment location shall be as close as practical to locations shown on the drawings.

B. Working clearances shall not be less than specified in the NEC.

C. Inaccessible Equipment:

1. Where the Owner determines that the Contractor has installed equipment not readily accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Owner.

2. "Readily accessible” is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

D. Electrical service entrance equipment and arrangements for temporary and permanent connections to the electric utility company’s system shall conform to the electric utility company's requirements. Coordinate fuses, circuit breakers and relays with the electric utility company’s system, and obtain electric utility company approval for sizes and settings of these devices.

1.11 EQUIPMENT IDENTIFICATION

A. In addition to the requirements of the NEC, install an identification sign which clearly indicates information required for use and maintenance of items such as switchboards and switchgear, panelboards, cabinets, motor controllers, fused and non-fused safety switches,

generators, automatic transfer switches, separately enclosed circuit breakers, individual breakers and controllers in switchboards, switchgear and motor control assemblies, control devices and other significant equipment.

B. Identification signs for Normal Power System equipment shall be laminated black phenolic resin with a white core with engraved lettering. Identification signs for Essential Electrical System (EES) equipment, as defined in the NEC, shall be laminated red phenolic resin with a white core with engraved lettering. Lettering shall be a minimum of 12 mm (1/2 inch) high. Identification signs shall indicate equipment designation, rated bus amperage, voltage, number of phases, number of wires, and type of EES power branch as applicable. Secure nameplates with screws.

1.12 SUBMITTALS

A. Submit to the Resident Engineer in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. The Owner's approval shall be obtained for all materials and equipment before delivery to the job site. Delivery, storage or installation of materials and equipment which has not had prior approval will not be permitted.

C. All submittals shall include six copies of adequate descriptive literature, catalog cuts, shop drawings, test reports, certifications, samples, and other data necessary for the Owner to ascertain that the proposed materials and equipment comply with drawing and specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify specific materials and equipment being submitted.

D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.

1. Mark the submittals, "SUBMITTED UNDER SECTION_____".
2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
3. Submit each section separately.

E. The submittals shall include the following:

1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, manuals, pictures, nameplate data, and test reports as required.
2. Elementary and interconnection wiring diagrams for communication and signal systems, control systems, and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
3. Parts list which shall include information for replacement parts and ordering instructions, as recommended by the equipment manufacturer.

F. Approvals will be based on complete submission of shop drawings, manuals, test reports, certifications, and samples as applicable.

1.13 SINGULAR NUMBER

A. Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

1.14 ACCEPTANCE CHECKS AND TESTS

A. The Contractor shall furnish the instruments, materials, and labor for tests.

B. Where systems are comprised of components specified in more than one section of Division 26, the Contractor shall coordinate the installation, testing, and adjustment of all components between various manufacturer’s representatives and technicians so that a complete, functional, and operational system is delivered to the Owner.

C. When test results indicate any defects, the Contractor shall repair or replace the defective materials or equipment, and repeat the tests for the equipment. Repair, replacement, and re-testing shall be accomplished at no additional cost to the Owner.

1.15 WARRANTY

A. All work performed and all equipment and material furnished under this Division shall be free from defects and shall remain so for a period of one year from the date of acceptance of the entire installation by the Contracting Officer for the Owner.

1.16 INSTRUCTION

A. Instruction to designated Owner personnel shall be provided for the particular equipment or system as required in each associated technical specification section.

B. Furnish the services of competent and factory-trained instructors to give full instruction in the adjustment, operation, and maintenance of the specified equipment and system, including pertinent safety requirements. Instructors shall be thoroughly familiar with all aspects of the installation, and shall be factory-trained in operating theory as well as practical operation and maintenance procedures.

C. A training schedule shall be developed and submitted by the Contractor and approved by the Resident Engineer at least 30 days prior to the planned training.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

D. Conductor Insulation:

1. Type THWN-2: Comply with UL 83.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

C. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

D. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

E. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

END OF SECTION

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26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B3.
2. Stranded Conductors: ASTM B8.
3. Tinned Conductors: ASTM B33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.3 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

D. Conduit Hubs: Mechanical type, terminal with threaded hub.

E. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

F. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.

G. Water Pipe Clamps:

1. Mechanical type, two pieces with stainless-steel bolts.

a. Material: Die-cast zinc alloy.

b. Listed for direct burial.

2. U-bolt type with malleable-iron clamp and copper ground connector.

2.4 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 5/8 by 96 inches.

B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.

1. Bury at least 30 inches below grade.

C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.

2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.

3. Connections to Ground Rods at Test Wells: Bolted connectors.

4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.
8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
9. X-Ray Equipment Circuits: Install insulated equipment grounding conductor in circuits supplying x-ray equipment.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

E. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.

3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

END OF SECTION

SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. ARC: Comply with ANSI C80.5 and UL 6A.
4. IMC: Comply with ANSI C80.6 and UL 1242.
5. EMT: Comply with ANSI C80.3 and UL 797.
6. FMC: Comply with UL 1; zinc-coated steel.
7. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings: Comply with NEMA FB 1 and UL 514B.

1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
4. Fittings for EMT:
   a. Material: Steel or die cast.
   b. Type: Setscrew or compression.
5. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
6. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1. ENT: Comply with NEMA TC 13 and UL 1653.
2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
3. LFNC: Comply with UL 1660.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
3. Fittings for LFNC: Comply with UL 514B.
4. Solvents and Adhesives: As recommended by conduit manufacturer.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: EMT.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated.

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
   a. Loading dock.
   b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
   c. Mechanical rooms.

d. Gymnasiums.

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.

5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.

6. Damp or Wet Locations: GRC.

7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 nonmetallic in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.

2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.

4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface raceways only where indicated on Drawings.

G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

C. Do not fasten conduits onto the bottom side of a metal deck roof.

D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

G. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

I. Support conduit within 12 inches of enclosures to which attached.

J. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for raceways.

2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

O. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.

Q. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

2. Where an underground service raceway enters a building or structure.

3. Conduit extending from interior to exterior of building.

4. Conduit extending into pressurized duct and equipment.

5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.

6. Where otherwise required by NFPA 70.

R. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

S. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

T. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.

U. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

V. Locate boxes so that cover or plate will not span different building finishes.

W. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

X. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

Y. Set metal floor boxes level and flush with finished floor surface.

Z. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 31 20 00 "Earthwork" for pipe less than 6 inches in nominal diameter.

2. Install backfill as specified in Section 31 20 00 "Earthwork."

3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 31 20 00 "Earthwork."

4. Install manufactured duct elbows for stub-up at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.

5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.

   b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.5 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.6 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

   2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 31 20 00
EARTHWORK

PART 1 GENERAL

1.01 DESCRIPTION OF WORK:

A. This section specifies the requirements for furnishing all equipment, materials, labor, tools, and techniques for earthwork including, but not limited to, the following:

1. Site preparation/mobilization.
2. Excavation.
3. Underpinning.
4. Filling and backfilling.
5. Grading.
6. Soil Disposal.
7. Clean Up/Demobilization.

1.02 DEFINITIONS:

A. Unsuitable Materials:

1. Fills: Topsoil; frozen materials; construction materials and materials subject to decomposition; clods of clay and stones larger than 3 inches; organic material, including silts, which are unstable; and inorganic materials, including silts, too wet to be stable and any material with a liquid limit and plasticity index exceeding 40 and 15 respectively. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction, as defined by ASTM D1557.
2. Existing Subgrade (Except Footing Subgrade): Same materials as 1.2.A.1, that are not capable of direct support of slabs, pavement, and similar items with possible exception of improvement by compaction, proofrolling, or similar methods.
3. Existing Subgrade (Footings Only): Same as paragraph 1, but no fill or backfill. If materials differ from reference borings and design requirements, excavate to acceptable strata subject to Resident Engineer's approval.

B. Trench Earthwork: Trenchwork required for utility lines.

C. Site Earthwork: Earthwork operations required in area outside of a line located 1500 mm (5 feet) outside of principal building perimeter and within new construction area with exceptions noted above.

D. Degree of compaction: Degree of compaction is expressed as a percentage of maximum density obtained by laboratory test procedure. This percentage of maximum density is obtained through use of data provided from results of field test procedures presented in ASTM D1556, ASTM D2167, and ASTM D6938.

E. Fill: Satisfactory soil materials used to raise existing grades. In the Construction Documents, the term “fill” means fill or backfill as appropriate.

F. Backfill: Soil materials or controlled low strength material used to fill an excavation.

G. Unauthorized excavation: Removal of materials beyond indicated sub-grade elevations or indicated lines and dimensions without written authorization by the Resident Engineer. No payment will be made for unauthorized excavation or remedial work required to correct unauthorized excavation.

H. Authorized additional excavation: Removal of additional material authorized by the Resident Engineer based on the determination by the Contractor’s soils testing agency that unsuitable bearing materials are encountered at required sub-grade elevations. Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in work.

I. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular sub-base, drainage fill, or topsoil materials.

J. Structure: Buildings, foundations, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

L. Drainage course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

M. Bedding course: Layer placed over the excavated sub-grade in a trench before laying pipe. Bedding course shall extend up to the springline of the pipe.

N. Sub-base Course: Layer placed between the sub-grade and base course for asphalt paving or layer placed between the sub-grade and a concrete pavement or walk.

O. Utilities include on-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

P. Debris: Debris includes all materials located within the designated work area not covered in the other definitions and shall include but not be limited to items like vehicles, equipment, appliances, building materials or remains thereof, tires, any solid or liquid chemicals or products stored or found in containers or spilled on the ground.

   1. Mud and other soil debris in accordance with Section 31 25 50 MUD AND OTHER SOIL DEBRIS

Q. Contaminated soils: Soil that contains contaminates as defined and determined by the Resident Engineer or the Owner’s testing agency.

1.03 RELATED WORK:

A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.

B. Safety requirements: Section 01 35 26 SAFETY REQUIREMENTS.

C. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements.

D. Erosion Control: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, and Section 32 90 00, PLANTING.

E. Site preparation: Section 01 90 00 RIDOT STANDARDS SPECIFICATIONS SECTIONS Section 208 TEMPORARY DEWATERING BASIN.

F. Paving sub-grade requirements: Section 01 90 00 RIDOT STANDARDS SPECIFICATIONS SECTIONS Section 401 DENSE GRADE HOT MIX ASPHALT (HMA) PAVEMENTS, Section 32 05 23 CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

G. Installation of PVC Sleeve under concrete pavement: Section 32 05 23 CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

1.04 CLASSIFICATION OF EXCAVATION:

A. Unclassified Excavation: Removal and disposal of pavements and other man-made obstructions visible on surface; utilities, and other items including underground structures indicated to be demolished and removed; together with any type of materials regardless of character of material and obstructions encountered.

B. Rock Excavation:

1. Trenches and Pits: Removal and disposal of solid, homogenous, interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits that cannot be excavated with a late-model, track-mounted hydraulic excavator; equipped with a 42 inch wide, short-tip-radius rock bucket; rated at not less than 138 hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 19,000 lbf; measured according to SAE J-1179. Trenches in excess of 10 feet wide and pits in excess of 30 feet in either length or width are classified as open excavation.

2. Open Excavation: Removal and disposal of solid, homogenous, interlocking crystalline material firmly cemented, laminated, or foliated masses or conglomerate deposits that cannot be dislodged and excavated with a late-model, track-mounted loader; rated at not less than 210 hp flywheel power and developing a minimum of 48,510 lbf breakout force; measured according to SAE J-732.

3. Other types of materials classified as rock are unstratified masses, conglomerated deposits and boulders of rock material exceeding 1 cubic yard for open excavation, or 3/4 cubic yard for footing and trench excavation that cannot be removed by rock excavating

equipment equivalent to the above in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted.

4. Definitions of rock and guidelines for equipment are presented for general information purposes only. The Contractor is expected to use the information presented in the Geotechnical Evaluation Report to evaluate the extent and competency of the soil and to determine both quantity estimations and removal equipment and efforts.

1.05 MEASUREMENT AND PAYMENT FOR EXCAVATION:

A. Measurement for Excavation and Borrow: There shall be no separate measurement for excavation and borrow. Payment for all work related to open excavation, trench excavation and site earthwork, rock excavation including removal of bedrock, boulders. rock debris, loose, scattered rocks and boulders collected within the limits of the work or generated during earthwork operation, for providing and placing fill, backfill, borrow, drainage courses, sub-base course, and bedding courses and for removing soil debris shall be included in the Bid Price and no separate payment will be paid thereof.

1.06 SUBMITTALS:

A. Materials testing and inspection during construction: Section 01 40 50, SAMPLING & TESTING.

B. Safety requirements: Section 01 35 26 SAFETY REQUIREMENTS

C. Furnish to Resident Engineer:

1. Contactor shall furnish resumes with all personnel involved in the project including Project Manager, Superintendent, Registered Professional Land Surveyor and/or Registered Professional Civil Engineer. Project Manager and Superintendent should have at least 3 years of experience on projects of similar size.

2. Soil samples.

a. Classification in accordance with ASTM D2487 for each on-site or borrow soil material proposed for fill, backfill, engineered fill, or structural fill.

b. Laboratory compaction curve in accordance with ASTM D1557 for each on site or borrow soil material proposed for fill, backfill, engineered fill, or structural fill.

c. Test reports for compliance with ASTM D2940 requirements for subbase material.

d. Pre-excavation photographs and videotape in the vicinity of the existing structures to document existing site features, including surfaces finishes, cracks, or other structural blemishes that might be misconstrued as damage caused by earthwork operations.

3. Contractor shall submit procedure and location for:

a. Disposal of unused satisfactory and unsatisfactory material.

b. Proposed source of borrow material.

c. Notification of encountering rock in the project.

d. Advance notice on the opening of excavation or borrow areas.

e. Advance notice on shoulder construction for rigid pavements.

1.07 QUALITY ASSURANCE

A. Materials to be used in the work shall be tested by a certified independent Testing Agency, engaged by the Contractor to confirm conformance with the requirements of these Specifications.

1. The soils testing laboratory will perform:

a. Grain size analyses (ASTM D422) of the samples to determine their suitability for use as backfill or fill material in conformance to the materials requirements specified herein.

b. Proctor analyses ASTM D1557 to determine the maximum dry densities required for compaction testing as specified elsewhere in the Contract Documents.

1.08 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. Rhode Island Department of Transportation Standard Specifications for Roads and Bridge Construction, 2004 Edition (most recently amended)

C. American Society for Testing and Materials (ASTM):

C33-03	Concrete Aggregate
D698-07e1	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft. lbf/ft^3 (600 kN m/m^3))
D1140-00	Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
D1556-07	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method
D1557-09	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN m/m^3))
D2167-08	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
D2487-11	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)

D2940-09	Standard Specifications for Graded Aggregate Material for Bases or Subbases for Highways or Airports
D6938-10	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth
D.	Society of Automotive Engineers (SAE):
J732-07	Specification Definitions - Loaders
J1179-08	Hydraulic Excavator and Backhoe Digging Forces

PART 2 PRODUCTS

2.01 MATERIALS:

A. General: Provide borrow soil material when sufficient satisfactory soil materials are not available from excavations.

B. Fills: Material in compliance with ASTM D2487 Soil Classification Groups GW, GP, SW, SP or any combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Material approved from on site or off site sources having a minimum dry density of 110 pcf, a maximum Plasticity Index of 15, and a maximum Liquid Limit of 40.

C. Engineered Fill: Naturally or artificially graded mixture of compliance with ASTM D2487 Soil Classification Groups GW, GP, SW and SP, or any combination of these groups, or as approved by the Engineer or material with at least 90 percent passing a 1 1/2-inch sieve and not more than 12 percent passing a No. 200 sieve, per ASTM D2940;.

D. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; except with 100 percent passing a 1 inch sieve and not more than 8 percent passing a No. 200 sieve.

E. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1 1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

F. Pea Stone at Pea Stone Strip, surrounding columbarium walls and for use at watering faucets at the Flower Watering Stations shall include the following:

1. Pea stone shall be hard, durable, rounded, or sub-angular particles of proper size and gradation, and shall be free from sand, loam, clay, excess fines, and other deleterious materials. Pea stone gravel shall be graded within the following limits:

Sieve No.	% Passing by Weight
5/8 in	100
1/2 in	40 - 100
3/8 in	15 - 45
No. 10	0 - 5

2. Filter Fabric shall be Mirafi 140N or equivalent.

G. Granular Fill:

1. Under concrete slab or foundation: granular fill shall consist of clean, poorly graded crushed rock, crushed gravel, or uncrushed gravel placed beneath a concrete pavement slab or columbarium wall foundation, meeting the following requirements:

Sieve No.	% Passing by Weight
2 inch	100
1-1/2 inch	70-100
¾ inch	50-85
No.4	30-55
No.50	8-24
#200	3-10

2. Bedding for sanitary and storm sewer pipe, crushed stone or gravel graded from 1/2 inch) to No 4, per ASTM D2940.

H. Buried Warning and Identification Tape: Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specific below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, “CAUTION, BURIED (intended service) LINE BELOW” or similar wording. Color and printing shall be permanent, Unaffected by moisture or soil. Warning tape color codes:

Red:	Electric
Orange:	Telephone and Other Communications
Blue:	Water Systems, including over water supply sleeves under concrete walkways
Green:	Sewer Systems

PART 3 EXECUTION

3.01 SITE PREPARATION/MOBILIZATION:

A. Clearing: Clear within limits of earthwork operations as shown. Work includes removal of trees, shrubs, fences, foundations, incidental

structures, paving, debris, trash, and other obstructions. Remove materials from Cemetery Property.

B. Grubbing: Coordinate with requirements of Section 02 41 00 DEMOLITION. Remove stumps and roots 3 inch and larger diameter. Undisturbed sound stumps, roots up to 3 inch diameter, and nonperishable solid objects a minimum of 3 feet below subgrade or finished embankment may be left.

C. Stripping and Stockpiling Topsoil:

1. Topsoil: Before stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation three to four weeks before stockpiling existing topsoil.

2. Install sedimentation and erosion control in accordance with Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

3. Strip topsoil from within limits of earthwork operations as specified. Coordinate with the requirements of section 32 90 00 PLANTING. Topsoil shall be a fertile, friable, natural topsoil of loamy character and characteristic of locality.

4. Stockpile in windrows less than six feet high. Orient direction of stockpile windrows to avoid channeling water and creating erosion.
5. Cover during precipitation events to minimize saturated soil conditions. Do not manipulate when in a wet or frozen condition, to include planting operations.

6. Install erosion control materials to prevent erosion or displacement of bulk products.

7. Eliminate foreign materials, such as weeds, roots, stones greater than 2-inches, subsoil, frozen clods, and similar foreign materials larger than 1/4 cubic foot in volume, from soil as it is stockpiled.

8. Retain topsoil on station. Remove foreign materials larger than 2 inches in any dimension from topsoil used in final grading. Topsoil work, such as stripping, stockpiling, and similar topsoil work shall not, under any circumstances, be carried out when soil is wet so that the composition of the soil will be destroyed.

D. Concrete Slabs and Paving: Score deeply or saw cut to insure a neat, straight cut, sections of existing concrete slabs and paving to be removed where excavation or trenching occurs. Extend pavement section to be removed a minimum of 12 inches on each side of widest part of trench excavation and insure final score lines are approximately parallel unless otherwise indicated. Remove material from Cemetery Property.

E. Lines and Grades: Registered Professional Land Surveyor or Registered Professional Civil Engineer, specified in Section 01 89 00 SITE CONSTRUCTION PERFORMANCE REQUIREMENTS, shall establish lines and grades.

1. Grades shall conform to elevations indicated on plans within the tolerances herein specified. Generally grades shall be established to provide a smooth surface, free from irregular surface changes. Grading shall comply with compaction requirements and grade cross sections, lines, and elevations indicated. Where spot grades are

indicated the grade shall be established based on interpolation of the elevations between the spot grades while maintaining appropriate transition at structures and paving and uninterrupted drainage flow into inlets.

2. Contractor is responsible to notify Resident Engineer of any differences between existing elevations shown on plans and those encountered on site by Registered Professional Land Surveyor/Registered Professional Civil Engineer described above. Notify Resident Engineer of any differences between existing or constructed grades, as compared to those shown on the plans.

3. Subsequent to establishment of lines and grades, Contractor will be responsible for any additional cut and/or fill required to ensure that site is graded to conform to elevations indicated on plans.

4. Finish grading is specified in Section 32 90 00, PLANTING.

F. Disposal: All materials removed from the property shall be disposed of at a legally approved site, for the specific materials, and all removals shall be in accordance with all applicable Federal, State and local regulations. No burning of materials is permitted on-site.

3.02 EXCAVATION:

A. Shoring, Sheeting and Bracing: Shore, brace, or slope, its angle of repose or to an angle considered acceptable by the Resident Engineer, banks of excavations to protect workmen, banks, adjacent paving, structures, and utilities.

1. Design of the temporary support of excavation system is the responsibility of the Contractor. The Contractor shall submit a Shoring and Sheeting plan for approval 15 days prior to starting work. Submit drawings and calculations, certified by a Registered Professional Civil-Structural Engineer, describing the methods for shoring and sheeting of excavations. Shoring, including sheet piling, shall be furnished and installed as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Shoring, bracing, and sheeting shall be removed as excavations are backfilled, in a manner to prevent caving.

2. Construction of the support of excavation system shall not interfere with the permanent structure and may begin only after a review by the Resident Engineer.

3. Extend shoring and bracing to a minimum of 5 feet below the bottom of excavation. Shore excavations that are carried below elevations of adjacent existing foundations.

B. Excavation Drainage: Operate pumping equipment, and/or provide other materials, means and equipment as required to keep excavation free of water and subgrade dry, firm, and undisturbed until approval of permanent work has been received from Resident Engineer. Approval by the Resident Engineer is also required before placement of the permanent work on all subgrades. Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation

slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 10 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 3 feet below the working level. Operate dewatering system continuously until construction work below existing water levels is complete. Submit performance records weekly. Measure and record performance of dewatering system at same time each day by use of observation wells or piezometers installed in conjunction with the dewatering system. Relieve hydrostatic head in pervious zones below subgrade elevation in layered soils to prevent uplift.

C. Subgrade Protection: Protect subgrades from softening, undermining, washout, or damage by rain or water accumulation. Reroute surface water runoff from excavated areas and not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches. When subgrade for foundations has been disturbed by water, remove disturbed material to firm undisturbed material after water is brought under control. Replace disturbed subgrade in trenches with concrete or material approved by the Resident Engineer.

D. Blasting: Blasting of materials classified as rock is not anticipated on this Project. If bedrock is found and blasting is required it shall be permitted only when authorized by Resident Engineer. Contractor shall meet all federal, state, and local requirements.

1. Blasting shall be done with explosives of quantity and power, and fired in such sequence and locations as to not injure personnel, damage or crack rock against which concrete is to be placed, damage property, or damage existing work or other portions of new work. Contractor shall be responsible for damage caused by blasting operations.

2. The Contractor shall submit a Blasting Plan, prepared and sealed by a Registered Professional Civil Engineer that includes calculations for overpressure and debris hazard. Blasting mats shall be provided and non-electric blasting caps shall be used. The Contractor shall obtain written approval prior to performing any blasting and shall notify the Resident Engineer 24 hours prior to blasting. The plan shall contain provisions for storing, handling and transporting explosives as well as for the blasting operations.

E. Proofrolling:

1. After rough grade has been established in cut areas and prior to placement of fill in fill areas under columbarium wall foundations and pavements, proofroll exposed subgrade with a fully loaded dump truck to check for pockets of soft material.

2. Proof rolling shall be done on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After stripping,

proof roll the existing subgrade within 10-feet of the columbarium walls with six passes of a dump truck loaded with 4 cubic yards of soil or equivalent device. Operate the truck in a systematic manner to ensure the number of passes over all areas, and at speeds between 2 1/2 to 3 1/2 mph. When proof rolling, one-half of the passes made with the roller shall be in a direction perpendicular to the other passes. Notify the Resident Engineer a minimum of 3 days prior to proof rolling. Proof rolling shall be performed in the presence of the Resident Engineer. Rutting or pumping of material shall be undercut as directed by the Resident Engineer to a depth of 12-inches and replaced with granular fill as defined in this Section. Maintain subgrade until succeeding operation has been accomplished.

F. Columbarium Wall Earthwork:

1. Excavation shall be accomplished as required by drawings and specifications.
2. Excavate foundation excavations to solid undisturbed subgrade.
3. Remove loose or soft materials to a solid bottom.
4. Fill excess cut under footings or foundations with 3000 psi concrete poured separately from the footings.
5. Do not tamp earth for backfilling in footing bottoms, except as specified.
6. Slope grades to direct water away from excavations and to prevent ponding.
7. Ensure that footing subgrades have been inspected and approved by the Resident Engineer prior to concrete placement.

G. Trench Earthwork:

1. Utility trenches (except sanitary and storm sewer):
   a. Excavate to a width as necessary for sheeting and bracing and proper performance of the work.
   b. Grade bottom of trenches with bell holes scooped out to provide a uniform bearing.
   c. Support piping on suitable undisturbed earth unless a mechanical support is shown. Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness.
   d. Length of open trench in advance of piping laying shall not be greater than is authorized by Resident Engineer.
   e. Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade
   g. Bedding shall be of the type and thickness shown. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be

taken to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM D 698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide materials as follows:

1) Class I: Angular, 0.25 to 1.5 inches, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

2) Class II: Coarse sands and gravels with maximum particle size of 1.5 inches, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D2487.

2. Sanitary and storm sewer trenches:

a. Trench width below a point 6 inches above top of pipe shall be 24 inches maximum for pipe up to and including 12 inches diameter, and four-thirds diameter of pipe plus 8 inches for pipe larger than 12 inches. Width of trench above that level shall be as necessary for sheeting and bracing and proper performance of the work.

1) Bed bottom quadrant of pipe on suitable undisturbed soil or granular fill. Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness. Undisturbed: Bell holes shall be no larger than necessary for jointing. Backfill up to a point 12 inches above top of pipe shall be clean earth placed and tamped by hand.

2) Granular Fill: Depth of fill shall be a minimum of 3 inches plus one sixth of pipe diameter below pipe to 12 inches above top of pipe. Place and tamp fill material by hand.

c. Place and compact as specified remainder of backfill using acceptable excavated materials. Do not use unsuitable materials.

d. Use granular fill for bedding where rock or rocky materials are excavated.

e. Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade

H. Site Earthwork: Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, rock and other materials or unauthorized excavation. Excavation shall be accomplished as required by drawings and specifications. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for

placing and removing concrete formwork, for installing services and other construction, complying with OSHA requirements, and for inspections. Remove subgrade materials that are determined by Resident Engineer as unsuitable, and replace with acceptable material. If there is a question as to whether material is unsuitable or not, the contractor shall obtain samples of the material, under the direction of the Resident Engineer, and the materials shall be examined by an independent testing laboratory for soil classification to determine whether it is unsuitable or not. Testing of the soil shall be performed by the Contractor's Testing Laboratory. When unsuitable material is encountered and removed, contract time will be adjusted in accordance with Articles, DIFFERING SITE CONDITIONS, CHANGES and CHANGES-SUPPLEMENT of the GENERAL CONDITIONS as applicable.

1. Site Grading:

   a. Provide a smooth transition between adjacent existing grades and new grades.

   b. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

   c. Slope grades to direct water away from buildings and to prevent ponds from forming where not designed. Finish subgrades to required elevations within the following tolerances:

      1) Lawn or Unpaved Areas: Plus or minus 1 inch.

      2) Walks: Plus or minus 0.25-inch.

      3) Pavements: Plus or minus 0.25-inch.

3.04 FILLING AND BACKFILLING:

A. General: Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation. For fill and backfill, use excavated materials and borrow meeting the criteria specified herein, as applicable. Borrow will be supplied at no additional cost to the Government. Do not use unsuitable excavated materials. Do not backfill until foundations for columbarium walls have been completed above grade and adequately braced, waterproofing or dampproofing applied, foundation drainage, and pipes coming in contact with backfill have been installed and work inspected and approved by Resident Engineer.

B. Placing: Place materials in horizontal layers not exceeding 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers and then compacted. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure. Place no material on surfaces that are muddy, frozen, or contain frost.

C. Compaction: Compact with approved tamping rollers, sheepsfoot rollers, pneumatic tired rollers, steel wheeled rollers, vibrator compactors, or other approved equipment (hand or mechanized) well suited to soil being compacted. Do not operate mechanized vibratory compaction equipment

within 10 feet of new or existing columbarium walls without prior approval of Resident Engineer. Moisten or aerate material as necessary to provide moisture content that will readily facilitate obtaining specified compaction with equipment used. Backfill adjacent to any and all types of structures shall be placed and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials to prevent wedging action or eccentric loading upon or against the structure. Compact soil to not less than the following percentages of maximum dry density, according to ASTM D698 or ASTM D1557 as specified below:

1. Fills, Embankments, and Backfill and under Natural Ground (Cut or Existing)

   a. Under proposed structures, concrete paved areas and asphalt paved areas, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material in accordance with ASTM D1557 Method A 95 percent.

   d. Landscaped areas, top 18 inches, D1557 Method A 82 - 84 percent.

   e. Landscaped areas, below 18 inches of finished grade, D1557 Method A 90 percent.

D. Borrow Material: Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from areas within the limits of the project site or from approved private sources.

E. Opening and Drainage of Excavation: Except as otherwise permitted, excavation areas shall be excavated providing adequate drainage. Overburden and other spoil material shall be transported off site and disposed of. The Contractor shall ensure that excavation of any area and the dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.05 PEA STONE SURROUNDING COLUMBARIUM WALLS AND AT FLOWER WATERING STATIONS

A. Excavate or otherwise properly define the trench surrounding columbarium walls as indicated. Install pea stone at Flowering Water Stations in locations indicated.

B. Clean all debris from the bottom of the trench without undermining the granular base beneath the surrounding concrete sidewalk.

C. Verify the bottom of the trenches at Columbarium Walls and in pits at Flower Watering Stations will infiltrate water at a rate of no less than 1-inch per hour. In the event that the subgrade/subsoil material has become too compact to infiltrate at this minimum rate, utilize air spade or other similar means of excavation in a narrow confine to loosen the soils. Tamp firm and retest for infiltration. Repeat these procedures until all sections of all trenches infiltrate at this rate.

D. Place filter fabric on the outside vertical face of the trench as indicated. Do not place filter fabric on the bottom of the trenches.

E. Backfill with pea stone to within 0.5-inches of the adjacent concrete pavement.

3.06 GRADING:

A. General: Uniformly grade the areas within the limits of this section, including adjacent transition areas. Smooth the finished surface within specified tolerance. Provide uniform levels or slopes between points where elevations are indicated, or between such points and existing finished grades. Provide a smooth transition between abrupt changes in slope.

B. Cut rough or sloping rock to level beds for foundations. In pipe spaces or other unfinished areas, fill low spots and level off with coarse sand or fine gravel.

C. Slope backfill away from new and existing columbarium walls for a minimum distance of 6 feet or as indicated on the Drawings.

D. Finish subgrade in a condition acceptable to Resident Engineer at least one day in advance of paving operations. Maintain finished subgrade in a smooth and compacted condition until succeeding operation has been accomplished. Scarify, compact, and grade subgrade prior to further construction when approved compacted subgrade is disturbed by Contractor's subsequent operations or adverse weather.

E. Grading for Paved Areas: Provide final grades for both subgrade and base course to +/- 0.25 inches of indicated grades.

3.07 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL:

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Cemetery property.

B. Remove from site and dispose of any excess excavated materials after all fill and backfill operations have been completed.

3.08 CLEAN UP/DEMOBILIZATION:

A. Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for subsequent construction operations. Remove all debris, rubbish, and excess material from Cemetery Property.

END OF SECTION

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SECTION 31 23 13
SUBGRADE PREPARATION IN PLANTING AREAS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Provide all labor, equipment, materials, incidental work, and construction methods necessary to evaluate, test and decompact the subgrade in areas designated for new lawns and planting.

1.02 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Earth moving: Section 31 20 00 EARTHWORK
2. Placement of planting soils: Section 32 91 19 LANDSCAPE GRADING

1.03 REFERENCES

A. The following standards shall apply to the work of this Section.

1. Associated General Contractors of America, Inc. (AGC):
   a. Manual of Accident Prevention in Construction
2. American Society for Testing and Materials (ASTM):
   a. D 1556 Density of Soil In-Place by the Sand Cone Method
   b. D 2167 Density and Unit Weight of Soil In-Place by the Rubber Balloon Method
   c. D 2922 Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth)
   d. D 2937 Density of Soil In-Place by the Drive-Cylinder Method
   e. D 3017 Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.04 QUALITY CONTROL TESTING REQUIREMENTS

A. Quality Control for Areas of Subsoiling and Decompaction:

1. Quality control shall be a 2 phase operation including 1) penetrometer/infiltration testing of existing undisturbed soils and 2) penetrometer/infiltration testing of areas of turf and planting after subsoiling operations have been completed.

2. Perform penetrometer/infiltration tests on existing, undisturbed subsoils in accordance with the requirements of this Section.
   a. Record penetrometer resistance of existing subgrade soils.
   b. Record infiltration rates of existing subgrade soils.
   c. Utilize these records to evaluate the levels of compaction in all areas of the project site disturbed during the course of the Work.
3. All areas of the site that have subgrade soils that are determined to be more compact than the existing in situ soils tested or determined to infiltrate at rates that are slower than the in-situ soils shall be decompacted in accordance with the subsoiling requirements of this Section.
4. Prior to the spreading planting soil in designated areas, the Contractor shall demonstrate to Resident Engineer that the depth of subsoiling, decompaction of subgrades and infiltration rates have been met in accordance with the requirements of this Section.

1.05 DEFINITIONS

A. Soil compaction: the formation of dense layers of overly packed soil. Compaction will force soil particles closer together, driving out pore space and reducing the volume of air and water in soil. Compaction seals off the soil surface and reduces the amount of air and water that enters the soil. Compaction reduces and can eliminate the movement of water and air through the soil, preventing the movement of plant roots through the soil and creating anaerobic conditions that will kill plant material and turf.

B. Sub-grade: Existing native soil in cut, on-site borrow in fill conditions, or imported soils in fill conditions, all of which meet the requirements of this Specification, upon which planting soils or granular pavement base are placed shall be known as sub-grade.

C. Subsoiling: The vertical and lateral fracturing of compacted subsoil material to full depth of compaction through deep ripping and de-compaction to restore soil porosity and permeability, to aid in infiltration of water, and to promote root growth.

D. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.06 COORDINATION

A. Prior to start of any subsoiling and decompaction work the Contractor shall arrange an on-site meeting with the Resident Engineer for the

purpose of establishing Contractor's schedule of operations and scheduling inspection procedures and requirements.

PART 2 PRODUCTS

2.01 PENETROMETER

A. Provide one Static Cone Penetrometer for use on this project. Make Penetrometer available to the Resident Engineer for use during the on-site Pre-Installation Conference and as required during the course of the work of the Project.

B. Static Cone Penetrometer shall be a hydraulic measuring device designed and manufactured to measure soil compaction. It shall be a 2 handed, analogue dial read meter gauged to read up to 1000 PSI. Penetrometer shall be one of the following hand- held devices:

1. Hand Penetrometer, #06.01 by Eijkelkamp Agrisearch Equipment, PO Box 4. 6987 ZG Giesbeek, The Netherlands
2. Handsounding Static Penetrometer, Model HAS-5, by Rocktest T: 1-450-465-1113; www.roctest.com
3. H-4210A Portable Static Cone Penetrometer, by Humboldt Manufacturing Company, Schiller Park IL 1-800-544-7220: www.humboldtmfg.com
4. Hydraulic Penetrometer, Pike Agri-Lab Supplies, Inc.; Jay, Maine; 207- 897- 9267; www.pikeagri.com
5. Hand Penetrometer Kit, 1 Meter Mechanical Gauge Type, 0325KL1 by Soil Moisture Equipment Corp., Santa Barbara, CA; T-805-964-3525; www.soilmoisture.com

2.02 INFILTRATION TESTING EQUIPMENT

A. Materials:

1. ASTM C33 fine aggregate.
2. A plastic bucket, measuring 7-inches diameter and 6-inches height. Drill one-quarter inch diameter holes in the bucket on the bottom and sides of the bucket as follows:
   a. Bottom surface: in a grid pattern approximately 1-inch on center
   b. On the side surface: at compass and cardinal points along the inside face of the bucket, drill 32 holes arranged in 8 vertical columns 45-degrees apart. Each of the 8 columns shall have 4 holes each. The bottom holes shall be one inch above the bottom of the bucket and each successive row of holes shall be two inches apart such that the last hole is no closer than one inch from the top of the bucket.

3. With an indelible marking pen, establish a measuring line at one-half inch increments on the side of the bucket and label each inch increment in successive numbers from one to five up the face of the bucket, the number one lowest and number five highest along the face of the bucket.

PART 3 EXECUTION

3.01 EARTHWORK - GENERAL

A. Work defined as excavation and filling, rough grading, trenching and backfilling, stripping and stockpiling of topsoil and all other earthwork related construction activities shall be specified, performed, permitted and paid for under the work of Section 31 20 00 EARTHWORK. Coordinate the work of this Section with work activities and schedules in those Sections.

B. Coordinate the schedule of penetrometer application or infiltration testing with the work of Section 32 91 19 LANDSCAPE GRADING.

3.02 TESTING PROCEDURES

A. Penetrometer Testing Alternative

1. Contractor shall verify level and depth of soil decompaction using a shovel and a penetrometer. In locations as directed by the Resident Engineer, dig holes 6-inches deep in the surface of the subsoil and test the bottom of the holes to depth of 6-inches with penetrometer, recording the dial gauge reading. Incrementally test the subsoil every three inches of increasing depth by shovel and penetrometer until the full specified thickness of subsoiling and decompaction has been verified. Record points where full depth subsoiling and decompaction have not been attained.

2. Repeat testing operation at representative locations of the construction site as determined by the Resident Engineer to verify specification requirements have been met.

3. In all areas where penetrometer testing shows specified depths of subsoiling have not been met, the Contractor shall perform remedial subsoiling to the specified depths.

4. Following the work of decompacting planting soil mixes and prior to any work of seeding, sodding or planting, test planting soil mixes and underlying subsoil with the penetrometer in locations as directed by the Resident Engineer.

5. In all areas where penetrometer testing shows the planting soil and underlying subsoil have not been decompacted, the Contractor shall perform remedial decompaction work through subsoiling as specified in this Section.

B. Infiltration Testing Alternative

1. In areas selected by the Resident Engineer, perform infiltration testing.

2. Procedure: Prior to the placement of any planting soil, perform infiltration tests to determine if the subgrade soils are overly compacted. Perform the following infiltration test procedure:

   a. Dig a hole in the subgrade or placed fills that is a minimum one inch greater than the diameter and depth of the approved bucket.

   b. Place a one-half inch lift of ASTM C33 fine aggregate (sand) in the bottom of the hole.

   c. Place the perforated bucket centered in the hole and tamp additional sand around the vertical face of the bucket.

   d. Fill the bucket with water to the level of the subgrade and allow the water to drain out of the bucket.

   e. Refill the bucket with water to the level of the subgrade and allowed to drop one inch.

   f. Testing commences once the level of water in the bucket has dropped one inch.

   g. Thereafter record the time it takes for the water level in the bucket to drop three inches.

   h. Calculate the rate at which the water infiltrates in inches per hour.

   i. Create a sketch showing the locations of the percolation tests.

3. Where subgrade soils drain at a rate of less than one-inch per hour then the subgrade soils shall be considered impermeable and shall be decompacted through the process of subsoiling as specified in this Section.

3.03 SUBSOILING AND DECOMPACTION OF SOILS

A. General:

1. All in-place soil within the limit of work that has been subject to any foot or vehicular traffic, equipment storage or material stockpiling prior to the commencement of this Contract or during the performance of this Contract shall be subsoiled and decompacted to a depth of 24 inches in accordance with the requirements of this Specification.

B. Recording compaction levels of existing soils:

1. At the beginning of the construction project and in the presence of the Resident Engineer, locate areas of the property that have not

been subject to loading and compaction. Locations of undisturbed soils are typically found on the edges of the property, in shrub beds or under trees. Using the penetrometer or the infiltration testing equipment, determine the base-line level of soil compaction/rate of infiltration of undisturbed soils on site.

a. In the event that the penetrometer probe encounters resistance or is prevented from penetrating the soil assume the probe has encounter a rock or other obstruction and perform the test in the immediate vicinity.

b. Perform no less than 12 penetrometer tests or infiltration tests on existing, undisturbed soils to determine compaction levels/infiltration rates of existing soil.

c. If the penetrometer option is chosen: Prepare a chart of findings noting PSI by location and present to the Resident Engineer for review and approval.

d. If infiltration testing option is chosen: Prepare a chart of findings noting infiltration rates by location and present to the Resident Engineer for review and approval.

C. Subsoiling Operations:

1. Vertically and laterally fracture all exposed subsoil material within the Limits of Work through deep ripping and decompaction, restoring soil porosity and permeability and aiding infiltration and reducing runoff. Restrict fracturing of subsoil to those areas of turf and planting. Fracture the subsoil to a depth of 24 inches.

2. Effective fracturing of compressed subsoil material is achieved only when the soil material is moderately dry to moderately moist. Perform subsoiling only when soil has suitable moisture content as described in this Specification.

3. In the presence of the Resident Engineer determine subsoil moisture content. The Contractor shall auger a hole to a depth of 24 inches below the surface of the subsoil. Reach in and extract a handful of soil.

4. Hand roll the sample between the palms down to a 1/8-inch diameter snake. If the soil sample crumbles apart in segments no greater than 3/8 of an inch long when it is rolled down to 1/8 inch diameter, it is low enough in moisture for deep ripping. Conversely, if the rolled sample stretch out in increments greater than 3/8-inch before crumbling, it is in a plastic state of soil consistency and is too wet for sub-soiling and final decompaction.

D. Subsoiling and Decompaction:

1. Subsoiling and decompaction shall be performed in a two-phase process.

2. Subsoiling shall be accomplished by deep ripping or bucket excavation as follows:

E. Subsoiling Large Areas by Deep Ripping:

1. Deep rip the affected areas of exposed subsoil material, aggressively fracturing it before the planting soil is spread. Use a “heavy duty” agricultural-grade, deep ripper for this first phase of deep ripping. Rip the subsoil to the full depth of compaction.

2. Use the following rule of thumb for tractor horsepower (hp) whenever deep ripping and decompacting: Have at least 40 hp of tractor pull available for each mounted shank/ leg of the ripper. For example, a 3-shank ripping implement shall be pulled by a tractor with a 120 hp engine. A 5-shank implement shall be pulled by a 200 hp tractor.

3. Deep ripping shall be performed in three passes across the compacted subsoil. The first and second passes shall consist of parallel, forward- and-return runs, with each progressive pass of the implement’s legs or shanks evenly staggered between those from the previous pass, ensuring vertical fracturing on 12 to 15 inch centers. A final pass shall be performed at a 45 to 60 degree angle to the previous two passes.

