PROJECT MANUAL

# Steam Upgrades and Improvements
# Fayerweather and Gorham Residence Halls

## University of Rhode Island
## Kingston Campus

November 1, 2021

JCE Job No. 14-35e
URI Job Number KC.R.FAGO.2018.001

ARDEN Engineering Constructors, LLC
An Arden Building Company
505 NARRAGANSETT PARK DR
PAWTUCKET, RI 02861
WWW.ARDENENG.COM
TEL (401) 727-3500
FAX (401) 727-3540

JCE
JOE CASALI ENGINEERING, INC.
CIVIL · SITE DEVELOPMENT · TRANSPORTATION
DRAINAGE · WETLANDS · ISDS · TRAFFIC · FLOODPLAIN
300 POST ROAD, WARWICK, RI 02888
(401) 944-1300 (401)944-1313 FAX WWW.JOECASALI.COM

| | |
|---|---|
| Owner: | State of Rhode Island Board of Education, University of Rhode Island, and State of Rhode Island |
| In care of: | Office of Capital Projects or Office of Campus Planning<br>University of Rhode Island<br>Sherman Building, 50 Tootel Road<br>Kingston, RI 02881<br>Attn: Matthew Jacques, PE<br>401-874-5288 |
| Design Agent: | Joe Casali Engineering, Inc.<br>300 Post Road<br>Warwick, RI 02888<br>Attn: Joseph A. Casali, PE, MBA<br>Attn: Daniel R. DeCesaris, PE<br>401-944-1300 |
| Consultant: | Arden Building Companies LLC<br>505 Narragansett Park Drive<br>Pawtucket, RI 02861<br>Attn: Tim Elliot, PE, LEED AP<br>401-727-3500 |

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**END OF DOCUMENT**

**DOCUMENT 00 5200 – AGREEMENT FORM**

PART 1 – GENERAL

1.1 The Agreement Form to be utilized on this project is AIA Document A101-2017 as amended, a copy of which follows this page.

**END OF DOCUMENT**

# 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 IslandOne Capitol Hill, Second Floor**
**Providence, Rhode Island 02908-5855**
**401.578.8100 (telephone); 401.574.8387 (facsimile)**
**www.puchasing.ri.gov**

**acting by and through,**

**The University of Rhode Island Purchasing Department**
**10 Tootell Road**
**Kingston, Rhode Island 02881**
**401.874.2171 (telephone); 401.874.2306 (facsmilie)**
http://web.uri.edu/purchasing/
**and**
**The University of Rhode Island Board of Trustees**
**35 Campus Ave, Green Hall**
**Kingston, Rhode Island 02881**

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

**The University of Rhode Island**
**Office of Capital Projects**
**60 Tootell Road – Sherman Building**
**Kingston, Rhode Island 02881**
**401.874.2725 (telephone)**

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

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

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

**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.
/

The Owner and Contractor agree as follows.

*(Paragraph Deleted)*

The Owner and Contractor agree as follows.

**TABLE OF ARTICLES**



## 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.

[ ] 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: $_____.

**.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.

**§ 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 30th 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;

.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.

**§ 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 University of Rhode Island Vice President for Administration and Finance pursuant to the provisions of the "Delegation of Limited Procurement Authority," dated January 19, 2018 and 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.***

**§ 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)*

**The University of Rhode Island, Purchasing Department**
**10 Tootell Road**
**Kingston, Rhode Island 02881**
**Paul M. DePace, PE**
**401.874.2725 (telephone)**

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

**The University of Rhode Island**
**Office of Capital Projects**
**60 Tootell Road – Sherman Building**
**Kingston, Rhode Island 02881**
**Paul M. DePace, PE**
**401.874.2725 (telephone)**

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

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

**§ 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)*

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

**.6** Specifications

*(Table Deleted)*

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

**§ 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 THE UNIVERSITY OF RHODE ISLAND PURCHASING DEPARMENT and THE UNIVERSITY OF RHODE ISLAND BOARD OF TRUSTEES**

| | |
|---|---|
| **OWNER** *(Signature)* | **CONTRACTOR** *(Signature)* |
| Abigail RiderVice President, Division of Administration and Finance, University of Rhode Island | |
| *(Printed name and title)* | *(Printed name and title)* |

## DOCUMENT 00 6140 - WAIVER OF LIEN FORM

U. R. I. Document Waiver of Lien Form is included, following this page, as an integral part of the Contract documents. A copy with completed information must be submitted with the second and each succeeding Application for Payment.

**WAIVER OF LIEN FORM - Material or Labor**

UNIVERSITY OF RHODE ISLAND

Construction Project Title: Fayerweather Gorham Steam Replacement

General Contractor: _____

Subcontractor/Supplier: _____

DUNS No.: _____

Application and Certificate for Payment No: _____
(prior to Application accompanying this form)

Schedule of Values Line Item No.: _____

DESCRIPTION OF WORK Heading: _____

Total payment Received, Including Current Payment: $ _____

The undersigned Representative of the above Subcontractor/Supplier has been contracted by the above General Contractor to furnish materials, or labor, or both, as included in the approved Schedule of Values under the Line Item No.___, and DESCRIPTION OF WORK heading indicated above, for the Construction Project listed above.

The undersigned acknowledges receipt of payment, under this Line Item No., and DESCRIPTION OF WORK heading, and hereby waives and releases any and all lien, or claim or right to lien, on the Construction Project listed above, and premises, under the statutes of the State of Rhode Island, relating to Mechanics Liens, on account of materials, or labor, or both, furnished, or which may be furnished, by the undersigned to, or on account of, the above numbered Application and Certificate for Payment.

Signed on this _____ day of _____, 20__.

_____ _____
(signature) (firm name)

**END OF DOCUMENT**

**DOCUMENT 00 7000 – GENERAL CONDITIONS**

PART 1 – GENERAL

1.1 The General Conditions to be utilized on this project is AIA Document A201-2007 as amended, a copy of which follows this page.

**END OF DOCUMENT**

# AIA® Document A201™ – 2007

## *General Conditions of the Contract for Construction*

**for the following PROJECT:**
*(Name and location or address)*

**THE OWNER:**
*(Name, legal status and address)*
State of Rhode Island
One Capitol Hill, Second Floor
Providence, Rhode Island 02908-5855
(401) 574-8100 (telephone)
(401 574-8387 (facsimile)

*(Paragraphs deleted)*
acting by and though
*(Paragraphs deleted)*
The University of Rhode Island Purchasing Department
*(Paragraphs deleted)*
10 Tootell Road
Kingston, Rhode Island 02881
(401) 874-2171 (telephone)
(401) 874-2306 (facsimile)
http://web.uri.edu/purchasing/
*(Paragraph deleted)*
and
*(Paragraphs deleted)*
The University of Rhode Island Board of Trustees
35 Campus Avenue, Green Hall
Kingston, Rhode Island, 02881
*(Paragraphs deleted)*
On behalf of the User Agency

**THE USER AGENCY**

*(Paragraphs deleted)*
*(Name, address, telephone and facsimile numbers, and web address)*

*(Paragraphs deleted)*
The University of Rhode Island
*(Paragraphs deleted)*
Office of Capital Projects
60 Tootell Road – Sherman Building
Kingston, Rhode Island 02881
(401) 874-2725 (telephone)

*(Paragraphs deleted)*
**THE Design Agent:**
*(Paragraphs deleted)*
*(Name, legal status, address, telephone and facsimile numbers, and web address)*

**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

## 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.

**§ 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.

**§ 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.

## § 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 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.

**§ 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.

**§ 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 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 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.

## 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, 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.

**§ 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 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.

**§ 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;
- **.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.

**§ 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, 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 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 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.

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### § 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.

### § 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 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 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.

**§ 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.

**§ 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 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.

**§ 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.

**§ 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.

**§ 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.

### § 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.

## 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.

**§ 15.2 INITIAL DECISION**

**§ 15.2.1** Claims shall be referred to the Initial Decision Maker for initial decision. The University of Rhode Island Vice President for Administration and Finance appointed pursuant to the provisions of the "Delegation of Limited Procurement Authority," dated January 19, 2018, will serve as the Initial Decision Maker in accordance with the provisions of the "Delegations of Limited Procurement Authority," 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.

**DOCUMENT 00 7200 – URI STANDARD DOCUMENTS**

PART 1 – GENERAL

1.1 The latest version of the following documents, available on the URI Capital Projects website, http://web.uri.edu/capitalprojects/manual-for-construction-project-safety-procedures/, will apply to all of the work of this project and are hereby incorporated by reference:

URI Sexual Harassment Policy
Manual for Construction Project Safety Procedures
Access Box Keys
Residential Sprinkler Protection
Hot Work Permitting
Fire Protection System Impairment
Fire Watches
URI Water System Regulations/Policies
URI Contractor Attestation Related to COVID-19 Pandemic

**END OF DOCUMENT**

# Division 01 - General Requirements

# SECTION 01 1000 - SUMMARY

## PART 1 - GENERAL

### 1.01 PROJECT

A. See Bid Form for official Project Information.

B. The Project consists of the construction of the following types of work:
   1. Remove and dispose existing steam vaults and internal piping.
   2. Abandon existing steam and condensate lines in place where practical; remove and dispose existing steam and condensate lines where necessary. Assume existing steam lines to be removed contain asbestos. Abatement of asbestos as described in the abatement plan, Attachment C, at the end of this section.
   3. Furnish and install new steam and condensate lines; new drainage; new prefabricated steam vaults and Bilco covers.
   4. Improvements to Fayerweather mechanical room.
   5. Site restoration including new paving, new sidewalks and new curbing.

### 1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 5200 - Agreement.

### 1.03 DESCRIPTION OF WORK

A. Scope of demolition and removal work is shown on drawings plus as specified in Section 02 2200.

B. Scope of alterations work is shown on drawings and/or as specified herein.

C. Site modifications: New steam vaults and associated piping; site restoration.

D. Mechanical: Improvements to Fayerweather mechncial room; new steam and condensate lines.

### 1.04 OWNER OCCUPANCY/SCHEDULE

A. Owner intends to continuously occupy the facility. Work areas will be made available as mutually agreed to during project scheduling. See Attachment A at the end of this section for availability and restrictions on access to spaces.

B. Work to begin within 7 days of receipt of Purchase Order unless otherwise defined in Attachment A at the end of this section.

D. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

### 1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings. Coordinate with Attachment A following this section. Include all costs of this coordination, including all

premium time wages that may be required to meet these requirements, in the Base bid.

B. Arrange use of site and premises to allow:
   1. Adjacent projects to progress as planned for the Owner.
   2. Use of street and adjacent properties by the Public.
   3. Continued operation of the facility in accordance with Attachment A.

C. Provide access to and from site as required by law and by Owner:
   1. Maintain appropriate egress for workforce and users of the facility.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit. Provide necessary signage and barriers to direct pedestrians around work areas.

D. Time Restrictions:
   1. Limit conduct of especially noisy work when events are in process.
   2. Night and weekend work is not allowed.
   3. Refer to Attachment A following this section for building specific scheduling restrictions

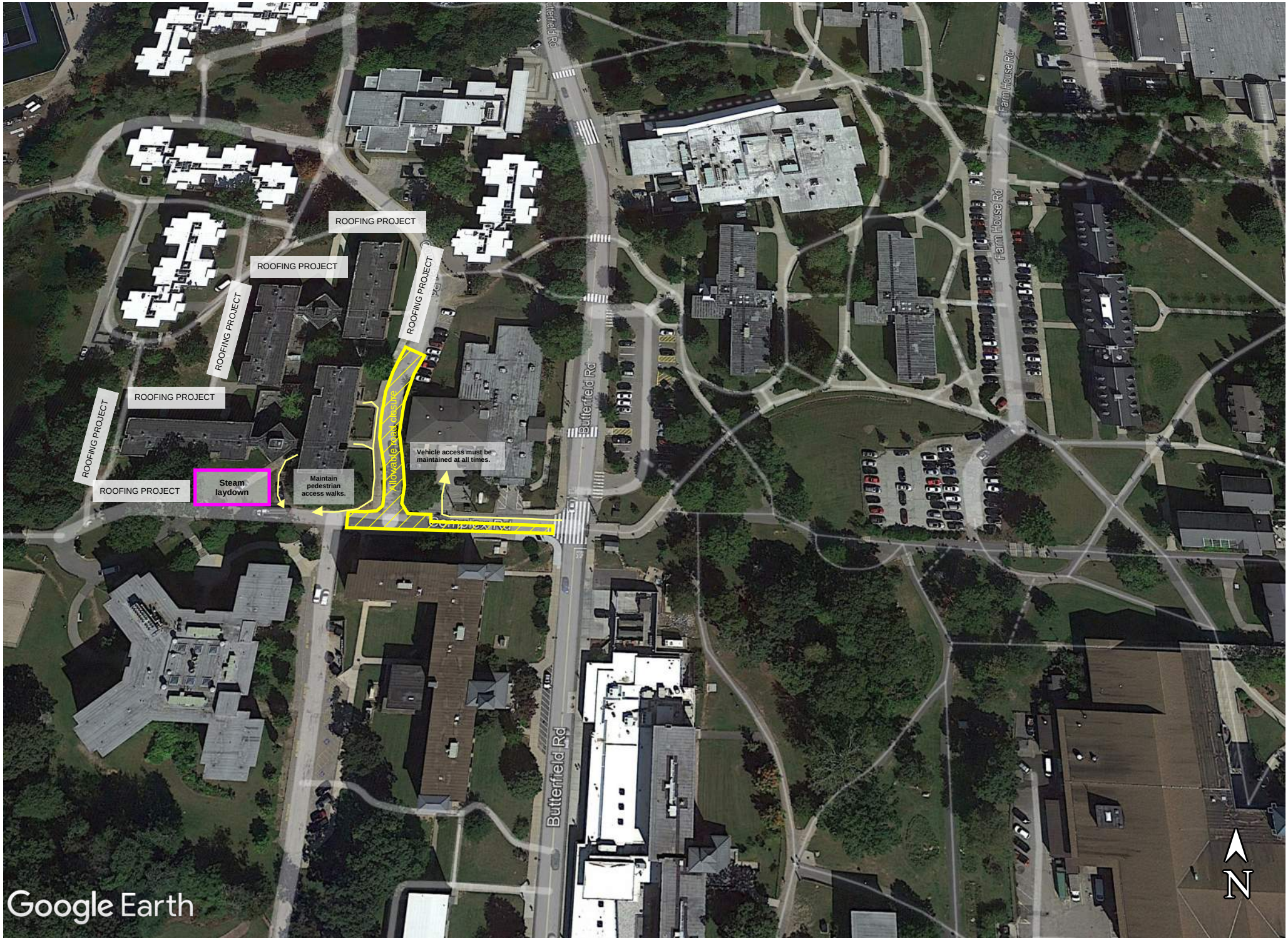
E. Utility Outages and Shutdown:
   1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
   2. Prevent accidental disruption of utility services to other facilities.
   3. Contractor to provide written notification on Fire Sprinkler and Alarm System Impairment Notification Form following this section as Attachment B.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION – NOT USED**

**END OF MAIN SECTION – See Attachments A, B, and C following.**

# Site Utilization - Fayerweather & Gorham Steam Improvements Summer 2022



# Attachment A – 01 1010

**NOTE:**
**Unrestricted = Contractor to plan and schedule work and submit for review by Owner**
**Limited Restriction = Contractor to meet with Owner and coordinate access to these areas**
**Restricted = Contractor to perform work on dates provided in this document**

## FAYERWEATHER BASEMENT:

The mechanical room within the Fayerweather basement will have unrestricted access. Contractor will have to coordinate work with Owner to maintain Owner access throughout construction.