4. Final depth of deep ripping of this first phase shall be achieved to a depth of 24 inches, to which end the ripping implement shall be modified as required.

5. The operating speed for pulling the deep ripper through the soil shall not exceed 3 mile per hour, a rate of operating speed slow that will ensure maximum functional performance of soil fracturing.

6. Do not use industrial-grade variations of ripping implements that are attached to power graders or bulldozers. The shanks and teeth of these rippers are often too short and stout and are mounted too far apart to properly restore soil permeability and infiltration.

7. Any oversize rocks which are uplifted to the subsoil surface during the deep ripping phase shall be collected and removed.

F. Sub-soiling Areas by Bucket Excavation:

1. Excavate the area of compacted areas to turn over and fracture the subsoil material before the planting soil is spread. Use backhoe or excavator for this first phase of sub-soiling.

2. Plan out and execute sub-soiling by bucket excavation in a manner such that the excavation equipment backs out of the area of compacted subsoil without traversing sub-soiled areas with equipment.

3. Final depth of bucket excavation of this first phase shall be 24 inches. Perform all excavation in the presence of the Resident Engineer.

4. Any oversize rocks which are uplifted to the subsoil surface during the excavation phase shall be picked up and removed by hand.

G. Decompaction of Planting Soil:

1. In the course of spreading the planting soil avoid compaction of the previously ripped subsoil. Avoid compaction of the planting soil. The second phase of the operations shall be evaluation of the planting soil by penetrometer. De-compact overly compacted planting soil as noted in this Section. This second phase of de-compaction mitigates the partial re-compaction which occurs during the heavy process of planting soil spreading and grading.

2. Prior to deep ripping and de-compacting the site, all construction activity, including access by construction equipment, material storage, site cleanup and trafficking shall be completed and the site closed off to further disturbance. In the event of the operations of deep ripping and de-compaction are interrupted by rain, proceed no further until the subsoil has dried and the palmed roll crumbles in accordance with the requirements of this Section.

3.04 COMPACTION

A. Compaction of areas where subgrade has been decompacted shall be performed as specified under the work of Section 32 91 19 LANDSCAPE GRADING. Particular attention shall be given to requirements for tracked or LGP vehicles.

3.05 PROTECTION

A. Protecting Graded Areas: Protect newly decompacted and sub-graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish subgrades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before acceptance of finished grade, remove finished surfacing or planting soil, backfill with additional soil material, recompact and reconstruct surfacing, planting soil and install new plant material or turf as directed by the Approved Soil Scientist.

D. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.06 CLEANUP

A. At the end of all earthwork and rough grading operations and before acceptance of the work, the Contractor shall remove all debris, rubbish, garbage, trash, and discarded material, from the site. He shall dispose of them in a manner satisfactory to the Resident Engineer. The premises shall be left clean, presentable, and satisfactory.

END OF SECTION

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SECTION 31 25 50
MUD AND OTHER SOIL DEBRIS

PART 1 GENERAL

1.01 DESCRIPTION

A. This section defines mud as debris and requires the Contractor to remove mud and other soil debris from the site at no additional cost to the Owner. Assume responsibility for the work of this Section as it relates the other Sections of this Specification that define the specific scopes of work for each contractor.

B. Soil is a major part of the natural environment, alongside air and water, and is vital to the health and wellbeing of the landscape of this Project. Existing and imported soil materials are important and valuable resources to this Project. Protecting soil resources on the Project site is an essential aspect of the work of this Contract. Protect soil resources at all times. Remove and discard all damaged soils from the site as directed by the Resident Engineer at no additional cost to the Owner.

1.02 RELATED WORK

A. The following sections include work related to this Section:

1. Earthwork and earth moving activities, Section 31 20 00 EARTHWORK
2. Sediment collected during erosion control, Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
3. Placement and management of planting soil and topsoil, Section 32 90 00 PLANTING.

1.03 DEFINITIONS

A. Soil: Soil is substrate at or near the surface of the Earth that has been altered by biological, chemical, and/or physical agents and processes. It is the result of the gradual breakdown of rock. As rock is broken down by weathering and erosion, smaller and smaller particles are created. The granular material between the bedrock and the surface of the ground is soil.

B. Constituent Parts of Soil: As a whole, soil is made up of four constituent parts: mineral material, organic material, air and water. Some soil materials deeper in the soil profile may have no organic material.

C. Mineral Component: The mineral component of soil will be made up of a range of particle sizes. A refined version of United States Department of Agriculture soil particle sizes follows:

Conventional Name	Retained on U.S. Sieve No.	Diameter (mm)
Boulders	8″	>200
Cobbles	3″	75 - 200
Coarse Gravel	1/2″	10 - 75
Fine Gravel	#10	2 - 10
Very coarse sand	#18	1 - 2
Coarse sand	#35	0.5 - 1
Medium sand	#60	0.25 - 0.5
Fine sand	#140	0.10 - 0.25
Very fine sand	#270	0.05 - 0.10
Silt		0.002 - 0.05
Clay		< 0.002

D. Soil Profile: the horizontal arrangement of soil layers, either man made or naturally occurring. For the purposes of this Section, the topmost layer of soil in an existing condition is considered topsoil. Any soil underlying the topsoil layer in an existing condition is considered subsoil. In any new landscape condition constructed under the work of this Contract, the topmost layer(s) of soil are planting soil and the layers below the planting soil are either drainage layers or subsoil as shown on the detailed drawings and defined elsewhere in these Specifications.

E. Soil Structure: Soil structure refers to the shape, size and degree of development of the aggregation of the primary soil particles (sand, silt, clay, organics) into crumb-like particles called soil peds. Larger blocks of peds and soil fragments are called clods.

F. Soil Peds: Soil peds are natural, relatively permanent aggregates, separated from each other by voids or natural surfaces of weakness. If undisturbed, soil peds will persist through cycles of wetting and drying and freezing and thawing.

G. Soil Fragments and Clods are artificial structural units, formed at or near the surface by cultivation or frost action, and are not peds.

H. Topsoil: the existing, on-site surficial soil that exhibits biological growth, including root growth from plants, insects, worms, etc. Topsoil is a non-renewable resource. Strip and stockpile under the work of Section 31 20 00 EARTHWORK.

I. Planting Soil: amended topsoil used to grow turf, herbaceous plants or woody plants.

J. Dry Soil: Soil that has dried out is characterized by rigidity, brittleness and maximum resistance to pressure. When pressure is applied to dry soil, it has a tendency to crush to a powder or to

fragments. Soil that is crushed may not have the ability to cohere again when it is wetted and pressed back together. Soil that is crushed when dry and rewetted may lose its crumb structure. A soil that has lost its crumb structure due to applied pressure when it has been dried has failed.

K. Wet Soil: When soil becomes saturated, water fills the large & medium sized pores between the peds. Left to drain, the integrity of the soil structure remains intact. When pressure is applied to wet soil the ped structure breaks down and the mineral and organic components mix into a water/soil slurry. Without exception under the terms of this Contract, saturated topsoil & planting soil subject to pressure is reduced to mud.

L. Mud: A soft, sticky matter resulting from the mixing of soil and water under pressure. Mud is construction debris that cannot be amended or ameliorated to return to functional use.

M. Compacted Soil: Topsoil, planting soil and subsoil that are subject to pressure will compact. Compacted soils drain poorly. The ped structure of topsoil and planting soil is compromised when these soils are subject to compaction. Under the terms of this Contract, there are no acceptable remediation efforts that can return compacted topsoil or planting soil to a useful product. Compacted topsoil and planting soil is debris.

N. Debris Soils: Compacted topsoil and planting soils, wet soils that have been subjected to pressure and mud are considered debris under the terms of this Contract. Sticks, stones, trash, rubbish and any broken construction materials are also considered debris under the terms of this Contract. Any material identified by the Resident Engineer as unwanted or unsuitable to the site shall be considered debris.

PART 2 MATERIALS

2.01 NOT USED

PART 3 EXECUTION

3.01 DEBRIS

A. Remove and discard all debris from the site prior to the start of landscape/surface restoration and installation of site improvements, planting soils and plant material.

B. Topsoil and planting soil that is determined to be dry shall be wetted by irrigation, left to soften and become freely draining. Only then will the Resident Engineer inspect the topsoil or planting soil to determine whether they are debris.

END OF SECTION

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SECTION 32 05 23
CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Site work concrete.
2. Pedestrian Pavement: Walks, flower/water stations, bench pads, wheelchair curb ramps and plaza areas.
3. Detectable warning panels
4. Salt guard spray application.
5. PVC sleeves under pavement.

1.02 RELATED REQUIREMENTS

A. Laboratory and Field Testing Requirements: Section 01 45 29, TESTING LABORATORY SERVICES.

B. EARTHWORK: Section 31 20 00

C. SITE FURNISHINGS: Section 32 33 00.

1.03 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. American Concrete Institute (ACI):

1. 302.1R Guide for Concrete Floor and Slab Construction.
2. 305R Hot Weather Concreting.
3. 306R Cold Weather Concreting.
4. 308R Standard Practice for Curing Concrete.
5. 309R Standard Practice for Consolidation of Concrete.
6. 316R Recommendations for Construction of Concrete Pavements and Concrete Bases.
7. 318 Building Code Requirements for Reinforced Concrete.
8. 347 Recommended Practice for Concrete Formwork.

C. ASTM International (ASTM):

1. A 185 Specification for Steel Welded Wire Fabric. Plain, for Concrete Reinforcement
2. A 615 Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement

3. C 33 Specifications for Concrete Aggregates
4. C 94 Specifications for Ready-Mixed Concrete
5. C 143 Test Method for Slump of Hydraulic Cement Concrete
6. C 150 Specification for Portland Cement
7. C 171 Specification for Sheet Materials for Curing Concrete
8. C 231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
9. C 309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete
10. C 494 Specification for Chemical Admixtures for Concrete
11. C 1116 Standard Specification for Fiber Reinforced Concrete & Shotcrete
12. D 226 Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
13. C260 Air-Entraining Admixtures for Concrete.
14. C494 Chemical Admixtures for Concrete.
15. D 545 Test Methods for Preformed Expansion Joint Fillers for Concrete Construction (Nonextruding and Resilient Types)
16. D 1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort [56,000 ft-lbf/ft3 (2,700 kN-m/m3)]
17. D 1752 Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

D. Rhode Island Department of Transportations

1. Standard Specifications for Road and Bridge Construction, latest amendment

1.04 PREINSTALLATION MEETINGS

A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this section.

1. Required Participants:

a. Resident Engineer

b. Landscape Architect

c. Registered Professional Civil Engineer

d. Contractor.

e. Installer.

2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.

a. Installation schedule.

b. Installation sequence.

c. Preparatory work.

d. Protection before, during, and after installation.

e. Installation.

f. Terminations.

g. Transitions and connections to other work.

h. Inspecting and testing.

i. Other items affecting successful completion.

3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.05 SUBMITTALS

A. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, Submittal Drawings:

1. Show size, configuration, and fabrication and installation details.

2. Show reinforcing.

3. Include jointing plan for concrete pavements.

B. Manufacturer's Literature and Data:

1. Description of each product.

a. Expansion joint filler.

b. Hot poured sealing compound.

c. Reinforcement.

d. Curing materials.

e. Detectable warning panels

f. PVC sleeves under pavement

g. Salt guard spray on protection against salt damage.

C. Samples:

1. Construct 2.4 m by 2.4 m by 100 mm (8 feet by 8 feet by 6 inch) sample panel of concrete pavement on project site, demonstrating materials, workmanship, scoring, detectable warning panels and curing methods to be used throughout project. Accepted sample panel provides visual standard for work of this section. Remove sample panel when no longer required for comparison with finished work.

D. Test Reports: Certify products comply with specifications.

1. Job mix formula.

2. Select subbase materials.

E. Certificates: Certify products comply with specifications.

1. Expansion joint filler.

2. Reinforcement.

3. Curing materials.

4. Concrete protective coating.

F. Qualifications: Substantiate qualifications comply with specifications.

1. Installer with project experience list.

2. Land surveyor.

G. Concrete mix design.

1.06 QUALITY ASSURANCE

A. Installer Qualifications:

1. Regularly installs specified products.

2. Installed specified products with satisfactory service on five similar installations.

a. Project Experience List: Provide contact names and addresses for completed projects.

B. Land Surveyor: Registered Professional Land Surveyor or Registered Professional Civil Engineer registered to provide land surveys in jurisdiction where project is located.

C. Preconstruction Testing:

1. Engage independent testing laboratory to perform tests and submit reports.

a. Deliver samples to laboratory in number and quantity required for testing.

2. Concrete mix design.

1.07 DELIVERY

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, and manufacture date.

C. Deliver steel reinforcement to prevent damage.

D. Before installation, return or dispose of products with damaged or opened packaging and distorted or damaged steel reinforcement.

E. Bulk Products: Deliver bulk products away from buildings, utilities, pavement, and existing turf and planted areas. Maintain dry bulk product storage away from contaminants.

1.08 STORAGE AND HANDLING

A. Store products indoors in dry, weathertight facility.

B. Protect products from damage during handling and construction operations.

1.09 WARRANTY

A. Construction Warranty: FAR clause 52.246 21, "Warranty of Construction."

PART 2 - PRODUCTS

2.01 CONCRETE

A. Concrete: Type C, air entrained as specified in Section 03 30 53 (SHORT FORM) CAST-IN-PLACE CONCRETE, except as follows:

TYPE	MAXIMUM SLUMP*
Bench Pads & Flower Watering Stations	75 mm (3 inches)
Pedestrian Pavement and Handicapped Access Ramps	75 mm (3 inches)
* For concrete to be vibrated: Slump as determined by ASTM C143/C143M. Tolerances as established by ASTM C94/C94M.	

2.02 REINFORCEMENT

A. Steel Reinforcement: Type, amount, and locations as shown on drawings and as specified.

B. Epoxy Coated Steel Reinforcement: ASTM A775/A775M.

C. Welded Wire Fabric: AASHTO M55M/M55.

D. Dowels: Plain steel bars complying with AASHTO M31M/M31.

E. Tie Bars: Deformed steel bars complying with AASHTO M31M/M31.

2.03 AGGREGATE BASE

A. Granular fill in accordance with the requirements of Section 31 20 00 EARTHWORK of these specifications.

2.04 PVC SLEEVES

A. ASTM D3034 PVC pipe, 1/4-inch wall thickness, 4-inch diameter. Provide sleeve caps to slip over ends of PVC pipe not used for water lines under this contract. Sleeve caps shall not be adhered in place.

2.05 FORMS

A. Forms: Metal or wood, straight and suitable in cross section, depth, and strength to resist springing during depositing and consolidating of concrete.

B. Tolerance: 3 mm (1/8 inch) maximum variation from straight line in any 3000 mm (10 foot) long section, in either a horizontal or vertical direction.

C. Wood Forms: Minimum 50 mm (2 inches) thick (nominal), free from warp, twist, loose knots, splits, or other defects. Provide approved flexible or curved forms for forming radii.

2.06 DETECTABLE WARNING PANELS

A. Detectable warning panels shall be in accordance with the requirements of RIDOT Standard Specification Section 942 Detectable Warning Panels. They shall be panels of truncated domes in an arrayed pattern compliant with Americans with Disabilities Act (ADA) in locations shown.

B. Panels shall be gray cast iron conforming to AASHTO M105 and AASHTO M306.

C. Panels shall have integrally cast domes and shall be manufactured with integral embedment lugs for the express installation into fresh unset Portland cement concrete.

2.07 CONCRETE CURING MATERIALS

A. Concrete Curing Materials: Comply with one of the following:

1. Burlap: AASHTO M182, weighing 233 g/sq. m (7 oz./sq. yd.) dry.

2. Impervious Sheeting: AASHTO M171.

   a. Polyethylene: Minimum 0.1 mm (4 mils) thick.

3. Liquid Membrane Curing Compound: AASHTO M148 Type 2, without paraffin or petroleum.

2.08 EXPANSION JOINT FILLERS

A. Expansion Joint Filler: AASHTO M213.

2.09 ACCESSORIES

A. Equipment and Tools: Obtain Resident Engineer's approval of equipment and tools for handling materials and performing work before work begins. Maintain equipment and tools in satisfactory working condition at all times.

B. Sealants shall be in accordance with the requirements of Section 07 92 00 JOINT SEALANTS.

2.10 CONCRETE PROTECTIVE COATING

A. Provide is a general-purpose silane/siloxane water repellent and chloride screen for concrete sidewalks. Provide Consolideck® Saltguard as manufactured by Prosoco, 800-255-4255, http://prosoco.com

PART 3 EXECUTION

3.01 PREPARATION

A. Examine and verify substrate suitability for product installation.

B. Protect existing construction and completed work from damage.

C. Prepare, construct, and finish subgrade as specified in Section 31 20 00, EARTHWORK.

D. Maintain subgrade in smooth, compacted condition, complying with required section and established grade until succeeding operation has been accomplished.

3.02 PVC SLEEVES

A. Install in locations indicated at 24-inch depth below pavement level. Surround with aggregate base. Cap unused sleeves at both ends.

3.03 AGGREGATE BASE

A. Install in accordance with the requirements of Section 31 20 00 EARHTWORK and the following:

B. Placing:

1. Place aggregate base on prepared subgrade in uniform layer to required contour and grades, to maximum 250 mm (10 inches) loose depth that, when compacted, will produce layer of required thickness.

2. When required compacted thickness exceeds 150 mm (6 inches), place aggregate base material in equal thickness layers.

C. Compaction:

1. Perform compaction with approved hand or mechanical equipment well suited to material being compacted.

2. Moisten or aerate material as required to provide moisture content that will readily facilitate obtaining specified compaction with equipment used.

3. Compact each aggregate base layer to minimum 95 percent or 100 percent of maximum density as specified by AASHTO T180 or AASHTO T99, respectively.

D. Tolerances:

1. Test completed aggregate base for grade and cross section with straight edge.

2. Surface Variation: Maximum 10 mm (3/8 inch) each layer.

3. Variation from Indicated Thickness: Maximum 13 mm (1/2 inch).

E. Protection:

1. Maintain finished aggregate base in smooth and compacted condition until concrete is placed.

2. When subsequent construction operations or adverse weather disturb approved compacted aggregate base, excavate and reconstruct base with new material meeting specified requirements, at no additional cost to State.

3.04 SETTING FORMS

A. Form Substrate:

1. Compact form substrate to uniformly support forms along entire length at grade as shown on drawings.

2. Correct substrate imperfections or variations by cutting or filling and compacting.

B. Form Setting:

1. Set forms sufficiently in advance of concrete placement to permit performance and approval of operations required with and adjacent to form lines.

2. Set forms to indicated line and grade and use stakes, clamps, spreaders, and braces to prevent movement in any direction.

3. Tolerances: Conform to line and grade with 3 mm (1/8 inch) tolerance when checked with straightedge, with maximum 6 mm (1/4 inch) deviation from true line at any point.

4. Remove forms when removal will not damage concrete and when required for finishing.

5. Clean and oil forms before each use.

C. Land Surveyor: Establish and control alignment and form grade elevations.

1. Make necessary corrections to forms immediately before placing concrete.

2. When any form has been disturbed or any subgrade or subbase has become unstable, reset and recheck form before placing concrete.

3.05 PLACING REINFORCEMENT

A. Keep reinforcement free of dirt, oil, rust, scale or other substances preventing concrete bond.

B. Install reinforcement as shown on drawings.

C. Support and securely tie reinforcing steel to prevent displacement during concrete placement.

D. Obtain Resident Engineer's approval of reinforcement placement before placing concrete.

3.06 PLACING CONCRETE - GENERAL

A. Preparation:

1. Obtain Resident Engineer's approval.

2. Remove debris and other foreign material from between forms.

3. Uniformly moisten subgrade, base, or subbase without standing water.

B. Convey concrete from mixer to final location without segregation or loss of ingredients. Deposit concrete to minimize handling.

C. During placement, consolidate concrete by spading or vibrating to minimize voids, honeycomb, and rock pockets.

1. Vibrate concrete against forms and along joints.

2. Avoid excess vibration and handling causing segregation.

D. Place concrete continuously between joints without bulkheads.

E. Install construction joint whenever concrete placement is suspended for more than 30 minutes and at end of each day's work.

F. Workmen or construction equipment coated with foreign material will not be permitted to walk or operate in concrete during placement and finishing operations.

3.07 PLACING CONCRETE ALL CONDITIONS

A. Place concrete in one layer conforming to cross section shown on drawings after consolidating and finishing.

B. Deposit concrete near joints without disturbing joints. Do not place concrete directly onto joint assemblies.

C. After concrete has been placed in forms, use a strike off guided by side forms to bring surface to proper section to be compacted.

D. Consolidate concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment.

E. Finish concrete surface to grade with wood or metal float.

F. Construct concrete pavements with sufficient slope to drain, preventing standing water. Refer to the grading plans for required drainage concept.

3.08 DETECTABLE WARNING PANELS

A. Panels shall be set flush into fresh unset concrete at the required line and grade to match the running grade and cross slope of the ADA accessible ramp or blended transition that warranted the installed panel.

B. Ensure that the alignment of the panel will match line and grade of the ramp such that the panel is flush with the ramp, and there is no physical conflict with other castings, fittings, structures, foundations or appurtenance thereof.

C. Utilize straight and radial castings to achieve the layout indicated on the Drawings, shown on the approved Shop Drawings and as directed by the Resident Engineer.

3.09 CONCRETE FINISHING - GENERAL

A. Follow operation sequence below, unless otherwise indicated on drawings:

1. Consolidating, floating, straight edging, troweling, texturing, and joint edging.
2. Maintain finishing equipment and tools in clean and approved condition.

3.10 CONCRETE FINISHING – ALL CONDITIONS

A. Walks, Flower Water Stations, Bench Pads, Wheelchair Curb Ramps and Plaza Areas:

1. Finish concrete surfaces to grade and cross section with metal float, troweled smooth and finished with a broom moistened with clear water.
2. Broom surfaces transverse to traffic direction.
3. Carefully finish slab edges, including at formed joints, with edger with radius as shown on drawings.
4. Unless otherwise indicated, edge transverse joints before brooming. Use brooming to eliminate flat surface produced by edger. Produce uniform corrugations, maximum 2 mm (1/16 inch) deep.
5. Provide surface uniform in color and free of surface blemishes, form marks, and tool marks.
6. Paving Tolerances:

a. Variation from Indicated Plane: Maximum 5 mm in 3000 mm (3/16 inch in 10 feet).

b. Variation from Indicated Thickness: Maximum 6 mm (1/4 inch).

7. Replace paving within joint boundary when paving exceeds specified tolerances.

3.11 JOINTS - GENERAL

A. Place joints, where shown on drawings.

1. Conform to details shown.

2. Install joints perpendicular to finished concrete surface.

B. Make joints straight and continuous from edge to edge of pavement.

3.12 CONTRACTION JOINTS

A. Cut joints to depth as shown with grooving tool or jointer of radius as shown on drawings or by sawing with blade to produce required width and depth.

B. Finish joint edges with edging tool having radius as shown on drawings.

C. Score pedestrian pavement with standard grooving tool or jointer.

3.13 EXPANSION JOINTS

A. Form expansion joints with preformed expansion joint filler material of thickness shown on drawings.

1. Without dowels, locate joints around perimeter of structures and features abutting site work concrete.

2. Create complete, uniform separation between structure and site work concrete.

B. Extend expansion joint material full depth of concrete with top edge of joint filler below finished concrete surface where sealant is indicated on drawings.

C. Cut and shape material matching cross section.

D. Anchor with approved devices to prevent displacing during placing and finishing operations.

E. Round the edges of joints with an edging tool.

3.14 FORM REMOVAL

A. Keep forms in place minimum 12 hours after concrete placement. Remove forms without damaging concrete.

B. Do not use bars or heavy tools against concrete to remove forms. Promptly repair damaged concrete found after form removal.

3.15 CONCRETE

A. Concrete Protection:

1. Protect unhardened concrete from rain and flowing water.
2. Ensure sufficient curing and protection materials are available and ready for use before concrete placement begins.
3. Protect concrete to prevent pavement cracking from ambient temperature changes during curing period.
   a. Replace pavement damaged by curing method allowing concrete cracking.
   b. Employ another curing method as directed by Resident Engineer.

B. Cure concrete for minimum 7 days by one of the following methods appropriate to weather conditions preventing moisture loss and rapid temperature change:

1. Burlap Mat: Provide minimum two layers kept saturated with water during curing period. Overlap mats minimum 150 mm (6 inches).
2. Impervious Sheeting: Provide waterproof paper, polyethylene coated burlap, or polyethylene sheeting.
   a. Wet exposed concrete surface with fine water spray and cover with sheet materials.
   b. Overlap sheets minimum 300 mm (12 inches).
   c. Securely anchor sheet materials preventing displacement.

C. Liquid Membrane Curing Compound:

1. Protect joints indicated to receive sealants preventing contamination from curing compound.
2. Insert moistened paper or fiber rope into joint or cover joint with waterproof paper.
3. Apply curing compound before concrete dries.
4. Apply curing compound in two coats at right angles to each other.
5. Application Rate: Maximum 5 sq. m/L (200 sq. ft./gal.), both coats.
6. Immediately reapply curing compound to surfaces damaged during curing period.

3.16 CONCRETE PROTECTIVE COATING

A. Apply protective coating to exposed to view concrete surfaces to protect the concrete against deicing materials.

B. Complete backfilling and curing operation before applying protective coating.

C. Dry and thoroughly clean concrete before each application.

D. Apply two coats in accordance with manufacturer’s written instructions.

E. Protect coated surfaces from vehicular and pedestrian traffic until dry.

F. Do not heat protective coating, and do not expose the protective coating to open flame, sparks, or fire adjacent to open containers or applicators. Do not apply material at temperatures lower than 10 degrees C (50 degrees F).

3.17 FIELD QUALITY CONTROL

A. Field Tests: Performed by testing laboratory specified in Section 01 45 29, TESTING LABORATORY SERVICES.

1. Concrete: Testing specified in Section 03 30 53 (SHORT FORM) CAST-IN-PLACE CONCRETE.

2. Slip Resistance: Steps and pedestrian paving.

3.18 CLEANING

A. After completing curing:

1. Remove curing material, except liquid membrane.

2. Sweep the concrete clean.

3. Seal all joints after removing foreign matter from joint.

4. Clean concrete of debris and construction equipment as soon as curing and joint sealing have been completed.

B. Remove & legally dispose of debris, rubbish, & excess material from project site.

3.19 PROTECTION

A. Protect exterior improvements from traffic and construction operations.

1. Prohibit traffic on paving for minimum seven days after placement, or longer as directed by Resident Engineer.

B. Remove protective materials immediately before acceptance.

C. Repair damage: When directed by Resident Engineer, replace concrete containing cracking, fractures, spalling, and other defects within joint boundary, at no additional cost to State.

END OF SECTION

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SECTION 32 08 00
COMMISSIONING OF PLANTING IRRIGATION SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Upon completion of irrigation system construction, provide commissioning of irrigation system for water consumption and conservation, electrical work, and controls for proper operation.

1.02 ADDITIONAL WORK REQUIRED

A. Items of work specifically included are:

1. Review Project Irrigation Plans, Details, and Specifications (328400)
2. Review Basis of Irrigation Design
3. Review Operation and Maintenance Manual, As-Built Plans, Manufacturer and Installer Guarantees at project closeout
4. Observe End-User Training and/or Operation and provide comment

1.03 QUALIFICATIONS

A. Qualified irrigation system commissioners must have a minimum experience of five (5) years with irrigation systems described in original design documents, and also:

1. Irrigation Association (IA) Certification / EPA WaterSense Partner
2. Irrigation Controller Manufacturer Certification
3. IA Certified Landscape Irrigation Auditor

B. Submit three (3) references for similar work performed in the last five (5) calendar years, including:

1. Contact name
2. Company Name
3. Contact Phone Number
4. Project Name and Location
5. Brief Project Description

1.04 PLANTING IRRIGATION SYSTEM DESCRIPTION

A. Planting Irrigation System for RIVMC is a new, two-wire irrigation system with its own controller and water supply. Irrigation system is expandable for up to Phase 1 as shown on the Drawings.

B. Sprinkler head placement and throw radius shall be better than head-to-head coverage.

C. Domestic water supply plumbing, including water meter, backflow preventers, irrigation master valve and flow sensor are installed in vandal-proof enclosure for irrigation and drinking fountain.

D. Irrigation system has drain, blow-out port, and stop and waste valve for winterization.

E. Installer shall provide training to Owner/Operator on irrigation system and remote management through Internet-based platform through cellular service (Internet-based management is optional).

1.05 AVAILABLE UTILITIES TO BE VERIFIED

A. Water Service Point of Connection

1. Existing static water pressure within site is purported to be 90 psi.

2. Approximate point of connection from existing main within site is located on Drawings.

a. Equipment within vandal-proof enclosure:

1) Enclosure (Painted Hunter Green, or Owner preference at Factory)

2) Irrigation Backflow Preventer (Reduced Pressure Zone, RPZ)

a) Size: 2-Inch

b) Construction: Bronze with Quarter Turn Ball Valve, Bronze Strainer,

c) Ratings: 175 psi Maximum

d) Manufacturer/Model: Watts Model 002M2-QT

3) Hose Bibb Backflow Preventer (RPZ)

a) Size: 3/4-Inch

b) Construction: Bronze with Quarter Turn Ball Valve, Bronze Strainer,

c) Ratings: 175 psi Maximum

d) Manufacturer/Model: Watts Model 002M2-QT

4) Water Meter

a) Size: 2-Inch

b) Construction: Bronze

c) Features: Automatic Meter Register (ARM), Threaded Input and Output for Nipples and Unions

5) 2-Inch Brass Irrigation Master Valve

6) 4-20 mA Pressure Sensor Decoder Kit

7) 2-Inch Brass Flow Sensor

b. Flow and pressure requirements at Irrigation System:

1) Flow: Maximum 60 gallons per minute

2) Pressure: 70 pounds per square inch (downstream of all plumbing)

B. Electrical Power Source to New Outdoor Controller

1. New electrical circuits to be provided by Electrical Contractor (Refer to Division 26 Electrical).

a. Power Requirements for Irrigation Controller within Stainless Steel Pedestal

1) 120-Volt, 1-Phase, 60-Hz, 20-Amp Breaker

2) Irrigation Controller has internal transformer for 24VAC valve wire

3) GFCI Receptacle within Irrigation Controller Enclosure

b. Conduits

1) Provide minimum Schedule 80 PVC conduits through Irrigation Controller pedestal concrete pad with long elbow sweeps and under all hardscape through sleeves.

C. Internet for Outdoor Controller (Optional, but Recommended)

1. Irrigation Controller shall come equipped with cellular service through controller manufacturer for remote, internet-based access through any web-enabled device.

D. Pipe Sleeves

1. Pipe sleeves to be provided by Earthwork Contractor beneath all hardscape, as indicated on Construction Drawings.

a. Pipe sleeve requirements

1) Two (2) parallel 4-inch Schedule 40 PVC

2) Extend 18 inches beyond edge of hardscape

3) Minimum cover: 18 inches

1.06 RELATED DOCUMENTS

A. Refer to overall project Construction Document Specifications and Drawings, including, but not limited to:

1. Division 01 – General Requirements

2. Division 02 – Existing Conditions

3. Division 03 – Concrete

4. Division 22 – Plumbing

5. Division 26 – Electrical

6. Division 31 – Earthwork
7. Division 32 – Exterior Improvements
   a. 32 84 00 – Irrigation
8. Division 33 – Utilities
9. Construction Drawings:
   a. IR101 – Irrigation Plan
   b. IR201 – Irrigation Details
   c. IR202 – Irrigation Details
   d. Review all other Project Construction Documents for coordination.

1.07 PRE-COMMISSIONING PROCEDURE

A. Define and Review Planting Irrigation Scope of Work
   1. Owners Project Requirements
   2. Basis of Design
   3. Extent of Construction with Phasing
   4. Maintain Log of Communication between Installer and Designer including:
      a. Requests for Information (RFI)
      b. Design Plan Redline Markups
      c. Substitutions and Field Changes
B. Final Commissioning of Irrigation System shall not commence until Planting Irrigation System installation is complete as determined by Designer through punchlist site visit.
C. Commissioning Agent shall receive and review final closeout documents from Installer prior to commissioning as specified in 32 84 00:
   1. Operation & Maintenance Manual (see 32 8400 for Table of Contents)
   2. As-Built Irrigation Plans
   3. Original Design Plans with Redline Markups
   4. Installer Guarantee
   5. Product Manufacturer Warranties
D. Project will be installed in phases. Commissioning shall be performed at conclusion of each phase to ensure continuity of operation between current and previous phases.

PART 2 PROCEDURE

2.01 COMMISSIONING PROCEDURE

A. Review Irrigation Controller Settings and ensure:

1. All Electric Zone Valves are connected to irrigation controller. Provide wire resistance readings to ensure all solenoids are within acceptable range of resistivity (turn off irrigation controller prior to reading):
   a. 0 – 6 ohms = Short Circuit
   b. 6 – 20 ohms = Slow Burn (Check Number of Solenoids Tied Together)
   c. 20 – 60 ohms = Acceptable
   d. 60 – 200 ohms = Partially Open Circuit
   e. 200+ ohms = Broken Wire
2. All Controllers, Sensors, and Decoders are grounded to earth (or building earth) with resistance readings of less than 10 ohms.
3. All Electric Zone Valves are assigned to a watering program with set run-time for peak watering requirements.
4. All Programs are assigned automatic water savings protocols, including:
   a. Soil moisture sensors allowing for sufficient soil drying prior to next irrigation cycle.
   b. Weather sensors, on-site or through web-based application, to apply or suspend watering based on real-time climate conditions.
   c. Rain sensors to immediately suspend irrigation during and after rainstorms.
5. Irrigation Master Valve is installed and appropriate orientation
   a. Normally Closed (NC) for this site
   b. Connected electrically to Irrigation Controller
   c. Irrigation Controller programmed to enable Master Valve closing upon abnormal flow range.
6. Irrigation Flow Sensor is installed with appropriate orientation
   a. Connected electrically to Irrigation Controller
   b. Irrigation Controller programmed to provide real-time feedback on flow sensing
   c. Irrigation Controller allowed to “learn flow” of each Electric Zone Valve and manual watering
   d. Irrigation Controller programmed to close Master Valve within 3 minutes on abnormal flow outside of learned flow (typically 10%-15% tolerance).
7. Irrigation 4-20 mA Pressure Sensor is installed with appropriate orientation
   a. Connected electrically to Irrigation Controller
   b. Irrigation Controller programmed to provide real-time feedback on pressure sensing

c. Irrigation Controller programmed to close Master Valve within 3 minutes on abnormal pressure outside of learned flow (typically 10%-15% tolerance).

8. Irrigation Controller Remote Management

a. With web-enabled device (smart phone, tablet, desktop or laptop computer), verify connectivity with internet and ensure all settings above have been programmed properly.

b. Ensure all alerts through Short Messaging Service (SMS) or other communication are received through email or text messaging to appropriate site managers.

c. Ensure all alerts are properly programmed for notification, including, but not limited to:

1) High Flow / Low Flow

2) High Pressure / Low Pressure

3) Wire Breaks / Connectivity Issues

4) Internet / Data Loss

5) Request for Spring Startup (programmed through controller by date)

6) Request for Winterization (programmed through controller by date)

d. Take Screenshots of Irrigation Controller graphical user interface (GUI) with settings and performance.

e. Observe Irrigation Controller GUI during test cycle of Irrigation System and observe:

1) Flow Readings

2) Zone Operation

3) Pressure Readings

9. Take computer screenshots of irrigation controller, graphical user interface (GUI), and internet connectivity of on-line web-enabled devices.

10. Take pictures of irrigation controller location and mounting, interior controller wiring, grounding wire and earth ground location.

11. Report all deficiencies in system that do not meet design intent or have missing information above.

B. Review Irrigation Wiring

1. All Wire Splices in planted landscape are made with DBY-6 Submersible-Rated Wire Splice Kits.

2. Within each valve box, ensure that there is sufficient wire slack for servicing.

3. Within each valve box, ensure that decoders are not buried and are operational through LED lights.
4. Observe all landscape grounding rod and/or plate installations with exothermic welds to bare copper wire as specified in design documents.

C. Review Irrigation Pipe and Valve Installation

1. Valve Boxes (Plastic or Polymer Concrete)
   a. Ensure all Valve Boxes are flush with grade with colors as specified by Owner and Designer
   b. Ensure all Valve Boxes are bolted down. Remove lid with appropriate ratchet tool for observation.
   c. Ensure all Valve Boxes are clean with level bases of stone and that no components are buried.
2. Electric Zone Valves
   a. Ensure all Electric Zone Valves have Schedule 80 PVC NPT fittings in and out of valve.
   b. Where specified, ensure Electric Zone Valves have isolation gate valves for servicing.
   c. Where specified, ensure Electric Zone Valves have Schedule 80 PVC unions on each side for appropriate servicing
3. Isolation Gate Valves
   a. Ensure all Isolation Valves are gate valves and not ball valves.
   b. Ensure all Isolation Gate Valves have cross handles and not wheel handles.
   c. Ensure all Isolation Gate Valves have Schedule 80 PVC NPT fittings in and out of valve.
4. Quick Coupling Valves
   a. Ensure all Quick Coupling Valves have rubber covers as specified.
   b. Ensure stabilization wings are installed on Quick Coupling Valve swing joint.
   c. Observe that all Quick Coupling Valves are engaged with a key.
   d. Ensure Owner has sufficient number of keys to engage all Quick Coupling Valves.

D. Review Sprinkler Operation

1. Installation
   a. Ensure all Sprinklers are installed flush with grade with minimum 2-inch separation from all hardscape surfaces.
   b. Ensure all Sprinklers have specified and designed pop-up height, either:
      1) 4-inches

2) 6-inches, or

3) 12-inches

c. Where stainless steel risers are specified, ensure those components are installed.

d. Ensure proper nozzles are installed on sprinklers.

e. Ensure all Sprinklers are clearly marked on their covers with:

1) Manufacturer

2) Model

3) Pressure Ratings

4) Additional Features

a) Check Valve

b) Pressure Regulation

c) Wiper Seal Technology

f. Observe Sprinkler Operation under test irrigation cycle

1) Ensure head-to-head or better coverage.

2) Observe pressure readings during test to ensure design intent is met.

3) Observe sprinkler stream to ensure proper water droplet breakup:

a) High Pressure = Atomizing and Misting

b) Low Pressure = Single Stream

4) Ensure overall coverage of landscape.

5) Observe and comment on overspray onto hardscape surfaces.

PART 3 REPORTING

3.01 REPORTING

A. Provide written report and findings of deficiencies in the irrigation system compared with design, design intent, and built system.

B. Report shall include pictures of system (both adequacies and deficiencies).

C. Report shall be included as part of O&M Manual for future reference.

D. All deficiencies shall be remedied as required by design plans, specifications, and commissioning observations prior to final payment and start of guarantee period.

END OF SECTION

SECTION 32 33 00
SITE FURNISHINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Flower watering stations, including trash and recycling receptacles, water spigot, granite post to support water spigot and flower vase container and complete any required work necessary to make the water supply equipment operate using the water supply source indicated.

2. Furnish and install benches at the specified locations.

1.02 RELATED REQUIREMENTS

A. Materials product data and samples: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Concrete footings: Section 03 30 53 – (SHORT FORM) CAST IN PLACE CONCRETE.

C. Product and Finish Color: as specified.

D. Concrete Pavement and Pads: Section 32 05 23 CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS

1.03 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. ASTM International (ASTM):

1. ASTM A53/A53M 12 - Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.

2. B221 14 - Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.

C. American Welding Society (AWS):

1. D1.1 2006 - Structural Welding Code - Steel.

2. D1.2 2014 - Structural Welding Code - Aluminum.

D. National Association of Architectural Metal Manufacturers (NAAMM):

1. AMP 500 06 Metal Finishes Manual.

1.04 SUBMITTALS

A. Submittals Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES:

B. Submittal Drawings:

1. Show size, configuration, and fabrication and installation details.

2. Show floral regulations decal content, lettering color and background color.

C. Manufacturer's Literature and Data:

1. Description of each product.
2. Installation instructions.
3. Warranty.

D. Samples:

1. Each Product: 152 mm (6 inch) square galvanized steel sheet with full color and texture as specified.
2. Benches and Flower Vase Receptacle: Full sized, complete assembly.
3. Approved samples may be incorporated into work.

E. Qualifications: Substantiate qualifications comply with specifications.

1. Manufacturer with project experience list.
2. Installer with similar project experience list.
3. Welders and welding procedures.

1.05 QUALITY ASSURANCE

A. Manufacturer, Fabricator, Installer Qualifications:

1. Regularly manufactures, fabricates, and installs specified products.
2. Manufactured, Fabricated, Installed, specified products with satisfactory service on five similar installations for minimum five years.
   a. Project Experience List: Provide contact names and addresses for completed projects.

B. Installer Qualifications:

1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
   a. Project Experience List: Provide contact names and addresses for completed projects.

C. Welders and Welding Procedures Qualifications: AWS D1.1/D1.1M. and AWS D1.2/D1.2M.

1.06 DELIVERY

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.07 STORAGE AND HANDLING

A. Store products indoors in dry, weathertight facility.

B. Protect products from damage during handling and construction operations.

1.08 WARRANTY

A. Construction Warranty: FAR clause 52.246 21, "Warranty of Construction."

B. Manufacturer's Warranty: Warrant benches, flower watering stations, and water spigot system, against material and manufacturing defects.

1. Warranty Period: Three years

PART 2 PRODUCTS - GENERAL

2.01 PRODUCTS - GENERAL

A. Provide each product from one manufacturer and from one production run.

2.02 FLOWER WATERING STATIONS

A. General: Materials, finishes and colors as indicated on Drawings and as specified below, including trash receptacle, flower vase receptacle, water spigot assembly, granite post, concrete pavement and connections to water supply system.

2.03 TRASH RECEPTACLE

A. Trash Receptacles: Provide as indicated on Drawings or approved equal.

1. Steel Body Construction:

a. Vertical Bar: Solid steel, 9.53 mm x 25.4 mm (3/8 x 1 inch).

b. Horizontal Bands: Solid steel, 6.35 mm x 63.5 mm (1/4 x 2 1/2 inches).

c. Support Bars: Steel, 9.53 mm x 76.2 mm (3/8 x 3 inches).

d. Top Ring: Solid steel, 15.88 mm (5/8 inch).

e. Leveling Feet: 9.53 mm (3/8 inch) diameter threaded steel shaft.

f. Joints: Fully welded, grind smooth.

2. Capacity: 136 liter (36 gallon).

3. Inner Liner: High density plastic inner liner, 2.72 kg (6 lbs.) maximum weight.

4. Lids: Manufacturer’s standard steel, tapered formed lid and dome, secured with stainless steel aircraft cable and attachments, with self closing door.