## FAYERWEATHER FIRST, SECOND, THIRD FLOOR:

Access is not anticipated to be required. Should the Contractor require access for any reason, limited restriction access is required. Contractor must coordinate with the Owner for access.

## OTHER AREAS/GENERAL NOTES:

The Contractor will be responsible for providing protection for all furniture and existing conditions with the building. The Contractor is also responsible for cleaning their work areas after each shift.

The Contractor is responsible for maintaining egress paths during construction to the satisfaction of the Fire Marshall and the AHJ.

The building occupants are sensitive to dust issues. The Contractor will be responsible for providing dust containment in each area while it is under construction and then cleaning each contained area daily when the shift is over. The Contractor will also be responsible for providing and maintaining temporary construction filters on all return air grills and AHUs and replacing with new filters at substantial completion.

Contractor is responsible for coordinating with the Owner for exterior hoisting, if needed, with respect to timing, crane placement, window removal, temporary openings and restoration, etc, and is responsible for any and all associated costs.

Parking is restricted to areas designated by the University.

Any material not installed during the shift must be removed from occupied areas at the end of each shift.

THE UNIVERSITY OF RHODE ISLAND
DIVISION OF ADMINISTRATION AND FINANCE

THINK BIG WE DO

OFFICE OF CAPITAL PROJECTS
Sherman Building, 523 Plains Road, Kingston, RI 02881 USA p: 401.874.2725 f: 401.874.5599

Fire Sprinkler and Alarm System Impairment Notification Form

To: URI Office of Capital Projects

Date _____

Start of Planned Impairment: _____
End of Planned Impairment: _____
Building occupied during impairment: Yes:_____ No:_____
Any hot work to be performed: Yes:_____ No:_____

Description of Work to be performed: _____

URI Manager of Alarms, Mike Suriani, can also be directly contacted at 401-639-2268.

Contractor supervisory personnel shall remain in the building for the entire duration of the impairment.

Name:_____

Company:_____

Phone:_____

# 01 1030 SUMMARY - Attachment C
# Abatement Plan

The asbestos abatement plan following this page has been prepared by the University's consultant and applies to the work areas of this project as noted. The following work has already been accomplished by other subcontractors:

*None*

The following work is to be included as part of this project and shall be included in the Base Bid price:

*Removal and disposal of any existing steam lines and condensate return lines should be assumed to contain asbestos. Remove and dispose in accordance with all local, State and Federal rules and regulations.*

# SECTION 01 2000 - PRICE AND PAYMENT PROCEDURES

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Allowances.

B. Testing and inspection allowances.

C. Schedule of values.

D. Applications for payment.

E. Warranty inspection retainage.

F. Sales tax exemption.

G. Change procedures.

H. Defect assessment.

I. Unit prices.

J. Alternates.

1.02 ALLOWANCES

A. See General Conditions Article 3.8 for Allowance provisions.

B. Design Agent Responsibility:
   1. Consult with Contractor for consideration and selection of products, suppliers, and Installers.
   2. Select products in consultation with Owner and transmit decision to Contractor.
   3. Prepare Change Order to adjust final cost.

C. Contractor Responsibility:
   1. Assist Design Agent or its Consultants in selection of products, suppliers and installers.
   2. Obtain proposals from suppliers and installers, and offer recommendations.
   3. On notification on selection by Design Agent, execute purchase agreement with designated supplier and installer.
   4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
   5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Schedule of Allowances: See Attachment A.

1.03 TESTING AND INSPECTION ALLOWANCE

A. All costs of regularly scheduled testing are included in the Base Bid. See Attachment A for allowance to cover costs of additional testing to be provided when directed by the Owner.

B. See Section 01 4000 and its attachment for testing requirements.

1.04 SCHEDULE OF VALUES

A. Submit Schedule of Values in duplicate, one copyrighted original and one copy.

B. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Identify site mobilization, bonds, insurance and closeout.

C. Include in each line item, the amount of Allowances specified in this Section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

D. Include separately for each line item, a direct proportional amount of Contractor's overhead and profit.

E. Revise schedule to list approved Change Orders, with each Application for Payment.

1.05 APPLICATIONS FOR PAYMENT

A. Submit each application on an original AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet, accompanied by three copies.
   1. Prepare a draft version “pencil copy” of each application and distribute via email 5 days prior to due date for review by Design Agent and Owner’s representative.
   2. After making agreed revisions, individually sign and notarize and emboss with notary's official seal, the original and each of the three copies. Deliver to Owner’s representative for further processing and distribution.
   3. Applications not including original copyrighted AIA G702, and G703 Forms, will be rejected, and returned for re-submittal.
   4. Applications not properly signed and notarized will be rejected, and returned for re-submittal.
   5. Applications submitted without the following items described in this section and its attachments will be returned for resubmittal.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Provide one hard copy and one copy in disc form of the updated construction schedule with each Application for Payment submission, prepared per Section 01 3300.

1. Provide a statement signed by the Contractor's firm principal certifying that there are no unidentified outstanding claims for delay.

D. Include with each monthly Application for Payment, following the first application, Certified Monthly Payroll Records with proper compliance cover sheet for the previous month's pay period. Identify MBE/DBE subcontractors and hours worked in a format acceptable to URI. See Attachment A this section for current State and Federal requirements.

E. Submit with transmittal letter as specified for Submittals in Section 01 3300.

F. Beginning with the second Application for Payment, Contractor's right to payment must be substantiated by documenting, on a copy of the URI Waiver of Lien Form included in Document 00 6140 - Waiver of Lien Form in this Project Manual, that payment monies due, less retainage not exceeding ten percent, have been paid in full to subcontractor and suppliers for work, materials, or rental of equipment billed for under specific line item numbers in the immediately preceding application.

G. Substantiating Data: When the Owner or Design Agent requires additional substantiating information from the review of the “pencil copy”, submit data justifying dollar amounts in question.

H. In addition to the items above, include the following with the Application for Payment :
1. Record Documents as specified in Section 01 7800, for review by the Owner which will be returned to the Contractor.
2. Affidavits attesting to off-site stored products with insurance certificates as requested.
3. Digital Photographs as specified in Section 01 3300. Include on same disc with construction schedule.

I. Payment Period: Submit at monthly intervals unless stipulated otherwise in the Supplemental General Conditions.

1.06 WARRANTY INSPECTION RETAINAGE

A. A percentage of job cost as defined in Attachment A will be retained from Final Payment for a duration of ten months. If, after ten months, all systems including mechanical and electrical, are determined by the Owner to be properly functioning, the Warranty Inspection Retainage will be released.

B. If, after ten months, there are found to be modifications, adjustments, or corrections necessary to be made to address any system or product malfunction, in order to fulfill specified performance or requirements of such systems or products, release of the warranty inspection retainage will be delayed until such malfunctions are rectified.

C. If, after twelve months from the date of Final Completion, all systems have not been fully addressed, the Owner may utilize the Warranty Inspection Retainage to hire others to execute necessary modifications, adjustments, or corrections.

## 1.07 SALES TAX EXEMPTION

A. Owner is exempt from sales tax on products permanently incorporated in Work of the Project.
   1. Obtain sales tax exemption certificate number from Owner.
   2. Place exemption certificate number on invoice for materials incorporated in the Work of the Project.
   3. Furnish copies of invoices to Owner.
   4. Upon completion of Work, file a notarized statement with Owner that all purchases made under exemption certificate were entitled to be exempt.
   5. Pay legally assessed penalties for improper use of exemption certificate number.

## 1.08 CHANGE PROCEDURES

A. Submittals: Submit name of the individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. The Design Agent will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time by issuing supplemental instructions on AIA Form G710.

C. The Design Agent may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate within 15 days.

D. The Contractor may propose changes by submitting a request for change to the Design Agent, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation, and a statement describing the effect on Work by separate or other Contractors. Document any requested substitutions in accordance with Section 01 6000.

E. Stipulated Sum Change Order: Based on Proposal Request, and Contractor's fixed price quotation, or Contractor's request for a Change Order as approved by Design Agent.

F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute the Work under a Construction Change Directive. Changes in the Contract Sum or Contract Time will be computed as specified for a Time and Material Change Order.

G. Construction Change Directive: Design Agent may issue a directive, on AIA Form G713 Construction Change Directive signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in the Contract Sum or Contract Time. Promptly execute the change.

H. Time and Material Change Order: Submit an itemized account and supporting data after completion of the change, including timeslips signed by Owner's representative, within the time limits indicated in the Conditions of the Contract. The Design Agent will determine the change allowable in the Contract Sum and Contract Time as provided in the Contract Documents. Only Owner-representative-signed timeslips will be considered.

I. Maintain detailed records of work done on a Time and Material basis. Submit timeslips daily for verification and sign-off by Owner's representative on-site. Provide full information required for an evaluation of the proposed changes, and to substantiate costs for the changes in the Work.

J. Document each quotation for a change in cost or time with sufficient data to allow an evaluation of the quotation. Provide detailed breakdown of costs and estimates for labor and materials including a detailed breakdown for subcontractor's or vendor's Work. Include copies of written quotations from subcontractors or vendors.

K. Change Order Forms: AIA G701 Change Order.

L. Execution of Change Orders: The Design Agent will issue Change Orders for signatures of the parties as provided in the Conditions of the Contract.

M. Correlation Of Contractor Submittals:
1. Promptly revise the Schedule of Values and the Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum. Promptly revise progress schedules to reflect any change in the Contract Time, revise sub-schedules to adjust times for any other items of work affected by the change, and resubmit.
2. Promptly enter changes in the Project Record Documents.

1.09 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Design Agent, it is not practical to remove and replace the Work, the Design Agent will direct an appropriate remedy or adjust payment.

C. The defective Work may remain, but the unit sum will be adjusted to a new sum at the discretion of the Design Agent.

D. The defective Work will be partially repaired to the instructions of the Design Agent, and the unit sum will be adjusted to a new sum at the discretion of the Design Agent.

E. The individual Specification Sections may modify these options or may identify a specific formula or percentage sum reduction.

F. The authority of the Design Agent to assess the defect and identify a payment adjustment, is final.

G. Non-Payment for Rejected Products: Payment will not be made for rejected products for any of the following:
1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

1.10 UNIT PRICES

A. See Attachment A.

1.11 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in the Purchase Order.

B. Coordinate related work and modify surrounding work as required.

C. Schedule of Alternates: See Attachment A.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used.

**END OF SECTION**

# 01 2010 PRICE AND PAYMENT PROCEDURES - Attachment A

A. Allowances

1. Unforeseen Utility Conditions: $65,000.00
    a. Includes any necessary modifications to pre-existing utilities not shown on the Contract Drawings, determined to be required to complete the Work as described on the Contract Drawings.

2. Custom Print Construction Fence Wrap: $7,500.00
    a. Includes furnishing and installing custom print construction fence wrap (customization to be provided by Owner).

3. Remove and Dispose Unsuitable Material; Replace with RIDOT M.01.09 Gravel Borrow: $10,000.00
    a. Includes the removal and disposal of unsuitable material, as described elsewhere in these Specifications. Includes the replacement of any and all unsuitable material with Rhode Island Department of Transportation Standard Specification M.01.09 Gravel Borrow, as described elsewhere in these Specifications.

B. Unit Prices

1. Remove and Dispose Unsuitable Material; Replace with RIDOT M.01.09 Gravel Borrow.
    a. Includes the removal and disposal of unsuitable material, as described elsewhere in these Specifications. Includes the replacement of any and all unsuitable material with Rhode Island Department of Transportation Standard Specification M.01.09 Gravel Borrow, as described elsewhere in these Specifications. Includes all costs related to testing, excavation, removal and legal disposal off site, overhead and profit.

2. Rock Excavation by Mechanical Means
    a. Includes the removal of intact bedrock, and boulders or detached bedrock fragments, as defined in Section 31 8000. Rock shall be removed by employing hydraulic splitters, air rams, paving breakers, or other mechanical means approved by the Engineer. Includes all costs related to testing, excavation, removal and legal disposal off site, overhead and profit.

C. Payroll Reporting

1. Forms for the submission of Certified Payroll Records may be found from the Rhode Island Prevailing Wage Website in either PDF or Excel formats. These forms must be used on monthly submittals.

2. Identify Apprenticeship hours required under RIGL 37-13-3.1 for all contracts over $1-million in value.

3. A Minority Utilization Report for minority subcontractors must be included. Use the form provided as Attachment B.

E. Warranty Inspection Retainage

1. One-half of one percent of the cost of the Work will be retained from Final Payment for this purpose.

**END OF ATTACHMENT**

**MBE Compliance Office**
**1 Capitol Hill, 2nd Floor**
**Providence, RI 02908**
**401-574-8670, 401-574-8387 (fax)**

**Attachment B – 01 2020**

**www.mbe.ri.gov (website)**

Pursuant to RIGL 37-14.1 as well as the regulations promulgated thereto, the MBE Compliance Office requires that you complete the following table. Please note that these figures will be verified with the MBEs identified. If there are outstanding issues, such as retainage or a dispute, please indicate and attach supporting documentation for same. Also note that copies of invoice and cancelled checks for payment to all MBE subcontractors and suppliers are required.

**Contractor/Vendor Name:**
**Project Name & Location:**
**Original Prime Contract Amount: $_____** **Current Prime Contract Amount: _____**

| MBE/WBE Subcontractor | Original Contract Amount | Change Orders | Revised Contract Value | % Completed To Date | Amount Paid To Date | Amount Due | Retainage % | Retainage Amount | Explanation |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
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I declare, under penalty of perjury, that the information provided in this verification form and supporting documents is true and correct.

_____ _____
Signature Date

_____
Printed Name

Notary Certificate:

Sworn before me this _____ day of _____ , 2012.

_____ _____
Notary Signature Commission Expires

## 01 2030 PRICE AND PAYMENT PROCEDURES - Attachment C
## Small Project Changes

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. No amendments are necessary in this Section due to project size. See Attachment A for project specific amendments.

**END OF ATTACHMENT**

# SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Site administration

B. Coordination and project conditions.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meetings.

F. Pre-installation meetings.

1.02 SITE ADMINISTRATION

A. Maintain a daily attendance log to include the names of all project employees and guests to the site regardless of project size. Each guest signing the log should indicate a brief description of the reason for the visit, the guest's employer or organization. The log sheet, or sheets, must clearly indicate the Project Name, and the name of the Prime contractor. Each line in the log should allow for the name of that employee, the employee's job title (use terminology used by prevailing wage job title), the name of that employee's employer and the employee's contact information. This log shall be kept on a uniform form prescribed by the Director of Labor and Training. Such log shall be available for inspection on the site at all times by the Purchaser, Owner, and/or the Director of the Department of Labor and Training and his or her designee. Provide copies when requested. The log shall comply with requirements of RIGL 37-12-12(c.).

1.03 COORDINATION AND PROJECT CONDITIONS

A. Coordinate the scheduling, submittals, and the Work of the various Sections of the Project Manual to ensure an efficient and orderly sequence of the installation of interdependent construction elements.

B. Verify that the utility requirements and characteristics of the operating equipment are compatible with the building utilities. Coordinate the Work of the various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate the space requirements, supports and installation of the mechanical and electrical Work, which are indicated diagrammatically on the Drawings. Follow the routing shown for the pipes, ducts, and conduit, as closely as practicable; place runs parallel with the lines of the building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. Coordinate the completion and clean up of the Work of the separate Sections in preparation for Substantial Completion and for portions of the Work designated for the Owner's partial occupancy.