5. Mounting Plate: Standard (1) anchor bolt hole.

6. Identification: Identify trash receptacle with the word “TRASH” graphic symbol, material, finish, color, letter style and size as indicated on Drawings.
7. Steel and Galvanized Steel Powder Coat Finish: Manufacturer's standard shot blasted, etched, phosphatized, preheated, and electrostatically polyester, powder coatings, 8 10 mils (200 250 microns) dry film thickness.
   a. Standard Colors: Victor Stanley Standard Black.

2.04 FLOWER VASE RECEPTACLE

A. Materials: Regularly manufactured for VA Cemeteries use.
   1. Size: As indicated on Drawings.
   2. Finish and Color: Same as trash receptacle, except as follows:
      a. Identification: Identify flower vase receptacles with the word “FLOWER VASES” as indicated on Drawings.
      b. Decal: “Floral Regulations” decal, factory applied pressure sensitive vinyl on top of receptacle lid as indicated on Drawings. Contents and color approved by Landscape Architect/Engineer.

2.05 WATER SPIGOT ASSEMBLIES

A. Water spigots: two models placed on opposite sides of the granite post. ADA accessible faucet shall be Haws Model 6252EHLF, faucet and value systems fabricated from solid, lead-free brass construction with an extended lever handle operating at less than 3.5 push pounds. Maintenance faucet with threaded male end shall be Arrowhead Brass Ball Valve Hose Bibb, model 302BV, Ball Valve Standard Hose Bibb 3/4-inch MIP x 3/4-inch Hose Connection.

2.06 BENCHES

A. Description: Front welds ground and polished to form continuous surface from top tubular section to each vertical steel slat. Steel seat members reverse contoured; solid steel bar end sections, welded and ground; end arm rests standard integral welded configuration, with no center armrests. Steelsites RB Series bench by Victor Stanley to the lengths indicated on the Drawings.
   1. Provide and install two benches in locations indicated.
   2. Receive one bench of same manufacturer from the Owner and install in location indicated.
B. Material: Steel.
C. Finish: Manufacturer's standard shotblasted, etched, phosphatized, preheated, and electrostatically polyester, powder coatings.
   1. Color: Black approved by Landscape Architect/Engineer.

D. Mounting Hardware: Tamper resistance stainless steel. Exposed bolt ends or flat bolt heads are not acceptable.

2.07 FINISHES

A. Steel Finish:

1. Powder Coat Finish: Manufacturer's standard two coat finish system consisting of the following:

a. One coat primer.

b. One coat thermosetting topcoat.

c. Dry film Thickness: 0.05 mm (2 mils) minimum.

d. Color: Black

2.08 ACCESSORIES

A. Primers:

B. Welding Materials: AWS D1.1/D1.1M, type to suit application.

C. Fasteners: Tamper resistant Stainless steel, acorn nut.

D. Anchors:

E. Galvanizing Repair Paint: MPI No. 18.

F. Touch Up Paint: Match shop finish.

G. Concrete Footing: Comply with Section 03 30 53 – (SHORT FORM) CAST IN PLACE CONCRETE.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect planned installation materials and locations. Notify Resident Engineer of any discrepancies in conditions.

1. Verify materials are damage free and compliant with Drawings. Report non compliance to Resident Engineer.

3.02 PREPARATION

A. Examine and verify substrate suitability for product installation.

B. Protect existing construction and completed work from damage.

C. Correct substrate deficiencies.

1. Fill.

2. Grind.

3. Level.

D. Stake alignment and locations for approval by Resident Engineer. Verify elements “fit” within location provided.

3.03 INSTALLATION - GENERAL

A. Install products according to manufacturer's instructions and approved submittal drawings.

1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Resident Engineer consideration.

2. Install items rigid and plumb as indicated on Drawings.

B. Flower Watering Stations:

1. Stake flower watering station location. Obtain Resident Engineer approval before forming concrete pad. Install concrete pad according to SECTION 32 05 23 CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

2. Anchor flower vase container as indicated on Drawings and manufacturer's instructions.

C. Trash Receptacle and Flower Vase Receptacle:

1. Anchor receptacles as indicated on Drawings and manufacturer’s instructions.

D. Water Spigot:

1. Install water spigot assemblies according to manufacturer’s instructions, including pipe, isolation valve, fittings, pressure reducing valve and valve boxes. Install washed stone for splash area.

E. Benches:

1. Install benches as recommended by manufacturer.

3.04 CLEANING

A. Clean exposed surfaces. Remove contaminants and stains.

B. Polish exposed surfaces gloss sheen.

C. Remove excess material and debris. Clean above ground portions of receptacles and other site improvements.

END OF SECTION

SECTION 32 84 00
IRRIGATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide all materials, labor, installation equipment, and technical service to complete automatic landscape irrigation system, as well as the testing and warranty of the system as defined in this Specification and Details. Provide Shop Drawings of sprinkler irrigation layout.

1.02 ADDITIONAL WORK REQUIRED

A. Items of work specifically included are:

1. Coordination of all utilities.
2. Procurement of all applicable licenses and fees.
3. Verification of site conditions.
4. Maintenance during guarantee period.

1.03 QUALIFICATIONS

A. Qualified irrigation system installers must have a minimum experience of five (5) years with work and products specified herein, including:

1. Two-Wire Controller and Valve Installation
2. Weather-Based and/or Soil Moisture-Based Smart Controllers
3. Landscape Irrigation Systems
4. Domestic Water Plumbing Systems

B. Submit three (3) references for similar work performed in the last five (5) calendar years, including:

1. Contact name
2. Company Name
3. Contact Phone Number
4. Project Name and Location
5. Brief Project Description

1.04 WORK DESCRIPTION

A. Landscape Irrigation System for RIVMC shall be a new, two-wire irrigation system with its own controller and water supply.

B. Sprinkler head placement and throw radius shall be better than head-to-head coverage.

C. Provide new backflow preventers, irrigation master valve and flow sensor in vandal-proof enclosure for irrigation water supply. Install 2-inch water meter to be provided by the Town of Exeter.

D. Install separate hose bibb supply line as shown on Drawings.

E. Provide drain, blow-out port, and stop and waste valve for winterization.

F. Provide and train Owner on remote irrigation management through Internet based platform through Wi-Fi or Cellular-based internet service to be coordinated with site contractor.

1.05 UTILITIES

A. Water Service Point of Connection

1. Existing static water pressure within street is purported to be 90 psi. Verify water pressure prior to commencing work.

2. Approximate point of connection from existing main within site is located on Drawings.

a. Equipment requirements within vandal-proof enclosure (see Irrigation Product Below):

1) Enclosure (to be painted at factory to Owner’s preference)

2) Irrigation Backflow Preventer

a) Size: 2-Inch

b) Construction: Bronze with Quarter Turn Ball Valve, Bronze Strainer,

c) Ratings: 175 psi Maximum

d) Manufacturer/Model: Watts Model 002M2-QT

3) Hose Bibb Backflow Preventer

a) Size: 3/4-Inch

b) Construction: Bronze with Quarter Turn Ball Valve, Bronze Strainer,

c) Ratings: 175 psi Maximum

d) Manufacturer/Model: Watts Model 002M2-QT

4) Water Meter (to be provided by Town of Exeter)

a) Size: 2-Inch

b) Construction: Bronze

c) Features: Automatic Meter Register (ARM), Threaded Input and Output for Nipples and Unions

5) 2-Inch Brass Master Valve (see Irrigation Product Below)

6) 4-20 mA Pressure Sensor Decoder Kit (see Irrigation Product Below)

7) 2-Inch Brass Flow Sensor (see Irrigation Product Below)

b. Flow and pressure requirements:

1) Flow: Maximum 60 gallons per minute

2) Pressure: 70 pounds per square inch (downstream of all plumbing)

B. Electrical Power Source to New Outdoor Controller

1. New electrical circuits to be provided by Electrical Contractor (Refer to Division 26 Electrical).

a. Power Requirements for Irrigation Controller within Pedestal

1) 120-Volt, 1-Phase, 60-Hz, 20-Amp Breaker

2) Irrigation Controller has internal transformer for 24VAC valve two-wire

b. Conduits

1) Provide minimum Schedule 80 PVC conduits through Irrigation Controller pedestal concrete pad with long elbow sweeps and under all hardscape through sleeves.

C. Internet for Outdoor Controller

1. Coordinate on-site Wi-Fi or Cellular service for Irrigation Controller for remote, internet-based access through any web-enabled device.

D. Pipe Sleeves

1. Pipe sleeves to be provided by Earthwork Contractor beneath all hardscape, as indicated on Construction Drawings.

a. Pipe sleeve requirements

1) Two (2) parallel 4-inch Schedule 40 PVC

2) Extend 18 inches beyond edge of hardscape

3) Minimum cover: 24 inches

1.06 RELATED REQUIREMENTS

A. Coordinate with other project trades and refer to overall project Construction Document Specifications and Drawings, including, but not limited to:

1. Division 01 – General Requirements

2. Division 02 – Existing Conditions

3. Division 03 – Concrete

4. Division 22 – Plumbing

5. Division 26 – Electrical

6. Division 31 – Earthwork

7. Division 32 – Exterior Improvements

a. 32 08 00 – Commissioning of Planting Irrigation Systems

b. 33 10 00 – Water Mains and Appurtenances

8. Division 33 – Utilities

9. Construction Drawings:

a. IR101 – Irrigation Plan

b. IR201 – Irrigation Details

c. IR202 – Irrigation Details

d. Review all other Project Construction Documents for coordination.

1.07 APPLICABLE STANDARDS AND CODES

A. At a minimum, comply with the following standards and codes:

1. American Society for Testing and Materials (ASTM)

2. National Standard Plumbing Code (NSPC)

3. National Electric Code (NEC)

4. National Sanitary Foundation (NSF)

5. Underwriters Laboratories, Inc. (UL)

6. Occupational Safety and Health Administration (OSHA)

B. Comply with applicable laws, standards, and regulations of the local governing authority. All local laws more stringent than those referenced above shall take precedent.

1.08 SUBMITTALS

A. Submit the following under provisions of Section 01 33 00 – Submittal Procedures:

1. Literature: Manufacturer's product data sheets, specifications and installation instructions for materials listed in this Specification (Part 2 – Products).

a. Product submittals shall be concise (no extraneous pages or sections) and clearly marked to show submitted product model, type, size, etc.

b. Substitute Product Submittal:

1) Provide specified product submittals for “an approved equal” to Owner’s Representative for approval.

2) Alternate products are acceptable when products of equal or better quality and performance are submitted and approved by the Owner’s Representative.

3) Substitute Product Submittals constitute representation that:

a) Substitute products have been thoroughly investigated and have been determined to be equal or superior in all respects to that specified.

b) Substitute products shall provide the same warranties as specified products.

c) Substitute products are compatible with interfacing items.

d) Assume responsibility of and guarantee system performance as a result of product substitution, including making all subsequent changes to meet design specifications.

c. Work shall not commence until all products specified are submitted and approved in a written notification by Owner's Representative.

d. All product installed shall be new, without defects, and of quality and performance as specified.

2. Schedule: Submit Schedule of all products to be furnished hereunder, indicating manufacturer, size, and model.

a. Ensure that all of the types/styles of products and installation equipment specified herein can be furnished by the manufacturer submitted.

b. Provide all spare irrigation parts as noted (see Spare Irrigation Parts)

c. Prior to submitting schedule, confirm current site conditions are as provided in the Construction Drawings.

1.09 DELIVERY, STORAGE AND HANDLING

A. Do not deliver materials to the site, until all specified submittals have been submitted to, and approved by, the Owner's Representative.

B. Coordinate with Owner's Representative for temporary storage and staging areas.

C. Protect materials from damage from construction traffic, weather, corrosion, and other causes while stored on-site. Minimize on-site storage as possible.

D. Store and handle all products and materials in compliance with manufacturer instructions and recommendations.

1.10 GUARANTEE AND REPLACEMENT

A. Guarantee entire irrigation system, parts and labor, for one (1) year from official written date of acceptance by Owner's Representative. Provide written warranty showing date of completion and period of warranty prior to request for final payment.

B. System malfunctions occurring during the guarantee period due to defective materials, poor workmanship, or improper adjustment shall be corrected to satisfaction of Owner's Representative at no additional cost to the Owner.

1. Repair all defects within 10 days of notification from Owner or Owner's Representative.
2. Repair defects with approved products.

C. First-year spring system start-up and winterization shall be included in system guarantee.

D. Manufacturer warranties shall be provided for all products and materials where such warranties are offered in published product data. Copies of manufacturer warranties are to be included in the Operations and Maintenance Manual (See Operation and Maintenance).

PART 2 PRODUCTS

2.01 AUTOMATIC IRRIGATION CONTROLLER

A. Controller

1. Size: 54-Station Maximum
2. Construction: Electronic with 120-Volt Input and 24-28 Volt Output; Outdoor Stainless-Steel Pedestal Enclosure.
3. Standards: UL-Listed
4. Features: Manual and Automatic Control, Water Budgeting, Cycle-Soak, Sensor Input Terminals, Internal Transformer, Flow Monitoring Capability, Lightning Protection, Remote Control via Internet, Conventional Wire with Two-Wire Capability.
5. Manufacturer/Model: Rain Bird, ESP-LXD, Baseline BaseStation 3200, or Approved Equal.

B. External Devices (Matching Manufacturer and Compatible with Controller)

1. Stainless Steel Pedestal Enclosure (VIT Strongbox, Model SB-16SS)
2. Wired Rain Sensor (free of Overhead Obstruction), with Enclosure Welded to Pedestal
3. 2-Inch Brass Flow Sensor with Decoder (Inside Backflow Enclosure)
   a. Provide Isolation Valves and Unions on Each Side for Winterization
   b. Flow Range = 4 – 80 gpm
4. Decoders
5. Lightning Surge Suppression

C. Outdoor Controller Grounding

1. Size
   a. Wire: 6AWG
   b. Rod: 5/8-Inch Diameter x 8-Foot Long
   c. Plate: 4-Inch x 96-Inch x 1/16-Inch Thick

2. Construction
   a. Wire: Bare Copper
   b. Rod: Copper
   c. Plate: Copper with Loresco PowerSet Ground Enhancement Material Above and Below
3. Ratings: UL-Listed
   a. Features: Cadweld Connectors from Wire to Rod, Plate Manufacturer provided Plate Connections, PVC or ADS Drain Pipe and Grate Cover over Rod Plate with Metal Detection

2.02 WIRE

A. Two-Wire
   1. Size: 14/2 AWG Minimum
   2. Construction: Dual Strand Solid Copper Conductors with PVC Insulation and Poly Jacket.
   3. Ratings: UL-Listed, NEC (Class II Circuit), Direct Burial UF/TWU, up to 600-Volt Potential
   4. Standards: ASTM B-3, ASTM B-8
   5. Markings: Manufacturer, Rating, Size, and Type
   6. Manufacturer/Model: Coleman Cable #51452; Paige P7072D, P7296D, P7350D, and P7354D; Regency 14/2 and 12/2 Maxi Cable; Hunter Decoder Jacketed; Service Wire Company DEC12/2BE and DEC 14/2BE; or Approved Equal.

B. Conventional Wire (From Decoders to Electric Zone Valves)
   1. Size: 14AWG Minimum
   2. Construction: Single Strand Solid Copper Conductor with PVC Insulation
   3. Ratings: UL-Listed, NEC (Class II Circuit), Direct Burial UF/TWU, up to 600-Volt Potential
   4. Standards: ASTM B-3, ASTM B-8
   5. Markings: Manufacturer, Rating, Size, and Type
   6. Manufacturer/Model: Paige Electric Model P7001D; Service Wire Company UF14, UF12; Regency Wire & Cable 14AWG, 12AWG; or Approved Equal.

C. Wire Splices
   1. Type: Direct Burial Wire Splice Kit (All Components Intact)
   2. Construction: Lockable Plastic Tube, Pre-Filled with Insulation Gel
   3. Ratings: UL-Listed, NEC, Direct Burial and Submersion, up to 600-Volt Potential

4. Manufacturer/Model: 3M DBY-6; Rain Bird DB Series; or Approved Equal.

D. Wire Conduit

1. Size: 1-Inch Minimum
2. Construction: PVC, Solvent Weld
3. Ratings: Schedule 80
4. Fittings: Long Sweep Elbows
5. Manufacturer: Cresline; Certainteed, JM Eagle; or Approved Equal.

2.03 PIPE AND FITTINGS

A. Irrigation Mainline, Lateral, and Hose Bibb Pipe

1. Size: 2½-Inch Maximum
2. Construction: Polyvinyl Chloride (PVC), Solvent Weld
3. Ratings: Schedule 40 PVC
4. Markings: Manufacturer, Nominal Size, Class or Schedule, Pressure, Extrusion Date, Pipe Insertion Mark.
5. Manufacturer: Cresline; Certainteed; JM Eagle; or Approved Equal.
6. Fittings
   a. For Valves Toe Nipples: Schedule 80 PVC
   b. Other Fittings: Schedule 40 PVC
7. Markings: NSF Designation, Size, Class or Schedule
8. Manufacturer: Lasco; Spears; Dura; or Approved Equal
9. Solvent
   a. Type: NSF Type I or Type II PVC
   b. Standards: ASTM D-2564
   c. Manufacturer: IPS Weld-On 711; Oatey HD Cement; Rectorseal Gold; or Approved Equal
10. Primer
   a. Type: NSF for PVC
   b. Standards: ASTM F-656
   c. Manufacturer: IPS Weld-On P-68; Oatey Clear Primer; Rectorseal Jim PR-2; or Approved Equal

B. Hose Bibb Riser Pipe

1. Size: 1-Inch Maximum
2. Construction: Galvanized Steel
3. Ratings: Schedule 40
4. Manufacturer: US Steel or Approved Equal.

5. Fittings: NPT

2.04 ELECTRIC ZONE VALVES

A. Sprinkler Zone Valve

1. Size: 1-Inch, 1.5-Inch, 2-inch
2. Construction: Plastic Globe Valve with Reinforced Nylon or Fiberglass Body
3. Ratings: 200 psi
4. Features: Manual Bleed Screw, Flow Control, Pressure Regulation, and Filter/Scrubber
5. Manufacturer/Model: Hunter ICV-FS; Rain Bird PESB; or Approved Equal

B. Master Valve (installed in Backflow Enclosure)

1. Size: 2-Inch
2. Construction: Brass Globe Valve
3. Ratings: 220 psi
4. Features: Manual Bleed Screw, Flow Control, Pressure Regulation, and Filter
5. Manufacturer/Model: Hunter IBV-FS; or Approved Equal

2.05 ISOLATION VALVES

A. Small Mainline Isolation Valve

1. Size: 2½-Inch and Smaller
2. Construction: Bronze, Gate Valve
3. Ratings: 200 psi
4. Features: Steel Cross Handle, Non-Rising Stem
5. Manufacturer/Model: Nibco T-113K; Apollo 102T-K; or Approved Equal

2.06 QUICK COUPLING VALVES

A. Small Mainline Quick Coupling Valve

1. Size: 1-Inch, Normally Closed
2. Construction: Brass, Spring-Loaded Valve Seat, Key Engaged
3. Ratings: 125 psi
4. Features: 1-Inch NPT Inlet, ACME Key, Locking Vinyl Cover, Anti-Rotation Stabilization Wings
   a. Swing Joint Assembly
      1) Size: 1-Inch
      2) Construction: PVC, with O-Ring Seals and Brass Threaded Outlet

3) Manufacturer: Hunter HSJ-1 with SnapLok; or Approved Equal

5. Manufacturer/Model: Hunter HQ-44RC-AW; or Approved Equal.

2.07 PLASTIC VALVE BOXES

A. General

1. Size:

a. 12-Inch Standard Valve Box

1) Single 2-Inch Electric Zone Valve

2) Double 1-Inch or 1½-Inch Electric Zone Valves

b. 6-Inch Round

1) Wire Splice

2) Decoder Grounding Rod

c. 10-Inch Round

1) Single 1-Inch or 1½-Inch Electric Zone Valve

2) Isolation Valve

3) Quick Coupling Valve

2. Construction: Resin

3. Ratings: Tensile Strength 3,000-5,000 psi

4. Color: Green or Black (per Owner’s Representative)

5. Features: Lockable, Bolt-Down Covers, Brick Supported

6. Manufacturer/Model: Carson, Model Specification Grade NDS Pro; Rain Bird VB; or Approved Equal

2.08 POLYMER CONCRETE VALVE BOXES

A. Polymer Concrete Valve Boxes shall be placed in locations adjacent to Columbarium hardscape for future expansion as shown on Drawings.

B. General

1. Size

a. 13-Inch x 24-Inch (Minimum)

1) Double 1-Inch or 1½-Inch Electric Zone Valves

2) Double 1-Inch Electric Zone Valve Kits

b. 12-Inch Square Valve Box

1) Hose Bibb Drain

2) Quick Coupling Valve

3) Isolation Gate Valve

2. Construction: Polymer Concrete

3. Ratings: ASTM C-857 A-16
4. Features: Bolt-Down Covers (Provide Bolts and Install), Brick Supported, Open Bottom for Drainage

C. Manufacturer/Model: Oldcastle H-Series, Quazite; or Approved Equal

2.09 SPRAY SPRINKLERS

A. Body

1. Size: 6-Inch Pop-Up for Lawn, 12-Inch for Groundcovers and Shrubs
2. Construction: Plastic, Ratcheting Riser, Removable Nozzle, Internal Check Valve
3. Ratings: Pressure Regulated to 30 psi
4. Manufacturer/Model: Hunter PROS-6-PRS30-CV and Hunter PROS-12-PRS30-CV; or Approved Equal

B. Nozzles

1. Size: 2’ – 15’ Radius (see Contract Drawings)
2. Features: Full and Part-Circle Fixed-Arc and Strip Patterns, Special Micro-Stream
3. Manufacturer/Model: Hunter Pro Spray; Rain Bird MPR; Toro Precision; or Approved Equal

2.10 ROTARY SPRINKLERS

A. Body

1. Size: 6-Inch Pop-Up
2. Construction: Plastic, Ratcheting Riser, Removable Nozzle, Internal Check Valve
3. Ratings: Pressure Regulated to 40 psi
4. Manufacturer/Model: Hunter PROS-06-PRS40-CV; Rain Bird 1806-SAM-PRS-P45, or Approved Equal

B. Nozzles

1. 12’ – 30’ Radius (see Contract Drawings)
2. Features: Full and Part-Circle Fixed-Arc and Strip Patterns
3. Manufacturer/Model: Hunter MP Rotator, Toro Precision Rotating, or Approved Equal

2.11 GEAR-DRIVEN ROTOR SPRINKLERS

A. General

1. Size: 6-Inch Stainless Steel Pop-Up Riser with ¾-Inch NPT Bottom Inlet

2. Ratings: 17 – 47 feet Radius, 20 – 100 psi Pressure, 0.5 – 14.8 gpm Flow
3. Construction: Gear-Driven, Removable Nozzle, Internal Check Valve, Stainless Steel Retraction Spring, Rubber Cover, Stainless Steel Riser
4. Features: Adjustable, Part, and Full Circle
5. Manufacturer/Model: Hunter I-20-06-SS; Rain Bird 5006-SAM-PRS-SS, or Approved Equal
6. Spacing: As shown on Drawings, generally 80% - 100% of manufacturer rating

B. Swing Joint Assembly

1. Size: 1-Inch with 12-Inch Lay Arm
2. Construction: PVC, with O-Ring Seals and Threaded Outlet
3. Manufacturer: Hunter HSJ-1-12; Rain Bird TSJ-12; Lasco G132-100 or Approved Equal
4. Provide Combination PVC Insert Tee Fitting with FPT Outlet at Lateral for Swing Joint

2.12 EARTH MATERIALS

A. Stone (in Valve Boxes)

1. Type: ¾-Inch (minimum) Crushed Stone

B. Clean Sand

1. Gradation: (passing by weight)
   a. No. 4 Sieve= 80% Minimum
   b. No. 200 Sieve = 5% Maximum

C. Concrete

1. Ratings: 3,000 psi 28-day Compressive Strength
2. Standards: ASTM C-33, ASTM C-94, ASTM-C150

2.13 CURB STOP AND WASTE VALVE

A. Size: 2-inch, Flared Ends with Curb Stop Key

B. Construction: Brass

C. Ratings: 175 psi Maximum

D. Features: Stop and Waste Feature for Winterization near Backflow Enclosure

E. Manufacturer: Mueller, Ford, or approved manufacturer

2.14 CURB BOXES AND LIDS

A. Size: 1-inch Upper Section, 2-inch Lower Section, Length to Match Finish Grade

B. Construction: Cast Iron Base and Lid per ASTM A48, Brass Plug per AWWA C800, Steel Upper Section

C. Ratings: 300 psi Maximum

D. Features: Arch Pattern, Phosphor Bronze Spring Friction Ring, Plug Style Lid

E. Manufacturer: Ford, EA2-xx-40 style or approved manufacturer

2.15 BACKFLOW PREVENTER

A. Size: 2-inch

B. Construction: Bronze with Quarter Turn Ball Valve with Strainer

C. Ratings: 175 psi Maximum

D. Manufacturer: Watts, Model 009M2-QT-S, or approved equal

2.16 WATER METER

A. Size: 2-inch

B. Construction: Bronze

C. Features: Automatic Meter Reading Option, Threaded Inlet and Outlet

D. Manufacturer: Provided by Town of Exeter

2.17 BACKFLOW AND METER ENCLOSURE

A. Size: 60 inches long x 24 inches wide x 39 inches high. Concrete Pad shall be 72 inches long x 36 inches wide x 8 inches thick (4-inch reveal) with 1-inch Chamfer on Top Edge. Enclosure pad shall be installed on 12 inches of level crushed stone.

B. Construction: Marine-Grade Aluminum (Painted at Factory, Color to be approved by Owner)

C. Features: Lockable with Padlock

D. Ratings: Insulated

E. Manufacturer: VIT Strongbox, Model PE-60AL, or approved equal

2.18 COPPER PIPE

A. Size: 2-inch Maximum

B. Construction: Type K Copper

C. Standards: ASTM B-88

D. Fittings: Wrought Copper, Silver Solder Joint (per ASTM B-828), Non-Corrosive Flux

2.19 ANGLED BALL METER VALVES

A. Size: 2-inch

B. Construction: Brass (85-5-5-5), Factory Installed Handles

C. Fittings: Elliptical Meter Flange (for 2-Inch Valves)

D. Manufacturer: Mueller, or Approved Equal

2.20 HOSE BIBB

A. Size: 1-inch

B. Ensure that hose bibbs selected by landscape architect have integral vacuum breakers.

2.21 SPARE PARTS

A. Wrenches, Keys, and Tools for Servicing and Adjusting Sprinkler Heads (2)

B. Quick Coupler Valve Keys (1)

C. Gate Valve (1 of each size on Drawings)

D. Electric Zone Valve (1 of each size on Drawings)

E. Sprinkler Heads and Nozzles (3 of Each)

F. Assorted Valves and Fittings

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Competent superintendents and assistants shall be on-site at all times during product delivery, installation, testing, and system adjustments.

1. Field communication by Owner or Owner’s Representative to superintendent shall be binding.

B. System features shall be laid out as indicated on Drawings, making minor adjustments for variations in planting arrangements or field conditions. Major changes shall be reviewed with Owner’s Representative before acceptance.

1. Irrigation and water lines shown on Construction Drawings are diagrammatic only. Location of irrigation equipment is contingent upon and subject to integration with all other underground utilities, tree roots, and hardscape design elements.

3.02 EXAMINATION

A. Review and verify project conditions are as indicated on Construction Drawings prior to starting work, including but not limited to:

1. Utilities provided by Others
2. Site grades and dimensions
3. Landscape and Hardscape Features
4. Structures
5. Pipe sleeves

B. Report any irregularities of site conditions to the Owner’s Representative prior to beginning work.

C. Beginning of installation connotes acceptance of existing project conditions.

3.03 PROJECT COORDINATION

A. Coordinate with Owner’s Representative to expeditiously install system.

B. Provide written notifications (electronic is acceptable) to Owner’s Representative prior to work commencement, weekly for progress report, for any proposed changes to system design, and upon installation completion.

C. All questions of design intent, proposed design changes, field notifications, and product substitution after installation commences shall be in writing to Owner’s Representative as a Request for Information (RFI).

D. Utility Coordination:

1. Maintain 6-inch minimum clearance between irrigation lines and any utility line. Do not install sprinkler lines directly above another utility of any kind.
2. Exercise care when excavating, trenching and working near existing utilities.

3.04 SITE PROTECTION

A. Protect landscaping, paving, structures, walls, footings, etc. from damage caused during work. Damage to work of another trade shall be reported at once.

B. Replace or repair any damage with same product or material, to the satisfaction of Owner’s Representative at no additional cost to the Owner per Guarantee.

C. Route pipe as necessary to prevent damage to tree roots. Where trenching must occur near trees, provide proper root pruning and sealing methods to all roots 1-inch and larger.

3.05 EXCAVATION, TRENCHING, AND BACKFILLING

A. Notify and request approval from Owner's Representative if pipe pulling is the intended installation method. Pipe pulling is an accepted installation practice only under the following conditions:

1. Maximum pipe size 2 inches, and
2. Suitable soils (i.e. naturally rounded loamy soils without sharp rocks), and
3. Specified pipe burial depth can be maintained.

B. Pipe Trench:

1. Excavate trenches straight and true, minimizing site disturbance as possible.
2. Final trench bottom shall be undisturbed soil and shall be free of rocks and debris larger than 1 inch or with sharp edges. If trench base is unsuitable for laying pipe, over excavate 2 inches below pipe invert, and place Clean Sand or Stone.

C. Clean Backfill:

1. Material: Clean Sand (See Earth Materials)
   a. Clean backfill must be free of foreign material, debris, frozen material and rocks larger than 1-inch.
2. Carefully place clean backfill a minimum depth of 10-inches over pipe and wire, tamp in place.
3. Carefully place material around pipe and wire, tamp in place.

D. Trench Backfill:

1. Material: Re-use excavated material
   a. Clean backfill must be free of foreign material, debris, frozen material, and rocks larger than 1-inch.
2. Place and compact in maximum 6-inch lifts to dry density equal to undisturbed soil. Compaction by truck or equipment tires is prohibited.
3. Avoid backfilling in hot weather.
4. Match adjacent subsurface grades without hills or depressions. Repair settling (as required by Guarantee).
5. If final planting soils, mulch, or sod were removed or disturbed during trenching, replace to match Project Specifications and regrade as necessary.
   a. Use sod cutter where applicable, or reseed disturbed areas to acceptance of Owner.

3.06 PIPE INSTALLATION

A. PVC Pipe Installation:

1. Cut plastic pipe with handsaw or pipe cutter, removing all burrs at cut ends. All pipe cuts shall be square and true. Bevel cut end as required to conform to manufacturer instructions.
2. Make all solvent-weld joints as per manufacturer's instructions and avoid applying excess primer or solvent. Do not wipe off excess solvent from each connection.
   a. Allow welded joints minimum 5 minutes set-up/curing time before moving or handling.
      1) Above 80ºF: Allow connections to set 24 hours
      2) Below 80ºF: Follow manufacturer instructions
      3) Below 40ºF: Prohibited
3. Maximum deflection per joint shall not exceed manufacturer limits.
4. Maintain 1-inch minimum between lines which cross at angels of 45 to 90 degrees

B. Pipe and wire shall run in same trench as mainline, at the elevation of the pipe invert (See Wire Installation).

C. Pipe Cover (unpaved surfaces):

1. PVC Mainline = 22 inches
2. PVC Lateral = 16 inches

D. Pipe Protection:

1. Prevent foreign material from entering pipe during installation.
2. Open ends of pipe shall be closed by watertight plug or seal when not in use.
3. Securely store pipe when not scheduled for installation.
4. Pipe shall not be installed when water is in trench, during rainstorms, or when temperature is below 40 ºF.
   a. No additional pipe may be installed or backfilled if water enters trench during pipe installation. Remove all water from trench before resuming installation.
   b. Pipe installed at temperatures below 40 ºF shall be removed and replaced at no cost to owner.
5. Trenched PVC pipe shall be snaked to accommodate for expansion and contraction due to changes in temperature.

3.07 PIPE SLEEVE INSTALLATION

A. Coordinate with Owner's Representative for provided pipe sleeves and locations installed by Earthwork Contractor.

B. New Pipe Sleeves:

1. Pipe Sleeve Cover: Minimum 24 inches
2. Install pipe sleeves where irrigation pipe runs under hardscape (see Construction Drawings).
3. Extend pipe sleeves minimum 18 inches beyond edges of hardscapes.
4. Prior to installation of pipe, pipe sleeve ends shall be field marked with vertical wood stakes extending above grade to allow field location during irrigation system installation.

C. Cutting through or jacking under new pavement shall be strictly prohibited. Failure to provide sleeves shall require notification to Owner's Representative for resolution.

3.08 ELECTRICAL CONDUIT INSTALLATION

A. Outdoor Electrical conduit shall be installed:

1. Under and through all hardscape areas
2. For all above ground wiring

B. Electrical conduit shall extend 18 inches beyond edges of hardscape.

3.09 ELECTRIC ZONE VALVE INSTALLATION

A. Install electric zone valves on level crushed stone base generally where shown on Construction Drawings. Do not pour stone around valves that are already installed.

B. Install all Schedule 80 PVC threaded nipples with Teflon tape, isolation valves, and/or union couplings in and out of electric zone valves as shown on details on Construction Drawings.

C. Set valves plumb with adjusting handle and all bolts, screws, and wiring accessible through valve box opening.

D. Install at sufficient depth to provide between 4-6 inches of cover from top of valve to finish grade.

E. Install specified valve box over all electric zone valves. Ensure lid is flush with final proposed grade (coordinate with Site Contractor).

F. Adjust zone valve operation after installation using flow control device on valve.

3.10 ISOLATION VALVE INSTALLATION

A. Install isolation valves per detail where indicated on Construction Drawings.

B. Install all isolation valves on level crushed stone base for operation ease with appropriate valve wrench. Do not pour stone around valves that are already installed.

C. Install specified valve box over all isolation valves. Ensure lid is flush with final proposed grade (coordinate with Site Contractor).

D. Check and tighten valve bonnet packing before valve box and backfill installation.

3.11 QUICK COUPLING VALVE INSTALLATION

A. Install quick coupling valves where indicated on Construction Drawings; generally, at ends of mainline branches and immediately downstream of well.

B. Mount mainline quick coupling valves on 1-inch diameter, 12-inch long brass swing joint assemblies and stabilizers.

C. Where mainline pressure exceeds 60 psi, install pressure regulating valves to 40 psi off quick coupling valve service tee.

3.12 WIRE INSTALLATION

A. Install wiring per local codes for less than 30-Volt service.

B. Install valve two-wire in trench alongside mainline at invert elevation. Backfill carefully to avoid any damage to wire insulation on conductors.

1. In areas of unsuitable material, use clean sand in bottom of trench before placing wire (see Excavation, Trenching, and Backfilling)

2. Minimum cover: 12-inches

C. Maintain sufficient slack for expansion, contraction and servicing. Do not install wiring tightly.

1. Provide and install additional 8 to 12 inches slack for conventional wire from decoder to valve.

2. Provide 30 inches slack between decoders for two-wire.

3. Provide sufficient length of wire in valve boxes to allow valve solenoid, splice, decoder wire, and all connections to be brought above grade for servicing.

4. Coil slack for neatness in valve box.

D. Install Decoder Cable Fuse Device as shown on Contract Drawings.

E. Provide waterproof splices at all in-ground wire connections using approved splice kits. All splices shall be made in valve boxes and recorded on Record Drawings.

F. Provide complete wiring diagram showing wire routing for connections between controller and valves as specified in Record Documents.

G. Securely store wire when not scheduled for installation.

3.13 GROUND INSTALLATION

A. Controller Grounding

1. Wire 6AWG Bare Copper Wire to Grounding Rod and Plate as shown on drawings.

2. Grounding Rod
   a. Coordinate with Site Contractor to ensure no obstructions below grade at grounding rod site (Call 811 / DIG-SAFE if necessary)
   b. Prepare valve box for grounding rod installation 8 feet from all valve boxes and electrical equipment. Drive 8-foot grounding rod into earth with 6 inches minimum below valve box lid.
   c. Make Cadweld connection between bare copper wire from lightning arrestor splice to grounding rod lug.

3.14 SPRINKLER INSTALLATION

A. Sprinklers shall not exceed maximum spacing on Shop Drawings.

B. Install sprinklers flush with grade on PVC swing joints as specified.

C. Flush system before installing internals, flush caps, and nozzles (see Testing and Adjustments)

D. Adjust all sprinklers after installation using flow control device on valve. Do not exceed radius reduction recommendations from manufacturer.

3.15 VALVE BOX INSTALLATION

A. Furnish and install valve boxes as per valve schedule above for each valve, splice, or sensor.

B. Install valve boxes on minimum 4-inches crushed stone base. Pouring stone into valve box after installation is not acceptable.

C. Finish elevation of all boxes shall be at grade, unless otherwise noted in Drawings.

D. Provide level brick supports beneath valve boxes.
   1. For square/rectangular boxes, provide four (4) supports - one at each corner.
   2. For round boxes, provide three (3) supports equally spaced.

3.16 AUTOMATIC IRRIGATION CONTROLLER INSTALLATION

A. Controller
   1. Controller located inside Stainless Steel Enclosure.
   2. Wire valves and external sensors into controller through conduits and set proper programming.
   3. Program “Cycle-Soak” feature for all zones with sloped or poorly draining soils.
   4. Use Irrigation Plans provided for Recommended Quantity and Assignment
   5. Using licensed electrical, wire controller to 120-Volt, 20-Amp electrical supply provided by Electrical Contractor.

6. Provide keys to Owner after final walkthrough.

B. Rain Sensors

1. Install sensors within Sensor Guard welded to irrigation controller enclosure. Wire sensor through Sensor Guard, through enclosure, and into Controller.

2. Exposed sensor wire shall be installed within ½-inch galvanized conduit, where applicable.

3. Rain Sensor shall have direct overhead exposure to atmospheric conditions and not in contact with overhead irrigation.

C. Grounding

1. Provide outdoor grounding for irrigation controller with grounding rod and grounding plate. Refer to Ground Installation and Construction Drawings details for installation steps.

3.17 TESTING AND ADJUSTMENTS

A. Include all testing and adjustments in submitted bid price.

B. System Flushing:

1. Open electric zone valves and flush out irrigation system under full head of water before installing sprinkler internals, flush caps, and nozzles.

2. Flush entire irrigation system after complete installation.

3. Clogged nozzles shall be remedied after completion of irrigation system.

C. Testing:

1. Test all pipe and valves for leaks at operating pressure. Repair all leaks and retest until leaks are remedied.

2. Perform coverage test with Owner’s Representative present. Operate electric zone valves for five (5) minutes minimum during coverage test. Readjust sprinkler nozzles and head locations (as necessary) to attain proper coverage. Replace any equipment that does not meet specified standards.

3. After testing, clean all equipment of debris during installation.

D. Adjust sprinkler heads and valve boxes as necessary for mowing and landscaping.

E. Throughout guarantee period, adjust sprinklers and ensure coverage due to settlement and landscaping operations.

3.18 RECORD DOCUMENTS

A. Record (As-Built) Drawings

1. Maintain and update Record Drawings with red-line markings as project progresses, including locations of:

a. Sprinklers and descriptions (nozzle, pop-up height, and type)

b. Valve Boxes and descriptions (valve type, zone numbers, splice, etc.)

c. All equipment installed with distinct symbols

d. Pipe routing and tees

e. Wire routing and splices

2. Locations of installed equipment (valve, controller, sensors) shall be referenced by two permanent locations (swing ties) or GPS.

3. Make all notes legible as work progresses, any new equipment added shall use distinct symbols denoting location.

4. Document any changes from original Construction Drawings.

5. Prints of original Construction Drawings may be obtained from the Owner’s Representative at cost (0% markup).

6. Record Drawings shall be used as basis of payment for work completed. Provide copies of red-lined set to Owner’s Representative along with payment request.

B. Record Documents

1. Record Documents shall be on-site at all times. Maintain record of the following as the project progresses:

a. Materials Approved and approval date

b. Pressure Test results, testing personnel and testing date.

c. Materials delivered, Accepted, and Installed by whom and date.

d. Field Communications and Requests for Information (RFI)

C. Prior to final punchlist, provide complete electronic and hard copy files of Record Drawings and Documents to Owner’s Representative as part of project completion. All information must be complete and shall be added to submitted documents prior to acceptance.

3.19 OPERATION AND MAINTENANCE

A. General

1. Bid price shall include up to four (4) hours of irrigation system overview and instruction with Owner and/or Owner’s Representative.

B. Operation and Maintenance Manual

1. Provide three (3) hard cover binders titled “Operation and Maintenance RIVMC Irrigation System” prior to application for acceptance and final payment.

2. Operation and Maintenance Manual shall include, but not be limited to:

a. Title Page and Table of Contents

b. One-Paragraph Written Description of Irrigation System

c. Manufacturers' Data and Cut Sheets of Equipment, including:

1) Copies of all approved submittals

2) Wire resistance readings to each electric valve at completion (for future troubleshooting)

3) Recommended operating settings

4) Recommended maintenance schedule

5) Name, address, and telephone number of installer (for repairs, spring startup, and winterization during 1-year guarantee period)

6) Irrigation program for periods without rain and recommended settings including, zone run time, days per week, cycle-soak, and rain sensor suspension.

7) Web Based Application Server settings, login, and troubleshooting

d. Winterization and Spring Startup Instructions (after 1-year guarantee period)

e. Guarantee Data

f. Pockets with Folded Plans of:

1) Original Design Drawing

2) Final Record Drawing

3) Controller Valve and Wiring System Diagram Drawing

4) Stop-and-Waste Valve Locations

5) Winterization Port Locations

3.20 SITE CLEANUP

A. Remove all unused materials and equipment from project site safely and efficiently. Dispose of all unused materials legally - including construction debris and trash.

B. Adjust ground, compact, and re-plant around irrigation sprinkler heads and trenches as necessary for proper angle and elevation.

C. Fill all depressions, erosion rills, tire tracks, etc. with proper planting soil mix to ensure site drainage.

3.21 FINAL OWNER ACCEPTANCE

A. Final Owner Acceptance of Irrigation System is predicated on:

1. Complete system installation, adjustment, testing, and instructional overview.

2. Submission of Operation and Maintenance Manuals to Owner's Representative.

3. Proper Programming and Internet Connection of Automatic Irrigation Controller

4. Completed and approved all punchlist items.

B. Owner and/or Owner’s Representative shall provide written notice (hard copy and/or electronic) for Final Acceptance. Date of Final Acceptance notice shall serve as start of 1-year Guarantee period as described above.

C. Upon Completion of Irrigation System, notify Commissioning Agent to review irrigation system.

END OF SECTION

SECTION 32 90 00
PLANTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Plants, turf, and landscape materials.