E. After the Owner's occupancy of the premises, coordinate access to the site for correction of defective Work and the Work not in accordance with the Contract Documents to minimize disruption of the Owner's activities.

1.04 PRECONSTRUCTION MEETING

A. The Design Agent will schedule a meeting after a Purchase Order is issued to the Contractor.

B. Attendance Required: Owner's Representative, Design Agent, and Contractor.

C. Agenda:
1. Distribution of the Contract Documents.
2. Submission of a list of Subcontractors, a list of products, schedule of values, and a progress schedule.
3. Designation of the personnel representing the parties in the Contract and the Design Agent.
4. The procedures and processing of the field decisions, submittals, substitutions, applications for payments, proposal requests, Change Orders, and Contract closeout procedures.
5. Scheduling.

D. Contractor shall record the minutes and distribute copies within two days after the meeting to the participants, with copies to the Design Agent, Owner, other participants, and those consultants affected by the decisions made.

1.05 SITE MOBILIZATION MEETING

A. The Design Agent will schedule a meeting at the Project site prior to the Contractor's occupancy and may occur at the same time as the Preconstruction meeting noted above.

B. Attendance Required: The Owner, Design Agent, Contractor, the Contractor's Superintendent, and major Subcontractors.

C. Agenda:
1. Use of the premises by the Owner and the Contractor.
2. The Owner's requirements and partial occupancy.
3. Construction facilities and controls provided by the Owner.
4. Temporary utilities provided by the Owner.
5. Security and housekeeping procedures.
6. Schedules.
7. Application for payment procedures.
8. Procedures for testing.

9. Procedures for maintaining the record documents.
10. Requirements for the start-up of equipment.
11. Inspection and acceptance of the equipment put into service during the construction period.

D. Contractor shall record the minutes and distribute the copies within two days after the meeting to the participants, with copies to the Design Agent, Owner, other participants, and those consultants affected by the decisions made.

1.06 PROGRESS MEETINGS

A. Schedule and administer the meetings throughout the progress of the Work at weekly intervals while work is in process.

B. Make arrangements for the meetings, prepare the agenda with copies for the participants, and preside at the meetings.

C. Attendance Required: The job superintendent, major subcontractors and suppliers, the Owner, Design Agent, and Consultants as appropriate to agenda topics for each meeting.

D. Agenda:
1. Review the minutes of previous meetings.
2. Review of the Work progress.
3. Field observations, problems, and decisions.
4. Identification of the problems which impede the planned progress.
5. Review of the submittals schedule and status of the submittals.
6. Review of delivery schedules.
7. Maintenance of the progress schedule.
8. Corrective measures to regain the projected schedules.
9. Planned progress during the succeeding work period.
10. Coordination of the projected progress.
11. Maintenance of the quality and work standards.
12. Effect of the proposed changes on the progress schedule and coordination.
13. Other business relating to the Work.

E. Contractor shall record the minutes and distribute the copies within two days after the meeting to the participants, with copies to the Design Agent, Consultants, Owner, participants, and others affected by the decisions made.

1.07 PREINSTALLATION MEETINGS

A. When required in the individual specification Sections, convene a pre-installation meeting at the site prior to commencing the Work of the Section.

B. Require attendance of the parties directly affecting, or affected by, the Work of the specific Section.

C. Notify the Design Agent four days in advance of the meeting date.

D. Prepare an agenda and preside at the meeting:
   1. Review the conditions of installation, preparation and installation procedures.
   2. Review coordination with the related work.

E. Record the minutes and distribute the copies within two days after the meeting to the participants, with copies to the Design Agent, Owner, participants, and those Consultants affected by the decisions made.

## PART 2 - PRODUCTS

Not used.

## PART 3 - EXECUTION

Not used.

**END OF SECTION**

## 01 3010 ADMINISTRATIVE REQUIREMENTS - Attachment A

A. Pre-installation Meetings

1. The following items of work will require pre-installation meetings:
    a. Prefabricated vaults.
    b. Fayerweather mechanical room work.

**END OF ATTACHMENT**

## 01 3020 ADMINISTRATIVE REQUIREMENTS - Attachment B
## Small Project Changes

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. Replace headings 1.01 C, D, E, and F with "C. Meetings".

C. Delete paragraphs 1.04, 1.05 and 1.07. Retitle 1.06 Progress Meetings to be "1.06 Meetings". Insert the words "or other requested" after "weekly" in 1.06 A. Delete subparagraph 1.06 D. Agenda. Meeting requirements may be less formal in small projects.

**END OF ATTACHMENT**

# SECTION 01 3300 - SUBMITTAL PROCEDURES

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed products list.

D. Product data.

E. Shop drawings.

F. Design Data.

G. Samples.

H. Test reports.

I. Certificates.

J. Manufacturer's instructions.

K. Manufacturer's field reports.

L. Digital Photographs.

M. Erection drawings.

N. Construction photographs.

1.02 SUBMITTAL PROCEDURES

A. Master List Submittal:
   1. Submit a master list of the required submittals with a proposed date for each item to be submitted. See Attachment A for initial minimum list on which to base master.
   2. Show the date submittal was sent, days since submittal was sent, status of submittal, date submittal was received in return, and any date associated with resubmittals.
   3. Up date master list with each submission and response.
   4. Issue copy of master list at least monthly to the Design Agent.

B. Transmit each submittal with a dated Design Agent-accepted transmittal form.

C. Transmit printed copies and electronic PDF copy of each submittal to the Design Agent for review and comment as outlined in each section below.

D. Sequentially number the transmittal form. Mark revised submittals with an original number and a sequential alphabetic suffix.

E. Identify the Project, Contractor, subcontractor and supplier; the pertinent drawing and detail number, and the specification Section number, appropriate to the submittal.

F. Apply a Contractor's electronic stamp certifying that the review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of the information is in accordance with the requirements of the Work and the Contract Documents.

G. Schedule submittals to expedite the Project, and deliver to the Design Agent’s FTP site. Coordinate the submission of related items.

H. For each submittal, allow 15 days for review.

I. Identify all variations from the Contract Documents and any Product or system limitations which may be detrimental to a successful performance of the completed Work.

J. Allow space on the submittals for the Contractor's, Design Agent’s, and Consultant's electronic review stamps.

K. When revised for resubmission, identify the changes made since the previous submission.

L. Distribute copies of the reviewed submittals as appropriate. Reproduce as necessary to inform subcontractors without internet download capabilities. Instruct the parties to promptly report any inability to comply with the Contract requirements.

M. Produce additional copies as required for the Record Document purposes as described in Section 01 7800.

1.03 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in duplicate within 20 days after Date of Commencement for Design Agent to review. After a review, submit detailed schedules within 15 days modified to accommodate the revisions recommended by the Design Agent and Owner.

B. Distribute copies of the reviewed schedules to the Project site file, subcontractors, suppliers, and other concerned parties. Instruct the recipients to promptly report, in writing, the problems anticipated by the projections indicated in the schedules

C. Submit updated schedules with each Application for Payment, identifying changes since previous version as follows:
   1. Indicate the progress of each activity to the date of submittal, and the projected completion date of each activity.
   2. Identify the activities modified since the previous submittal, major changes in the scope, and other identifiable changes.
   3. Provide a narrative report to define the problem areas, the anticipated delays, and impact on the Schedule. Report the corrective action taken, or proposed, and its effect including the effect of changes on the schedules of separate contractors.

D. Submit a computer-generated horizontal bar chart with separate line for each major portion of the Work or operation, identifying the first work day of each week.

E. Show a complete sequence of construction by activity, identifying the Work of separate stages and other logically grouped activities. Indicate the early and late start, the early and late finish, float dates, and duration.

F. Indicate an estimated percentage of completion for each item of the Work at each submission.

G. Provide a separate schedule of submittal dates for shop drawings, product data, and samples, including Owner-furnished Products and Products identified under Allowances, if any, and the dates reviewed submittals will be required from the Design Agent. Indicate the decision dates for selection of the finishes.

H. Indicate the delivery dates for Owner furnished Products, and for Products identified under Allowances.

1.04 PROPOSED PRODUCTS LIST

A. Within 20 days after the Date of Commencement, submit a list of major products proposed for use, with the name of the manufacturer, the trade name, and the model number of each product.

B. For the products specified only by reference standards, give the manufacturer, trade name, model or catalog designation, and reference standards.

C. With each product listed, indicate the submittal requirements specified to be adhered to, and an indication of relevant "long-lead-time" information , when appropriate.

1.05 PRODUCT DATA

A. Product Data: Submit to the Design Agent for review for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Provide copies and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 7800.

B. Submit one (1) printed copy and one (1) electronic PDF copy for review. The Design Agent will retain the reviewed printed copy for record and return the reviewed electronic PDF copy to the Contractor for distribution.

C. Mark each copy to identify the applicable products, models, options, and other data. Supplement the manufacturers' standard data to provide the information specific to this Project.

D. Indicate the product utility and electrical characteristics, the utility connection requirements, and the location of utility outlets for service for functional equipment and appliances.

E. After a review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01 7800.

1.06 SHOP DRAWINGS

A. Shop Drawings: Submit to the Design Agent for review for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 7800.

B. Submit two (2) printed copies and one (1) electronic PDF copy for review. The Design Agent and /or Consultants will retain the reviewed printed copies for record and return the reviewed electronic PDF copy to the Contractor for distribution.

C. Indicate the special utility and electrical characteristics, the utility connection requirements, and the location of utility outlets for service for functional equipments and appliances.

1.07 SAMPLES

A. Samples: Submit to the Design Agent for review for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Produce duplicates and distribute in accordance with the

SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 7800.

B. Samples for Selection as Specified in Product Sections:
   1. Submit to the Design Agent for aesthetic, color, or finish selection.
   2. Submit samples of the finishes in the colors selected for the Design Agent's records.
   3. After review, produce duplicates and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 7800.

C. Submit samples to illustrate the functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate the sample submittals for interfacing Work.

F. Include identification on each sample, with the full Project information.

G. Submit at least the number of samples specified in the individual specification Sections; the Design Agent will retain two samples.

H. Reviewed samples, which may be used in the Work, are indicated in the individual specification Sections.

I. Samples will not be used for testing purposes unless they are specifically stated to be in the specification Section.

1.08 TEST REPORTS

A. Submit (1) printed and (1) electronic PDF lab reports in accordance with Section 01 4000.

B. Submit test reports for information for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.

1.09 DESIGN DATA

A. Submit (1) printed and (1) electronic PDF data for the Design Agent’s knowledge as contract administrator for the Owner.

B. Submit information for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.

1.10 CERTIFICATES

A. When specified in the individual specification Sections, submit (1) printed and (1) electronic PDF certification by the manufacturer, installation/application subcontractor, or the Contractor to the Design Agent in the quantities specified for the Product Data.

B. Indicate that the material or product conforms to or exceeds the specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

A. Certificates may be recent or previous test results on the material or product, but must be acceptable to the Design Agent and its Consultants.

1.10 MANUFACTURER'S INSTRUCTIONS

A. When specified in the individual specification Sections, submit (1) printed and (1) electronic PDF copy of instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to the Design Agent for delivery to the Owner in the quantities specified for Product Data.

B. Indicate the special procedures, and the perimeter conditions requiring special attention, and the special environmental criteria required for application or installation.

1.11 MANUFACTURER'S FIELD REPORTS

A. Submit (1) printed and (1) electronic PDF of reports for the Design Agent's benefit as contract administrator for the Owner.

B. Submit the report within 30 days of observation to the Design Agent for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.

1.12 DIGITAL PHOTOGRAPHS

A. Submit minimum 12 digital photographs of construction progress each month on the same CD as the project schedule submittal. Include both jpg. and reduced-size PDF versions for email use.

B. Include an additional minimum of 12 photographs documenting underground utilities when installed in relationship to visible site features.

C. Include photographs of important in-wall or ceiling utilities before close-in at appropriate stages of construction.

D. See Section 01 7800 for close-out copy requirements of these files.

1.13 ERECTION DRAWINGS

A. When specified in the individual Specification sections, the trade contractors shall submit (1) printed and (1) electronic PDF copy of erection drawings for review prior to proceeding with fabrication and/or construction.

B. Erection drawings shall be prepared in accordance with the latest edition of the respective trades' codes of standard practice.

C. All erection drawings shall be fully developed by the trade contractors or by agents of the contractors. CAD files, photocopies, or other reproductions of the contract drawings in whole or in part shall not be used by the trade contractors or their agents for the preparation and development of erections drawings without the expressed written consent of the Design Agent.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used.

**END OF SECTION**

# 01 310 SUBMITTAL PROCEDURES - Attachment A

A. Refer to individual specification sections for full submittal requirements.

B. HVAC Submittal List

1. Above Ground Piping Submittals
    a. Include maintenance data for hydronic specialties, special duty valves to include in the Operation and Maintenance Manual specified in Specification Section 70867-15000.
    b. Piping layout drawings (1/4” = 1'-0") showing proposed pipe routing with elevations and sections as required. Layout shall show all expansion compensation supports, anchors and guides.
    c. Manufacturer's Data Sheets on all catalogued valves and fittings being used.
    d. Manufacturer's Data Sheets on all catalogued pipe supports being used.
    e. Drawings covering all specially designed hanger assemblies and fabrications.
    f. Piping Isometrics showing bill of materials, valves, and pipe cut lengths for hook-ups to equipment.
    g. All applicable welding procedures.
    h. A copy of welder qualification status, W-102.
    i. Prefabricated underground piping with materials layout, details, stress analysis all using exact field dimensions.
    j. Pipe sleeves and link seals.

2. Underground Piping Submittals
    a. Submit shop drawings, product data, operation and maintenance manuals, record drawings and warranties.
    b. Provide copies of welding procedures, documentation to demonstrate that employees are trained and certified to their procedure. Also, provide a weld map of all welding work done on the pipe and identify the welder.
    c. Submit the following for the underground steam and condensate System:
        i. Complete erection drawings.
        ii. Pipe and fittings.
        iii. Prefabricated underground piping system.
        iv. Conduit-to-wall and conduit-to-floor penetration sleeves and seals.
        v. Warning tapes.
        vi. Concrete thrust blocks.
        vii. Pipe stress analysis calculations

d. Contractor's Material and Test Certificates: Complete Certificates in their entirety and submit for review and approval before final submission of Operation and Maintenance Manuals. Incomplete Certificates will be rejected. If requested information on Certificate is not applicable, indicate "N/A."
e. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
f. Pipe Sleeves and Link Seals.

3. Above Ground Pipe Insultation
    a. Provide pipe insulation submittals with jacketing for approval. Include pipe insulation schedule of thicknesses, jacketing material and type along with data sheets for all materials being used. Include insulation data sheet with all thermal performance for insulation thickness listed.

4. Pipe Hangers
    a. Submit each item in this Specification according to the conditions of the Contract and Division 1 Specification Sections.
        i. Steel pipe hangers and supports.
        ii. Thermal-hanger shield inserts.
        iii. Powder-actuated fastener systems.
        iv. Pipe positioning system.
        v. Inserts & Anchors
        vi. Pipe Anchors and Guide product and installation details.
    b. Shop drawings are to include fabrication and installation details and include calculations for the following.
        i. Trapeze pipe hangers. Include product data for components.
        ii. Metal framing systems. Include product data for components.
        iii. Pipe stands. Include product data for components.
        iv. Equipments support.
        v. Drawings covering all specially designed hanger assemblies and fabrications.
        vi. Welding Certificates

C. Site/Civil Submittal List

1. General Conditions
    a. Contractor to submit Dig Safe System Inc. clearance number.

2. Soil and Aggregate Materials
    a. For each imported material:
        i. Samples: Furnish one (1) five-gallon pail of a representative soil sample for each material proposed for fill and/or backfill, including location of source on Transmittal.

ii. Shop Drawings:
    1. For each material proposed for fill and/or backfill, provide sieve analysis in accordance with AASHTO T 27 and T 11 when gradation requirements are given in these specifications.
    2. For each material proposed for fill and/or backfill, provide compaction test report in accordance with ASTM D 1557-12 Method C Modified when compaction requirements are given in the specifications.