1.02 DEFINITIONS

A. Integrated Pest Management (IPM) is a systematic approach to managing pest, which focuses on long-term prevention or suppression with minimal impact on human health, the environment and non-target organisms. IPM incorporates all reasonable measures to prevent pest problems by properly identifying pests, monitoring population dynamics, and utilizing cultural, physical, biological or chemical pest population control methods to reduce pests to acceptable levels.

B. Pesticide: Any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests and is specifically labeled for use by U.S. Environmental Protection Agency (EPA). Also, any substance used as plant regulator, defoliant, disinfectant, or biocide.

C. Sustainable Planter Bed: Those areas containing trees and low-growing fescues serving for stormwater retention and infiltration.

D. Stand of Turf (seed or sod): 95 percent of established species with no bare spot greater than 8-square inches and.

1.03 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. American National Standards Institute (ANSI):

1. Z60.1 2014 – American Standard for Nursery Stock.

C. American Society for Testing And Materials (ASTM):

1. C602 13a - Agricultural Liming Materials.

D. Hortus Third: Concise Dictionary of Plants Cultivated in United States and Canada.

E. Dirr: Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses, Michael Dirr et al, latest edition: standardized plant names

F. Tree Care Industry Association (TCIA):

1. A300P1 2008 - Tree Care Operations - Trees, Shrubs and Other Woody Plant Maintenance Standard Practices (Pruning).

2. Z133.1 2012 - Arboricultural Operations - Safety Requirements.

G. Turfgrass Producers International (TPI):

1. 2006 Guideline Specifications to Turfgrass Sodding.

H. NTEP: National Turfgrass Evaluation Program, Beltsville Agricultural Research Center – West, Beltsville MD 20705

1.04 PREINSTALLATION MEETINGS

A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this section.

1. Required Participants include the Resident Engineer (henceforth referred to as the RE), Landscape Architect, Contractor and Installer.

2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.

a. Inspection of planting materials.

b. Installation schedule.

c. Installation sequence.

d. Preparatory work.

e. Protection before, during, and after installation.

f. Installation.

g. Inspecting.

h. Environmental procedures.

3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.05 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Fertilizer:

a. Coordinate with the requirements of Sections 32 91 13 PLANTING SOILS and 32 91 19 LANDSCAPE GRADING.

b. Submit product literature of seeding fertilizer and certificates showing composition and analysis.

2. Chemical Treatments:

a. Submit product literature of pesticides proposed for use (herbicides and insecticides) and certificates showing composition, analysis and dilution and application rates.

b. Submit Safety Data Sheets (SDS) for all proposed pesticide treatments.

c. Maintain and submit Log of Use of chemical treatments, including:

1) Product applied

2) Date of application

3) Quantity applied at each application

3. Seed: Submit a manufacturer's Certificate of Compliance to the Specifications with each shipment of seed. Include in certificates the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.

4. Erosion Control Matting (Blankets): Submit manufacturer's literature.

5. Hydroseeding: Prior to the start of hydroseeding, submit a certified statement as to the number of pounds of materials to be used per 100 gallons of water with conversion to pounds per acre application rate.

6. Wood Fiber Mulch: Submit manufacturer's literature.

7. All additives needed to amend a specific soil in order to meet these specifications.

C. In Lieu of Nursery Inspection when approved by the RE:

1. Photographs: Color photographs of each plant species showing actual size and condition of plants to be provided with measuring device included for scale. Include on each photograph, plant full scientific name, size, and source nursery.

D. Warranty: written statement of warranty provisions in accordance with the requirements of this Section.

E. Samples:

1. Organic and Compost Mulch: 1 L. (1 quart) sealed plastic bag of each required mulch, including label with percentage weight of each material and source representing material to be provided. Samples to match color, texture, and composition of installed material.

F. Test reports: Certify products comply with specifications.

G. Certificates: Certify products comply with specifications.

1. Plant Materials: Department of Agriculture certification by State Nursery Inspector declaring material to be free from insects and disease.

H. Qualifications:

1. Proof of Landscape Contracting Company experience.

2. Certifications of Foreman or Crew Leader under the Rhode Island Certified Horticulturist Program.

3. Certification of Arborist.

1.06 QUALITY ASSURANCE

A. Installer Qualifications:

1. The contractor responsible for planting and turf establishment shall be the contractor responsible for topsoil and planting soil management as specified under Section 32 91 13 and 32 91 19.

2. Preparation of subgrade, placement of planting soil, seeding and turf establishment and planting of trees shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five-years of experience. Proof of this experience shall be submitted per SUBMITTALS paragraph of this Section.

   a. Project Experience List: Provide contact names and addresses for a minimum of five (5) completed projects.

B. Qualifications of Foreman/Crew Leader:

1. Foreman/Crew Leader shall be:

   a. Certified by the Rhode Island Certified Horticulturalist Program as a Horticulturalist: (https://rinla.org/ri-certified-horticulturist-program/) and either of the following,

   b. Certified by the Associated Landscape Contractors of Massachusetts as a Massachusetts Certified Landscape Professional, (https://mlp-mclp.org/) or,

   c. Certified by the Massachusetts Nursery and Landscape Association as a Massachusetts Certified Horticulturist (https://www.mnla.com/default.aspx).

2. The ratio of laborers to the certified Foreman/Crew Leader shall not exceed 12 to 1. Foreman/Crew Leader shall be on the project site throughout the day-to-day performance of the work described.

C. Qualifications of Arborist: Certified by the International Society of Arboriculture as an ISA Certified Arborist, with a clear understanding of soil management, installation and establishment, safe work practices, tree biology, pruning, diagnosis and treatment, tree protection and tree risk management.

D. Soil Testing Laboratory Qualifications: In accordance with the requirements of Sections 32 91 13 and 32 91 19.

E. Measure plants according to ANSI Z60.1. Pruning to obtain required sizes will not be permitted.

F. RE or designated representative may review plant materials either by photograph, at place of growth or project site before planting for compliance with requirements. RE retains the right to inspect plants to determine if any unacceptable conditions exist and to reject any plants at any time during Project, including after delivery and installation. All rejected plants must be immediately removed from Project site. Submit plant material source information to RE 30 days in advance of delivery to Project site.

G. Material Test Reports: For existing stripped and stockpiled topsoil and imported supplemental planting soil shall be in accordance with the requirements of Sections 32 91 13 and 32 91 19.

1.07 DELIVERY

A. Deliver packaged products in manufacturer's original sealed packaging.

1. As applicable, show weight, certified analysis, name and address of manufacturer and compliance with state and Federal laws.

B. Protect materials from theft, damage, weather, dirt, oils, grease, and construction activities.

C. Sequence deliveries to avoid delay. On-site storage space is permissible only with written notice from the RE and in locations indicated.

D. Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil.

E. Bulk Materials: in accordance with requirements specified in Sections 32 91 13 and 32 91 19.

F. Antidesiccants: Apply antidesiccant to trees and shrubs according to manufacturer's instructions to protect during digging, handling, and transportation.

1. For deciduous trees or shrubs in full leaf, spray with antidesiccant at nursery before transporting, again two weeks after planting and again 6 weeks after planting.

G. Trunk Protection:

1. The base of the deciduous tree trunks shall be wrapped with a protective burlap layer, surrounded by a cardboard trunk protector extending no less than 36 inches upward from the root flare, and loosely tied with twine.

H. Deliver trees with branches tied and exposed branches covered with material that allows air circulation. Prevent damage to branches, trunks, root systems, and root balls and desiccation of leaves.

I. Use of equipment such as "tree spades" is permitted provided plant balls are sized according to ANSI Z60.1 and tops are protected from damage.

1.08 DELIVERY, STORAGE AND HANDLING

A. Chemical Controls:

1. Mixing, applying and/or disposing of pesticides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. All applicators must wear the required personal protective equipment specified on the herbicide label.

2. Take precautions to avoid herbicide applications before or during rain or precipitation events. Monitor weather conditions and

adjusting the work schedule as appropriate for the herbicide and application method to be used.

3. Assume responsibility for any damage to trees, shrubbery or turf beyond the target area due to the use of chemical controls.
4. Store liquids in tightly closed containers protected from freezing and excessive heat
5. Ensure the public does not enter the work area while herbicide application or spraying is underway.
6. Chemical Safety: Cease operations and notify the RE immediately if safety of adjacent structures or workers appears to be endangered. Take precautions to properly support structures and protect workers. Do not resume operations until safety is restored.

B. Store seeds and other packaged materials in dry locations away from contaminants.

C. Plant Storage and Protection: Store and protect plants not planted on day of arrival at Project site as follows:

1. Shade and protect plants in outdoor storage areas from wind and direct sunlight until planted.
2. Heel in bare root plants.
3. Protect balled and burlapped plants from freezing or drying out by covering balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss, or other approved material. Provide covering that allows air circulation.
4. Keep plants in moist condition until planted by watering with fine mist spray.
5. Do not store plant materials directly on concrete or bituminous surfaces.

D. Handling: Do not drop or dump plants from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle balled and burlapped trees carefully to avoid damaging or breaking earth ball or root structure. Do not handle plants by trunk or stem. As directed by the RE, remove damaged plants from Project site.

1.09 PLANTING SEASONS

A. Turf Establishment:

1. The season for seeding shall be from August 15 to September 15. The actual planting of seed shall be done, however, only during periods within these specified seasons that are normal for such work as determined by weather conditions, by accepted practice in this locality and as approved by the RE. Schedule seeding operations to insure seeding and placement of erosion control blankets by October 15th.
2. If the contractor elects to establish turf during any other season of the year than this fall season then the contractor assumes all responsibility for applications of herbicides to eradicate grass-like and broadleaf weeds. This responsibility may require an

ongoing weed control strategy that could extend the contract and the contractor’s responsibilities to return to the site repeatedly to manage weeds, reseed, fertilize and continue temporary irrigation for several years.

3. To prevent loss of soil via water and wind erosion and to prevent the flow of sediment, fertilizer, and pesticides onto roadways, sidewalks, and into catch basins, seed turf areas within 5 Days of spreading and fine grading the planting soil.

4. Seed only when the bed is in a friable condition, not muddy, dry or hard.

5. Limit of grading and earthwork shall be limit of seeding unless otherwise indicated on the Contract Documents. All landscape areas disturbed outside the limit of seeding shall be prepared and seeded as specified herein at no additional cost to the Owner.

B. Planting Period:

1. Locate all plant material sources and ensure that plants are shipped in timely fashion for installation within the following Seasons for Planting:

   a. Spring: Deciduous materials - March 21 through May 1; Evergreen materials - April 15 through June 1.

   b. Fall: Deciduous materials - October 1 through December 1; Evergreen materials - August 15 through October 15.

2. When schedule of construction requires installation of plant material outside of these specified planting seasons, the Contractor shall bare full responsibility for planting out of season and shall be held fully responsible for any plant material losses resulting from planting out of the specified seasons. Contractor shall replace all plant material that does not meet the requirements of this Section with new plant material that conforms to the requirements of this Section.

3. Weather Limitations: Install plantings only during current and forecasted weather conditions that are comply with plant requirements. Apply associated products in compliance with manufacturers' instructions.

1.10 FIELD CONDITIONS FOR PLANTING OF TREES

A. Environment:

1. All areas to be planted shall be inspected by the Contractor before starting work and any defects such as subgrade elevations that will require additional excavation to insure adequate volumes of planting soil, incorrect grading or inadequate drainage shall be reported to the RE prior to beginning this work.

2. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to providing planting soil to the depths and volumes specified, the potential need for storing and maintaining plants temporarily and/or re-handling plants prior to final installation.

3. Coordinate installation of planting materials during optimal planting seasons for each type of plant material required.

B. Do no work when the ground is frozen, snow covered, too wet or in an otherwise unsuitable condition for planting. Special conditions may exist that warrants a variance in the specified planting dates or conditions. Submit a written request to the RE stating the special conditions and proposal variance.

1.11 WARRANTY

A. Construction Warranty: FAR clause 52.246 21, "Warranty of Construction", and the following:

B. Nursery Warranty: Warrant trees comply with the requirements of this Section. Warranty shall be carried by the Contractor on behalf of the Nursery and shall extend to two years from the date of digging the trees at the Nursery. If at any time during this two year period living trees are determined not in compliance with the requirements of this Section, the Contractor shall replace the trees at no additional cost to the Owner.

C. Installation and Performance Warranty for Trees:

1. All trees shall be the full responsibility of the Contractor between the time of digging at the nursery and final acceptance. As a basis of this Contract, the Contractor will be assigned full responsibility for any decline or damage to the plant material from the time the plants are dug until the entire Project has received final acceptance from the RE.

2. RE will re-inspect trees as part of the project Punch List protocol. Replace any dead, missing, or defective plant material. Warranty Period will end on date of this inspection provided Contractor has complied with warranty work required by this specification. Comply with following requirements:

a. Replace any tree more than 25 percent dead, missing or defective plant material before final inspection.

b. Only one replacement of each plant will be required except when losses or replacements are due to failure to comply with these requirements.

c. Complete remedial measures as directed by RE to ensure plant and turf survival.

d. Repair damage caused while making plant replacements.

D. Installation and Performance Warranty for Turf:

1. Maintenance shall begin immediately after any area is seeded and shall continue until Final Acceptance of the Project by the RE. Perform turf maintenance generally from the first week in April though the last week in November.

2. Protect turf areas from drought, washout by rain events and wind erosion.

3. Maintenance shall include reseeding, mowing and trimming, watering and fertilizing as specified herein. Turf work maintenance shall also include chemical treatments as required for weed, fungus and/or pest control.
4. During the maintenance period, any decline in the condition of seeded areas shall require immediate action to identify potential problems and to undertake corrective measures.
5. Watering shall be done in a manner that will provide uniform coverage, encourage a deep rooting of grass plants, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.
6. After the grass in seeded areas has germinated, reseed all areas and parts of areas that fail to show a uniform stand of grass. Reseed such areas and parts of areas repeatedly until all areas are covered with a satisfactory growth of grass. Reseeding together with necessary grading, fertilizing, and trimming shall be done at the Contractor’s expense.

PART 2 PRODUCTS

2.01 PRODUCTS - GENERAL

A. Provide each product from one source or manufacturer.

2.02 EXISTING ON-SITE TOPSOIL, IMPORTED SUPPLMENTAL PLANTING SOIL, INORGANIC SOIL AMENDMENTS AND COMPOST

A. In accordance with the requirements of Sections 32 91 13 PLANTING SOILS and Section 32 91 19 LANDSCAPE GRADING.

2.03 PLANT MATERIALS

A. Plant Materials: ANSI Z60.1, conforming to varieties specified and be true to scientific name as listed in Hortus Third and Dirr, whichever is determined to best advantage to the Owner by the RE.

2.04 GRADES AND STANDARDS OF PLANTS - GENERAL

A. The Contractor shall furnish all plants shown on the Contract Documents, as specified, and in quantities listed on the PLANT LIST. No substitutions will be permitted, without written approval by the RE. All plants shall be nursery grown unless specifically authorized to be collected as noted on the PLANT LIST.

B. Plants shall be true to the species and variety specified and shall be nursery grown in accordance with good horticultural practices. Unless approved by the RE, plants shall have been grown at a latitude not more than 200 miles (325 km) north or south of the latitude of the project unless the provenance of the plant can be documented to be compatible with the latitude and cold hardiness zone of the planting location.

C. If proof is submitted in writing that a plant specified is not obtainable, consideration will be given to the nearest available size or similar variety, with a corresponding adjustment of the contract price.

D. Plants shall be dug during the most recent favorable harvest season and subject to the review of the RE.

E. Plants shall be in accordance ASNS except as noted in this Section.

F. Plants shall conform to the measurements specified on the PLANT LIST, except that plants larger than those specified may be used if approved by the RE. When so approved, larger plants shall be provided and installed at no additional cost to the Owner. Root balls of larger plans shall be increased in proportion to the size of the plant.

G. Trees shall be specimen quality in accordance with requirements of ASNS, and shall have exceptionally heavy branching, be symmetrical, and so trained or favored in development and appearance as to be unquestionably superior in form, shape and compactness.

H. Plants shall show no signs of frost or winter damage to the foliage. Foliage shall not be in a state of drought stress. Leaves shall show no signs of wilt or desiccation due to weather stress at any season of the year.

I. Plants shall be free of disease and insects, eggs, or larvae. They shall be free from physical damage, sun-scald, frost cracks, injuries and abrasions of the bark, broken branches, damaged leaders, included bark, v-shaped crotches, or other conditions that would prevent, long-term, vigorous growth and aesthetic appeal as determined by the RE.

J. If, at any time during the performance of the Contract, any plant shows signs of graft incompatibility, as determined by the RE, then the tree or shrub and all other similarly grafted plants of the same Genus/Species/Variety shall be rejected and removed from the site.

2.05 TREE STANDARDS

A. All deciduous and evergreen trees shall meet the following standards:

1. Main leader and branches:

a. Unless otherwise designated as multi-stemmed on the PLANT LIST, trees shall have single, strong, straight central leaders, well-formed and sturdy, with no lateral branches greater than 2/3 the caliper of the main leader.

b. Branches shall not have included bark at their unions with the main

c. Branching of all deciduous trees shall be best quality representatives of the species, cultivar or variety. Trees shall have branches equally spaced around the central leader at least 6-inches apart.

d. Branches shall occupy their own space and not cross, intertwine or touch.

e. All branches on deciduous trees shall meet the trunk at angles no less than 30 degrees and no greater than 90 degrees from the vertical.

2. Foliage:

a. All trees shall have healthy, vigorous leaves or needles of normal size, color, shape, and texture for the particular species and variety.

b. Terminal and top whorl buds of all evergreen trees shall be in healthy and whole condition at the time of harvest.

c. Deciduous shade trees and deciduous flowering trees shall have fall color typical for their species and variety.

3. Pruning Scars:

a. All pruning wounds shall show vigorous bark on all edges at the time of harvest.

b. Pruning scars within the crown of any tree shall be clean cut and shall leave no protrusion beyond the branch collar.

c. No tree shall be pruned after the RE has tagged the plant in the nursery except as directed by the RE.

4. Size:

a. Unless otherwise indicated on the PLANT LIST, the height and spread of deciduous shade trees shall be the minimum requirements.

b. Take caliper measurements for deciduous trees 6 inches above ground level up to and including 4 inches caliper size and 12 inches above ground for larger sizes.

c. Unless otherwise noted on the PLANT LIST, shade trees for use in or immediately adjacent to paved areas shall have no branches lower than 6.5 feet from finish grade and no higher than 7.5 feet from finish grade.

d. Flowering trees for use in areas away from pedestrian traffic shall have the first branch of their crowns no higher than 4 feet from finish grade

2.06 ROOT SYSTEMS FOR ALL PLANTS

A. Requirements:

1. Each plant shall have an extensive, symmetrically balanced fibrous root system. Root balls shall encompass the fibrous and root feeding system necessary for the healthy recovery of the plant.

2. Any root ball that shows signs of asymmetry, girdling, injury, or damage to the root system will be rejected.

3. All parts of the fibrous root system of all plants shall be moist and fresh.

4. The root systems of all plants shall be free of disease, insect pests, eggs, or larvae.

B. Balled and Burlapped Root Balls:

1. Root ball diameters for field grown stock shall be in accordance with the diameter and depth requirements in ASNS and as follows. Field grown stock may be dug by hand or by digging machines.

2. For those plants having a coarse or wide-spreading root system because of natural habit of growth, soil condition, infrequent transplanting practice, or plants that are moved out of season, root balls of field grown stock shall be larger than the ASNS recommended sizes.

3. Conversely, if the nursery grower can demonstrate to the satisfaction of the RE nursery cultural practices that increase root density of a tree or shrub, smaller root ball sizes may be accepted.

4. All balled and burlapped trees and shrubs shall be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8 ounce natural, biodegradable fabric burlap, firmly laced with stout, natural biodegradable cord or twine.

5. The base of the deciduous tree trunks shall be wrapped with a protective burlap layer, surrounded by a cardboard trunk protector extending no less than 36 inches upward from the root flare, and loosely tied with twine.

2.7 SEED

A. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 0.25% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers.

B. All seed shall comply with State and Federal seed laws and shall carry ‘Certified State of Origin’ tags on their bags or containers at the time of seeding. Seed shall conform to applicable state seed laws and standards of minimum purity, minimum germination, maximum crop seed, maximum weed seed, and be free of noxious weed seed as specified in this Section.

C. Seed that has become wet, moldy or otherwise damaged shall not be acceptable.

D. Fescues shall contain Acromonium endophytes. Seed containing endophyte must be kept cool and dry at all times; do not stockpile in the sun.

E. Cultivars of Turf-type grasses shall conform to the specified ratings of the NTEP: National Turfgrass Evaluation Program, Beltsville Agricultural Research Center – West, Beltsville MD 20705

2.8 SEED MIXES

A. Seed Mix No. 1 for all areas, including areas indicated and areas disturbed in the course of the work:

Botanical Name Common Name (Variety)	Percentage by Weight of Pure Live Seed (PLS)	Min. Purity	Min. Germination
Festuca longifoli Hard Fescue - Spartan II	98%	95%	85%
Trifolium repens Micro-clover – var. Pirouette (Little Bighorn, SRX 3BHO)	02%	97%	85%

1. Seeding rate 6 pounds per 1000 SF for hydroseeding

2.09 SOD FARM GROWING MEDIUM

A. The soil in which sod was grown shall be classified as loam or sandy loam (silt loam is not acceptable) and shall conform to the following grain size distribution for material passing the #10 sieve:

U.S. Sieve No.	% Passing by Weight	
	Minimum	Maximum
10	100	---
18	85	100
35	60	85
60	25	40
140	6	18
270	4	12
0.002 mm	2	5

B. The maximum retained on the #10 sieve shall be 15% by weight of the total sample.

C. Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

D. The organic content shall be between 3.0 and 8.0 percent.

2.10 SOD

A. Sod shall be nursery grown sod grown from the following seed mixtures and in accordance with percentages as specified:

Common Name	Proportion of Seed by Weight
Tall Fescue (Black Beauty or approved equal.)	90% maximum
Perennial Rye	10% maximum

B. Sod shall be machine cut from an established sod farm specializing in the production and harvesting of top quality, grass turf products. Sod shall be machine cut at a uniform soil thickness of 3/4-inch +/- 1/4 inch, at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pads and torn or uneven ends will not be acceptable. Sod shall be at least one year old from time of original seeding.

C. Sod shall be free of grass species other than those specified in this Section. Sod shall be free of weeds.

D. Provide sod in Big Roll and small roll from same source.

E. Big Rolls: to minimize seams and tripping. Replacement sod for all locations shall be conventional small roll sod.

F. Small Roll Sod: Sod shall be furnished and installed in rectangular sod strips measuring 12 inches or 16 inches in width and from 4 feet to 6 feet in length, stored in rolls with the grass top side inverted so that the topsoil is to the exterior.

G. Sod shall be harvested, delivered and installed within a period of 18 hours. Soil on sod pads shall be kept moist at all times.

H. The turf shall be of sufficient density so that no surface soil is visible when mowed to a height of 1.5 inches. At the time of sale, the turf shall contain no more than one percent undesirable grasses or clover and not more than two weeds per 50 square yards. The thickness of the soil portion of the turfgrass sod should not exceed one-half inch.

I. Sod shall have no visible signs of disease or insect stress. The turfgrass sod shall be neatly mowed and be mature enough that when grasped at one end of a small roll, it can be picked-up and handled without damage.

J. Sod delivered to the construction site which does not conform to the requirements of this Section, will be rejected by the Owner’s Representative and shall be removed from the site by the Contractor at no additional cost to the Owner. Sod found to contain unacceptable levels of unspecified grass species or weed species at any time up to and including Final Acceptance will be rejected by the Owner’s Representative. Contractor shall remove such sod from the site at no additional cost to the Owner. Contractor shall replace unacceptable sod with new, approved sod at no additional cost to the Owner. The Owner’s Representative will be the sole judge of what constitutes acceptable or unacceptable levels of unspecified grass species or weed species.

2.11 PLANT FERTILIZERS

A. General Requirements:

1. Soil Test: Evaluate existing soil conditions and requirements before fertilizer selection and application to minimize use of all fertilizers and chemical products. Obtain approval of RE for allowable products, product alternatives, scheduling and application

procedures. Evaluate existing weather and site conditions before application. Apply products during favorable weather and site conditions according to manufacturer's instructions and warranty requirements. Fertilizers to be registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer applicable to specific areas as required for Project conditions and application. Provide commercial grade plant and turf fertilizers, free flowing, uniform in composition and conforms to applicable state and federal regulations.

2. Fertilizers containing petrochemical additives or that have been treated with pesticides or herbicides are not acceptable.

3. Fertilizer shall be a commercial product complying with the State and United States fertilizer laws.

4. Fertilizer shall be delivered in original unopened standard size bags showing weigh, analysis ingredients and manufacturer’s name.

B. Fertilizer for Trees

1. Granular Fertilizer: Organic, granular controlled release fertilizer containing minimum percentages, by weight, of plant food nutrients.

a. Composition: Nitrogen, phosphorous, potassium, sulfur, and iron in amounts recommended in soil reports from qualified soil testing laboratory.

2. Fertilizer Tablets are not permitted for use on this Project.

C. Turf Fertilizer

1. Nitrogen Fertilizer: Ammonium Sulfate (NH4)2SO4

a. Granular grade fertilizer

b. Fertilizer analysis for nitrogen-phosphorus-potassium (N-P-K) shall be 21-0-0.

2. Soluble liquid fertilizer for use in hydroseeding equipment: Provide a standard NPK formulation designed to provide one pound of Phosphorus per 1,000 square feet.

2.12 MULCH SYSTEMS FOR SEEDED AREAS

A. Wood Fiber Mulch:

1. Wood fiber mulch to cover hydro seeded areas shall be biodegradable, dyed, wood fiber mulch. It shall be non-toxic and free of plant-growth or germination inhibitors, with maximum moisture content of 12 percent and a pH range of 4.5 to 7.5.

2. Fiber mulch shall have the following characteristics:

a. It shall be dyed dark green color for easy metering and confirmation by RE.

b. It shall be formulated to allow machinery to efficiently without clogging or clumping at the nozzle.

c. When mixed with water it shall be dispersed into a uniform slurry at an accelerated rate to maintain construction schedules.

d. Capable of staying in suspension of uniform consistency for the duration of the application.

e. Full application rate shall be 2,500 pounds per acre.

f. Reduced application rate for scalped areas of existing turf: as determined by the Contractor and reviewed by the RE, the reduced application rate shall allow for new seedling protection while allowing existing grass plants to reestablish.

B. Tackifier shall be a non-asphaltic colloidal tackifier as recommended by the approved fiber-mulch manufacturer. It shall be suitable for slurry application; non-toxic and free of plant-growth or germination inhibitors.

C. Hydraulically Applied Bonded Fiber Matrix

1. Mulch to cover hydroseeded areas with slopes 5H:1V or steeper shall be Bonded Fiber Matrix (BFM).

2. BFM shall be a hydraulically-applied, 100% biodegradable, United States-manufactured matrix composed of 100% recycled thermally refined wood fibers and naturally derived cross-linked biopolymers. The BFM shall be phyto-sanitized, free from plastic netting, and when cured shall form an intimate bond with the soil surface to create a continuous, porous, absorbent and flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth.

3. The BFM product shall have a cure time of approximately 24 to 48 hours with a manufacturer’s specified application rate from 3,000 to 4,000 pounds per acre based on slope length and inclination. BFM product shall be greater than 90 percent effective at reducing erosion when subjected to a 5-inches-per hour rain event for durations of 60 minutes. It shall have Wet Bond Strength of 6 lb/ft in accordance with ASTM D6818, water-holding capacity of 1,400-percent per ASTM D7367. It shall be 100-percent biodegradable in accordance with ASTM D5338.

4. BFM product shall conform to Testing Protocols and Procedures as developed by the Erosion Control Technology Council (ECTC), www.etc.org.

5. The primary goal for selecting and using the hydraulically applied BFM product shall be erosion control during extended period of inclement weather. The additional benefit of establishing permanent turf shall also be weighed in selecting and approving the recommended product, especially in light of the schedule of site stabilization and schedule of completion.

D. Erosion Control Blankets:

1. Erosion control blankets shall be 100% biodegradable, woven mesh blankets designed specifically to nurture seed germination and growth and prevent water born erosion.

2. Erosion control blankets shall be BioNet by North American Green, Curlex NetFree by American Excelsior Company, or BioD-OCF by RoLanka International, Inc, or approved equal. Synthetic netting shall not be permitted.

2.13 MULCH FOR PLANT BEDS AS INDICATED

A. Bark Mulch: Mulch shall be high quality premium pine, hemlock or spruce bark mulch. Mulch shall have been aged for a minimum of six months and not longer than two years. Bark mulch shall be shredded to a uniform size; free of dirt, debris and foreign matter; with pieces no thicker than 1/4 inch. Mulch must be free of stringy material or chunks over 3 inches in size and shall not contain, in the judgment of the RE, an excess of fine particles. Submit sample for the RE's approval.

2.14 INOCULANTS AND STIMULANTS

A. Mycorrhizal fungal inoculant shall be live spores packaged in plastic packets. At a minimum each packet of inoculant shall contain the following:

1. Live spores of VA Endomycorrhizal fungi: Vesicular-Arbuscular mycorrihizae fungi, minimum of 8 species.
2. Live spores of Ectomycorrhizal fungi: including Pisolithus tinctorius.
3. Mycorrhizal fungal inoculant shall be manufactured by Plant Health Care Incorporated, 440 William Pitt Way, Pittsburgh, PA 15238, Telephone: (800) 421-9051; Horticultural Alliance, 2946 Louise Street, Sarasota, FL 34237, (800) 628-6373; BioPlex Organics, 2213 Huber Drive, Manheim, PA 17545 (800) 441-3573, or approved equal.

B. Biostimulant

1. Biostimulant shall be a dry water soluble plant treatment that includes beneficial rhizosphere bacteria (Bacillus licheniformis, Bacillus megaterium, Bacillus polymyxa, Bacillus subtilis, Bacillus thuringiensis, Paenibacillus azotofixans), humic acids, microbial nutrients (maltodextrin, seaweed and yeast extracts) and inert ingredients.
2. Biostimulant shall be Diehard Transplant as manufactured by Horticultural Alliance, Sarasota Florida: www.horticulturalalliance.com; Soil Support Root Enhancer/Soil Amendment as manufactured by ENP Investments, LLC, Mendota IL www.enpturf.com; Tree Saver Transplant by Plant Health Care, Pittsburg PA www.planthealthcar.com, or approved equal.

2.15 ANTIDESICCANT

A. Antidesiccant: An emulsion specifically manufactured for agricultural use that will provide protective film over plant surfaces permeable enough to permit transpiration.

2.16 STAKING AND GUYING MATERIALS

A. Stakes for supporting trees shall be of sound wood of uniform shape and size, reasonably free of knots, insects and fungi and capable of

standing in the ground at least 2 years. Unless noted otherwise, stakes shall be 2-inch diameter 8-foot long round poles or approved equivalent diameter. Stakes shall be pointed at one end and stained dark green.

1. Guying system shall be lock-stitch, polypropylene webbing. It shall be low-stretch product with a tensile strength of no less than 3000 lbs, which establishes contact with the trunk of the tree with a broad, smooth surface between 0.5 and 0.75 inches wide. Webbing shall be green color. Submit guying system to the RE for review and approval.

2.17 TREE WRAP

A. Crinkled Paper Tree Wrap: Two thicknesses of crinkled paper cemented together with layer of bituminous material. Minimum 100 mm (4 inches) wide with stretch factor of 33 1/3 percent. Tie with lightly tarred medium or coarse sisal yarn twine.

B. Tape: Bio degradable tape suitable for nursery use to secure tree wrap which degrades in sunlight maximum 2 years after installation.

2.18 WATER

A. Coordinate with the applicable Division 32 Section 32 84 00 IRRIGATION.

B. Contractor shall provide all labor and water required to establish turf and plants at no extra cost to the Owner. If possible, the Owner may furnish the Contractor upon request with an adequate source and supply of water. Contractor shall provide a water meter to measure water used during the course of the Contract and shall reimburse the Owner for the cost of the water. However, if the Owner's water supply is not available or not functioning at any time during the course of the Work, the Contractor shall be responsible to furnish adequate supplies at his own cost. All turf and plant material injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct.

C. Water shall be free from impurities injurious to vegetation.

D. During the maintenance period the Contractor shall water as required to insure that soil moisture in turf areas is sufficient to germinate grass seed and, thereafter until Final Acceptance, is sufficient to keep turf healthy and growing. For plant beds, insure soil moisture is maintained to a depth of six inches or greater at all times.

E. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to maintain required water levels in the soil.

2.19 PESTICIDES

A. Consider IPM (Integrated Pest Management) practices to minimize use of all pesticides and chemical products. Obtain Contracting Officer's Representative's approval for allowable products, product alternatives, scheduling and application procedures. Evaluate existing weather and site conditions before application. Apply products during favorable weather and site conditions according to manufacturer's instructions and warranty requirements.

B. Provide chemicals and insecticides as needed for fungus or pest control. All chemicals and insecticides shall be approved by the Rhode Island governing agency for the intended uses and application rates.

C. Pre-emergent crabgrass control

1. Pre-emergent crabgrass control shall be Dithiopry, which alters microtubule polymerization and stability by ‘interacting with microtubule associated proteins and or microtubule organizing centers.

2. Pre-emergent crabgrass control shall be Prodiamine by Syngenta or approved equal. Control chemical shall work by inhibiting mitotic processes in plants and controlling susceptible weeds by preventing growth and development of newly germinated weeds.

3. Pre-emergent crabgrass control products shall have LD50 Oral levels >3,000 mg/kg in accordance with published SDS information.

D. Herbicide to eradicate non-grass species, include post-emergent crabgrass

1. Herbicide shall be Tenacity (Mesotrione) as manufactured by Syngenta, or approved equal, to inhibit plant enzymes essential to photosynthesis and preventing formation of carotenoids in susceptible plant species, whereby light energy and by-products of photosynthesis destroy chlorophyll and cell membranes, causing bleaching of leaves, followed by necrosis and death of the plant.

2. Liquid application, using dilution and application rates per manufacturer’s product literature.

PART 3 - EXECUTION

3.01 PRELIMINARY

A. In accordance with Sections 32 91 13 and 32 91 19: Provide ample, free-draining, pH corrected, mineral soils with good organic amendments is essential to insuring the long-term health of Plant Material.

B. Earthwork activities related to maintaining or restoring overly compacted subgrade and subsoil material to a free-draining condition are specified in Division 31 Sections. Report any subgrade or subsoil condition suspected to being overly compacted to the RE immediately upon discovery.

C. Topsoil/Planting Soil volumes: Coordinate installation with the requirements of Sections 31 20 00 EARTHWORK, 32 91 13 PLANTING SOIL, 32 91 19 LANDSCAPE GRADING.

1. Shade trees – provide a minimum of 1,200 cubic feet of planting soil per tree.
2. Flowering trees and tall evergreen shrubs as indicated – provide a minimum of 800 cubic feet of planting soil per plant.
3. Plant beds: minimum depth of 18-inches, continuous for the entire extent of the plant beds.
4. Lawn areas, minimum depth of 9-inches.

3.02 SITE EXAMINATION

A. Prior to spreading existing topsoil or imported planting soil, examine site to confirm that existing conditions are satisfactory for the work of this section to proceed.

B. Confirm that the subgrade is at the proper elevation and compacted as required.

C. Confirm that surface of all areas to be spread with topsoil or planting soil are free of construction debris, refuse, compressible or biodegradable materials, stones greater than 2 inches diameter, soil crusting films of silt or clay that reduces or stops drainage from the topsoil or planting soil into the subsoil; and/or standing water. Remove unsuitable material from the site.

D. Confirm that no adverse drainage conditions are present.

E. Confirm that no conditions are present which are detrimental to plant growth.

F. Confirm that utility work has been completed per the drawings.

G. If unsatisfactory conditions are encountered, notify the RE immediately to determine corrective action before proceeding.

H. Proceed with placement of topsoil and planting soil only after unsatisfactory conditions have been corrected.

3.03 FILLING AND COMPACTION

A. Confirm existing subgrade in all turf and planting areas infiltrates water. These requirements are specified in Section 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS. Perform percolation tests or penetrometer tests on existing subgrade or placed fill prior to placing and spreading topsoil or planting soil material.

3.04 PLACING AND AMENDING TOPSOIL AND PLANTING SOIL

A. In accordance with the requirements of Section 32 91 19 LANDSCAPE GRADING.

3.05 FINE GRADING

A. In accordance with the requirements of Section 32 91 19 LANDSCAPE GRADING.

3.06 COMPACTION OF TOPSOIL AND PLANTING SOIL

A. In accordance with the requirements of Sections 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS and 32 91 19 LANDSCAPE GRADING.

3.07 EXCAVATION FOR PLANTING

A. In accordance with requirements of Section 31 20 00 EARTHWORK and Section 32 91 19 LANDSCAPE GRADING and the following.

B. In the event that rock or underground construction work or obstructions are encountered in any plant pit or bed excavation work, notify the RE immediately. The RE will select alternate locations. Relocation of plant pits or beds shall be provided at no additional cost to the Owner. Provide the RE with no less than 48 hours' notice of obstruction so that a site visit can be scheduled to establish new locations for plants.

C. Installing the specified volumes of planting soil for trees and planting beds is an essential aspect of the Work of the Contract and the work of this Section.

D. Prior to excavating for plant pits and beds, verify the location of any underground utilities. Repair all damage to utility lines that is the result of negligence of the contractor or any of his assigns at no additional cost to the Owner.

E. Where lawns have been established prior to planting operation, cover the surrounding turfgrass before excavations are made in a manner that will protect turfgrass areas. Protect existing trees, shrubbery, and beds that are to be preserved in a manner that will effectively protect them during the project construction.

F. Remove rocks and other underground obstructions to a depth necessary to permit proper planting according to plans and specifications. Where underground utilities, construction, or solid rock ledges are encountered, notify the RE immediately so that alternative locations for plantings can be made.

G. Trees shall be planted in beds with the minimum soil volumes shown on the approved Submittals. Within tree beds, the Contractor will not be required to excavate circular plant pits. Shrub pits and beds shall be excavated as noted below.

   1. All tree pits dug with a machine shall have the sides of the holes scraped with hand shovels to prevent glazing or compaction of the sides of the hole. Remove and stockpile excavated planting soil for reuse as backfill for plant pit. All subsoil excavated from the bottoms of planting pits shall be removed from the site.

   2. Tree pits shall be dug to encourage the root growth out of the rootball and into the surrounding planting bed.

   3. Plant pits shall be dug to the depth of the rootball to be planted.

   4. Remove all soil from around the root flare of the stem of the plant and from the top of the rootball to determine the true depth of the

rootball. All plants that have been planted and have root flares that are buried will be rejected.

3.08 PLANTING OPERATIONS

A. Immediately following the installation of planting soil, install plant material to the following requirements.

B. In the event that rock or underground construction work or obstructions are encountered in any plant pit or bed excavation work, notify the RE immediately. The RE will select alternate locations. Relocation of plant pits or beds shall be provided at no additional cost to the Owner. Provide the RE with no less than 48-hours' notice of obstruction so that a site visit can be scheduled to establish new locations for plants.

C. Requirements:

1. Plants shall be installed so that the root flare is exposed. Prior to placing each plant, remove burlap from the top of the root ball and remove soil from over and around the root flare. Replace burlap.

2. Planting hole shall be at same depth as the height from the bottom of the rootball to the root flare. In certain cases it may be necessary to compensate for soil settlement, the Contractor shall set root ball slightly higher as directed by RE.

3. Plants must be set plumb and braced in position until soil has been placed around the root ball and roots. The trunk of the tree shall not be used as a lever in positioning or moving the tree in the planting hole. The Contractor shall take care not to crack or loosen the ball during planting.

4. For balled and burlapped plants, after the plant has been set, remove ropes, strings and burlap from the top surface of the root ball. Remove at least the top half of the wire basket before backfilling. The Contractor shall not fold back burlap. Cut away burlap and discard all debris off site.

5. Mychorrhiza and biostimulants shall be added to the planting soil back fill mix after the plant has been placed in its hole. Thoroughly mix mychorrhiza and biostimulants into the upper 10 inches of backfill soil. Apply in accordance with the manufacturers written instructions and the size of the plants being installed.

6. Backfill with specified soil in 6-inch lifts to avoid injury to roots and to fill all voids. Firmly tamp by hand each lift to prevent settlement. Do not ram soil into place with feet, shovel handles or any device other than hands.

7. Mulch and thoroughly water all plants immediately after planting. Open ended hoses are not permitted. Hoses must be fitted with watering wand. Eliminate air pockets and compact the soil by flooding the tree pit or plant bed as the work progresses. Avoid walking on previously placed planting soil. After water has drained from the planting pit or bed and planting backfill has dried sufficiently, spread additional planting soil in pit or bed to bring

the finished surface of the planting pit or bed to grades shown on the Contract Documents.

8. Fertilizer shall be spread over the plant bed. Till the fertilizer into the planting soil at the same time as tilling approved compost into the top surface of the planting soil.

9. Spread approved compost in plant beds and tree pits to a depth of 2-inches and till the planting soil to a depth of 6-inches to integrate compost into the top layer of the planting soil

10. Do not place mulch until tilling of the fertilizer and compost has been verified by the RE. Fertilizer application rates shall be as determined by soil testing, analysis, and testing laboratory recommendations specified, performed and paid for under this Section

11. Any excess soil, debris, or trimmings shall be removed from the Project site immediately upon completion of each planting operation.

3.09 POST-PLANTING OPERATIONS

A. The Contractor shall inspect beds 24 hours after initial watering to confirm that they are draining properly. If surface water or excessively saturated plant pit soils exist, the Contractor shall immediately notify the RE. The RE will direct the Contractor to perform remedial measures based upon site conditions and as specified in this Section.

B. Keeping Trees Plumb:

1. Contractor shall keep trees plumb and upright at all times.

2. Perform staking and guying at the time of planting. Stakes shall be of even height and neat in appearance and they shall not injure plant balls. Elastic webbing, belting or tape shall be installed in accordance with manufacturer's instructions. Install staking in accordance with the Detailed Drawings.

C. Pruning:

1. As directed by the RE, each plant shall be pruned in accordance with the workmanship requirements of ANSI A300, to preserve the natural character of the plant.

D. Protect lawns from damage. Any damage resulting from planting operations shall be repaired immediately at no cost to the Owner. Repair work shall be as specified and installed under the work of Division 2 Section, PLANTING, of this Specification and paid for under this Section.

E. Absolutely no debris may be left on the site. Repair any damage to site as directed by the RE, at no additional cost to the Owner.

3.10 MAINTENANCE OF PLANT MATERIAL

A. Maintenance shall begin immediately after each plant is planted and shall continue until Final Acceptance.

B. Maintenance shall consist of keeping the plants in a healthy growing condition and shall include but is not limited to watering, weeding, cultivating, pruning, re-mulching, tightening and repairing of guys, straightening of trees to a plumb position, removal of dead material, resetting plants to proper grades or upright position, maintaining the planting saucer and replacement of plants that are in decline or die.