3. Erosion and Sedimentation Controls
    a. Manufacturer's specifications and product data for all materials.

4. Flexible Paving
    a. Shop Drawings: Include plans, elevations, sections, details, attachments to other work as necessary. RIDOT approved mix designs and certified laboratory test results including:
        i. Asphalt Content of HMA by Ignition Method (AASHTO T 308)
        ii. Mechanical Analysis of Extracted Aggregate (AASHTO T 30)
        iii. Bulk Specific Gravity of Compacted HMA (AASHTO T 166)
        iv. Maximum Specific Gravity of HMA (AASHTO T 209)
        v. Volumetric Analysis

5. Cement Concrete Sidewalks
    a. Concrete mix design, field quality control test and inspection reports.

6. Curbing
    a. Concrete mix design, certified laboratory test results (concrete compressive strength), cut sheets.

7. Loam and Seed
    a. Certifications and/or labels of proposed seed mixtures stating common and scientific names of grasses, percentages by weight, and percentages or purity and germination.
    b. Submit test samples of loam or borrow material being used.
    c. Product information for all proposed weed control chemicals.

8. Water Utilities
    a. Provide shop drawings, details, manufacturers' data and catalog cuts for all elements of the sewer system including, but not limited to, pipes, fittings, manholes, castings, joint gaskets, and connections to

existing pipes and structures in accordance with Specification 01 33 00 Shop Drawings, Product Data and Samples.

b. Provide Certificates of Compliance to the Specifications and referenced Standards for all piping and precast structures. Include certified copies of all required test reports.
c. Manufacturer's Recommendations: The Sub-Contractor shall, as a part of the shop drawings, submit, as indicated in Specification 01 33 00, the manufacturer's recommendations for each material or procedure to be utilized which is required to be in accordance with such recommendations. The Sub-Contractor shall have a copy of the manufacturers' instructions available at the construction site at all times and shall follow these instructions unless otherwise directed by the Engineer.
d. All pipe furnished under the contract shall be manufactured only in accordance with the Specifications and the reviewed Drawings.
e. Working Drawings
    i. Working drawings shall show completely dimensioned piping layouts for all exposed piping. When any of the work is of special design, such work shall be shown in large detail.
    ii. Schedules of pipe fittings and valves; such schedules shall show the material and thickness or class of all pipe, the material and class of all, fittings and the rating and description of all valves.
    iii. Details of quality, type, design and location of all hangers, supports, cradles, anchors, braces and guides required for the proper installation of the pipe lines. Design Computations shall be included in the submittal and certified by piping manufacturer.
    iv. Details and methods for joining all pipes, including but not limited to: expansion joints, mechanical joints and flexible couplings; soldered, brazed or welded joints; adhesive joints; where shown, specified or required for a complete working installation.
    v. Other piping appurtenances and data pertinent to the layout of pipe lines whether specifically mentioned in the Specifications or shown on the Drawings.
f. Submit manufacturers’ certificates of conformance.
g. Submit certified copies of test reports.

9. Storm Drainage Utilities
    a. Product Data: Submit manufacturer's technical product data and installation instructions for storm sewage system materials and products.
    b. Shop Drawings: Submit shop drawings for all precast components of storm sewage systems.

10. Marking Tape
    a. Two sets of manufacturer's literature on the materials, colors and printing specified herein, shall be submitted to the Engineer for review.

**END OF ATTACHMENT**

## 01 3320 SUBMITTAL PROCEDURES - Attachment B

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. Delete headings 1.01 C, F, L, M, and N. Submittal requirements are reduced for small projects.

C. Replace subparagraph 1.02 A with the following:

"A. Submit all information listed in the Master List provided in Attachment A."

D. Delete paragraphs 1.12 and 1.13.

**END OF ATTACHMENT**

# SECTION 01 4000 – QUALITY REQUIREMENTS

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Quality control and control of installation.

B. Verification of Credentials and Licenses.

C. Tolerances

D. References.

E. Testing and inspection services.

F. Manufacturers' field services.

G. Mock-up Requirements.

1.02 QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Monitor a quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of the specified quality.

B. Comply with all manufacturers' instructions and recommendations, including each step in sequence.

C. When the manufacturers' instructions conflict with the Contract Documents, request a clarification from the Design Agent before proceeding.

D. Comply with the specified standards as a minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform the Work by persons qualified to produce the required and specified quality.

F. Verify that field measurements are as indicated on the Shop Drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 VERIFICATION OF CREDENTIALS AND LICENSES

A. The Owner has implemented a project management oversight process and is applying it to current construction projects at URI.

B. An element of this oversight process is the verification that persons employed on the project site have appropriate and current credentials and licenses in their possession, at the project site, for the work they are performing.

C. Be forewarned that state resident inspectors will be checking for verification of credentials and licenses of both union and non-union persons, in their onsite inspections.

D. State resident inspectors will also be reviewing Contractor's Certified Monthly Payroll Records for conformance with RI State Prevailing Wage Rate requirements.

E. Those persons without the appropriate credentials and licenses will be subject to dismissal from the project site.

1.04 TOLERANCES

A. Monitor the fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with the manufacturers' tolerances. When the manufacturers' tolerances conflict with the Contract Documents, request a clarification from the Design Agent before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.05 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by the date of issue current on the date of the Contract Documents, except where a specific date is established by code.

C. Obtain copies of the standards where required by the product specification Sections.

D. When the specified reference standards conflict with the Contract Documents, request a clarification from the Design Agent before proceeding.

E. Neither the contractual relationships, duties, or responsibilities of the parties in the Contract, nor those of the Design Agent, shall be altered from the Contract Documents by mention or inference otherwise in reference documents.

1.06 TESTING AND INSPECTION SERVICES

A. The Contractor will submit the name of an independent firm to the Design Agent for approval by the Owner, to perform the testing and inspection services. The Contractor shall pay for all the services required in the Base Bid as described in Attachment A. Contractor shall coordinate any Owner-authorized testing also described in Attachment A, to be paid for from Testing Allowance.

B. The independent firm will perform the tests, inspections and other services specified in the individual specification Sections and as required by the Design Agent or its Consultants.
1. Laboratory: Authorized to operate in the location in which the Project is located.
2. Laboratory Staff: Maintain a full time registered Engineer on staff to review the services.
3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either the National Bureau of Standards or to the accepted values of natural physical constants.

C. Testing, inspections and source quality control may occur on or off the project site. Perform off-site testing as required by the Design Agent or the Owner.

D. Reports will be submitted by the independent firm to the Design Agent, the Consultant for that trade, and the Contractor, in duplicate, indicating the observations and results of tests and indicating the compliance or non-compliance with Contract Documents.

E. Cooperate with the independent firm; furnish samples of the materials, design mix, equipment, tools, storage, safe access, and the assistance by incidental labor as requested.
1. Notify the Design Agent and Engineer and the independent firm 24 hours prior to the expected time for operations requiring services.
2. Make arrangements with the independent firm and pay for additional samples and tests required for the Contractor's use.

F. Testing and employment of the testing agency or laboratory shall not relieve the Contractor of an obligation to perform the Work in accordance with the requirements of the Contract Documents.

G. Re-testing or re-inspection required because of a non-conformance to the specified requirements shall be performed by the same independent firm on instructions by the Design Agent or its Consultant. Payment for the re-testing or re-inspection will be charged to the Contractor by deducting the testing charges from the Contract Sum.