1. Plants shall be inspected for watering needs at least twice each week and watered to promote plant growth and vitality. Do not compact planting soil in the process of water plant material. Place wood board ballast to walk between plants.

2. For trees in lawn or mulched beds, apply water to the ground surface directly under the canopy. Water shall be applied at a sufficiently slow rate to prevent run off from the soil surface.

3. Stakes shall be kept neat in appearance. Guys shall be tightened and repaired weekly as required to meet the requirements of this Section.

4. Planting beds and individual plant pits shall be kept free of weeds, and mulch shall be replaced as required to maintain the specified layer of mulch. Beds and individual pits shall be neat in appearance and maintained to the designed layout.

5. Plants that are in decline or die during the maintenance period shall be removed and replaced by the Contractor within one week of notification and replaced during that growing season, unless directed otherwise by the RE.

6. Spraying of insecticides or herbicides shall be done by State-licensed professionals. Spraying for insects, pests and diseases shall conform to the National Arborist Association Standards under the section entitled "Standards for Pesticide Application Operations", as currently adopted and as approved by the RE.

7. Work of pruning, fertilizing, spraying, and similar activities shall be undertaken only by Certified Arborists and licensed chemical applicators, as pertinent to the work being performed.

C. During the maintenance period, any decline in the condition of plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures. The RE shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the RE.

3.11 EXAMINATION OF AREAS TO RECEIVE SEED OR SOD

A. Verify limits of turf in the field with drawings. Verify areas where imported planting soil have been placed. Notify RE of discrepancies prior to proceeding with lawn work.

B. Examine finish surfaces, grade, topsoil and planting soil quality, and depth.

C. Do not start lawn work until unsatisfactory conditions are corrected. Prevent excess compaction of lawn areas throughout the construction period.

3.12 GENERAL SEEDING PRINCIPLES

A. The following principles shall be applied to all seeding activities.

1. Protect all planting soils against erosion and sedimentation. Schedule seeding operations to avoid loss of planting soil.
2. The seedbed shall be weed free, clod-free, smooth, firm but not overly compacted and moist but not wet.
3. Apply seed at times of the year when weed competition is at its lowest.
4. Apply seed in a manner that provides direct seed to soil contact. Seed application system employed by the Contractor that does not apply seed directly to the surface of the soil or cultivates the seed into the soil shall be rejected.
5. Verify water sources for supplemental irrigation are available to maintain soil moisture.
6. Keep seed moist throughout the germination period.
7. Light and temperature play a key role in successful germination. Manage seeding operations to utilize light and temperature to the greatest advantage.

3.13 PREPARE SEED BED

A. Perform a pH test, sieve, and nutrient analysis of the prepared and placed planting soil and advise the results to the RE prior to adding limestone or other soil amendments.

B. Grade lawn areas to a smooth, free draining even surface with a loose, moderately coarse texture. Roll, scarify, rake, and level as necessary to obtain true, even lawn surfaces and fill depressions as required to drain. Correct irregularities in the surface resulting from tillage operations to prevent formation of depressions or water pockets.

C. Remove debris. Remove stone 0.75-inch or larger by handpicking, fine tooth aluminum grading rakes, and/or mechanized stone picker. When topsoil has hardened, cultivate soil to a four inch depth by plowing, disking, harrowing, or otherwise scarifying and loosening the topsoil.

D. Rake area with fine toothed aluminum grading rake before placing seed to obtain a smooth surface at the proper elevation. Drag area with a wood float to level out minor humps and hollows. Beds shall have a smooth friable uniform surface, free of areas ponding water.

E. Do not move heavy objects except necessary lawn making equipment over the lawn areas after the soil is prepared unless it is again loosened and graded. Level undulations and irregularities in the surface.

F. Place starter fertilizer at the rate of 4 lbs. per 1,000 S.F. and mix into full depth of topsoil.

3.14 SEEDING

A. The season for seeding shall be from August 15 to September 15. The actual planting of seed shall be done, however, only during periods within these specified seasons that are normal for such work as determined by weather conditions, by accepted practice in this locality and as approved by the RE. Schedule seeding operations to insure seeding and placement of erosion control blankets by October 15th.

B. To prevent loss of soil via water and wind erosion and to prevent the flow of sediment, fertilizer, and pesticides onto roadways, sidewalks, and into catch basins, seed turf areas within 5 Days of spreading and fine grading the planting soil.

C. Seed only when the bed is in a friable condition, not muddy, dry or hard.

D. Limit of grading and earthwork shall be limit of seeding unless otherwise indicated on the Contract Documents. All landscape areas disturbed outside the limit of seeding shall be prepared and seeded as specified herein at no additional cost to the Owner.

E. Means and methods of seeding shall be determined by the Contractor based on his/her experience, site conditions, season of seeding, weather conditions and any, all or other environmental conditions. Seeding of turf may be by Conventional Seeding Method, Hydroseeding, Drill Seeding or other method selected by the Contractor to insure full seed to soil contact.

F. Following application of seed apply bonded fiber matrix to the all seeded areas on slopes at rates established by the manufacturer’s written instructions. Wood fiber mulch may be used on relatively flat areas within designated project limits.

   1. For slopes that are steeper than five to one (5H:1V), apply a separate application of bonded fiber matrix immediately following the sowing of seed. Apply the Bonded Fiber Matrix at the manufacturer’s recommended application rates.

   2. Do not apply the bonded fiber matrix in advance of rainfall. Install bonded fiber matrix to ensure that it dries completely for the manufacturer’s recommended minimum time period prior to rainfall. In the event of rainfall during the required drying period, reapply additional seed and bonded fiber matrix to all eroded, slumping or water affected areas as directed by the RE.

3.15 SODDING

A. Immediately prior to sodding operations, the loam bed shall be lightly scratched with a fine toothed harrow or hand rake to provide a slightly roughened surface to accept the sodding application.

B. The soil on which the sod is laid shall be reasonably moist and shall be watered, if necessary. The sod shall be laid smoothly, edge to edge, and where continuous or solid sodding is called for on the plans sod shall be laid with the longest dimension parallel to the contours. Sodding shall start at the base of slopes and progress upwards in

continuous parallel rows. Vertical joints between sods shall be staggered. Immediately after laying, press the sod firmly into contact with the soil bed by tamping, rolling, or by other approved methods so as to eliminate all air pockets. Provide true and even surfaces, insure knitting and protect all exposed sod edges, but without displacement of the sod or deformation of the sod surface.

3.16 SOD SEASONS

A. Contractor shall schedule sodding operations to ensure full establishment of root systems into planting soil no less than 6 weeks before Final Acceptance to insure the sod root system knits into the planting soil before the sod protection fencing is removed and the lawn panels are made accessible to the public.

B. The season for sodding shall be from April 15 to June 1 and from September 15 to September 30 except as directed by the Owner’s Representative to achieve the requirements of the above Paragraph A. The actual placement of sod shall be done, however, only during periods within these specified spring and fall seasons that are normal for such work as determined by weather conditions, by accepted practice in this locality and as approved by the Owner’s Representative.

C. To prevent loss of soil via water and wind erosion and to prevent the flow of sediment, fertilizer, and pesticides onto roadways, sidewalks, and into catch basins, place sod within 3 Days of spreading and fine grading the planting soil.

D. Sod only when the bed is in a friable condition, not muddy or hard.

E. Means and methods of sodding shall be determined by the Contractor based on his/her experience, site conditions, season of sodding, weather conditions and any, all or other environmental conditions.

3.17 INSTALLATION OF EROSION CONTROL BLANKETS

A. ECBs shall be installed on all areas where planting soil has been spread and seed has been sown and landform or service function of the facility suggests a greater susceptibility to erosion. This includes all slopes, walkway shoulders, swales of shallow slope, (steep swales shall be armored with crushed stone), detention basins, level spreaders and all other miscellaneous areas disturbed and restored as part of this Contract.

B. Erosion control blankets (ECBs) shall be installed on the overflow surfaces of the level spreaders of all permanent detention basins as noted under the Division 01 Section 01 90 00 RIDOT STANDARD SPECIFICATON SECTIONS. Provide minimum 10 foot width such that the blankets extend down slope either side of the level spreader sufficiently to control high water event erosion of the level spreader landform.

C. Install ECBs in accordance with manufacturer’s instructions.

D. Maintenance shall consist of repairs made necessary by erosion, wind, or any other cause. Maintain, protect, repair, or replace the erosion

control material until the Termination of the Plant and Warranty Period.

3.18 WATERING OF TURF AREAS

A. Establish turf.

1. Providing sufficient water to insure germination and establishment is an essential aspect of the work of this Contract. Furnish sufficient watering equipment to maintain required water levels in the soil. Furnish connections to existing water supply (if made available by the Owner), pumps, temporary controllers to insure automatic function, temporary back-flow preventer, water meter, hoses, pipes, spray heads, tripods to support spray heads, sprinkling equipment, and all miscellaneous components and appurtenances.

2. Program irrigation controller to provide supplemental water to the seeded and planted areas to insure germination of seed and establishment of turf and plant material. Monitor soil moisture during the course of the establishment period to maintain adequate soil moisture.

3. Apply supplemental irrigation water to all turf areas to compensate for droughty conditions or infrequent rain events. Monitor available soil moisture to determine whether off-site water is required to supplement rainfall and meet the required turf and plant material establishment deadline.

B. Apply water to turfs areas immediately following sowing at a rate sufficient to ensure thorough, constant wetting of the soil to a depth of at least 2 inches during germination period. Thereafter, during the establishment period, apply sufficient water per week to maintain a consistent wetting of the soil to a depth of 4-inches. Monitor application rates to insure a uniform distribution of water to achieve these requirements.

C. Continue watering of the turf until final acceptance of all turf areas. As the turf approaches acceptance criteria, gradually lengthen the time period between supplemental watering events, applying water less frequently but at greater applications per watering. The goal is to deepen the wetted depth of the soil to encourage a deeper rooting system.

D. Supervise watering operation to prevent run-off. Repair all areas damaged by water operations.

3.19 FERTILIZING TURF IN LAWN AREAS

A. Fertilizing: The first application of fertilizer shall occur immediately after the topsoil or planting soil is spread, in accordance with the requirements of Section 32 91 19 LANDSCAPE GRADING.

B. A second application of nitrogen fertilizer shall be applied to seeded areas at the time of the first mowing and shall be performed and paid for under this Section. This second application shall be applied at a rate that ensures that one-half pound of nitrogen is applied to each

1,000 square feet. A third application of nitrogen fertilizer shall be applied to seeded areas approximately two months after the second application and shall be paid for under this Section. This third application shall correspond to the following application rates dependent upon the month of application.

1. The springtime application of fertilizer shall occur during the last two weeks of March. Apply 0.5 pounds of nitrogen per 1,000 square feet.
2. The early summer application of fertilizer shall occur during the last first two weeks of June. Apply 0.5 pounds of nitrogen per 1,000 square feet.
3. The fall application of fertilizer shall occur during the last two weeks of August. Apply 0.5 pounds of nitrogen per 1,000 square feet.
4. The last application of fertilizer shall occur during the first two weeks of October. Apply 0.5 pounds of nitrogen per 1,000 square feet.

3.20 MOWING

A. Schedule:

1. Maintain a neat and trim appearance of lawn turf. Keep lawn areas neatly trimmed at the edges. Maintain the height of the turf between 2.5 and 3.5 inches.
2. Never remove more than one-third of the height of the grass plants at any single mowing.
3. To achieve these goals:
   a. Anticipate mowing all turf areas on a weekly schedule ranging between five and ten days.
   b. The average shall be once every seven days, approximately 34 cuttings in the course of an average year.
   c. When appearance and height of grass exceeds the standards indicated above, more frequent mowings may be required at no additional cost to the Owner.
   d. Additional mowings may be required by the approach of special events or due to high grass growth rates at no additional cost to the Owner.
   e. Mowing shall occur from the first two weeks of April through the first week in November as weather permits, as required by turf growth and as directed by the RE.

B. Schedule mowing to avoid conflict with pedestrians at employee arrival and departure times at the beginning and end of the day.

C. Collect all material and debris generated during the mowing operation that blows onto pavement. Collect on the same day as mowing. Dispose of collected material off site at the end of each workday.

D. The work of this item shall include both mowing of turf areas and trimming as described herein. The final appearance of all turf areas

shall be neat and uniform. The lawn shall have smooth contours without ridges, lines, and bald/scalped areas. Clippings shall not be visible.

E. Immediately prior to beginning any mowing, remove all surface trash, litter, foreign matter and debris from the area to be mowed as indicated.

F. Mow turf areas to a mowing height of between 2.5-inches and 3.5 inches. When mowing during the summer season when water conservation is paramount, moderate the mowing height to the best advantage of turf and water conservation. Final cut of the season shall be 3.5-inches height

G. Do not remove more than one-third of the blades of the grass plants at any mowing.

H. Sharpen and balance cutting blades of mowing machines after every 40 hours of use.

I. Leave clippings in place to provide a nitrogen boost as they decompose. If, in the opinion of the RE, excessive clippings are visible, rake clipping up and remove from the project site.

J. Do not mow during rainstorms or when turf areas are wet. If, due to scheduling problems, the turf areas are mown when wet, then collect the clippings and remove them from the project site.

K. Avoid damage to trees, shrubs, site furnishings and gravestones. Damage to any site item shall be reported immediately. Trees have been staked to prevent equipment damage. When landscape equipment strike stakes, straighten the stakes to original condition. Replace stakes if broken. Replace existing and new trees damaged or destroyed by mowing and trimming.

L. Trim around buildings, walls, walks, posts, and all vertical elements, as required by Owner and the RE to maintain a neat and trim appearance. Generally, anticipating trimming after each mowing. Trim by trimmers or other mechanical devices. Under no circumstances shall trimming cause stain or damage to buildings or site features.

M. If approved by the RE then utilize glyphosate chemical herbicide to establish a no-grow buffer around vertical elements. Width of no-mow buffer shall not exceed 2-inches nor be too narrow to prevent accidental impact by equipment.

N. Do not trim around trees or shrubs using a string trimmer when doing so will damage the thin bark of the trees.

O. All mowing equipment shall have deflector shields in place at all times to avoid injury to staff or the public.

P. Adjust cutting patterns week to week to prevent permanent wheel rutting and irregular growth patterns of grass blades. Using a variety of mowers with different wheel bases dimensions is encouraged.

Q. Make no tight turns with mowing machines. Avoid turf degradation and wheel rutting by taking broad turns or three point turns at low speeds.

R. Trim on the same day as mowing. Clean up all debris from trimming operation on the same day as trimming.

3.21 EDGING OF LAWN AREAS

A. Schedule:

1. Turf areas adjacent to pavement, at tree pits and at shrub beds shall be edged three times during the year: during the last two weeks of April; during the last two weeks of June; and during the last week of August and the first two weeks of September.

B. Edging shall be scheduled to avoid conflict with pedestrians.

C. Remove all material and debris generated during the edging operation. Dispose of material and debris at the end of each workday, off site in a legal manner.

D. The goal of edging shall be to redefine the line between the turf and shrubs, and pavement edges. Edges shall be even, unbroken lines, smooth and true.

E. Use either hand tools or mechanical edgers to edge at shrubs, shrub beds and at pavement edges.

F. All edging cuts shall be vertical.

G. Depth of edging cut shall be minimum two inches below pavement line and to the full depth of the root zone at shrub beds.

H. After edging, pull out the grass and the grass roots.

I. Do not mix grass or grass roots into the mulch of tree rings and beds.

3.22 SUBSTANTIAL COMPLETION FOR PLANTING OPERATIONS

A. Upon completion of all planting work, the Contractor shall request in writing that the RE formally inspect the planting work for Substantial Completion.

B. Standards for Substantial Completion: If plant material is reviewed when it is in full leaf, leaves shall be plump with water with a shape indicative of the species and shall be free of insect, pest and disease damage. Twigs shall have living cambium for their full length. Twigs and branches shall have a full bud set for their full length, including terminal buds. Trunks and branches shall be free of frost cracks; sun scald; damage due to insects, pests, and disease; structural defects; and damage resulting from machinery or tools. Plant material inspected and reviewed when the plants are not in full leaf shall have twigs, branches and trunks meeting the above requirements. All plants regardless of the season of review shall have a minimum of 85 percent healthy, balanced branching structure with a healthy terminal leader(s) with viable terminal bud(s).

C. If any number of plants do not meet these Acceptance Standards at the time of inspection, or if in the RE 's opinion, workmanship is unacceptable, written notice will be given by the RE to the Contractor in the form of a Punch List, which itemizes necessary planting replacements and/or other deficiencies to be remedied. The Contractor's responsibility for maintenance of all plants shall be extended until replacements are made or other deficiencies are corrected. All plants that do not meet these Acceptance Standards shall be removed from the project within 7 days of receipt of the punch

list. Replacements shall conform in all respects to the Specifications for new plants and shall be planted in the same manner.

3.23 FINAL ACCEPTANCE OF PLANT MATERIAL

A. Following the correction of all Punch List deficiencies, the Contractor shall request in writing that the RE again formally inspect the planting work. If plant materials and workmanship are acceptable, the RE will issue a written Certificate of Final Acceptance to the Contractor.

3.24 ACCEPTANCE STANDARDS FOR SUBSTANTIAL COMPLETION OF TURF AREAS

A. Maintain turf until standards for acceptance have been met, as determined by the RE.

B. When, in the Contractor’s opinion, standards of acceptance have been achieved, notify the RE in writing for a formal punch list inspection. Request for inspection shall be received by the Owner at least 10 Days before anticipated date of inspection.

C. The RE will inspect the turf areas and judge the quality of turf establishment against the following Acceptance Standards. With three days of this punch list inspection the RE will issue an inspection report. If there are items that require additional work a Punch List will be issued and the Contractor shall fulfill the requirements of the Punch List prior to requesting a second inspection for Substantial Completion. If, during the first Punch List inspection, the RE determines the fields meet the Acceptance Requirements then Substantial Completion may be granted by formal written approval.

D. Acceptance Standards:

1. The RE will be the sole judge of turf acceptance.
2. Seeded areas shall have a close stand of grass with no weeds present and no bare spots greater than 6 square inches over greater than 5 percent of the overall seeded area as determined by the RE.
3. The turf shall include a mixture of the Genus species specified as determined by the RE.
4. Seeded areas shall be free of weed species as determined by the RE.
5. The turf is free of winter kill, dead grass, thatch, brown spots and areas of insect and pest damage as determined by the RE.
6. The foot system of the turf is healthy, dense and has grown to a depth 2.0 to 2.5-inches as determined by the RE based on field sampling.

E. If the RE finds the turf areas do not meet the acceptance standards then a deficiency report will be issued with specific Punch List items identified.

1. Where deficiencies are identified and a Punch List is issued correct deficiencies identified on the Punch List. Maintain all seeded areas until deficiencies are corrected and the site is accepted by the RE. Responsibility for maintenance of all turf areas shall be

extended until deficiencies are corrected, even if final acceptance of the entire project must be extended.

2. Turf areas to be corrected shall be prepared, reseeded and maintained in accordance with the requirements of this Section.

F. If the RE finds the turf areas meet the acceptance standards then Final Acceptance will be granted.

3.25 FINAL ACCEPTANCE

A. Review to determine Final Acceptance of turf areas will be made by the RE upon request by the Contractor. Provide notification of at least five working days before requested review date.

B. At the time of acceptance, the Contractor shall remove any temporary barriers used to protect turf areas.

3.26 RESTORATION AND CLEAN-UP

A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the RE, at no additional cost to the Owner.

END OF SECTION

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SECTION 32 91 13
PLANTING SOIL

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Section includes administrative and procedural requirements for providing and installing planting soils, including but not limited to the following:

1. Soil material acquisition.
2. Testing and analysis of soils as indicated for conformance to the specification
3. Preparation of planting soil and testing for conformance
4. Coordination with other contractors

B. Related Requirements:

1. Stripping and stockpiling existing topsoil: Section 31 20 00 EARTHWORK
2. Management of subgrade soils: Section 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS
3. Installation of Planting Soil: Section 32 91 19 LANDSCAPE GRADING
4. Installation of plant material and turf: Section 32 90 00 PLANTING

1.02 REFERENCES

A. ASTM

1. D422 Standard Test Method for Particle-Size Analysis
2. D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
3. D1556 Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
4. D2167 Standard Test Method for density and Unit Weight of Soil in Place by the Rubber Balloon Method
5. D4427 Standard Classification of Peat Samples by Laboratory Testing
6. D5856-15 Standard Test Method for Measurement of Hydraulic Conductivity of Porous Material Using a Rigid-Wall, Compaction-Mold Permeameter
7. D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
8. F1647 Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes

9. F2396 Standard Guide for Construction of High Performance Sand-Based Rootzones for Athletic Fields

B. US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels Chemical Contaminants mg/kg (ppm)

C. NAPT: The North American Proficiency Testing Program

D. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

E. SSSA: Soil Science Society of America.

1.03 DEFINITIONS

A. Soil Definitions:

1. Soil Peds: Soil peds are natural, relatively permanent aggregates, separated from each other by voids or natural surfaces of weakness. If undisturbed, soil peds will persist through cycles of wetting and drying and freezing and thawing.

2. Topsoil: on-site or off-site surficial soil that exhibits biological growth, including root growth from plants, insects, worms, etc.

3. Planting Soil: amended topsoil meeting the requirements of this Section and used to grow turf, herbaceous plants or woody plants under the work of the Related Requirements noted in this Section.

1.04 ACTION SUBMITTALS: SOIL TESTING

A. General:

1. Submit on-site topsoil, supplemental imported planting soil, compost and coarse sand for testing at least 12 weeks before scheduled installation of Planting Soil. These soil components are part of an integrated system. Submit all test results as a single submission. If submitted individually then the Resident Engineer will take NO action until all other soil test results are submitted.

2. Do not order or deliver any soils, components or amendments until submittals have been returned “No Exceptions Taken”. Said action by the Resident Engineer does not constitute final acceptance. The Resident Engineer reserves the right to reject any material delivered to the site, stockpiled for use on the site, or moved and spread anywhere on the site, that does not meet the requirements of this Specification.

3. Recognize these submittals are time-critical. Do not delay in organizing and making the submittals as specified. The testing protocols and iterative resubmissions shall be considered long lead-time items. Failure to make submittals on a timely basis shall constitute failure to meet project requirements.

4. Testing shall be at the Contractor’s expense. Deliver all samples to the Testing Laboratories and to the Resident Engineer by overnight delivery and assume all costs.

5. Testing reports shall be sent directly to the Resident Engineer.

B. Testing Agencies:

1. Testing for mechanical gradation, chemical analysis carbon/nitrogen ratio, organic content, pH, salinity and nutrient content: UMass, West Experiment Station, Amherst, MA 01003, tel:413-545-2311 or approved equal agency capable of performing tests as specified in Northeastern Regional Publication No. 493, 3rd Edition as noted below.

C. Perform soil tests and provide test reports for existing topsoil, supplemental imported planting soil and sand, meeting the following requirements:

D. Comprehensive Particle Size Analysis:

1. On-site topsoil, supplemental imported planting soil and sand: Determine soil texture in accordance with USDA Textural Classification System by combined Hydrometer Analysis for silt and clay, and dry sieving of sands. Standard Sieve sizes shall be used: No. 10, 18, 35, 60, 140 and 270 (2.00 mm, 1.00 mm, 0.50 mm, 0.25 mm, 0.10 mm, 0.05 mm). For particle sizes less than No. 270 (0.05 mm), testing in accordance with ASTM D422, Hydrometer method.

2. For Gravel and coarse sands: Determine the particle sizes in accordance with AASHTO requirements. Standard Sieve sizes shall be 2 in., 1-1/2 in., 3/4 in., 1/2 in., 3.8 in., No. 4, No. 8, No. 16, No. 30 (50 mm, 375 mm, 19 mm, 12.5 mm, 10.0 mm, 4.75 mm, 2.36 mm, 1.18 mm, 0.600 mm), testing in accordance with AASHTO T27.

3. For on-site topsoil, supplemental imported planting soil and sand:

a. Soil Ph (Soil acidity): Ph by SMP method in accordance with Northeastern Regional Publication No. 493, 3rd Edition, Chapter 3.

b. Cation Exchange Capacity (CEC): by Compulsive Exchange

c. Soluble Salts: Extract Method for air-dried samples of 1-part Soil to 2-parts Water (1:2 volume to volume), in accordance with the requirements of Northeastern Regional Publication No. 493, 3rd Edition, Chapter 10. Submit as mmhos/cm (Ds/m)

4. Organic Content of on-site topsoil, supplemental imported planting soil and sand:

a. Loss of Weight on Ignition, (LOI) in accordance with Northeastern Regional Publication No. 493, 3rd Edition, Chapter 8.

$$\text{LOI}(\%) = \frac{(\text{Weight at } 105^{\circ}\text{c} - \text{Weight at } 360^{\circ}\text{c}) \times 100}{\text{Weight at } 105^{\circ}\text{c}}$$

and

b. ASTM F1647 Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes Loss on Ignition at 360 +/- 10Oc, which is same testing procedure as described.

5. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable

plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

E. For Compost

1. Comprehensive Compost Tests, including:

   a. pH

   b. Electrical Conductivity (mmhos/cm (Ds/m)

   c. Bulk Density

   d. Percent Solids

   e. Organic Matter (LOI)

   f. Total Nitrogen

   g. Organic Nitrogen

   h. Nitric Nitrogen

   i. Total Carbon

   j. Carbon: Nitrogen (C:N) ratio

   k. Total Phosphorus, Potassium, Calcium, Magnesium

1.05 ACTION SUBMITTALS – SAMPLES

A. Samples: For compost, on-site topsoil, supplemental imported planting soil and sand, submit to the Resident Engineer a 2-gallon volume in sealed containers labeled with the content, source and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1. Provide a two gallon sample from each source with required soil testing results. The sample shall be a mixture of the random samples taken around the source stockpile or field.

2. For topsoil and planting soil samples: Samples shall be delivered with soil peds intact that represent the size and quantity of expected peds in the final delivered soil.

3. Submit sources for coarse sand, compost, topsoil and planting soil. The Resident Engineer shall have the right to reject any source of these materials without recourse by the Contractor.

B. Product Data: provide the most recent product information from manufacturer for:

1. Compost: identify the material from which the compost was made and identify the location where the material was composted.

1.06 INFORMATIONAL SUBMITTALS

A. Qualifications of Supplier of Soil Components and Manufacturer of Planting Soil:

1. Submit name, address, telephone number and contact name of supplier/manufacturer with certification that same has requisite 5-years' experience as specified.

2. Submit certification that the supplier/manufacturer will be able to provide required volumes of soil components and blended soil mixes for the entire project.

3. The Resident Engineer and the Owner will have the right to reject any supplier/manufacturer without explanation to or appeal by the Contractor.

4. Provide alternative supplier/manufacturer as directed by the Resident Engineer.

B. Qualification Data: For each testing agency, demonstrate in writing that the testing agency is NAPT-affiliated, can perform the specified tests in accordance with the specified testing procedures.

1.07 PRE-INSTALLATION MEETING

A. In accordance with the requirements of Section 32 91 19 LANDSCAPE GRADING: At least 30 days prior to delivery of planting soil to the site, conduct a meeting to review: status of submittals; coordination of work; methods of delivery, storage, mixing and spreading of soils; and inspections and testing.

B. Attendees: Include but not limited to General Contractor; Landscape subcontractors; Resident Engineer and Owner.

C. Minutes of the meeting: Contractor shall take minutes and type and distribute the minutes to attendees within five days of the meeting.

1.08 QUALITY ASSURANCE - GENERAL

A. Source of supply for Soil Components and Planting Soil:

1. Suppliers of soil components and planting soil shall have a minimum of 5-years' experience at supplying and manufacturing custom planting soil mixes.

1.09 QUALITY ASSURANCE – TESTING AGENCY

A. Testing Agency Qualifications: Agricultural soil testing laboratory, NAPT –participating, independent, State-operated or university-operating laboratory experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

B. Soil Test Agency shall utilize the following soil test procedures and methods by region:

1. Northeastern United States: Recommended Soil Testing Procedures for the Northeastern United States, Northeastern Regional Publication No. 493, 3rd Edition. Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and West Virginia.

C. Perform penetrometer and/or percolation testing of the prepared subgrade in accordance with Section 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS.

1.10 SOIL-SAMPLING REQUIREMENTS

A. Sampling shall be done by the Contractor. The size of the samples and method of sampling shall be as follows: Samples shall be representative of the material to be brought to the site. Each sample shall be a Composite Sample, which consists of 8 separate sub samples taken from a minimum of 8 different locations at each source and mixed together to make the test sample.

1. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.

2. 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. Protect materials from theft, damage, weather, dirt, oils, grease, and construction activities.

C. Sequence deliveries to avoid delay. On-site storage space is permissible only with written notice from the Owner. Deliver materials only after preparations for placement of planting soil have been completed.

D. Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil.

E. Vehicular access to the site is restricted. Before construction, the Contractor shall submit for approval a plan showing proposed routing for deliveries and site access.

F. 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.

G. On-site topsoil, supplemental imported planting soil and compost:

1. Stockpile in windrows less than six feet high and no longer than ten days before placement or use.
2. Cover during precipitation events to minimize saturated soil conditions. Do not manipulate when in a wet or frozen condition, to include planting operations.

1.12 PROJECT/SITE CONDITIONS

A. in accordance with Section 31 91 19 LANDSCAPE GRADING

PART 2 PRODUCTS

2.01 EXISTING ON-SITE TOPSOIL

A. The topsoil excavated during site preparation shall be stockpiled for testing and reuse. Strip the existing topsoil in a single operation and stockpile existing topsoil in a single location, properly windrowed, and left in place until the time of amendment and spreading. The drawings indicate approved locations for stockpiling. Existing topsoil shall be used as a planting soil mix or as a component of manufactured planting soil mixes and shall be amended to meet all criteria specified in this Section.

B. The Owner does not stipulate that there will be sufficient on-site topsoil to meet the specified requirements, needs, soil depths or soil volumes specified in these Specification Sections. The Owner stipulates that the existing on-site topsoil can be stockpiled on site for the duration of the project and shall serve the purposes and requirements of this Section through proper handling, management and amendments.

C. Test on-site stockpiled topsoil to determine Soil Texture, Soil pH, CEC, Soluble Salts, Organic Content.

2.02 TOPSOIL

A. Topsoil: Fertile, friable soil suitable for the germination of seeds and the support of vegetative growth.

B. Amend existing on-site topsoil as required to meet the specific needs of the project, based on soil testing specified in this Section and as directed by the Resident Engineer. Once amended, existing topsoil shall be referred to as planting soil.

C. Supplemental imported planting soil shall not contain weed seeds in quantities that cause noticeable weed infestations in the final planting beds. Supplemental imported planting soil shall meet the following physical and chemical criteria:

1. Soil texture of supplemental imported planting soil shall be similar in soil texture to the existing, on-site topsoil as approved by the Resident Engineer:

2. Generally, imported planting soil shall conform to the following requirements for USDA sandy loam, fine sandy loam, loam, or sandy clay loam

   a. Loam borrow shall have the following mechanical analysis:

Textural Class	% of Total Weight	Average %
Sand (0.05 - 2.0 mm dia. range)	45 - 75	60
Silt (0.002-0.05 mm dia. range)	15 - 35	25
Clay (less than 0.002 mm dia. range)	5 - 20	15

   b. The maximum size of particles shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 15 percent by weight of the total sample.

3. pH value shall be between 5.5 and 7.0.

4. Percent organic matter (OM): 2.0-5.0-percent, by dry weight.

5. Soluble salt level: Less than 1 mmho/cm.

6. Soil chemistry suitable for growing the plants specified.

7. The organic content and particle size distribution shall be the result of natural soil formation.

8. Soil shall have an observable crumb and clod structure. Soil crumbs (peds) and clods shall be the same color on the inside as are visible on the outside.

D. Supplemental imported planning soil shall be a harvested soil from:

1. Naturally well-drained areas that have never been stripped before and have a history of satisfactory vegetative growth. Comply with all Town, City and State lawns and regulations concerning the removal of topsoil from their boundaries.

2. A commercial processing facility specializing in the manufacturing of loam.

E. Supplemental imported planting soil shall NOT have been screened and shall retain soil peds or clods larger than 2 inches in diameter throughout the stockpile after harvesting.

F. Supplemental imported planting soil shall not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to crabgrass, annual bluegrass, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass, and all other primary noxious weeds. Topsoil shall not be delivered or used for planting while in a frozen or muddy condition.

G. Supplemental imported planting soil shall be free of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing

compound, acid, and other extraneous materials that are harmful to plant growth.

H. Supplemental imported planting soil shall be free of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

I. The existing topsoil on the site has been sampled and tested. See soil test results at the end of this Section. The existing topsoil material meets the above criteria and are acceptable for use on this project

2.03 COARSE SAND

A. Uniformly graded medium to coarse sand consisting of clean, inert, natural grains of quartz or other durable rock that is free of toxic and deleterious materials harmful to plant growth. Sand shall have the following characteristics.

1. Coefficient of uniformity (D70/D20) for material passing the No. 10 Sieve shall be <3
2. pH < 7.0
3. Containing no calcium carbonate
4. USDA Silt fraction < 2.5 percent
5. USDA Clay fraction < 0.5 percent

B. ASTM C-33 Fine Aggregate with the following particle size distribution.

Sieve	Sieve Size	% Passing
3/8-inch	9.50 mm	100
1/4-inch	6.30 mm	96 - 100
No. 10	2.00 mm	82 - 98
No. 18	1.00 mm	50 - 80
No. 35	0.500 mm	20 - 53
No. 60	0.250 mm	28 - 61
No. 140	0.100 mm	6.5 - 35
No. 270	0.050 mm	0 – 2.5
0.002 mm	0 – 0.5	

2.04 COMPOST

A. Compost used to amend planting soils and for topdressing beds shall be an aerobically decomposed, stable, mature, humus-like material free of debris, stones greater than 0.5-inch, metal, plastics, wood and similar inert or unwelcome contaminants.

B. It shall be commercially prepared, meeting US Compost Council STA/TMECC criteria or as modified in this section for “Compost as a Landscape Backfill Mix Component”. Refer to: http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf.

1. Compost shall be deep brown or darker color and intended by the manufacturer for ornamental planting purposes.

2. It shall have been screened to remove all particles >0.50 inches. 90 to 100 percent shall pass a 3/8-inch screen.
3. It shall not have an unpleasant odor as determined by sniff test of submitted samples.
4. The ratio of carbon to nitrogen (C:N ratio) shall be between 15:1 and 25:1.
5. Salinity shall not exceed 2.0 dS/m (2.0 mmhos/cm)
6. pH: Between 6 & 8
7. Minimum organic content of 35 percent by weight.
8. Chemical contaminants, mg/kg (ppm): meet or exceed US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels.
9. Biological contaminants select pathogens fecal coliform bacteria, or salmonella, meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) level requirements.
10. Moisture content: wet weight basis 30 – 60 percent.

2.05 PLANTING SOIL MIXES FOR SPECIFIC USES

A. Planting soil for the top 18-inches of the soil profile for planting trees and other ornamental plants may be approved topsoil, imported planting soil or a blended mix of approved coarse sand, topsoil and compost meeting the following requirements:

1. The ratio of the particle size for 80 percent passing (D80) to the particle size for 30-percent passing (D30) shall be 15 or less. (D80/D30 < 15).
2. Maximum size shall be 2-inches largest dimension. The maximum retained on the #10 sieve shall be 15-percent by weight of the total sample.
3. The organic content shall be between 5 and 8 percent by weight
4. Saturated hydraulic conductivity of the mix: not less than 2 inches per hour according to ASTM D5856 when compacted to a minimum of 86% Standard Proctor, ASTM 698
5. pH: 5.5 through 6.5 for non-acid loving plants
6. pH: 4.5 through 5.5 for Ericaceae and other acid-loving plants

2.06 INORGANIC SOIL AMENDMENTS USE AS APPLICABLE:

A. Ground Limestone: dolomitic limestone containing not less than 50 percent of total carbonates and 25 percent total magnesium with a neutralizing value of at least 100 percent. Material shall be ground to such fineness that 40 percent will pass 100 mesh U.S. standard sieve and 98 percent will pass through 20 mesh U.S. standard sieve.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur. Chelated Iron: Commercial-grade FeEDDHA (ethylenediamine-N,N'-bis(2-hydroxyphenylacetic acid) or dicots and woody plants, and commercial-grade FeDTPA (Diethylene Triamine Penta Acetic Acid Iron) for ornamental grasses and monocots.

2.07 FERTILIZERS

A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of [20] [33] [50] percent available phosphoric acid.

B. Pre-Plant Fertilizer

1. Complete, fertilizer made from all-natural ingredients complying with State and Federal fertilizer laws. Fertilizer shall contain the following available plant food by weight, unless soils test indicate a need for different composition:

	Nitrogen	Phosphorus	Potash
Deciduous Trees and Shrubs	2%	3%	3%
Evergreen Trees and Shrubs	2%	3%	3%

C. Fertilizer: Pro Start 2-3-3 manufactured by North Country Organics, Bradford, Vermont 05033, ph# 802.222.4277 or approved equal.

D. Fertilizer shall be delivered in original unopened standard size bags showing weigh, analysis ingredients and manufacturer’s name.

PART 3 EXECUTION

3.01 TRANSPORT AND DELIVERY

A. The Contractor shall provide sufficient topsoil, planting soil, coarse sand and compost to complete the work of the Contract.

B. Locate, procure and delivery soils and soil components sufficiently in advance of earthwork and earth moving activities, landscape grading, planting and turf establishment to meet Project schedules.

C. Deliver soils and soil components to the Project site in tarpaulin-covered trucks. Stockpile in locations approved by the Resident Engineer.

D. Stockpiled soil and aggregate materials shall be protected from erosion and sedimentation in accordance with the relevant provisions of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS of this Specification.

E. Coordinate the stockpiling of soils and soil components with the work of Section 32 91 19 LANDSCAPE GRADING

3.02 NOTIFICATION

A. Notify the Resident Engineer when the soils and soil components are scheduled for delivery and schedule his/her attendance on site to witness delivery and stockpiling. The Resident Engineer will inspect

the soils and soil components for conformance to the requirements of the Contract.

3.03 INSTALLATION

A. Install existing on-site stockpiled topsoil, planting soil, coarse sand and compost in accordance with the requirements of Section 32 91 19 LANDSCAPE GRADING.

3.04 CLEANUP

A. In accordance with requirements of Section 31 91 19 LANDSCAPE GRADING.

END OF SECTION

SECTION 32 91 19
LANDSCAPE GRADING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Section includes administrative and procedural requirements for installing planting soils, including but not limited to the following:

1. Inspection and testing of subgrade, as specified and directed
2. De-compaction and re-compaction of soils, as directed
3. On site transport of topsoil, planting soil, coarse sand and compost as required to fulfill the requirements of the Contract.
4. Placement of topsoil and planting soil
5. Soil amendments as required to meet the requirements of Section 32 91 13 PLANTING SOILS and this Section 32 91 19 LANDSCAPE GRADING.
6. Final in-place testing of soils as directed
7. Coordination with other contractors
8. Clean up.

B. Related Requirements:

1. Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS
2. Section 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS
3. Section 32 91 13 PLANTING SOILS for planting soil standards
4. Section 32 90 00 PLANTING for placing planting soil for planting and turf.

1.02 REFERENCES

A. ASTM

1. D422 Standard Test Method for Particle-Size Analysis
2. D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
3. D1556 Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
4. D2167 Standard Test Method for density and Unit Weight of Soil in Place by the Rubber Balloon Method
5. D5856-15 Standard Test Method for Measurement of Hydraulic Conductivity of Porous Material Using a Rigid-Wall, Compaction-Mold Permeameter
6. D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

7. F1647 Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes

8. F2396 Standard Guide for Construction of High Performance Sand-Based Rootzones for Athletic Fields

B. NAPT: The North American Proficiency Testing Program

1.03 DEFINITIONS

A. Soil compaction: the formation of dense layers of overly packed soil. Compaction will force soil particles closer together, driving out pore space and reducing the volume of air and water in soil. Compaction seals off the soil surface and reduces the amount of air and water that enters the soil. Compaction reduces and can eliminate the movement of water and air through the soil, preventing the movement of plant roots through the soil and creating anaerobic conditions that will kill plant material and turf.

B. Under the terms of this Contract, there are no acceptable remediation efforts that can return compacted loam borrow, existing on-site topsoil or horticultural subsoil to a useful product.

C. Compacted planting soil system components will be considered debris.

D. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or un-amended soil as indicated.

E. Soils:

1. Sub-grade/subsoil: Existing native soil in cut, on-site topsoil in fill conditions, or imported soils in fill conditions as part of the planting soil system.

2. Soil Peds: Soil peds are natural, relatively permanent aggregates, separated from each other by voids or natural surfaces of weakness. If undisturbed, soil peds will persist through cycles of wetting and drying and freezing and thawing.

3. Dry Soil: Soil that has dried out is characterized by rigidity, brittleness and maximum resistance to pressure. When pressure is applied to dry soil, it has a tendency to crush to a powder or to fragments. Soil that is crushed may not have the ability to cohere again when it is wetted and pressed back together. Soil that is crushed when dry and rewetted may lose its crumb structure. A soil that has lost its crumb structure due to applied pressure when it has been dried has failed.

4. Wet Soil: When soil becomes saturated, water fills the large and medium sized pores between the peds. Left to drain, the integrity of the soil structure remains intact. When pressure is applied to wet soil the ped structure breaks down and the mineral and organic components mix into a water-and-soil slurry. Without exception under the terms of this Contract, saturated topsoil and planting soil subject to pressure is reduced to mud.

5. Mud: A soft, sticky matter resulting from the mixing of soil and water under pressure. Mud is construction debris that cannot be amended or ameliorated to return to functional use.

6. Debris Soils: Compacted topsoil and planting soils, wet soils that have been subjected to pressure and mud are considered debris under the terms of this Contract. Sticks, stones, trash, rubbish and any broken construction materials are also considered debris under the terms of this Contract. Any material identified by the Resident Engineer as unwanted or unsuitable to the site shall be considered debris.

F. Subsoiling: The vertical and lateral fracturing of compacted subsoil material to full depth of compaction through deep ripping and de-compaction to restore soil porosity and permeability, to aid in infiltration of water, and to promote root growth.

G. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.04 ACTION SUBMITTALS: SOIL TESTING

A. General: as specified under Section 32 91 13 PLANTING SOILS.

B. When directed by the Resident Engineer, sample and test amended existing topsoil and supplemental imported planting soil. Sampling and testing requirements shall be in accordance with the requirements of Section 32 91 13 PLANTING SOILS.

1.05 ACTION SUBMITTALS

A. Product Data: provide the most recent product information from manufacturer for:

1. Fertilizer
2. Ground limestone
3. Superphosphate

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency, demonstrate in writing that the testing agency is NAPT-affiliated, can perform the specified tests in accordance with the specified testing procedures.

B. Soil Installation Mockup Test Reports: Submit a report of the final methods of soil amendments and modifications, along with the penetrometer and soil moisture readings.

C. Certification of subgrade conditions, as directed by the Resident Engineer:

D. Certification by the Professional Land Surveyor or Civil Engineer that subgrade elevations conform to the requirements identified in this Section.

E. Certification by the General Contractor and/or sub-contractor responsible for earth moving work that the soils have been de-compacted in accordance with the requirements of this Section 32 91 19 and Section 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS.

F. Field quality-control reports for Soil Installation Mockup:

1. Density Tests: Test all areas of the site for soil density after installation. In place density testing in accordance with ASTM D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.

2. In-place density tests shall be carried out at a rate of one test per 5,000+/- square feet for each type of material placed.

3. Provide correlated test results for density testing, penetrometer testing and percolation testing for review and acceptance.

1.07 PRE-INSTALLATION MEETING

A. General: At least 30 days prior to delivery of bulk materials and amendment materials to the site, conduct a meeting to review: status of submittals; coordination of work; methods of delivery, storage, amending soils; and inspections and testing.

B. Attendees: Include but not limited to Contractor; Landscape subcontractors; Resident Engineer and Owner’s Representative.

C. Minutes of the meeting: Contractor shall take minutes and type and distribute the minutes to attendees within five days of the meeting.

1.08 QUALITY ASSURANCE - GENERAL

A. Inspections: Do not spread planting soil until:

1. Contractor has performed requirements of Soil Installation Mockup.

2. Contractor has certified in writing the subgrade infiltrates water at the minimum specified rate.

1.09 QUALITY ASSURANCE – PLANTING SOIL INSTALLER

A. The Landscape Contractor shall be the same firm that is installing planting and establishing turf as described in respective Division 32 Sections.

B. The Landscape Contractor shall be a firm having at least 5 years of successful experience of a scope similar to that required for the Work, including mixing and amending topsoil in a manner that does not destroy soil structure.

C. Installer Field Supervision: Installer to maintain an experienced full-time supervisor on Project site when any topsoil amendment work is in progress.

D. The Landscape Contractor’s crew shall be experienced in the amendment and installation of planting soil, grading and interpretation of grading plans.

E. Soil work shall be performed by a firm that has sufficient earthwork machinery at the job site to execute the site work without interruption or delay, except for unforeseen circumstances, such as weather. Machinery operators shall be well experienced in this type of work

without limitation to topography or existing conditions to be protected.

F. Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities.

1.10 QUALITY ASSURANCE – TESTING AGENCY

A. Perform penetrometer and/or percolation testing of the prepared subgrade in accordance with the requirements of Section 31 23 12.

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. Protect materials from theft, damage, weather, dirt, oils, grease, and construction activities.

C. Sequence deliveries to avoid delay. On-site storage space is permissible only with written notice from the Owner.

D. Bulk Materials:

1. Stockpile in windrows less than six feet high and no longer than ten days before placement or use.

2. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

3. 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.

4. Do not move or handle materials when they are wet or frozen.

5. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

E. Compost:

1. Stockpile in windrows less than six feet high and no longer than ten days before placement or use.

2. Cover during precipitation events to minimize saturated conditions. Do not manipulate when in a wet or frozen condition, to include planting operations.

1.12 PROJECT/SITE CONDITIONS

A. Soil Moisture Content

B. Do not amend, spread or manipulate planting soils when moisture content is so great that adequate mixing or management are not possible, nor when it is so dry that dust will form in the air or that clods will not break readily, nor when it is frozen. Apply water, if necessary, or

allow soil to dry to bring soil moisture between 60% of optimum moisture content and optimum moisture con-tent as determined by ASTM D698 for compaction, grading and plantings.

C. Soil may not be manipulated in any way while in a wet condition, including amending, fine grading, planting or any other excavation. Contractor is responsible for removal and replacement of any and all soils that were manipulated when wet.

D. Field Soil Moisture Test

1. Form soil in palm of hand, if soil retains shape and crumbles upon touching, the soil may be worked.
2. If the soil will not retain shape it is too dry and should not be worked.
3. If the soil retains shape and will not crumble, it is too wet and should not be worked.
4. If the soil glistens or free water is observed when the sample is patted in the palm of hand the soil is too wet and should not be worked.

PART 2 - PRODUCTS

2.01 TOPSOIL AND PLANTING SOIL

A. Specified and delivered under the work of Section 32 91 13 PLANTING SOILS.

B. Topsoil and planting soil shall NOT be amended or manipulated in any manner that might alter, damage or destroy the soil’s existing structure. Retain soil peds or clods larger than 2 inches in diameter throughout the amendment process.

2.02 COARSE SAND – IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 91 13 PLANTING SOIL.

2.03 COMPOST– IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 91 13 PLANTING SOIL.

2.04 INORGANIC SOIL AMENDMENTS - AS SPECIFIED UNDER SECTION 32 91 13 PLANTING SOILS.

2.05 FERTILIZERS

A. Pre-Plant Fertilizer

B. Complete, fertilizer made from all-natural ingredients complying with State and Federal fertilizer laws. Fertilizer shall contain the following available plant food by weight, unless soils test indicate a need for different composition:

Nitrogen	Phosphorus	Potash
Deciduous Trees and Shrubs	2%	3%	3%
Evergreen Trees and Shrubs	2%	3%	3%

C. Fertilizer: Pro Start 2-3-3 manufactured by North Country Organics, Bradford, Vermont 05033, or approved equal, natural, non-burning, eco-compatible starter fertilizer.

D. Fertilizer shall be delivered in original unopened standard size bags showing weigh, analysis ingredients and manufacturer’s name.

PART 3 EXECUTION

3.01 SITE EXAMINATION

A. Prior to installation of Planting Soil, examine site to confirm that existing conditions are satisfactory for the work of this section to proceed.

1. Confirm that the subgrade is at the proper elevation and compacted as required.
2. Confirm that surface of all areas to be filled with Planting Soil are free of construction debris, refuse, compressible or biodegradable materials, stones greater than 2 inches diameter, soil crusting films of silt or clay that reduces or stops drainage from the Planting Soil into the subsoil; and/or standing water. Remove unsuitable material from the site.
3. Confirm that no adverse drainage conditions are present.
4. Confirm that no conditions are present which are detrimental to plant growth.
5. Confirm that utility work has been completed per the drawings.
6. Confirm that irrigation work, which is shown to be installed below prepared soil levels, has been completed.

B. If unsatisfactory conditions are encountered, notify the Resident Engineer immediately to determine corrective action before proceeding.

C. Proceed with placement of planting soil only after unsatisfactory conditions have been corrected.

3.02 PROTECTION

A. Protect areas of in-place, existing topsoil from 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.

3.03 FILLING AND COMPACTION

A. Perform penetrometer and/or percolation tests on existing subgrade or placed fill prior to placing and spreading loam borrow in accordance with the requirements of Section 01 90 00 RIDOT STANDARD SPECIFICATION SECTIONS.

B. Confirm that the subgrade is at the proper elevation and that no further earthwork is required to bring the subgrade to proper elevations to receive planting soil. Rough grade the subgrade so that it slopes parallel to the finished grade. Confirm in writing that the subgrade has been placed to the required elevations and that the subgrade drains freely.

C. Clear the subgrade of all construction debris, trash, rubble and any foreign material. In the event that fuels, oils, concrete washout or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Remove such construction debris, trash, rubble and foreign material from the site and disposed of it in a legal manner. Fill any over excavation with approved fill and compact to the required subgrade compaction levels.

D. Do not proceed with the installation of planting soil until all utility work in the area has been installed.

E. Protect adjacent walls, walks and utilities from damage or staining by earthwork activities and placement of planting soil. Use plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work. Clean up all trash and any soil or dirt spilled on any paved surface at the end of each working day.

3.04 PLACING AND AMENDING PLANTING SOIL

A. Coordinate the work of this Article with the work of Section 32 90 00 PLANTING.

B. Immediately prior to dumping and spreading planting soil, the subgrade shall be cleaned of all stones greater than 2 inches and all debris or

rubbish. Such material shall be removed from the site, not raked to the edges and buried. Notify the Resident Engineer that the subsoil has been cleaned and request his/her attendance on site to review and approve subgrade conditions prior to spreading planting soil.

C. For Turf Areas: Place planting soil in a single lift sufficiently deep so that after compaction the planting soil in turf areas is 9-inches deep.

D. In Plant Beds: Place planting soil in multiple lifts. Each lift shall be approximately 9 to 12-inches deep and shall be compacted to the approved Proctor density before placing subsequent lifts. Depth of planting soil in plant beds shall be as indicated but in no case shall the depth be less than 18-inches.

E. Do not handle planting soil in any way if it is in an overly dry, wet or frozen condition.

F. Soil additives, including coarse sand, compost, amendments and fertilizer shall be spread and incorporated into the planting soil by methods that preserve the soil structure. Apply additives and amendments based on soil test results and discussion during the on-site, preconstruction conference.

G. At the direction of the Resident Engineer and at no additional cost to the Owner, sample and test the installed planting soil in accordance with Section 32 91 13 PLANTING SOILS, to verify additives and amendments have be correctly applied to meet specification requirements.

H. After planting soil and required additives and amendments have been spread, carefully prepare the planting soil by scarifying, harrowing, or tilling the planting soil to mix soil additives and amendments into the top 6 inches of the planting soil. Remove all brush, roots, stumps, litter and other foreign matter churned up by this mixing operation. Do not damage soil structure. Soil peds shall be readily visible after mixing operations.

3.05 FINE GRADING

A. Grade the finish surface of all lawn, turf and planted areas to meet the grades shown on the drawings, allowing the finished grades to remain higher (10 – 15% of depth of soil modification) than the grades on the grading plan, to anticipate settlement over the first year.

B. Utilize hand equipment, small garden tractors with rakes, or small garden tractors with buckets with teeth for fine grading to keep surface rough without further compaction. Do not use the flat bottom of a loader bucket to fine grade, as it will cause the finished grade to become overly smooth and or slightly compressed.

C. Provide for positive drainage from all areas toward the existing inlets, drainage structures and or the edges of planting beds. Adjust grades as directed to reflect actual constructed field conditions of paving, wall and inlet elevations. Notify the Resident Engineer in the event that conditions make it impossible to achieve positive drainage.

D. Provide smooth, rounded transitions between slopes of different gradients and direction. Modify the grade so that the finish grade before adding mulch and after settlement is one or two inches below all paving surfaces or as directed by the drawings.

3.06 COMPACTION

A. Set sufficient grade stakes to confirm finished grades. Set stakes in the bottom of swales and at the top of slopes. Deviation from indicated elevations that are greater than one-tenth of a foot shall not be permitted. Connect contours and spot elevations with an even slope. Finish grades shall be smooth and continuous with no abrupt changes at the top or bottom of slopes.

B. During the compaction process, all depressions caused by settlement or rolling shall be filled with additional planting soil and the surface shall be re-graded and rolled until presenting a smooth and even finish corresponding to the required grades.

C. Install planting soil in successive horizontal lifts no thicker than 6 inches in turf areas and 12 inches in plant bed areas to the compaction as described herein. The Resident Engineer will ensure that the full depths of planting soil for lawn and plant beds are obtained by digging holes in the loam borrow at the same frequency as for compaction testing.

1. Compact planting soil to the required density as specified herein.

   Maximum dry density for planting soil shall be determined in accordance with ASTM D698. The following percentages of minimum to maximum dry densities shall be achieved for fill materials or prepared subgrades.

   In lawn, plant beds, tree pits and treeways:

Minimum	Maximum
Fills within lawn and planting areas in top eighteen inches of finished grade 80%	85%

2. The surface area of each lift shall be scarified by raking prior to placing the next lift.

D. In addition to the range cited above, compact each lift sufficiently to reduce settling but not enough to prevent the movement of water and feeder roots through the soil. The planting soil in each lift should feel firm to the foot in all areas and make only slight heel prints. At completion of planting soil installation, the soil should offer a firm, even resistance when the penetrometer is inserted from lift to lift.

E. All equipment utilized to install or grade planting soils or for access to subgrade soils or placed fills, shall be wide track or balloon tire machines rated with a ground pressure of 4 psi or less. All grading and soil delivery equipment shall have buckets equipped with 6 inch long teeth to scarify any soil that becomes compacted.

F. Phase work such that equipment to deliver or grade soil does not have to operate over previously installed Planting Soil. Work in rows of lifts the width of the extension of the bucket on the loader. Install all lifts in one row before proceeding to the next. Work out from the furthest part of each bed from the soil delivery point to the edge of the each bed area.

G. Where travel over installed planting soil is unavoidable, limit paths of traffic to reduce the impact of compaction to the planting soil. Each time equipment passes over the installed planting soil it shall reverse out of the area along the same path with the teeth of the bucket dropped to scarify the soil.

H. The depths and grades shown on the drawings are the final grades after settlement and shrinkage of the compost material. Install the planting soil at a higher level to anticipate this reduction of planting soil volume. A minimum settlement of approximately 10 - 15% of the soil depth is expected.

I. Maintain all stockpiles of planting soil and existing topsoil on the site until the Resident Engineer has approved finish grades. Upon written approval of finished grades, remove excess planting soil and topsoil from the construction site and relocate stockpiles to locations on the project property as directed by the Resident Engineer.

3.07 PERCOLATION TESTING OF SUBGRADE CONDITIONS

A. In accordance with the requirements of Section 31 23 12 SUBGRADE PREPARATION IN PLANTING AREAS.

3.08 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 Resident Engineer.

END OF SECTION

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33 10 00
WATER MAINS AND APPURTENANCES

PART 1 - GENERAL

1.1 SUMMARY: Work under shall consist of the installation of six-inch (6”) water lines as shown on the Contract Documents or as directed by the Resident Engineer.

1.2 WORK INCLUDED

A. Furnishing and installing new ductile iron water lines, valves, and miscellaneous appurtenances.

B. Reconnecting the new water new water main to the existing water main.

C. Pressure testing and disinfection.

D. As-built plans.

1.3 REFERENCE STANDARDS

A. ANSI A21.4/AWWA C104 - Cement Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water.

B. ANSI A21.10/AWWA C110 - Gray Iron and Ductile Iron Fittings, 3" through 48", for Water and Other Liquids.

C. ANSI A21.11/AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.

D. ANSI A21.51/AWWA C151 - Ductile Iron Pipe.

E. ANSI B.16 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.

F. ASTM D2321 - Underground Installation of Flexible Thermoplastic Sewer Pipe.

G. ASTM A126 - Gray Iron Castings for Valves, Flanges and Pipe Fittings.

H. ASTM B62 - Composition Bronze or Ounce Metal Castings.

I. AWWA C502 - Dry Barrel Fire Hydrants.

J. AWWA C600 - Installation of Cast Iron Water Mains.

K. AWWA C601 - Disinfecting Water Main.

L. AWWA C150 - Thickness Design for Ductile Iron Pipe

M. AWWA C504 - Rubber Seated Butterfly Valves

N. AWWA C500 Gate Valves, 3-inch through 48-inch

O. AWWA C509 Resilient-Seated Gate Valves

P. AWWA C550 Protective Interior Coatings for Valves and Hydrants.

1.4 SUBMITTALS

A. Shop drawings and product data shall be submitted to the Resident Engineer for review and approval. No water main materials shall be brought to the site without approval from the Resident Engineer and the Quonset Development Corporation.

B. Prior to the acceptance of the water main system, the Contractor shall submit to the Resident Engineer, for review and approval, As-Built Drawings that indicate the true measurement and location, horizontal and vertical, of all new construction. As-Built drawings shall be stamped and signed by a Rhode Island Licensed Land Surveyor or Licensed Professional Engineer. The as-built plans shall also be submitted electronically as an AutoCAD drawing file (release 2017 or higher).

1.5 INSPECTION AND TESTING

A. All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Resident Engineer sworn certificates of such tests.

B. In addition, the Resident Engineer and/or water authority reserves the right to have any or all pipe, fittings and special casting inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.

C. Pipes and fittings shall be subjected to a careful inspection and a hammer test just before being laid or installed.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products included in this section shall conform to the requirements of any standard specifications referenced herein.

B. Pipe size shall be as shown on the Contract Documents.

C. All pipe materials and shall be as shown on the Contract Documents.

2.2 PIPE AND FITTINGS

A. Ductile Iron Pipe

1. Pipe shall be designed in accordance with AWWA C150 and shall conform to ANSI A21.51/AWWA C151, Class 52 and shall have push-on joints except that pipe installed in vaults shall have flanged ends conforming to ANSI B16.1. Pipe shall be double cement-lined with seal coat inside and out, conforming to ANSI A21.4/AWWA C104. Push-on joints and rubber gaskets shall be in accordance with ANSI

A21.11/AWWA C111 and be restrained joint type. All pipe joint gaskets shall be Field Lok 350 or equal.

B. Pipe Fittings and Tees:

1. Fittings shall be compact ductile iron, 350 psi pressure rating, conforming to ANSI A21.53-88/AWWA C153 with mechanical joints. Joints and gaskets shall conform to ANSI 21.11/AWWA C111. Joints shall be furnished with ductile iron follower glands. Fittings shall be double cement-lined and seal-coated inside and out in accordance with ANSI A21.4/AWWA C104. Tees for hydrant branches and for stubs for future use shall have mechanical joints on the run with a plain end having an integral rotating gland on the branch. The gland will anchor mechanical joint pipe or valve ends to the plain end of the tee. Fittings shall be U.S. manufactured.

C. All ductile iron pipe and fittings shall be clean, sound and without defects. The castings shall be smooth and free from pinholes, excess iron, etc. The coatings shall be continuous, smooth and neither brittle nor sticky.

D. The pipe manufacturer shall supply the Resident Engineer with certificates of compliance with these specifications and certification that the ductile iron pipe has been tested at the foundry with the Ball Impression Test, Ring Bending or other approved test for ductility.

E. Joint restraining devices on all bends, tees, valves, caps, plugs and hydrants shall be Mega-Lug Series 1100 by EBAA Iron or approved equal. Restraining glands using set screws will not be accepted.

2.3 VALVES

A. Resilient Seated Gate Valves

1. Resilient seated gate valves shall be manufactured to meet or exceed the requirements of AWWA C-509 or latest revision. Valves shall have an unobstructed water way when fully opened equal in diameter to at least 1/4" greater than the nominal valve size. Valves shall have mechanical joint end.

2. All internal surfaces shall be coated with epoxy to a minimum thickness of 4 mils. Said coating shall be non-toxic, impart no taste to water and shall conform to AWWA C-550 of latest revision and be NSF Certified for use with potable water.

3. Valves shall be provided with two O-ring stem seals. Both O-rings shall be located above the thrust collar. The sealing mechanism shall provide a dual seal with zero leakage at the water working pressure when installed with the line flow in either direction, and shall consist of a cast iron gate having a vulcanized synthetic rubber coating with no rubber metal seams or edges in the water way when in the fully closed position.

4. All valves shall be seal tested at the rated working pressure in accordance with Section 6 of AWWA C-509. Valve shall be rated at 200 psi working pressure and 400 psi test pressure.

5. All brass components of the valve that are in contact with the water shall be lead free in accordance with NSF/ANSI Standard 372.

6. Valves shall be as manufactured by M&H Valve Company, Clow Valve Co., Kennedy Valve Co. or approved equal.

7. Valves shall **open right**.

B. Butterfly Valves

1. All butterfly valves shall be of the rubber-seated tight-closing type and shall meet or exceed AWWA Specification C-504-70, with latest revisions. Valves shall be designed for underground service.

2. Valves shall have mechanical joint ends. Standard M. J. accessories are also to be provided.

3. Valve shall be equipped with a 2-inch AWWA operating nut and shall open as specified below. The operators shall have overload protection and allow for up to 450 foot pounds of torque without damage to the operator. The operator shall be permanently lubricated and sealed from ground water.

4. All valves shall be rated at 200 psi minimum working pressure and hydrostatically tested at 400 psi.

5. All brass components of the butterfly valve that are in contact with the water shall be lead free in accordance with NSF/ANSI Standard 372.

6. Valves shall have thermosetting epoxy coating on the interior and exterior. The coating shall meet all requirements of AWWA C-550 of latest revision and be NSF 61 Certified. All bodies and vanes shall be factory coated prior to assembly and tested. All ferrous surfaces of the valve body waterway and vane shall receive an epoxy coating with a minimum dry film thickness of 8 mils.

7. Valves shall be as manufactured by M&H Valve Comp., Henry Pratt Comp., Kennedy Valve Comp. or approved equal.

8. Valves shall **open right**.

C. Valve Boxes

1. Valve boxes shall be furnished for all valves and shall be made in the America. Shop drawings will be required for approval before delivery.

2. Valve boxes shall be standard cast-iron, asphalt coated, adjustable, sliding type, together with cast-iron covers with the word "water" plainly cast in relief on the top surface.

3. The bottom section shall have a minimum I.D. of 5-1/4-inches. The top section shall have a minimum diameter of 6-1/8-inches. There shall be a minimum 6-inch overlap between sections.
4. The bottom section shall be 48-inch in length for all butterfly valves and 36 inches in length for all gate valves. The top section shall be at least 26 inches in length and have a plain bottom. No three-piece combinations shall be acceptable.
5. Valve boxes shall be completely and thoroughly coated with bitumastic paint.

2.4 COPPER TUBING

Piping for buried water services shall be continuous Type K heavy wall annealed seamless copper designed for buried water service with compression connection joints conforming to ASTM B88 Standard Specifications for Seamless Copper Water Tube or U.S. Federal Specification WW-T-799C for Tube, Copper, Seamless. Fittings or unions are not allowed on services less than 100 feet in length.

2.5 SADDLES AND CORPORATION STOPS

A. A saddle is required when making copper water service connections to water lines 10 inches in diameter or smaller.

B. Corporation stops shall be brass compression type with AWWA taper (CC or CS) thread. Corporations shall be supplied with pack joint. Corporation stops shall be Ford type F1000 or approved equal. They shall be lead free in accordance with NSF/ANSI Standard 372.

C. Adaptor couplings may be required for fitting new services to existing service lines. Such fittings shall be compression connections and provide electrical continuity.

2.6 CURB STOPS AND BOXES

A. Curb stops shall be ball valve type and shall be of brass, with compression type pack joints on both ends, 300 psi working pressure. They shall be lead free in accordance with NSF/ANSI Standard 372. Curb stops shall **open right**.

B. Each curb stop shall be provided with a cast iron box. The box shall be the Erie Style with arch pattern. The upper section shall be 5-1/2’ in length and a 9/16” service box rod shall be provided. Boxes shall be furnished with a cast iron plug cover. Boxes shall be completely and thoroughly coated with bitumastic paint.

PART 3 - EXECUTION:

3.1 GENERAL

A. Pipe and accessories shall be handled and stored in such a manner as to ensure that pipe is installed in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating or lining.

B. Ductile iron pipe and fittings and the cement linings are comparatively brittle. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe or lining, scratching or marring machined surfaces, and abrasion of the pipe coating or lining.

C. Any pipe showing a distinct crack with no evidence of incipient fracture beyond the limits of the visible crack, if approved, may have the cracked portion cut off by, and at the expense of, the Contractor before the pipe is laid so that the pipe used is perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches from the visible limits of the crack.

D. If authorized, cutting of the pipe shall be done so that the cut is square and clean, without causing damage to the pipe lining. Unless otherwise authorized by the Resident Engineer all pipe cutting shall be done by means of an approved type of power cutter. The use of hammer and chisel, or any other method, which results in rough edges, chips and damaged pipe, is prohibited. All cut edges shall be field beveled by use of a power grinder, as required, prior to installation.

E. Each pipe section shall be placed into position in the trench in such manner and by such means required to cause no damage to the pipe, person or to property.

F. The Contractor shall furnish slings, straps and/or approved devices to provide satisfactory support of the pipe when it is lifted. Transportation from delivery areas to the trench shall be restricted to operations which can cause no damage to the pipe units.

G. Pipe shall not be dropped from trucks onto the ground or into the trench.

H. The Contractor shall have on the job site, with each laying crew, all the proper tools to handle and cut the pipe.

I. Damaged pipe coating and/or lining shall be restored before installation only as approved or directed by the Resident Engineer.

3.2 CONTROL OF ALIGNMENT AND GRADE

A. The Contract Documents have shown property and other control lines necessary for locating the work as well as elevations and benchmarks used in the design of the work on the Contract Documents.

B. The Contractor shall use this information to set line and use a surveyor's level or transit to set grade as required.

C. The use of string levels, hand levels, carpenter's levels or other curved devices for transferring grade or setting pipe are not permitted.

D. During construction, the Contractor shall provide the Resident Engineer, at their request, all reasonable and necessary materials, opportunities, and assistance for setting stakes and making measurements, including the furnishing of one or two rodmen or chain men as needed at intermittent times. The Contractor shall not proceed until a timely request has been made of the Resident Engineer for, and has received from the Resident Engineer, such controls and instructions as may be necessary for the work to progress. The work shall then be done in strict conformity with such controls and instructions.

The Contractor shall carefully preserve benchmarks, reference points and stakes, and in case of willful or careless destruction by the Contractor, the Contractor will be charged with the resulting expense and shall be responsible for any mistakes or delay that may be caused by their unnecessary loss or disturbance.

3.3 PREPARATION OF BED

A. As soon as excavation has been completed to required depth, place and compact bedding material to the elevation necessary to bring the pipe to grade.

B. The compacted bed shall be rounded so that at least the bottom quadrant of the pipe shall rest firmly for the full length of the barrel. Suitable holes for bells or couplings shall be dug around the pipe joints to provide ample space for making tight joints.

C. The trench bottom shall be straight, free of bumps or hollows and at the proper depth. Any irregularities in the trench bottom shall be leveled off or filled in with a selected gravel or sand thoroughly tamped.

D. If determined by the Resident Engineer, the trench bottom shall be prepared by digging at least 6-inch deeper than pipe grade and backfilling to proper grade with a selected gravel or sand backfill properly tamped.

E. All unsuitable material shall be removed from the bottom of the trench excavation as directed by the Resident Engineer to the depths ordered. The trench shall be backfilled with an approved gravel backfill material, placed in 6-inch layers, to within 6-inches of proper pipe grade. Each gravel lift shall be thoroughly tamped. A 6-inch layer of selected gravel or sand shall be placed and tamped for proper pipe support.

3.4 LAYING PIPE

A. Laying of pipe and fittings shall be in accordance with the requirements of AWWA Standard Specifications for Installation of Cast-Iron Water Mains, C600, except as otherwise provided herein.

B. Each pipe length shall be inspected for cracks, defects in coating or lining, and any other evidences of unsuitability. Contractor shall excavate a minimum amount of trench and shall backfill trench to within 2 lengths of pipe laying. All trenches shall be backfilled at night.

C. Pipe shall be laid in the dry and at no time shall water in the trench be permitted to flow into the pipe.

D. The pipe shall then be laid on the trench bedding, and the pipe pushed home. Jointing shall be in accordance with the manufacturer's instructions and appropriate ASTM Standards, and the Contractor shall have on hand for each pipe laying crew, the necessary tools, gauges, pipe cutters, tamping bars, etc. necessary to install the pipe in a workmanlike manner. Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow.

E. Blocking under the pipe will not be permitted except where a concrete cradle is proposed, in which case precast concrete blocks shall be used.

F. If inspection of the pipe indicates that the pipe has been properly installed as determined by the Resident Engineer, the Contractor may then refill or backfill the remainder of the trench in accordance with the specifications. Tamping bars will be used to consolidate initial backfill under and around each pipe.

G. At any time that work is not in progress, the end of the pipe shall have a temporary plug to prevent the entry of animals, earth, water, etc.

H. Acceptable alignment shall be preserved in laying. The deflection at joints shall not exceed 3 degrees, or 12 inches for an 18-foot length of pipe. Fittings, in addition to those shown on the Drawings, shall be provided, if required, in crossing utilities, which maybe encountered upon opening the trench. Solid sleeves shall be used only where approved by the Resident Engineer.

I. Concrete thrust blocks shall be installed at all fittings and other locations as directed by the Resident Engineer. Minimum bearing area shall be as shown on the Drawings. Joints must be protected by felt roofing paper prior to placing concrete. Concrete shall be placed against undisturbed material, and shall not cover joints, bolts or nuts, or interfere with the removal of any joint. Wooden side forms shall be provided for thrust blocks.

J. Push-on joints shall be made in strict accordance with the manufacturer's instructions. Pipe shall be laid with bell ends on the upstream side. A rubber gasket shall be inserted in the groove of the bell end of the pipe and joint surfaces cleaned and lubricated, with a lubricant that is NSF Certified for use with potable water. The plain

end of the pipe to be entered shall then be inserted in alignment with the bell of the pipe to which it is to be jointed and pushed home with a jack or by other means. After jointing the pipe, a metal feeler shall be used to make certain that the rubber gasket is located correctly.

K. Mechanical joints at valves, fittings and where designated shall be in accordance with the "Notes on Method of Installation" under ANSI Specification A21.11 and the instruction of the manufacturer. To assemble the joints in the field, the Contractor shall thoroughly clean the joint surfaces and rubber gasket with soapy water before tightening the bolts. Bolts shall be tight to the specified torques. Under no conditions shall extension wrenches or pipe over handle or ordinary ratchet wrench be used to secure greater leverage.

3.5 INSTALLATION OF VALVES AND FITTINGS & TEES

A. Valves and boxes shall be set with the stem vertical and box vertically centered over operating nut. Valves shall be set on a firm foundation and supported by tamping selected excavated material under and at the sides of the valve. The gate box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade.

B. Valves shall be anchored to all tees or fittings megalugs, wherever possible or as directed by the Resident Engineer.

C. Install couplings, fittings and tees in accordance with manufacturer's instructions.

3.6 INSTALLATION OF CHLORINATION INJECTION POINTS

A. Installation of chlorination taps shall be in accordance with AWWA Standards.

B. The exact location of the chlorination injection points will be determined in the field.

3.7 TESTING

A. The Contractor shall furnish all labor, pumps, taps, chemicals, and other necessary equipment to conduct hydrostatic pressure tests and measured leakage test; and to disinfect thoroughly the lines laid under this contract in accordance with Section 4 AWWA C600-82 - Installation of Ductile Iron Water Main.

B. The tests and disinfection shall be conducted at a time specified by and under the supervision and direction of the Resident Engineer who shall judge the success or failure of the work to meet the required standards.

C. In the event that the work fails to meet the required standards as stated herein, the Contractor shall perform such excavation, repair,

relaying of pipe, rechlorinating, and all other work necessary to correct the work; and shall repeat the tests or chlorination as often as may be necessary and until such time as the required standards are met.

3.8 PRESSURE TESTS

A. Before applying the specified test pressure, all air shall be expelled from the pipe. If suitable means of expelling air are not available at high places, the Contractor shall make all the necessary taps as shown on Contract Documents or as the Resident Engineer may direct. After the tests have been completed, the corporation stops shall be left in place or removed and plugs inserted, as directed by the Resident Engineer.

B. The newly laid pipe shall be tested in valved or plugged sections as determined by the Resident Engineer in the field. Water shall be slowly introduced into the section being tested by means of an approved power-driven high-pressure test pump.

C. The new laid pipeline shall be tested to a pressure equal to 150% of the maximum static pressure for the section being tested, measured at the lowest point of the section being tested corrected to the elevation of the test gauge. If the static pressure of any newly laid section of pipeline being tested is less than 100 psig measured at the lowest point of the pipeline section, then the minimum test pressure shall be 150 psig.

D. The pressure shall be raised to the test pressure required for each section being tested as determined by the Resident Engineer. When the test pressure is reached, the time shall be recorded and the test shall begin. The duration of each pressure test shall be a minimum of two hours. During the test, pressure shall be maintained in the section of pipeline being tested by means of a recirculating by-pass type test pump. Water shall be added in measured amounts from a container of known volume if required to maintain pressure. The addition of excessive amounts of water shall constitute immediate test failure. The Resident Engineer will approve all gauges and test equipment.

E. During the test, the line will be examined by the Resident Engineer for visible leaks and breaks. Any defects in the works shall be repaired, and any defective materials shall be removed and replaced by the Contractor as and where directed by the Resident Engineer.

3.9 LEAKAGE TEST

A. Method of Testing. The leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the

pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

B. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SDP^{1/2}}{148,000}$$

in which L is the allowable leakage, in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

C. Allowable leakage at various pressures is shown in the following table.

Allowable Leakage per 1000 ft (305 m) of Pipeline*--gph**

	Nominal Pipe Diameter-in.												
Avg. Test Pressure psi (Bar)	3	4	6	8	10	12	14	16	18	20	24	30	36
450 (31)	0.43	0.57	0.86	1.15	1.43	1.72	2.01	2.29	2.58	2.87	3.44	4.3	5.16
400 (28)	0.41	0.54	0.81	1.08	1.35	1.62	1.89	2.16	2.43	2.7	3.24	4.05	4.86
350 (24)	0.38	0.51	0.76	1.01	1.26	1.52	1.77	2.02	2.28	2.53	3.03	3.79	4.55
300 (21)	0.35	0.47	0.7	0.94	1.17	1.4	1.64	1.87	2.11	2.34	2.81	3.51	4.21
275 (19)	0.34	0.45	0.67	0.9	1.12	1.34	1.57	1.79	2.02	2.24	2.69	3.36	4.03
250 (17)	0.37	0.43	0.64	0.85	1.07	1.28	1.5	1.71	1.92	2.14	2.56	3.21	3.85
225 (16)	0.30	0.41	0.61	0.81	1.01	1.22	1.42	1.62	1.82	2.03	2.43	3.04	3.65
200 (14)	0.29	0.38	0.57	0.76	0.96	1.15	1.34	1.53	1.72	1.91	2.29	2.87	3.44
175 (12)	0.27	0.36	0.54	0.72	0.89	1.07	1.28	1.43	1.61	1.79	2.15	2.68	3.22
150 (10)	0.25	0.33	0.5	0.66	0.83	0.99	1.16	1.32	1.49	1.66	1.99	2.48	2.98
125 (9)	0.23	0.3	0.45	0.6	0.76	0.91	1.06	1.21	1.36	1.51	1.81	2.27	2.72
100 (7)	0.2	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.62	2.03	2.43

*If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

**To obtain leakage in liters/hour, multiply the values in the table by 3.785.

D. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/h/in. of nominal valve size shall be allowed.

E. When hydrants are in the test section, the test shall be made against the closed hydrant.

F. Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified, the Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.

G. All visible leaks are to be repaired regardless of the amount of leakage. At the end of the test period if the amount of water added to the main from the calibrated vessel is less than the allowable leakage, and if the line shows no visible leaks or other failures, that portion of the main tested will be approved by the Resident Engineer.

3.10 TESTING OF VALVES

A. All valves shall be pressure tested during the main pipeline test.

B. All main line butterfly or gate valves and control valves on any intersecting side streets shall also be tested by the same procedures outlined above as far as practical. The Resident Engineer shall decide if it is impractical to test any one particular valve location. No pressure test shall be considered acceptable until all possible control valves have been tested to insure proper closing and water tightness.

C. The Contractor shall make any taps and furnish all necessary caps, plugs, etc., as required in conjunction with testing. The Contractor shall also furnish a test pump, gauges and any other equipment required in conjunction with carrying on the hydrostatic tests. The Contractor shall at all times protect the new water lines and the existing water lines against the entrance of polluting material.

3.11 DISINFECTION

A. After satisfactory pressure and leakage tests have been made, before placing the newly-laid waterlines in service, and when directed by the Resident Engineer, the Contractor shall disinfect by chlorination.

B. Prior to chlorination, the water lines shall be flushed to remove dirt and other foreign substances.

C. The water lines shall be disinfected by the Contractor under the supervision of the Resident Engineer. The Contractor shall use a manually controlled, vacuum type solution feed chlorinator using a mixture of water and an approved chlorine-bearing compound of known chlorine content, such as calcium hypochlorite. The chlorine shall be introduced into the main through a 1-inch corporation stop installed approximately one foot up-stream from the valve at the beginning of the job and shall be tested for residual chlorine at a 1-inch corporation

stop installed approximately one foot from the downstream valve at the end of the project.

D. Water from an approved source shall be introduced slowly into the main during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the chlorine dose entering the lines shall be at least 50 parts per million. When the pipe line has been completely filled with treated water, the main shall be sealed off. Treated water shall be retained in the main for a period of at least twenty-four (24) hours. At the end of the retention period, the chlorine residual at the extremities of the pipe and at other representative points shall be at lest 5 parts per million.

E. Should the first treatment fail to meet the above requirements, the procedure shall be repeated until tests show that, in the opinion of the Resident Engineer, effective disinfection has been accomplished.

F. Following acceptance of the disinfection process, the chlorinated water shall be flushed from the newly-laid main until such time as the replacement water throughout its entire length shall be equal in quality to that elsewhere in the system.

G. After final flushing and before the new water main is connected to the distribution system the Contractor shall arrange and pay for two (2) consecutive sets of acceptable samples taken at least 24 hours apart, to be collected only by Water Department Personnel from the new water main for Coliform testing at Premier Laboratory, Inc. Two (2) consecutive sets of samples taken at least 24 hours apart shall be analyzed for coliform bacteria and heterotrophic plate count (HPC). The testing results are to be recorded on Rhode Island Department of Health’s analytical result forms and forwarded to the Rhode Island Department of Health’s Office of Drinking Water Quality for review and approval prior to placing potable water pipeline into service. The water main shall not be put into service until safe test results are obtained. All required retesting samples shall be collected by only Water Department Personnel or their appointed testing agency at no cost to the Owner.

H. Special disinfection procedures, such as soaking or swabbing, approved by the Resident Engineer, shall be used in connections to existing water lines and where the method outlined above is not practicable.

3.12 DECHLORINATION

A. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine residual measurements show the concentration in the discharged water is no higher than that generally prevailing in the system or is acceptable for domestic use.

B. The environment to which the chlorinated water is to be discharged shall be inspected by the Resident Engineer. If there are any concerns that the chlorinated discharge water will cause harm to the

environment, then a reducing agent shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. Chlorine residual water being disposed will be neutralized by treating with one of the following chemicals: (All amounts are in pounds)

Residual Chlorine Concentration (mg/L)	Sulfur Dioxide (SO2)	Sodium Bisulfate (NaHSO4)	Sodium Sulfite (Na2SO3)	Sodium Thiosulfate (Na2S202.5h20)
1	0.8	1.2	1.4	1.2
2	1.7	2.5	2.9	2.4
10	8.3	12.5	14.6	12.0
50	41.7	62.6	73.0	60.0

C. Where necessary, Federal, State and Local regulatory Agencies shall be contracted to determine special provisions for the disposal of heavily chlorinated water.

3.13 CONNECTION TO EXISTING SYSTEM

A. The Contractor shall furnish all necessary labor, tools, joint materials, equipment, etc. to connect new water line to existing water lines with the required proper fittings. Flexible transition couplings used to connect new water lines to existing water lines shall be as specified.

B. All connections shall be made at such time and in such a manner as to cause as little interruption in water service as possible.

C. Coordination of all such work shall be made with the Resident Engineer who shall be present when the work is done and shall operate all valves. The Contractor shall notify the Resident Engineer a minimum of one working day in advance of when the Contractor plans to connect into the existing water lines.

D. All materials, equipment and labor necessary for the connection of the new water lines to the existing water lines shall be accomplished as shown on the Contract Documents and/or as directed by the Resident Engineer and shall be considered subsidiary to the pipe laying items.

3.14 SEWER SERVICES AND DRAIN LINES

A. The Contractor shall exercise extreme caution to properly locate and protect the existing sewer services and drain lines from construction damage. It shall be the Contractor's responsibility to demonstrate that all existing active sewer services and drains are functioning properly after the installation of the proposed water main to the satisfaction of the Resident Engineer.

B. Damage to existing drains and sewer services shall be repaired and/or replaced immediately with materials of the same size as the existing service. Existing slopes and inverts shall be maintained. Pipe joints shall be made using suitable flexible couplings, approved by the Resident Engineer. Fernco couplings are an acceptable coupling for sewer service repair. The Contractor shall use same. Concrete mortar joints will not be accepted.

C. If damage occurs to existing house or business sewer services or storm drains and acceptable repairs are accomplished as outlined above, the Contractor shall be required to adequately demonstrate to the Resident Engineer that the repaired service is functioning normally before any backfill material shall be allowed to be placed.

END OF SECTION

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REFERENCE A

GZA GeoEnvironmental, Inc.

Geotechnical Evaluation Report
Rhode Island Veterans Memorial Cemetery
Columbarium Project
Exeter, Rhode Island

Dated January 2020
File No. 34428.01

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Proactive by Design

GEOTECHNICAL EVALUATION REPORT

RHODE ISLAND VETERANS MEMORIAL CEMETERY COLUMBARIUM PROJECT

EXETER, RHODE ISLAND

January 2020
File No. 34428.01

PREPARED FOR:
Bryant Associates, Inc.
Lincoln, Rhode Island

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January 13, 2019
File No. 03.0034428.01

Ms. Teresa M. Capuano
Bryant Associates, Inc.
640 George Washington Highway
Building C, Suite 100
Lincoln, Rhode Island 02865

Re: Geotechnical Evaluation Report
Columbarium Project
Rhode Island Veterans Memorial Cemetery
301 South County Trail
Exeter, Rhode Island 02822

Dear Ms. Capuano:

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide you with our geotechnical report for the above-referenced project. This report was prepared in accordance with our proposal dated June 20, 2019 (Revised November 13, 2019) and is subject to the Limitations in **Appendix A**.

BACKGROUND

The Rhode Island Veterans Memorial Cemetery (RIVMC) is located at 301 South County Trail, Exeter, Rhode Island. The property consists of approximately 280 acres. There are currently seven individual buildings located on this property, including the administration office, public rest rooms, committal chapel, columbarium committal center, maintenance office (with heated storage service bay) and two unheated storage buildings. The proposed project consists of a five-phase design of a new columbaria area accommodating a minimum of 14,000 niches. It is GZA's understanding that the columbarium consists of stone or cast-in-place/pre-cast concrete structures with footings. If it is a concrete structure, it will be faced with brick, block, stone, granite, or pre-cast veneer, similar in material to other structures in the cemetery. This report supports the design of Phase One option of the project.

The objectives of our geotechnical evaluation services were to provide foundation design and related earthwork recommendations for the proposed Columbarium structures and prepare design plans and specifications for the earthwork portion of the project.

Electronic versions of the existing site plan and conceptual plan, titled "Geotech Locations_Borings-Test Pits_11x17_40 Scale_columbaria_2019-12-02.pdf" and "RIVMC_Proposed Geotechnical Locations_2019-12-02", were provided to GZA by Bryant Associates Inc. on December 3, 2019. These documents were used in conjunction with a Google professional electronic image file to develop **Figure 2, Exploration Location Plan**.

REVIEW OF UNITED STATES GEOLOGICAL SURVEY (USGS) PUBLICATIONS

Several United States Geologic Survey (USGS) publications were reviewed to obtain an understanding of the area geology. These publications included the "Surficial Geologic Map of the Slocum Quadrangle, Rhode Island", dated 1957, the "Bedrock Geology Map of the Slocum

Quadrangle", dated 1959, and the "Ground-Water Resources of the Slocum Quadrangle, Rhode Island" dated 1959. A summary of the geologic conditions anticipated to be found at the site is presented in the following paragraphs.

SURFICIAL GEOLOGY

The 1956 USGS Surficial Geologic Map of the Slocum Quadrangle indicates that the surficial soils for most of the site are outwash plains of sorted sand and local deposits of coarse gravel.

BEDROCK GEOLOGY

The 1959 USGS Bedrock Geologic Map of the Slocum Quadrangle indicates the bedrock below the site is Augen Gneiss. The Augen Gneiss refers to a rock formation of devonian origin with a regional rock type of strongly lineated and foliated gneiss with many inclusions of feldspathic biotite schist.

SUBSURFACE EXPLORATIONS

Two test borings and two test pits were completed at the site by GZA. GZA also excavated fifteen (15) test pits at the site for preliminary geotechnical purposes in 2018. Figure 2, **Exploration Location Plan,** shows the approximate location of the subsurface explorations and details of the subsurface exploration programs are provided in the following sections.

PREVIOUS GZA SUBSURFACE EXPLORATIONS

Two test pits, designated TP-01 through TP-02, were excavated within the columbarium area by Cryan Landscape Contractors, Inc. of Attleboro, Massachusetts to a depth of 10 feet below existing grade on September 26, 2018. The test pits were completed to assess the RIVMC for the potential of containing intact historical or archaeological deposits. Implications of site development on the undeveloped portions of the parcel relative to wetland resources and permitting were also assessed. Logs of these test pits are included in **Appendix B**.

RECENT GZA SUBSURFACE EXPLORATIONS

Two (2) test borings, designated GZ-101 and GZ-102, and two (2) test pits, designated TP-101 and TP-102, were performed for the Rhode Island Veteran's Memorial Cemetery Columbarium Project as part of our geotechnical investigation. The exploration locations were located using a Trimble R1 unit with an accuracy of approximately 15 inches. Ground surface elevations of the explorations have been estimated based on interpolation of topographic contours shown on the conceptual plan titled "RIVMC_Proposed Geotechnical Locations_2019-12-02" and should be considered approximate.

TEST PITS

The test pits were performed for the Rhode Island Veteran's Memorial Cemetery Columbarium Project as part of our geotechnical investigation on December 16, 2019. **Figure 2, Exploration Location Plan**, shows the locations of the test pits and the logs are attached in **Appendix C**. An engineer from GZA was present during the test pit excavations to observe and log the explorations. A Rhode Island licensed soil evaluator was also present at the time of the test pits and evaluated the soils for the civil engineer's stormwater evaluation.

The test pits were excavated by Cryan Landscape Contractors, Inc. of Attleboro, Massachusetts on December 16, 2019. The test pits were excavated to a depth of 9 feet below existing ground surface using a CAT 305 E2CE mini excavator. Groundwater observation wells were installed in both test pit. Each observation well consists of a 4-inch PVC perforated pipe wrapped in filter fabric and

was installed from the base of the test pit excavation to above ground surface. The excavation around each well was backfilled with spoils from the test pit.

BORINGS

The test borings were drilled on December 21, 2019 by Hoffman Environmental Services of North Kingston, Rhode Island. Logs of the explorations are included in **Appendix C**, and the locations are shown on the attached **Figure 2, Exploration Location Plan**.

An ATV-mounted drill rig was utilized to advance the borings to a depth of 9.0 feet below existing ground surface. The borings were advanced with auger methods utilizing a 2.25-inch inner-diameter hollow stem auger. Split spoon samples were obtained in five-foot intervals or less in conformance with ASTM D-1586, the Standard Penetration Test (SPT). The test consists of driving a 1-3/8 inch inside diameter standard split spoon sampler at least 18 inches with a 140-pound hammer dropping from a height of 30 inches. The standard penetration value (N-value) is the number of blows required to drive the split spoon sampler from 6 to 18 inches of penetration and is a commonly used indicator of the relative density and consistency. The borings and soil samples were observed and logged by a representative of GZA. Refer to the boring logs in **Appendix C** for specific conditions encountered in each test boring.

GENERALIZED SUBSURFACE CONDITIONS

The generalized subsurface profile encountered at the site consists of topsoil, underlain by about 1 foot of subsoil, or up to 8 feet of miscellaneous fill, further underlain by glacial outwash sand. A 15-inch layer of buried topsoil was discovered in exploration GZ-102 at a depth of approximately 7 feet. Cobbles and boulders of various sizes were encountered throughout the explorations. The subsurface conditions are described in greater detail in the sections below. Refer to the logs in **Appendix C** for more specific information.

TOPSOIL/SUBSOIL

Approximately 12 inches of brown fine to medium sand, some silt, varying amounts of fine to coarse gravel, and trace amounts of organics (Topsoil) was encountered at the ground surface in the test pits and borings. Subsoil was encountered directly below the topsoil in exploration TP-102 and extended to a depth of 2 feet below existing grade. The subsoil consisted of fine to medium sand with up to 50 percent silt, little fine to coarse gravel, and trace roots. Large boulders were encountered throughout the topsoil and subsoil layers. SPT N-values were approximately 5 blows per foot (bpf), indicating a relative density of “loose”. Cobbles ranging between 3 inches to 6 inches in size were encountered at the ground surface and in the topsoil/subsoil layer during test boring and test pit explorations.

MISCELLANEOUS FILL

A 6 to greater than 8-foot-thick layer of fill was encountered directly below the topsoil/subsoil in all the explorations. Both test pits were terminated in the layer due to reach of excavator used. The fill varied across the explorations, but generally consisted of brown fine to medium sand, with varying amounts of silt, fine to coarse gravel, and miscellaneous urban debris. SPT N-values ranged from 2 to 11 blows per foot (bpf), indicating a relative density of “very loose” to “medium dense”. A single large (>36”) boulder was encountered within the fill layer at exploration TP-102.

BURIED TOPSOIL

A 15-inch thick layer of buried topsoil was encountered directly below the fill in exploration GZ-102. The material consisted of brown silt with trace amounts of organic matter. SPT N-values were approximately 8 blows per foot (bpf), indicating a relative density of “medium dense”.

GLACIAL OUTWASH

The fill or buried topsoil was underlain by naturally deposited glacial outwash in explorations GZ-101 and GZ-102. Two unique types of glacial outwash were observed during the boring program and are described further below:

- Brown, fine to coarse sand with varying amounts of fine to coarse gravel and trace silt;
- Brown or gray Silt.

SPT N-values ranged from 6 to 24 blows per foot (bpf), indicating a relative density of "loose" to "medium dense".

BEDROCK/BOULDERS

A single large (>36") boulder was encountered approximately 3 feet below the existing ground surface in exploration TP-102. Many cobbles were encountered throughout the explorations through the fill layer. Bedrock was not encountered.

GROUNDWATER

Depths to groundwater were measured upon completion of the explorations. Groundwater was not encountered in either of the test pits. Groundwater observations in the GZA borings were made at the time and under the conditions stated in the exploration logs. Samples collected while drilling the test borings transitioned from moist to saturated at a depth of 14 feet below ground surface in exploration GZ-101 and 19 feet below ground surface in exploration GZ-102 corresponding to approximate elevations of 145 feet and 140 feet, respectively. Groundwater observation wells were installed in both test pits to a depth of 9 feet below ground surface.

Groundwater observations were made at the time and under the conditions stated in the exploration logs and it is anticipated that groundwater levels will vary due to variations in rainfall and other factors different than those prevailing at the time the explorations were performed, and the measurements were made. Seasonally lowest groundwater levels typically occur during the late summer and fall months and the highest levels typically occur during the spring months. Refer to the logs in **Appendix C** for additional details on groundwater observations.

The seasonal high water table (SHWT) for test pits TP-101 and TP-102 was estimated by a Rhode Island licensed soil evaluator in the field. The SHWT estimates for the test pits are summarized below. The soil evaluation logs are attached in **Appendix C.**

Test Pit	Approximate G.S. Elevation (ft)	Estimated Depth to SHWT (ft)	Estimated Elevation of SHWT (ft)
TP-101	159	8.0	151
TP-102	159	8.0	151

NOTES:

1.) "G.S." = Ground Surface. Elevations were estimated to the nearest 0.5 feet.
2.) All elevations are in reference to the North American Vertical Datum of 1988 (NAVD88).

GEOTECHNICAL LABORATORY TESTING

Four soil samples obtained during the recent subsurface exploration program were analyzed for particle size distribution in general accordance with ASTM D 422. Soil sample S-2 from boring GZ-101 and S-3 from boring GZ-102 are representative of the existing fill at their respective boring locations. Soil sample S-5 from boring GZ-101 and S-6A from boring GZ-102 are representative of the glacial outwash at their respective boring locations. The sieve results are summarized below and are included in **Appendix C**.

Test Pit, Sample, Depth	Stratum (USCS Symbol)	Test Performed	Burmister Description
GZ-101, S-2, 2'-4'	SP	Sieve	Dark brown fine to coarse SAND and fine to coarse GRAVEL, little Silt, trace Organics (wood)
GZ-101, S-5, 9'-11'	SP	Sieve	Brown fine to coarse GRAVEL and fine to coarse SAND, trace Silt
GZ-102, S-3, 5'-7'	SM	Sieve	Brown SILT, some fine to coarse Gravel, some fine to coarse Sand
GZ-102, S-6A, 14'-16'	ML	Sieve	Light gray SILT, trace fine to medium Sand

IMPLICATIONS OF SUBSURFACE CONDITIONS

Undisturbed naturally deposited glacial outwash and properly placed and compacted structural fill are considered competent bearing material for the support of shallow foundations. The existing topsoil, subsoil, and fill are considered unsuitable for foundation support in their current condition and should be removed from the columbarium structure prior to structural fill placement and foundation construction.

The existing fill can be selectively reused as structural fill provided that it is re-placed in lifts and properly compacted. The existing fill contains cobbles and boulders, which should be culled from soils prior to reuse. These boulders could be crushed for reuse or disposed of off-site. Due to the silty nature of the fill, it may be difficult to work with if it becomes saturated by precipitation. It is critical that the earthwork contractor manage the soils to be reused by protecting stockpiles and loose lifts from precipitation and maintaining positive drainage during earthwork operations to avoid ponding of stormwater runoff.

Groundwater was measured at approximate elevation 145 feet in boring GZ-101 and approximate elevation 143.5 feet in boring GZ-102 at the times the explorations were performed. While groundwater at these elevations is not expected to interfere with foundation construction, these readings were taken in the dry season and the groundwater elevation is expected to be higher during the wet season. Perched water may also be encountered within the excavations for new foundations. It is anticipated that any perched water or groundwater encountered could be readily controlled through the use of sumps and open pumping techniques.

CONCLUSIONS AND RECOMMENDATIONS

The following sections of this report present foundation design related earthwork recommendations for design and construction of the proposed project. If the design is modified, GZA should be provided the opportunity to revise our recommendations as/if needed.

Foundations

Shallow spread footing foundations bearing on undisturbed naturally deposited glacial outwash or properly placed and compacted structural fill are recommended for support of the columbarium structures. Topsoil, subsoil, existing fill, and any other unsuitable materials should be removed from beneath the columbarium area prior to fill placement and foundation construction.

All unsuitable materials and existing fill should be removed from the proposed columbarium area to a limit defined by a 1-horizontal to 1-vertical slope extending downward and outward from two feet outside the edges of the columbarium area footprint to firm undisturbed glacial outwash. Following the over-excavation, and prior to the placement of fill, the soil subgrade should be surface compacted with a minimum of six passes of a vibratory roller having a drum weight of at least 10,000 pounds and a dynamic force of at least 20,000 pounds. All areas not accessible to large vibratory rollers should be compacted with ten passes of a walk-behind compactor having a centrifugal force rated not less than 1,000 pounds. Should the subgrade soils become disturbed during construction, they should be over-excavated by 6 to 12 inches and replaced by "Sand-Gravel Fill" or "3/4-Inch Crushed Stone" placed over a layer of filter fabric similar to Mirafi FW700 for separation and in accordance with the recommendations of this report.

Care must be taken if the soils are wet so as not to cause weaving and softening of the subgrade. If subgrade soils are saturated, static rolling may be more appropriate. If saturated soils resulting from precipitation or groundwater are encountered at subgrade elevations and cannot be compacted, the subgrade could either be left to dry to a workable moisture content and be re-compacted or be replaced. If the subgrade is to be replaced, the subgrade should be over-excavated by 6 to 12 inches and replaced by "Sand-Gravel Fill" or "3/4-Inch Crushed Stone" placed over a layer of filter fabric similar to Mirafi FW700 for separation and in accordance with the recommendations of this report. Placement of crushed stone should be performed in horizontal lifts and compacted with vibratory compaction equipment until a non-yielding surface is observed. Boulders encountered within excavations for columbarium area should be removed to a depth of at least 12 inches below the bottom of footings. Voids that result from boulder excavations should be filled with compacted "Granular Fill", or crushed stone if the subgrade is wet as described above.

Structural fill consisting of "Granular Fill" and/or "Sand-Gravel Fill" should then be placed to the proposed bottom of footing and/or slab subgrade elevations. Structural fill and backfill should be placed and compacted in horizontal lifts. The maximum loose lift thickness should be 12 inches for vibratory rollers and 6 inches for plate compactors. Structural fill in the columbarium area and foundation bearing zones should be compacted to 95% of the maximum dry density as determined by the modified Proctor test (ASTM D1557). Fill placed outside the bearing zone, beyond the 1H:1V slope defined above, should consist of "Granular Fill" compacted to 92% of the maximum dry density. Soils placed within 3 feet of paved surfaces as either the subbase or base course for pavement or as structural backfill for retaining walls or other structures should be compacted to 95% of the maximum dry density as determined by the modified Proctor test. The existing fill can be reused as backfill in these areas, provided that it is culled of boulders and deleterious material and that proper placement and compaction techniques are followed.

General Foundation Recommendations

A net allowable bearing pressure of 4,000 pounds per square foot (psf) should be used for design of footings bearing on undisturbed glacial outwash and/or compacted structural fill. For footings less than three feet wide, the allowable bearing pressure should be reduced proportionately, and in no case should continuous footings be less than 18 inches wide, nor isolated footings be less than 24 inches wide. For frost protection, exterior footings should extend at least 4'-0 feet below final exterior grade.

Settlement of foundations bearing on natural, undisturbed glacial outwash or properly placed and compacted structural fill are anticipated to be less than 1 inch and may be expected to occur during construction. The maximum differential settlement between adjacent footings is expected to be less than ½ inch.

Earthwork Recommendations

If construction schedules require earthwork during the winter or spring months, it may be advantageous to initially over-excavate all footing excavations in silty soils by six inches and place a working mat of ¾-inch crushed stone underlain by a layer of filter fabric (Mirafi FW700). The intent of the crushed stone is to mitigate the potential for the subgrade to become disturbed due to groundwater or precipitation which may saturate the silty soils before concrete can be placed and may eliminate the need to re-excavate areas which become disturbed. It is recommended that contract specifications and budgeting reflect the need for the use of crushed stone and filter fabric to stabilize wet subgrades.

Demolition of Existing Utilities

Active underground utilities within the project area will likely need to be removed or relocated prior to demolition and earthwork activities. It is recommended that GZA be retained during the demolition phase of the project to observe the remediation of any disturbed soils. The remnants of any abandoned underground utilities should be completely demolished and removed from the site prior to commencing earthwork operations for new construction.

Drainage & Dewatering

During construction, run-off from precipitation should be diverted away from excavations to avoid ponding. Sumping of ponded rainfall from excavations may be required. Should the subgrade material exposed in foundation excavations become saturated and disturbed, it should be removed and replaced with compacted "Sand-Gravel Fill" or "Crushed Stone," as discussed previously. Roof drain and surface water runoff should also be directed away from any excavations.

Based on the depth of the existing fill, the measured depths to groundwater, and the groundwater fluctuations that occur in glacial outwash, it is possible that groundwater will be encountered during construction. It is anticipated that any groundwater can be managed with standard construction dewatering practices such as sumps and open pumping techniques.

Fill Materials

All fill should be free from ice, snow, roots, sod, rubbish, rubble, and other deleterious or organic matter. Gradation requirements for the fill materials should meet the requirements tabulated below.

Sieve Size	Percent Finer by Weight		
	Sand-Gravel Fill	Granular Fill	¾-Inch Crushed Stone
*	100	100	-
1½-inch	-	-	-
1¼-inch	-	-	-
¾-inch	-	-	90-100
½-inch	50-85	-	10-50
No. 4	40-75	-	0-5
No. 10	30-60	30-95	-
No. 40	10-35	10-70	-
No. 100	5-20**	-	-
No. 200	0-8	0-10	-

*The maximum recommended stone size is 4 inches where used as a base course below slabs and pavement; elsewhere, maximum stone sizes should be 2/3 of the loose lift thickness.

** The amount passing the No. 100 sieve should be between forty percent (40%) and seventy percent (70%) of that amount passing the No. 40 sieve.

The silty nature of some of the existing site soils and fill may make them susceptible to disturbance from construction operations, particularly under wet working conditions. Material saturated from precipitation or surface runoff may not be able to be properly compacted for reuse as structural fill without drying it first to a workable water content. The on-site soils that

do not meet the gradation requirements for "Granular Fill" may still be used, at the discretion of the Geotechnical Engineer, so long as they can be properly placed and compacted.

Contract Documents and Construction Monitoring

It is recommended that GZA be retained to work with the design team to develop the earthwork specification and review the design of the columbarium structures. GZA personnel should also be in attendance for pre-bid and pre-construction meetings. It is also recommended that GZA be considered to provide submittal reviews and Special Inspections services related to Soils and Foundations during the earthwork and foundation construction phases of the project. Construction services may include verification of subgrade soils, observation of proof rolling operations and placement of fill, performance of field density tests, and in general observe compliance with recommendations in this report and the contract documents. Construction oversight is considered an important part of obtaining quality site improvements.

We trust that this report addresses the geotechnical requirements for this project as they are currently planned. We appreciate the opportunity to have been of service to you and look forward to working with you and the rest of the design team as the project progresses. Please do not hesitate to contact Doug Le Do at (401) 427-2711 or Doug.LeDo@gza.com if there are any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Doug Le Do
Senior Project Manager

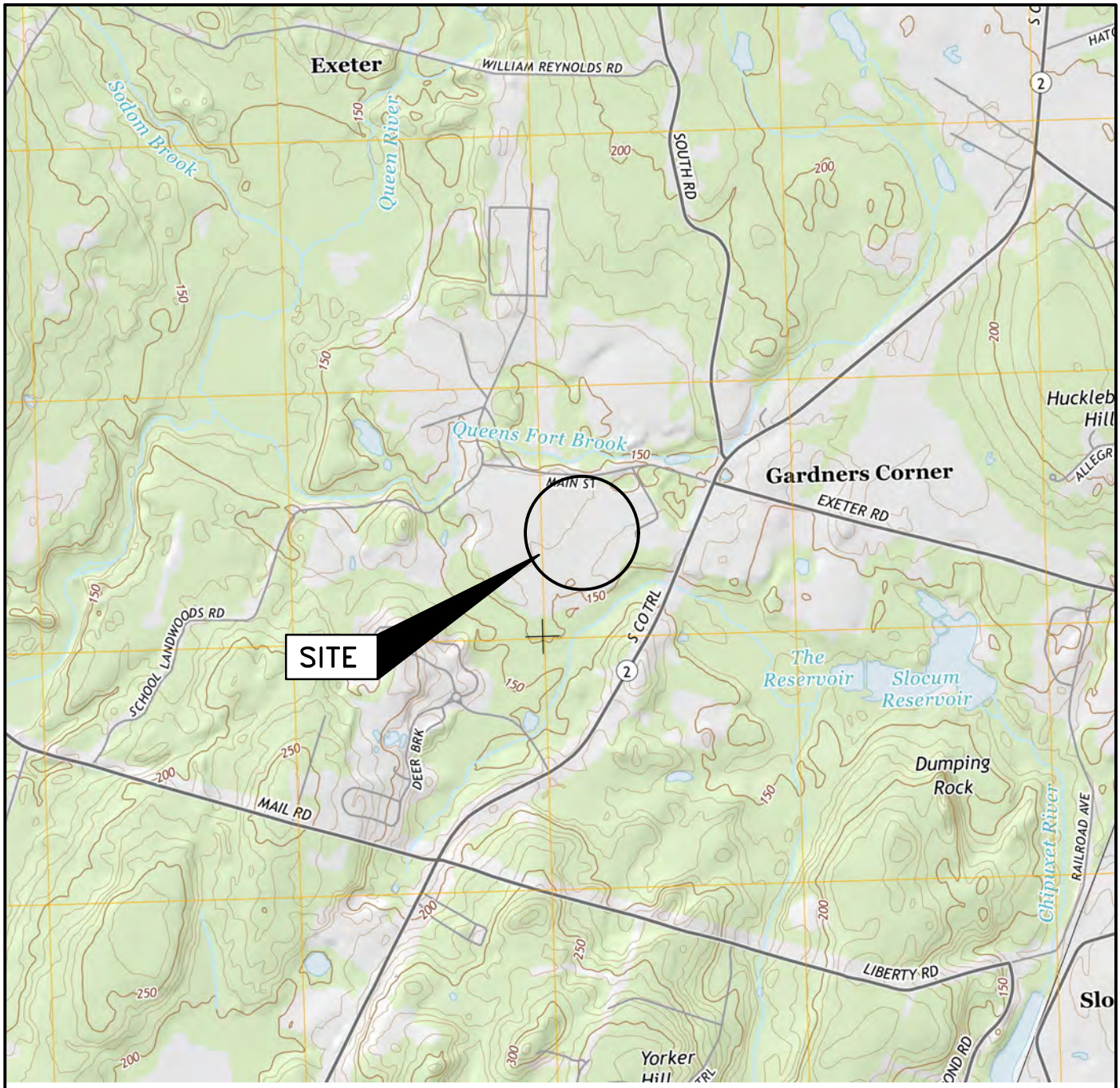
David R. Carchedi, Ph.D., P.E.
Project Reviewer

Russell J. Morgan, P.E.
Principal

Attachments:	Figure 1:	Locus
	Figure 2:	Exploration Location Plan
	Appendix A:	Limitations
	Appendix B:	Previous GZA Subsurface Explorations Logs
	Appendix C:	Recent GZA Subsurface Exploration and Soil Evaluation Logs
	Appendix D:	Geotechnical Laboratory Test Results

FIGURE 1

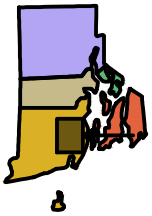
LOCUS PLAN



0 1000' 2000' 4000'

SCALE IN FEET 1" = 2000'

RHODE ISLAND



QUADRANGLE LOCATION

SOURCE:

BASE MAP FROM THE FOLLOWING USGS QUADRANGLE MAP:

(SLOCUM) EXETER (2015)

DIGITAL TOPOGRAPHIC MAPS PROVIDED BY USGSSTORE.GOV.

CONTOUR ELEVATIONS REFERENCE NAVD 88,

CONTOURS ARE SHOWN IN FEET AT 10' INTERVALS

N W E S

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GEOTECHNICAL EVALUATION
RHODE ISLAND VETERANS MEMORIAL CEMETERY
EXETER, RHODE ISLAND

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
BRYANT ASSOCIATES, INC.

LOCUS PLAN

PROJ MGR: DLD	REVIEWED BY: DLD	CHECKED BY: MEA	FIGURE 1
DESIGNED BY: MBL	DRAWN BY: GRB	SCALE: AS NOTED	
DATE: JANUARY, 2020	PROJECT NO. 34428.01	REVISION NO. 0	SHEET NO. 1 OF 2

© 2016 – GZA GeoEnvironmental, Inc. GZA–J:\GEO\34428.01.DLD\FIGURES\CAD\DWGS\34428.01_R0_LOCUS.DWG LOCUS JUNE 12, 2014 GARY BASTIEN

FIGURE 2

EXPLORATION LOCATION PLAN

REFERENCE NOTES:

1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED IN FEBRUARY, 2018.

LEGEND:

GZ-101 — INDICATES BORINGS PERFORMED BY HOFFMAN ENVIRONMENTAL SERVICES AND OBSERVED BY GZA PERSONNEL ON DECEMBER 21, 2019.

TP-101 — INDICATES TEST PITS PERFORMED BY CRYAN LANDSCAPE CONTRACTORS, INC. AND OBSERVED BY GZA PERSONNEL ON DECEMBER 16, 2019.

TP-01 — INDICATES TEST PITS PERFORMED BY CRYAN LANDSCAPING AND OBSERVED BY GZA PERSONNEL ON SEPTEMBER 25 AND 26, 2018.

(OW) — INDICATES OBSERVATION WELL

N
W E
S

0 50' 100' 200'
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

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GEOTECHNICAL EVALUATION
RHODE ISLAND VETERANS MEMORIAL CEMETARY
EXETER, RHODE ISLAND

EXPLORATION LOCATION PLAN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
BRYANT ASSOCIATES, INC.

PROJ MGR: DLD	REVIEWED BY: DLD	CHECKED BY: MEA	FIGURE 2
DESIGNED BY: -	DRAWN BY: GRB	SCALE: AS NOTED	
DATE: JANUARY, 2020	PROJECT NO. 34428.01	REVISION NO. 0	SHEET NO. 1 OF 2

©2016 – GZA GeoEnvironmental, Inc. GZA-J:\GEO\34428.01.DLD\FIGURES\CAD\DWGS\34428.01_R0_EXP.DWG EXP PLAN JANUARY 7, 2020 MICHAEL AUBIN

APPENDIX A

LIMITATIONS

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report,as appropriate, to reflect the unanticipated changed conditions .

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

COST ESTIMATES

11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

ADDITIONAL SERVICES

12. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX B

PREVIOUS GZA SUBSURFACE EXPLORATION LOGS

TEST PIT LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bryant Associates
RI Veterans Memorial Cemetery Survey
Exeter, Rhode Island

EXPLORATION NO.: TP-01
SHEET: 1 of 1
PROJECT NO: 03.0034428.00
REVIEWED BY: Doug Le Do

Logged By: M. Landi
Contractor: Cryan Landscaping
Foreman: Dan Flynn

Boring Location: N168678, E317505.2
Ground Surface Elev. (ft.): 158.225
Date Start: 9/26/2018
Date Finish: 9/26/2018

H. Datum: RI NAD 83 FEET
V. Datum: NAVD 88

Equipment: CAT
Model: 305E2CE
Reach (ft.): 11
Capacity (cu.yd.): 1

Weather: Fog 70's
Time Start: 11:28
Time Finish: 12:13

Groundwater Depth (ft.)

Date	Time	Depth (ft.)	Symbol
9/26/18		NE	▽

Depth (ft)	Depth (ft.)	Stratum Description (Modified Burmister Classification)	Elev. (ft.)	Excavation Effort	Boulder Count Qty./Class	Remark
1	1.0	Brown, fine to coarse SAND, some Silt, little fine to coarse Gravel, little Roots (Topsoil)	156.6	E		
2		Brown, fine to coarse SAND, some fine to coarse Gravel, trace Organics, trace Plastic, trace Silt, 1-2% Cobbles (Fill)		M		
3	3.0		154.6	M		1
4				D		2
5				D		3
6				D		
7		Brown, fine to coarse SAND, some Roots, little fine to coarse Gravel, little Silt, trace Plastic, pockets of Fibrous Peat throughout, slight oganic odor (Fill)		D		
8				D		
9				D		4
10	10.0		147.6	D		5 6
11		End of exploration at 10 feet.				
12						
13						
14						
15						

Test Pit Plan: 10 ft. × 3 ft.
North
Volume = 11 ± cu.yd.

LEGEND: ▽ Observed Water Level

Proportions Used:

Trace (Tr)	0-10%
Little (Li)	10-20%
Some (So)	20-35%
And	35-50%

Excavation Effort:

Easy	E
Moderate	M
Difficult	D

Boulder Size Range Designation:

Diameter	Letter Designation
6 to 16 in.	A
16 to 36 in.	B
> 36 in.	C

REMARKS

1 - Sample S-1 taken from ±2-3' bgs.
2 - Sample S-2 taken from ±3-4' bgs.
3 - Sample S-3 taken from ±4-5' bgs.
4 - Sample S-4 taken from ±8-9' bgs.
5 - Sample S-5 taken from ±9-10' bgs.
6 - End of exploration at ±10' bgs due to extreme sidewall collapse, groundwater not encountered. (NE)

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: TP-01

GZA TEMPLATE TEST PIT; 10/10/2018; 4:41:36 PM

TEST PIT LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bryant Associates
RI Veterans Memorial Cemetery Survey
Exeter, Rhode Island

EXPLORATION NO.: TP-02 (OW)
SHEET: 1 of 1
PROJECT NO: 03.0034428.00
REVIEWED BY: Doug Le Do

Logged By: M. Landi
Contractor: Cryan Landscaping
Foreman: Dan Flynn

Boring Location: N168755.9, E317476.9
Ground Surface Elev. (ft.): 157.618
Date Start: 9/26/2018
Date Finish: 9/26/2018

H. Datum: RI NAD 83 FEET
V. Datum: NAVD 88

Equipment: CAT
Model: 305E2CE
Reach (ft.): 11
Capacity (cu.yd.): 1

Weather: Fog 70's
Time Start: 10:30
Time Finish: 11:15

Groundwater Depth (ft.)			
Date	Time	Depth (ft.)	Symbol
9/26/18		NE	▽
10/8/18	NE		

Depth (ft)	Depth (ft.)	Stratum Description (Modified Burmister Classification)	Elev. (ft.)	Excavation Effort	Boulder Count Qty./Class	Remark
	0.5	Brown, fine to coarse SAND, some Silt, little fine to coarse Gravel, little Roots (Topsoil)	157.7			
1				E		
2		Brown, fine to coarse SAND, some Silt, little fine to coarse Gravel, trace Roots (Fill)		M	1B	1
3				M		
4	4.0		154.2	M		
5						
6	3'	Dark brown, fine to coarse SAND, little Roots, little Organics, little fine to coarse Gravel, trace miscellaneous Urbran Debris, slight organic odor at approximately 6' bgs (Fill)		D		
7				D		2 3
8						
9				D		
10	10.0		148.2	D		4
		End of exploration at 10 feet.				
11						
12						
13						
14						
15						

Test Pit Plan: 13 ft. × 3 ft.
North
Volume = 14 ± cu.yd.

LEGEND: Observed Water Level

Proportions Used:
Trace (Tr) 0-10%
Little (Li) 10-20%
Some (So) 20-35%
And 35-50%

Excavation Effort:
Easy E
Moderate M
Difficult D

Boulder Size Range Designation:

Diameter	Letter Designation
6 to 16 in.	A
16 to 36 in.	B
> 36 in.	C

REMARKS

1 - Sample S-1 taken from ±1-2' bgs.
2 - Sample S-2 taken from ±6-7' bgs.
3 - Large tree stump or root encountered at ±6' bgs; unable to move with excavator; test pit extended 3' to the west.
4 - End of exploration at ±10' bgs due to extreme sidewall collapse; groundwater not encountered (NE); four inch PVC perforated pipe installed for groundwater monitoring.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: TP-02 (OW)

GZA TEMPLATE TEST PIT; 10/10/2018; 4:41:37 PM

APPENDIX C

RECENT GZA SUBSURFACE EXPLORATION LOGS

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bryant Associates
RI Veterans Memorial Cemetary
301 South County Trail
Exeter, RI

EXPLORATION NO.: GZ-101
SHEET: 1 of 1
PROJECT NO: 34428.01
REVIEWED BY: Doug Le Do

Logged By: Jessie Chabot
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: Diedrich D50
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 159
Final Boring Depth (ft.): 21
Date Start - Finish: 12/21/2019 - 12/21/2019

H. Datum: NAD 83
V. Datum: NAVD 88

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 2.25"

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)				
Date	Time	Stab. Time	Water	Casing
12/21/19	10:30	0.5 Hours	14'	15'

Depth (ft)	Casing Blows/ (Core Rate)	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description (Modified Burmister Classification)	Remark	Stratum Description	Depth (ft.)	Elev. (ft.)
		S-1	0.0-2.0	24	9	3 3 2 1	5	S-1: Loose, brown SILT, little coarse Gravel, little fine Sand, trace Organics (roots, grass), moist (Topsoil)		TOPSOIL	1	158.0
		S-2	2.0-4.0	24	7	1 1 1 1	2	S-2: Very loose, dark brown fine to coarse SAND and fine to coarse Gravel, little silt, trace Organics (wood), moist		SANDY FILL		
5		S-3	4.0-6.0	24	1	1 1 1 2	2	S-3: Very loose, brown fine to medium SAND, little fine Gravel, trace Silt, moist				
		S-4	6.0-8.0	24	1	3 4 3 3	7	S-4: Loose, brown, coarse GRAVEL, trace fine to medium Sand, trace Silt, moist	1		8	151.0
10		S-5	9.0-11.0	24	4	5 3 5 6	8	S-5: Loose, brown, fine to coarse GRAVEL and fine to coarse Sand, trace Silt, moist		GLACIAL OUTWASH		
15		S-6	14.0-16.0	24	14	4 6 8 7	14	S-6: Medium dense, brown fine to coarse SAND, trace fine Gravel, trace Silt, Saturated	2			
20		S-7	19.0-21.0	24	12	20 13 7 9	20	S-7: Medium dense, brown fine to coarse SAND, trace Silt	3		21	138.0
								End of exploration at 21 feet				
25												
30												

REMARKS

1 - Auger grinding while drilling from ±2' to 8' bgs. Driller informed GZA that the auger was drilling through cobbles/boulders.
2 - Driller introduced water to the drill rods after collecting sample S-6.
3 - End of exploration at ±21' bgs.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-101

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/8/20 11:28 - J:\GINT PROJECT DATABASES\34428.01_RI VETERANS MEMORIAL CEMETARY.GPJ

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bryant Associates
RI Veterans Memorial Cemetary
301 South County Trail
Exeter, RI

EXPLORATION NO.: GZ-102
SHEET: 1 of 1
PROJECT NO: 34428.01
REVIEWED BY: Doug Le Do

Logged By: Jessie Chabot
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: Diedrich D50
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 159
Final Boring Depth (ft.): 21
Date Start - Finish: 12/21/2019 - 12/21/2019

H. Datum: NAD 83
V. Datum: NAVD 88

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 2.25"

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
12/21/19	12:00	0.5 Hours	15.5'	15'

Depth (ft)	Casing Blows/ (Core Rate)	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description (Modified Burmister Classification)	Remark	Stratum Description	Depth (ft.)	Elev. (ft.)
		S-1	0.0-1.0	12	3	6 8		S-1: Brown SILT, some coarse Gravel, trace fine to medium Sand, trace Organics (roots, grass), moist (Topsoil)	1	TOPSOIL	1	158.0
										INFERRED BOULDERS/COBBLES	3	156.0
		S-2	3.0-5.0	24	12	8 8 3 2	11	S-2: Medium dense, brown fine SAND and SILT, trace fine Gravel, moist				
5		S-3	5.0-7.0	24	6	1 2 9 10	11	S-3: Medium dense, brown SILT, some fine to coarse Gravel, some fine coarse Sand, moist		SANDY FILL	7	152.0
		S-4	7.0-9.0	24	20	4 5 3 3	8	S-4: Top 1": Brown fine SAND and SILT, little fine to coarse Gravel, moist Middle 15": Dark brown SILT, trace Organics (roots), moist Bottom 4": Brown SILT, trace fine Gravel, moist		BURIED TOPSOIL	8.25	150.8
10		S-5	9.0-11.0	24	12	3 3 3 2	6	S-5: Loose, brown SILT, moist				
15		S-6	14.0-16.0	24	18	3 4 8 17	12	S-6: Top 18": Medium dense, light gray SILT, trace fine to medium Sand, moist Tip of spoon: Black and brown fine to medium SAND, trace Silt, trace fine Gravel, moist		GLACIAL OUTWASH		
20		S-7	19.0-21.0	24	11	7 12 12 11	24	S-7: Medium dense, brown fine SAND and fine to coarse Gravel, trace Silt, saturated	2		21	138.0
								End of exploration at 21 feet				
25												
30												

REMARKS

1 - Spoon kicked out of position while collecting sample S-1. Driller stopped driving spoon and augered to ±3' bgs. Auger grinding while drilling from ±1'-3' (likely boulders).
2 - End of exploration at ±21' bgs.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-102

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/8/20 11:28 - J:\GINT PROJECT DATABASES\34428.01_RI VETERANS MEMORIAL CEMETARY.GPJ

TEST PIT LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bryant Associates
RI Veterans Memorial Cemetary
301 South County Trail
Exeter, RI

EXPLORATION NO.: TP-101 (OW)
SHEET: 1 of 1 **PROJECT NO:** 34428.01 **REVIEWED BY:** Doug Le Do

Logged By: Jessie Chabot
Contractor: Cryan Landscape
Foreman: Dan Flynn

Boring Location: See Plan
Ground Surface Elev. (ft.): 159
Date Start: 12/16/2019
Date Finish: 12/16/2019

H. Datum: NAD 83
V. Datum: NAVD 88

Equipment: CAT
Model: 305 EZ CR
Reach (ft.): 11'
Capacity (cu.yd.): 0.25

Weather: Overcast 30's
Time Start: 09:35
Time Finish: 11:30

Groundwater Depth (ft.)			
Date	Time	Depth (ft.)	Symbol
12/16/19	Not Encountered		

Depth (ft)	Stratum Description (Modified Burmister Classification)	Elev. (ft.)	Excavation Effort	Boulder Count Qty./Class	Remark
1	Brown fine SAND, some Silt, trace fine Gravel, trace Organics (roots), dry (Topsoil)	158.0			
2	Dark brown stratified with gray and black fine to medium SAND, some Silt, trace fine Gravel, trace Cobbles, trace Miscellaneous Debris (plastic), trace Organics (wood), moist (Fill)		E		
3			E		
4			E		
5			E		
6			M		
7			M		
8			M		
9		150.0	D		1 2
10	End of exploration at 9 feet.				
11					
12					
13					
14					
15					

Test Pit Plan: 11 ft. × 2.5 ft.
North
Volume = 9 ± cu.yd.

LEGEND: Observed Water Level

Proportions Used:

Trace (Tr)	0-10%
Little (Li)	10-20%
Some (So)	20-35%
And	35-50%

Excavation Effort:

Easy	E
Moderate	M
Difficult	D

Boulder Size Range Designation:

Diameter	Letter Designation
6 to 16 in.	A
16 to 36 in.	B
> 36 in.	C

REMARKS

1 - Removed stump from bottom of excavation at ±9'.
2 - End of exploration at ±9' bgs due to limit of excavator reach; four inch PVC perforated pipe installed for groundwater monitoring.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: TP-101 (OW)

GZA TEMPLATE TEST PIT; 1/3/2020; 4:19:45 PM

TEST PIT LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bryant Associates
RI Veterans Memorial Cemetary
301 South County Trail
Exeter, RI

EXPLORATION NO.: TP-102 (OW)
SHEET: 1 of 1 **PROJECT NO:** 34428.01 **REVIEWED BY:** Doug Le Do

Logged By: Jessie Chabot
Contractor: Cryan Landscape
Foreman: Dan Flynn

Boring Location: See Plan
Ground Surface Elev. (ft.): 159
Date Start: 12/16/2019
Date Finish: 12/16/2019

H. Datum: NAD 83
V. Datum: NAVD 88

Equipment: CAT
Model: 305 EZ CR
Reach (ft.): 11'
Capacity (cu.yd.): 0.25

Weather: Overcast 30's
Time Start: 09:10
Time Finish: 11:45

Groundwater Depth (ft.)			
Date	Time	Depth (ft.)	Symbol
12/16/19	Not Encountered		

Depth (ft)	Stratum Description (Modified Burmister Classification)	Elev. (ft.)	Excavation Effort	Boulder Count Qty./Class	Remark
1	Brown fine SAND, some Silt, trace fine Gravel, trace Organics (roots), dry (Topsoil)	158.0	E		
2	Light brown, fine to medium SAND, some Silt, little fine to coarse Gravel, trace Cobbles, moist (Subsoil)	157.0	E		
3	Brown fine to medium SAND, little Silt, little fine to coarse Gravel, trace Cobbles, moist (Fill)		E	1C	
4			E		
5			E		
6			M		
7			M		
8			M		
9		150.0			1
10	End of exploration at 9 feet.				
11					
12					
13					
14					
15					

Test Pit Plan: 11 ft. × 2.5 ft. **North**
Volume = 9 ± cu.yd.

LEGEND: Observed Water Level

Proportions Used: Trace (Tr) 0-10%; Little (Li) 10-20%; Some (So) 20-35%; And 35-50%

Excavation Effort: Easy E; Moderate M; Difficult D

Boulder Size Range Designation:

Diameter	Letter Designation
6 to 16 in.	A
16 to 36 in.	B
> 36 in.	C

REMARKS
1 - End of exploration at ±9' bgs due to limit of excavator reach; four inch PVC perforated pipe installed for groundwater monitoring.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: TP-102 (OW)

GZA TEMPLATE TEST PIT; 1/3/2020; 4:19:46 PM

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** NA

Property Owner: State of Rhode Island
Property Location: AP 67-1 Lot 6 & AP 67-4 Lot 1 Exeter, RI
Date of Test Hole: December 16, 2019
Soil Evaluator: Chris Sutter License Number: D-4077
Weather: Overcast, 30's Shaded: Yes ☐ No ☑ Time: 8:00 am

TH 101 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM1	0-72"	C	S						mixed/sandy			Fill
HTM2	72-90"	C	S						mixed			Fill
HTM3	90-120"								silty			Fill

TH 102 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM	0-108"								mixed			Fill

TH 1 Soil Class HTM/Fill Total Depth 120" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 96" (og)
TH 2 Soil Class HTM/Fill Total Depth 108" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 96" (og)

Comments:
Note: Moisture/saturation at 108" in TH 1 and TH 2. No free water or seepage observed

APPENDIX D

GEOTECHNICAL LABORATORY TEST REULTS

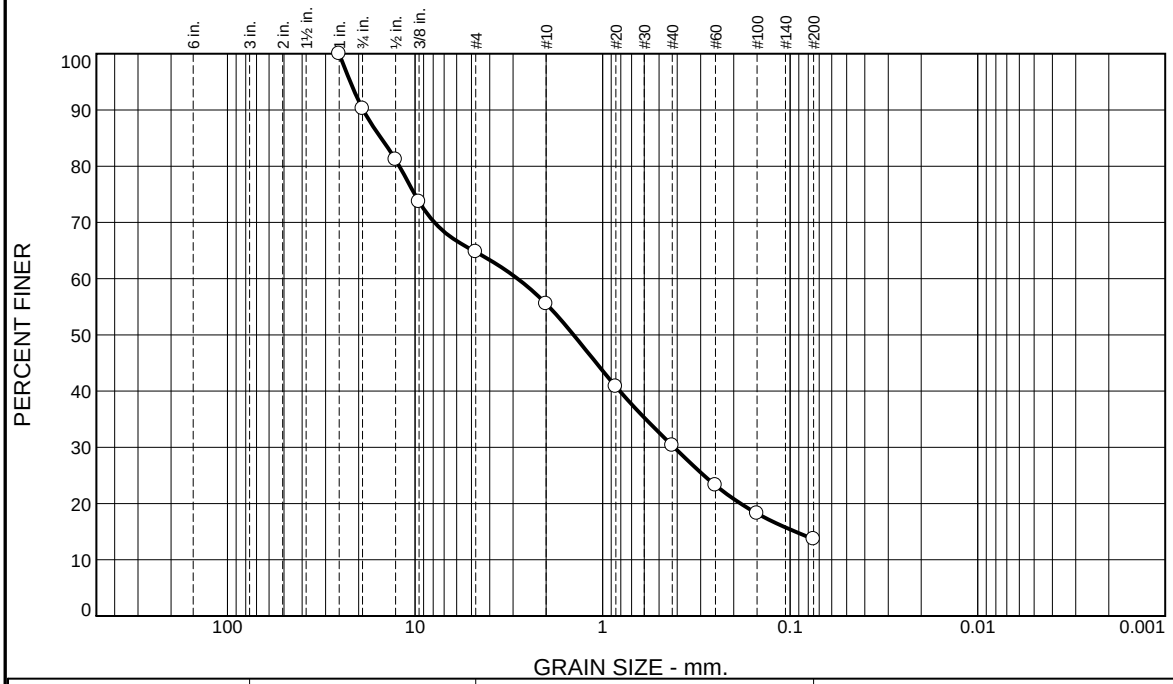
THIELSCH ENGINEERING	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 thielsch.com *Let's Build a Solid Foundation*	Client Information: GZA GeoEnvironmental Providence, RI PM: Doug Le Do Assigned By: Jessie Batalon Collected By: Jessie Batalon	Project Information: **RI Veteran's Memorial Cemetary Columbarium Project** **301 S. county Trail, Exeter, RI** GZA Project Number: 03.0034428.01 Summary Page: 1 of 1 Report Date: 01.07.20

LABORATORY TESTING DATA SHEET, Report No.: 7420-A-105

Boring ID	Sample No.	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) / W_{opt} (%)	γ_d MAX (pcf) / W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
GZ-101	S-2	2-4	20-S-0029				35.2	51.1	13.7											Dark Brown f-c SAND and f-c GRAVEL, little Silt
GZ-101	S-5	9-11	20-S-0030				46.0	44.0	10.0											Brown f-c GRAVEL and f-c SAND, trace Silt
GZ-102	S-3	5-7	20-S-0031				31.2	30.3	38.5											Brown SILT, some f-c Gravel, some f-c Sand
GZ-102	S-6A	14-16	20-S-0032				0.0	1.9	98.1											Light Gray SILT, trace f-m Sand

Date Received: 01.03.20 Reviewed By: Date Reviewed: 01.07.2020

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.8	25.4	9.3	25.2	16.6	13.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	90.2		
0.5"	81.2		
0.375"	73.7		
#4	64.8		
#10	55.5		
#20	40.8		
#40	30.3		
#60	23.2		
#100	18.2		
#200	13.7		

* (no specification provided)

Material Description

Dark Brown f-c SAND and f-c GRAVEL, little Silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 18.8977 D_{85}= 15.1765 D_{60}= 2.8412
D_{50}= 1.4273 D_{30}= 0.4154 D_{15}= 0.0938
D_{10}= C_u= C_c=

Remarks

Date Received: 01.03.20 **Date Tested:** 01.07.20

Tested By: JM / IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

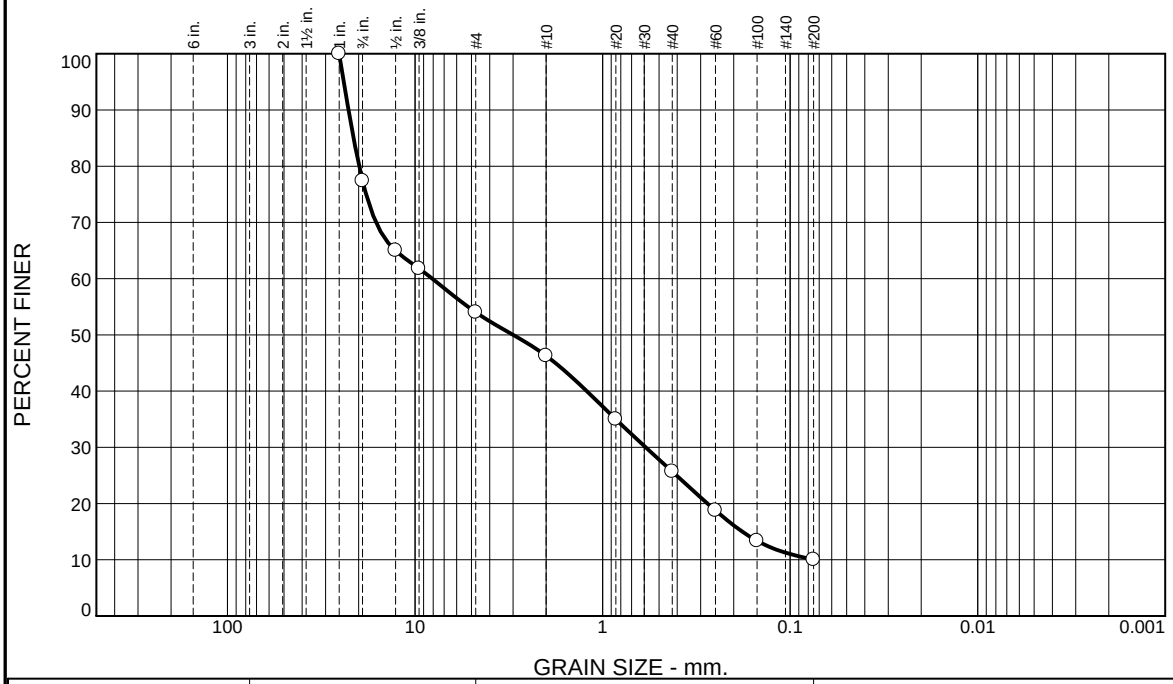
Source of Sample: Boring **Depth:** 2-4' **Date Sampled:**
Sample Number: GZ-101 / S-2

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: RI Veteran's Memorial Cemetary Columbarium Project
301 S. County Trail, Exeter. RI
Project No: 03.0034428.01 **Figure** 20-S-0029

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.6	23.4	7.7	20.6	15.7	10.0	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	77.4		
0.5"	65.0		
0.375"	61.8		
#4	54.0		
#10	46.3		
#20	35.0		
#40	25.7		
#60	18.8		
#100	13.4		
#200	10.0		

* (no specification provided)

Material Description

Brown f-c GRAVEL and f-c SAND, trace Silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= GP-GM **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 22.6312 D_{85}= 21.2704 D_{60}= 8.0897
D_{50}= 2.9993 D_{30}= 0.5890 D_{15}= 0.1797
D_{10}= C_u= C_c=

Remarks

Date Received: 01.03.20 **Date Tested:** 01.07.20

Tested By: JM / IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

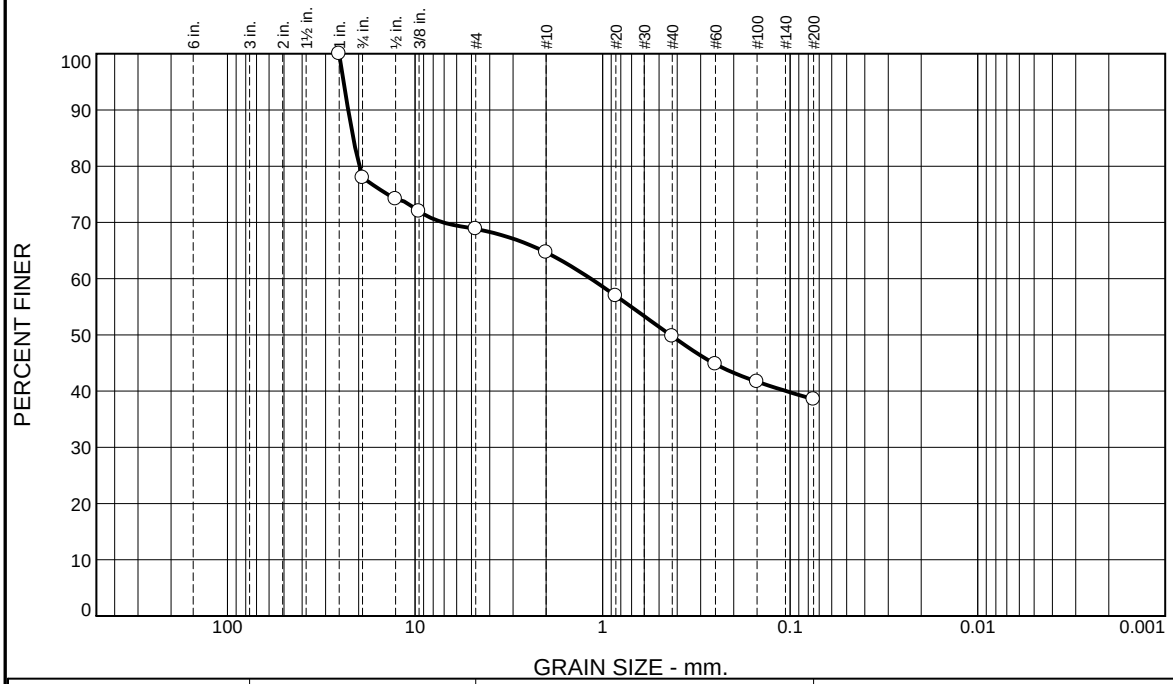
Source of Sample: Boring **Depth:** 9-11'
Sample Number: GZ-101 / S-5 **Date Sampled:**

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: RI Veteran's Memorial Cemetary Columbarium Project
301 S. County Trail, Exeter. RI
Project No: 03.0034428.01 **Figure** 20-S-0030

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.0	9.2	4.1	14.9	11.3	38.5	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	78.0		
0.5"	74.2		
0.375"	72.0		
#4	68.8		
#10	64.7		
#20	56.9		
#40	49.8		
#60	44.8		
#100	41.7		
#200	38.5		

* (no specification provided)

Material Description

Brown SILT, some f-c Gravel, some f-c Sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= GM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 22.7164 D_{85}= 21.3472 D_{60}= 1.1570
D_{50}= 0.4351 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 01.03.20 **Date Tested:** 01.07.20

Tested By: JM / IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Boring **Depth:** 5-7' **Date Sampled:**
Sample Number: GZ-102 / S-3

Thielsch Engineering Inc.

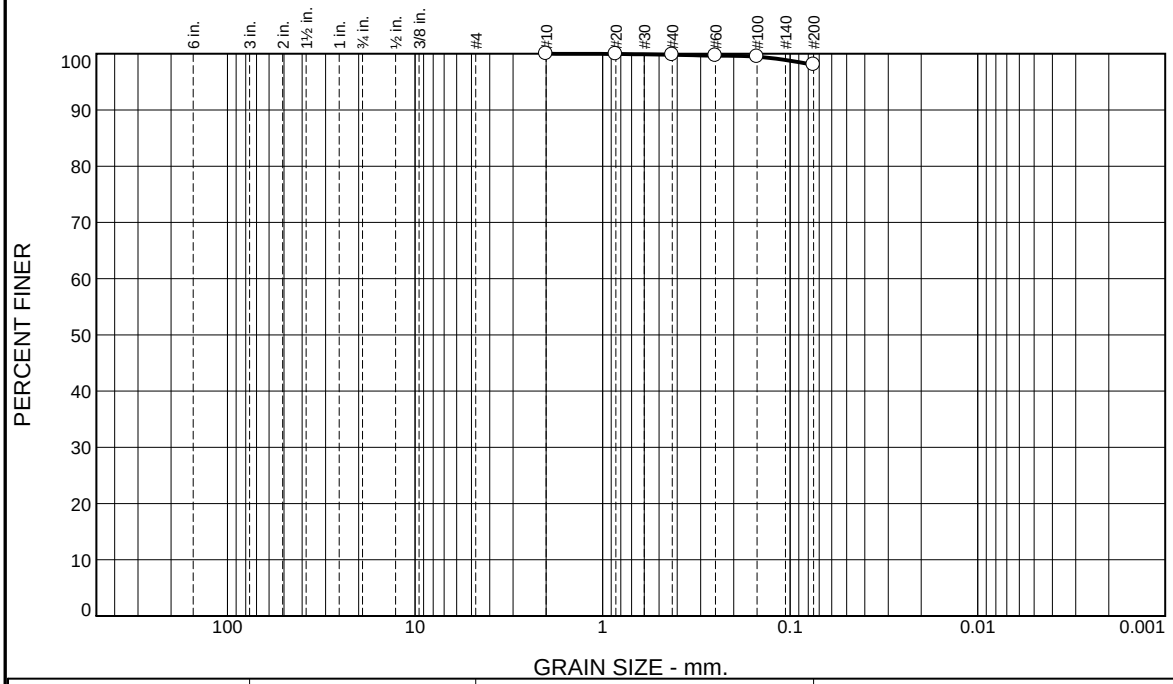
Cranston, RI

Client: GZA GeoEnvironmental

Project: RI Veteran's Memorial Cemetary Columbarium Project
301 S. County Trail, Exeter. RI

Project No: 03.0034428.01 **Figure** 20-S-0031

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	1.7	98.1	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.7		
#100	99.5		
#200	98.1		

* (no specification provided)

Material Description

Light Gray CLAYEY SILT, trace f-m Sand

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/4".

Date Received: 01.03.20 **Date Tested:** 01.07.20

Tested By: JM / IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Boring **Depth:** 14-16' **Date Sampled:**
Sample Number: GZ-102 / S-6A

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental

Project: RI Veteran's Memorial Cemetary Columbarium Project
301 S. County Trail, Exeter. RI

Project No: 03.0034428.01 **Figure** 20-S-0032

REFERENCE B

Hager-Richter Geoscience, Inc.

Utility Location Survey
RIVMC – Columbarium Project
301 South County Trail
Exeter, Rhode Island

Dated December, 2019,
File 19J44

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HAGER-RICHTER
GEOSCIENCE, INC.

UTILITY LOCATION SURVEY
RIVMC – COLUMBARIUM PROJECT
301 SOUTH COUNTY TRAIL
EXETER, RHODE ISLAND

Prepared for:

Bryant Associates, Inc.
90 Canal Street
Boston, Massachusetts

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079

File 19J44
December, 2019

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HAGER-RICHTER
GEOSCIENCE, INC.

GEOPHYSICS FOR THE ENGINEERING COMMUNITY
SALEM, NEW HAMPSHIRE
Tel: 603.893.9944
FORDS, NEW JERSEY
Tel: 732.661.0555

January 8, 2020
File 19J44

Teresa M. Capuano
Project Manager
Bryant Associates, Inc.
90 Canal Street
Boston, Massachusetts

Tel: 617-248-0300
Dir: 617-294-5920
Cell: 617-997-5763
Email: TCapuano@bryant-engrs.com

RE: Utility Location Survey
RIVMC – Columbarium Project
301 South County Trail
Exeter, Rhode Island

Dear Ms. Capuano:

In this report, we summarize the results of a geophysical survey conducted by Hager-Richter Geoscience, Inc. (HRGS) at the above referenced site in Exeter, Rhode Island for Bryant Associates, Inc. (Bryant) in December, 2019. The scope of the survey and area of interest were specified by Bryant. Bryant was provided with a Google Earth kmz file[1] on December 13, 2019, summarizing the locations of utilities detected at the time of the survey and a potential conflict with the marked location of a proposed boring.

INTRODUCTION

The site was at the Rhode Island Veterans Memorial Cemetery (RIVMC), located in Exeter, Rhode Island. The general location of the site is shown in Figure 1. As part of planning for possible expansion of the cemetery, Bryant requested a geophysical survey to search for underground utilities and other subsurface obstructions in an approximately 1-acre area of interest (AOI). In addition, Bryant requested information on potential conflicts between detected subsurface utilities and the marked locations of two borings (GZ-101 and GZ 102) and two test pits (TP-101 and TP-102).

The specified AOI was located along the northeast side of the main circular drive between existing columbaria CW-1 in the south and CW-2 in the north. The approximate limits of the geophysical survey are shown in Figure 2. The ground surface in the specified AOI is a combination of grassy lawn and paved roadways and walkways.

[1] RIVMC-HRGS-Survey-121219-Field Markings.kmz, dated December 13, 2019.

OBJECTIVE

The objective of the geophysical survey was to detect, and if detected, to locate subsurface utilities or other subsurface obstructions in the accessible portions of the specified area of interest.

THE SURVEY

Steven Grant, P.G., and Bryan Carnahan of HRGS conducted the geophysical survey on December 12, 2019. The project was coordinated with Teresa M. Capuano of Bryant, who specified the limits of the areas of interest. The area of interest was unobstructed, with the exception of a few small trees. A light snow cover over grassy areas did not adversely affect the survey. Photograph 1, below, shows typical conditions at the site.

Photograph 1. Southeast portion of the area of interest, view to the southeast. Existing columbarium CW-1 is visible behind the trees in the upper left of the photograph.

The geophysical survey of the specified area of interest was conducted using three (3) complementary methods: time domain electromagnetic induction metal detection (EM), ground penetrating radar (GPR), and precision utility location (PUL).

The EM data were acquired at approximately 8-inch intervals along lines spaced 5 feet apart across the accessible portions of most of the specified area of interest. The EM method detects

buried metal. However, the EM method cannot provide information on the type of objects causing an EM anomaly.

GPR data were acquired along traverses oriented in two mutually perpendicular directions, with lines spaced no more than 10 feet apart across the accessible portions of the areas of interest. The GPR method is capable of detecting both metal and nonmetal objects.

The PUL method was used to search for subsurface utilities in the areas of interest by passively searching for signals from active electric lines and by actively tracing signals applied by direct connections to accessible utility structures such as, conduits, hydrants, valves, and other exposed pipes or conduits.

A local survey grid was established in the interest for the acquisition of the geophysical data. The locations of utilities detected at the time of the survey were marked on site and their locations were recorded for inclusion on the site plan. The geophysical data were reviewed in the office and additional utility segments and other structures were identified, and their locations are shown on the plan included in this report. The survey grids and other site features were georeferenced using a Trimble Geo7X CM GPS system utilizing a Zephyr-2 external antenna. The results of the survey are presented relative to the Massachusetts State Plane System, NAD 1983 (CORS 96).

EQUIPMENT

EM61. The EM survey was conducted using a Geonics EM61-MK2 time domain electromagnetic induction metal detector. The EM61-MK2 instrument was designed specifically for detecting buried metal objects such as utilities, underground storage tanks (USTs), and drums. An air-cored transmitter coil generates a pulsed primary magnetic field in the earth, thereby inducing eddy currents in nearby metal objects. The eddy current produces a secondary magnetic field that is sensed by two receiver coils, one coincident with the transmitter and one positioned 40 cm above the main coil. By measuring the secondary magnetic field after the current in the ground has dissipated but before the current in metal objects has dissipated, the instrument responds only to the secondary magnetic field produced by metal objects. Four channels of secondary response are measured in mV and are recorded on a digital data logger. The system is generally operated by pushing the coils configured as a wagon with an odometer mounted on the axle to trigger the data logger automatically at approximately 8-inch intervals.

GPR. The GPR survey was conducted using a GSSI UtilityScan Dual Frequency digital subsurface imaging radar system. The system includes a survey wheel that triggers the recording of the data at fixed intervals, thereby ensuring the accuracy of the features detected along the survey lines. The system was used with 800 MHz and 300 MHz antennae. Data were recorded using 35 and 65 ns[2] time windows for the 800 MHz antenna and 300 MHz antenna, respectively.

[2] ns, abbreviation for nanosecond, 1/1,000,000,000 second. Light and the GPR signal require about 1 ns to travel 1 ft in air. The GPR signal requires about 3.5 ns to travel 1 ft in unsaturated sandy soil.

GPR uses a high-frequency electromagnetic pulse (referred to herein as “radar signal”) transmitted from a radar antenna to probe the subsurface. The transmitted radar signals are reflected from subsurface interfaces of materials with contrasting electrical properties. Travel times of the radar signal can be converted to approximate depth below the surface by correlation with targets of known depths and by a curve matching routine. We monitor the acquisition of GPR data in the field and record the GPR data digitally for subsequent processing. Interpretation of the records is based on the nature and intensity of the reflected signals and on the resulting patterns.

Data from the GPR survey were processed using RADAN 7.4 GPR processing software from Geophysical Survey Systems, Inc. We reviewed profile images of the GPR data. Interpretation of the records is based on the nature and intensity of the reflected signals and on the resulting patterns.

PUL. The PUL survey was conducted using a Radiodetection RD 8000 series PUL instrument. The RD 8000 series consists of separate transmitter and receiver. The system can be used in "passive" and "active" modes to locate buried pipes by detecting electromagnetic signals carried by the pipes. In the "passive" mode, only the receiver unit is used to detect signals carried by the pipe from nearby power lines, live signals transmitted along underground power cables, or very low frequency radio signals resulting from long wave radio transmissions that flow along buried conductors. In the "active" mode of operation, the transmitter is used to induce a signal on a target pipe, and the receiver is used to trace the signal along the length of the pipe. Our system uses a 10W transmitter.

LIMITATIONS OF THE METHODS

> HRGS MAKES NO GUARANTEE THAT ALL TARGETS WERE DETECTED IN THIS SURVEY. HRGS IS NOT RESPONSIBLE FOR DETECTING TARGETS THAT CANNOT BE DETECTED BY THE METHODS EMPLOYED OR BECAUSE OF SITE CONDITIONS. GPR SIGNAL PENETRATION MIGHT NOT BE SUFFICIENT TO DETECT ALL TARGETS.

Field mark-outs. Utilities detected by the PUL method at the time of the survey are marked in the field. Adverse weather and site conditions (rain, uneven surfaces, high traffic, etc.) can hamper in-field interpretation. Mark-outs made on wet pavement, sand or gravel surfaces, or in active construction zones may not last. HRGS is not responsible for maintaining utility mark-outs after leaving the work area.

EM61. The EM61 cannot detect non-metallic objects. The data from an EM61 survey are adversely affected by surface metal. The EM61 has a depth sensitivity limited to about 12 feet. The instrument is relatively cumbersome and works best where the transmit and receive coils can be hand pushed in a small wagon.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a metal object, and the electromagnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.?). Although the EM data cannot be used to identify all buried metal objects, they provide excellent guides to the identification of some objects. For example, buried metal utilities produce anomalies with lengths many times their widths.

GPR. There are limitations of the GPR technique as used to detect and/or locate targets such as those of the objectives of this survey. Limitations include: (1) surface conditions, (2) electrical conductivity of the ground, (3) contrast of the electrical properties of the target and the surrounding soil, and (4) spacing of the traverses. Of these restrictions, only the last is controllable by us.

The condition of the ground surface can affect the quality of the GPR data and the depth of penetration of the GPR signal. Sites covered with high grass, bushes, landscape structures, debris, obstacles, soil mounds, etc. limit the survey access and the coupling of the GPR antenna with the ground. In many cases, the GPR signal will not penetrate below concrete pavement, especially inside buildings, and a target may not be detectable. The GPR method also commonly does not provide useful data under canopies found at some facilities.

The electrical conductivity of the ground determines the attenuation of the GPR signal and thereby limits the maximum depth of exploration. For example, the GPR signal does not penetrate clay-rich soils, and targets buried in clay might not be detected.

A definite contrast in the electrical conductivities of the surrounding ground and the target material is required to obtain a reflection of the GPR signal. If the contrast is too small, possibly due to construction details or deeply corroded metal in the target, then the reflection may be too weak to recognize, and the target can be missed.

Spacing of the traverses is limited by access at many sites, but where flexibility of traverse spacing is possible, the spacing is adjusted to the size of the target. The GPR operator controls the spacing between lines, and the design of the survey is based on the dimensions of the smallest feature of interest. Targets with dimensions smaller than the spacing between GPR survey lines can be missed.

PUL. The PUL equipment cannot detect non-metallic utilities, such as pipes constructed of vitrified clay, transite, plastic, PVC, and unreinforced concrete, when used in passive mode alone. Such pipes can be detected if a wire tracer is installed with access to such tracer for transmission of a signal or where access (such as floor drains and clean-outs) permits insertion of a device on which a signal can be transmitted. In some, but not all cases, the subsurface utility designation equipment cannot detect metal utilities reliably under reinforced concrete because the signal couples onto the metal reinforcing in the concrete. Similarly, the method commonly

cannot be used adjacent to grounded metal structures such as chain link fences and metal guardrails. In congested areas, where several utilities are bundled or located within a short distance of each other, the signal transmitted on one utility can couple onto adjacent utilities, and the accuracy of the location indicated by the instrument decreases.

RESULTS

General. The geophysical survey was conducted using the EM61, GPR, and PUL methods across the accessible portions of the areas of interest specified by Bryant. Figure 2 shows the approximate limits of the geophysical survey. Figure 3 shows a color contour plot of the EM61 differential response for the area of interest. Figure 4 shows an integrated interpretation of the geophysical data in the area of interest.

Bryant was provided with a Google Earth kmz file on December 13, 2019, summarizing the locations of utilities detected at the time of the survey and a potential conflict with the marked location of proposed boring GZ-102.

EM61. The EM61 data were acquired at approximately 8-inch intervals along survey lines spaced 5 feet apart across the accessible portions of most of the areas of interest. As indicated above, the results of the EM61 survey are shown in color contour form in Figure 3. Interpretation of EM61 data is based on the relative response of the instrument in millivolts to local conditions. The instrument is not calibrated to provide an absolute measure of a particular property, such as the conductivity of the soil or the strength of the earth's magnetic field. Subsurface metal objects produce sharply defined positive anomalies when the EM61 is positioned directly over them. Acquiring data at short intervals along closely spaced lines, as was done at the subject site, provides high spatial resolution of the location and footprint of the targets. Thus, buried metal is recognized in contour plots of EM61 data by positive anomalies with spatial dimensions roughly corresponding to the physical dimensions of the buried metal.

Several low- to high-amplitude EM anomalies (blue to red areas) are present within the area of interest, as is evident in Figure 3. Some such anomalies are attributed to surface features containing metal, including a prominent linear high-amplitude EM anomaly in the south corner of the area of interest that is attributed to a reinforced concrete sidewalk. In addition, several small low- to- moderate amplitude EM anomalies are present in the southeast portion of the site or along the circular drive and are attributed to metal tree stakes or signage. We note that the presence or absence of subsurface metal in such areas cannot be determined on the basis of the EM data alone because of the anomalies caused by the surface metal objects.

A high-amplitude EM anomaly not attributable to surface metal is present in the southeast portion of the area of interest, and based on GPR reflections (see below), we infer that a buried metallic object or utility segment is present at this location. A small area of buried metal was detected adjacent to the east side of the circular road. In addition, a linear low-amplitude EM anomaly not attributable to surface metal is present along the side of the circular road and north

of columbarium CW-1 and is attributed to a water line. The locations of the buried metallic object/utility segment, area of possible buried metal, and water line are shown in Figure 4.

GPR Survey and Integrated Interpretation. Apparent GPR signal penetration was fair, with two-way travel time reflections received from approximately 55 to 65 ns of 65 ns acquired for the 300 MHz antenna, and from 30 to 35 of 35 ns acquired for the 800 MHz antenna. Based upon site-specific time-to-depth conversions for the GPR signal, the GPR signal penetration is estimated to have been about 8 to 10 feet for the 300 MHz antenna and about 4 to 5 feet for the for the 800 MHz antenna.

GPR reflections consistent with the presence of a buried object were detected in an area that coincides with the location of a high-amplitude EM anomaly, and we infer that a buried metallic object or utility segment is present at this location. The buried object/utility is approximately 4-5 feet deep, 5-6 feet wide, and at least 10-12 feet long. The location of the buried metallic object/utility segment is shown in Figure 4.

The locations of water and electric lines were inferred from linear alignments of GPR reflectors and/or linear EM anomalies, as well as by direct connection and induction with the PUL instrument. The locations of water and electric lines were marked in the field and their locations are shown in Figure 4.

CONCLUSIONS

Based upon the geophysical survey conducted by HRGS at the Rhode Island Veterans Memorial Cemetery (RIVMC), located in Exeter, Rhode Island for Bryant Associates, Inc., (Bryant) in December 2019, we conclude:

- A buried metal object/utility segment and a small area of buried metal are present
- The locations of water and electric lines were determined

LIMITATIONS ON USE OF THIS REPORT

This letter report was prepared for the exclusive use of Bryant (Client). No other party shall be entitled to rely on this Report, or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (HRGS) in the performance of its work. The Report relates solely to the specific project for which HRGS has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of HRGS. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to HRGS.

HRGS has used reasonable care, skill, competence and judgment in the performance of' its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by HRGS should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, HRGS makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with Bryant Associates, Inc., on this project. We look forward to working with you again in the future.

Sincerely,
HAGER-RICHTER GEOSCIENCE, INC.

Steven Grant, P.G.
Senior Geophysicist

Jeffrey Reid, P.G.
Owner / Principal Geophysicist

Attachments: Figures 1 – 4

N

APPROXIMATE SCALE (feet)

0 1000 2000

LOCATION

NOTE:

Modified from Google Earth Pro aerial photograph.

Figure 1
General Site Location
RIVMC – Columbarium Project
301 South County Trail
Exeter, Rhode Island

File 19J44	January, 2020

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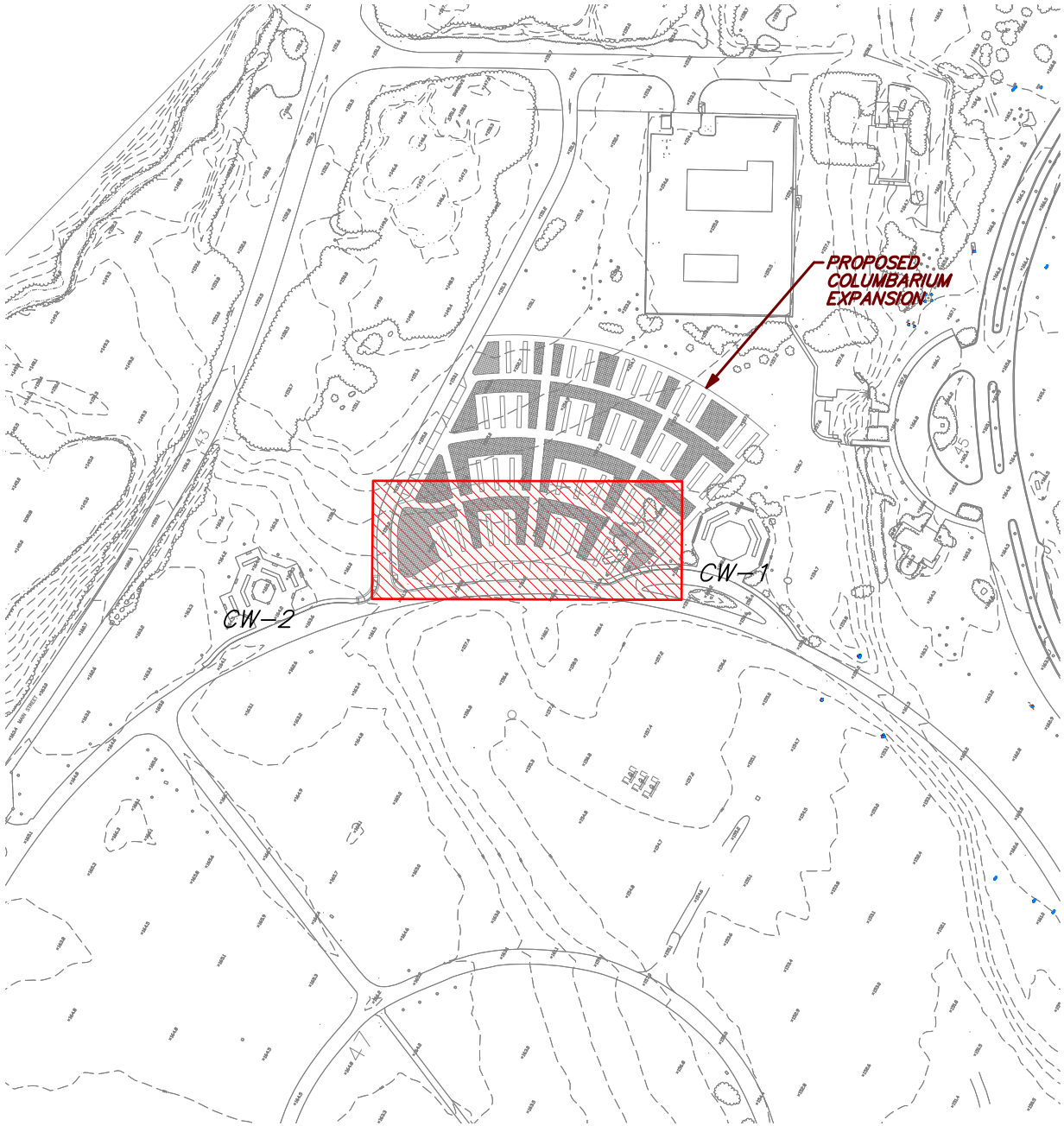
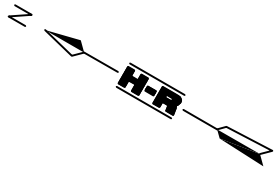
Salem, NH | Fords, NJ





LEGEND

APPROXIMATE LIMITS OF GPR SURVEY AREA

SCALE (feet)

0 200 400

NOTE:

Modified from site plan provided by Bryant Associates, Inc., identified as XR-SITE.dwg.

Figure 2
Site Plan
RIVMC – Columbarium Project
301 South County Trail
Exeter, Rhode Island

File 19J44	January, 2020

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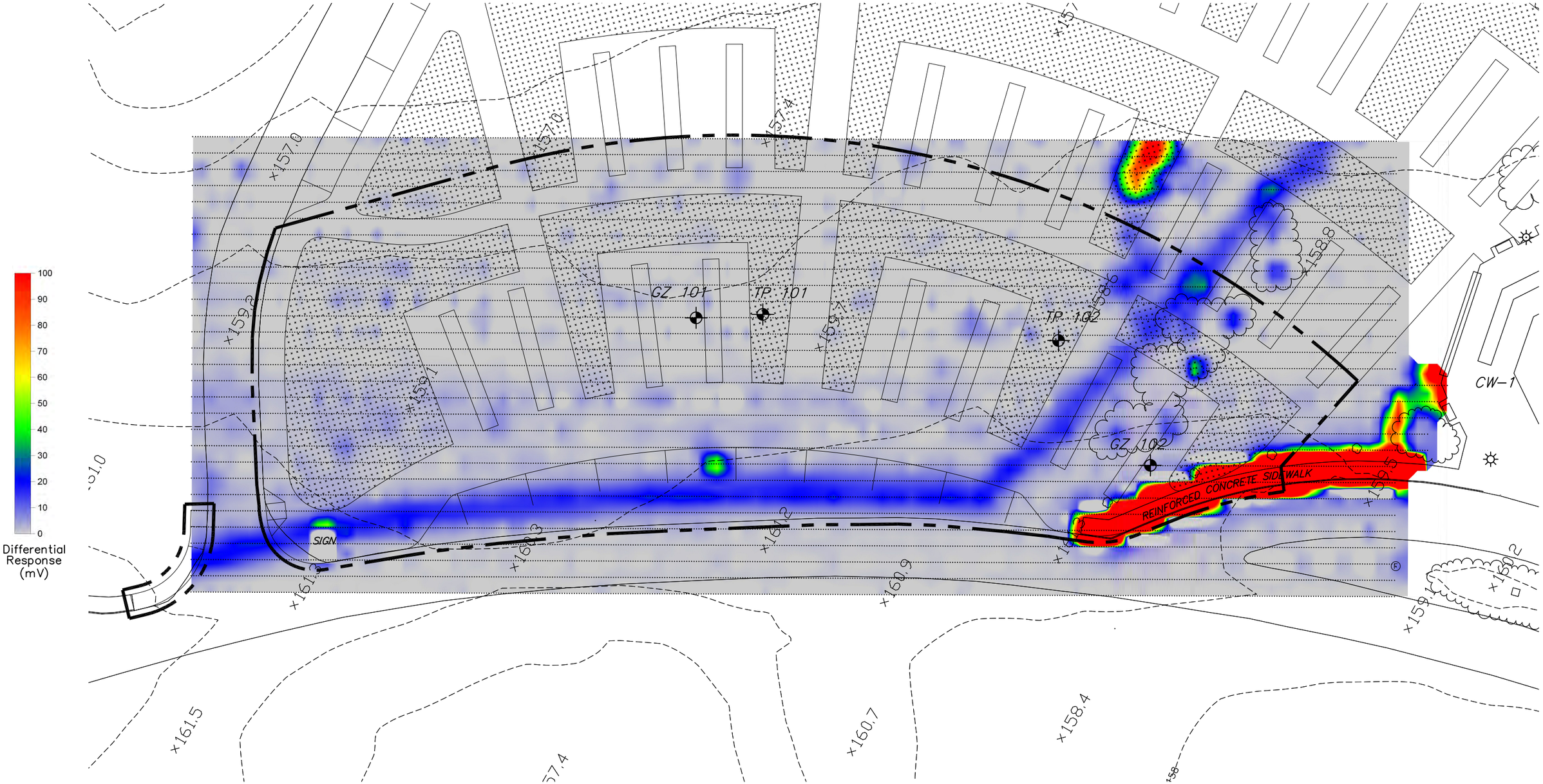

NOTES:

1. Modified from site plan provided by Bryant Associates, Inc., identified as XR–SITE.dwg.
2. Data were acquired with Geonics EM61–MK2. Differential response shown.
3. Differential response equals top coil response – bottom coil response.

SCALE (feet)

0 30 60

LEGEND

DATA STATIONS

LIGHT POLE

BORING

FLAG POLE

N

H-R

Figure 3
EM Survey
RIVMC – Columbarium Project
301 South County Trail
Exeter, Rhode Island

File 19J44	January, 2020

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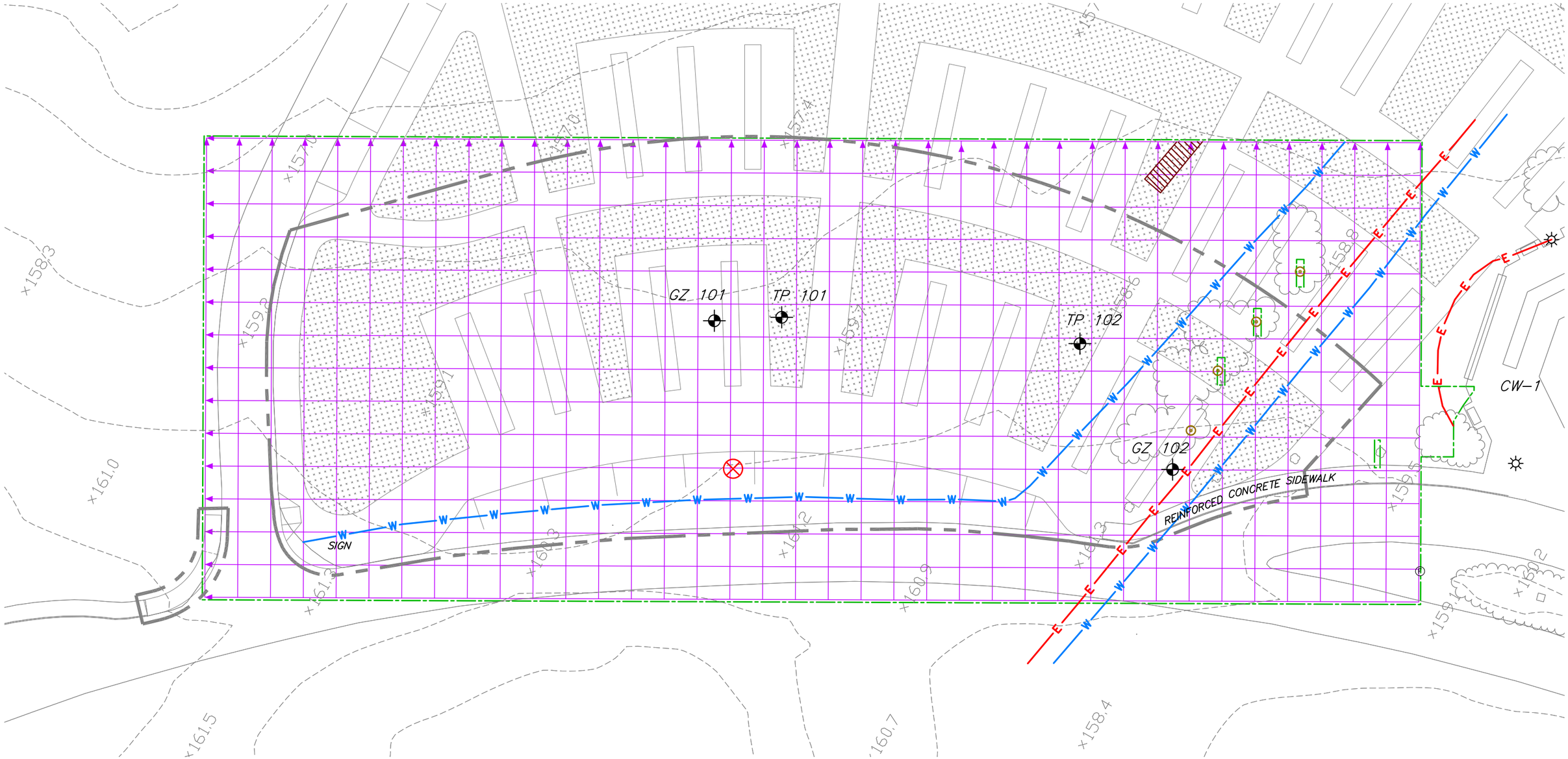

LEGEND

- GPR TRAVERSE
- APPROXIMATE LIMITS OF EM SURVEY AREA
- BURIED OBJECT/POSSIBLE UTILITY SEGMENT
- AREA OF POSSIBLE BURIED METAL
- ELECTRIC LINE
- WATER LINE
- POSSIBLE TREE STAKE
- LIGHT POLE
- BORING
- FLAG POLE

SCALE (feet)

0 30 60

N

NOTE:

Modified from site plan provided by Bryant Associates, Inc., identified as XR-SITE.dwg.

Figure 4
GPR Survey &
Integrated Interpretation
RIVMC – Columbarium Project
301 South County Trail
Exeter, Rhode Island

File 19J44 | January, 2020

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