H. Agency Responsibilities:
1. Test samples of mixes submitted by the Contractor.
2. Provide qualified personnel at the site. Cooperate with the Design Agent or its Consultant and the Contractor in performance of services.
3. Perform specified sampling and testing of the products in accordance with the specified standards.
4. Ascertain compliance of the materials and mixes with the requirements of the Contract

Documents.

5. Promptly notify the Design Agent, Consultant and the Contractor of observed irregularities or non-conformance of the Work or products.
6. Perform additional tests required by the Design Agent or its Consultants.
7. Attend the preconstruction meetings and the progress meetings.

I. Agency Reports: After each test, promptly submit two copies of the report to the Design Agent, appropriate Consultant, and to the Contractor. When requested by the Design Agent, provide an interpretation of the test results. Include the following:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

J. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
4. Agency or laboratory may not assume any duties of the Contractor.
5. Agency or laboratory has no authority to stop the Work.

1.08 MANUFACTURERS' FIELD SERVICES

A. When specified in the individual specification Sections, require the material or Product suppliers, or manufacturers, to provide qualified staff personnel to observe the site conditions, the conditions of the surfaces and installation, the quality of workmanship, the start-up of equipment, or test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Submit the qualifications of the observer to the Design Agent 30 days in advance of the required observations. Observer is subject to approval of the Design Agent.

C. Report the observations and the site decisions or instructions given to the applicators or installers that are supplemental or contrary to the manufacturers' written instructions.

D. Refer to Section 01 3300 - SUBMITTAL PROCEDURES, MANUFACTURERS' FIELD REPORTS article.

1.09 MOCK-UP REQUIREMENTS

A. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

B. Accepted mock-ups shall be a comparison standard for the remaining Work.

C. Where mock-up has been accepted by Design Agent and is no longer needed, remove mock-up and clear area when directed to do so.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not used.

**END OF SECTION**

# 01 4010 QUALITY REQUIREMENTS - Attachment A

A. Base Bid Testing Requirements List

1. Pressure Testing of Water and Steam Piping Systems
    a. All new piping systems (above ground and below ground) shall be tested at a pressure of 150 psig for a period of 8 hours.

2. Soils Testing (prior to import)
    a. Sieve Analysis (ASTM D422)
    b. Proctor Test (Modified) (ASTM D1557)

3. Soils Testing (on site)
    a. Density and Water Content (Nuclear Methods) (ASTM D6938)

4. Asphalt Testing
    a. Density Testing (Nuclear Methods) (AASHTO T 355)

**END OF ATTACHMENT**

## 01 4020 QUALITY REQUIREMENTS - Attachment B

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. Delete header 1.01 G. Delete paragraph 1.09. No mock-ups required.

**END OF ATTACHMENT**

# SECTION 01 5000 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Temporary Utilities:
   1. Temporary electricity.
   2. Temporary lighting for construction purposes.
   3. Temporary heating.
   4. Temporary cooling.
   5. Temporary ventilation.
   6. Telephone service.
   7. Temporary water service.
   8. Temporary sanitary facilities.

B. Construction Facilities:
   1. Field offices and sheds.
   2. Hoisting.
   3. Parking/Traffic.
   4. Progress cleaning and waste removal.
   5. Project identification.
   6. Traffic regulation.

C. Temporary Controls:
   1. Barriers.
   2. Enclosures and fencing.
   3. Security.
   4. Fire detection.
   5. Water control.
   6. Dust control.
   7. Erosion and sediment control.
   8. Noise control.
   9. Pest control.
   10. Pollution control.
   11. Rodent control.

D. Removal of utilities, facilities, and controls with reseeding and repair of grounds.

E. See Attachment A for any modifications.

### 1.02 TEMPORARY ELECTRICITY

A. The Owner will pay the cost of energy used. Exercise measures to conserve energy. Utilize the Owner's existing power service.
B. Complement the existing power service capacity and characteristics as required for construction operations.

C. Provide power outlets, with branch wiring and distribution boxes located at each floor or as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment. All flexible power cords shall be suspended with hangers to eliminate trip hazards.

D. Provide main service disconnect and over-current protection at a convenient location, or a feeder switch at the source distribution equipment or meter.

E. Permanent convenience receptacles may not be utilized during construction.

F. Provide distribution equipment, wiring, and outlets to provide single-phase branch circuits for power. Provide 20-ampere duplex outlets, single-phase circuits for power tools.

1.03 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft (21 watt/sq m).

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

C. Maintain lighting and provide routine repairs.

D. Permanent building lighting may be utilized during construction where not removed.

1.04 TEMPORARY HEATING

A. Existing facilities will be occupied and heated by the University when temperatures require. Take care to avoid leaving doors open in exterior walls that could compromise heating operations. For new construction, the cost of energy will be borne by the Contractor. Provide temporary heating as necessary for construction operations.

B. Supplement with temporary heat devices if needed to maintain the specified conditions for construction operations even in existing buildings.

C. Maintain a minimum ambient temperature of 50 degrees F in the areas where construction is in progress, unless indicated otherwise in the product Sections.

D. In areas of work with mechanical hot-air heating, clean units and replace filters after Substantial Completion.

E. Do not use new equipment for heating after replacement during construction.

1.05 TEMPORARY COOLING

A. Existing cooling facilities are typically not available.

B. Provide and pay for cooling devices and cooling as needed to maintain the specified conditions for construction operations.

C. Maintain a maximum ambient temperature of 80 degrees F in the areas where construction is in progress, unless indicated otherwise in the specifications.

1.06 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve a curing of materials, to dissipate humidity, and to prevent the accumulation of dust, fumes, vapors, or gases.

B. If existing ventilation fans are used during construction, clean fans in areas of work after Substantial Completion.

1.07 TELEPHONE SERVICE

A. Provide, maintain, and pay for cell phone service to the field supervisor at the time of project mobilization and until project Final Completion.

1.08 TEMPORARY WATER SERVICE

A. The Owner will pay the cost of temporary water. Exercise measures to conserve energy. Utilize the Owner's existing water system, extend and supplement with temporary devices as needed to maintain the specified conditions for construction operations.

B. Extend branch piping with outlets located so that water is available by hoses with threaded connections. Provide temporary pipe insulation if needed to prevent freezing.

1.09 TEMPORARY SANITARY FACILITIES

A. Contractor shall provide and maintain temporary toilet facilities for use by all construction personnel. Trades people will not be permitted to use existing facilities within the building.

1.10 FIELD OFFICES AND SHEDS

A. Do not use existing facilities for storage. Job meetings will be held on campus at a location to be chosen by the University.

B. Storage Areas and Sheds: Size to the storage requirements for the products of the individual Sections, allowing for access and orderly provision for the maintenance and for the inspection of Products to the requirements of Section 01 6000. Containers will be permitted within the project limit line. Coordinate with URI for storage areas.

C. Preparation: Fill and grade the sites for the temporary structures to provide drainage away from the buildings.

D. Removal: At the completion of the Work remove the buildings, foundations, utility services, and debris. Restore the areas.

1.11 HOISTING

A. Contractor is responsible for all hoisting required to facilitate, serve, stock, clean, and complete the Work. Include all costs for Operating Engineers, fuel, delivery and removal, mobilization, staging, protection of grades and surfaces, and equipment.

1.12 PARKING/TRAFFIC

A. Workers must park in lots assigned by the University with daily permits. See Site Utilization Plan.

B. Use of designated existing on-site streets and driveways for construction traffic is permitted. Tracked vehicles are not allowed on paved areas.

C. Do not allow heavy vehicles or construction equipment in parking areas.

D. Do not allow vehicle parking on existing sidewalks.

E. Provide and maintain access to fire hydrants and control valves free of obstructions.

F. Remove mud from construction vehicle wheels before entering streets. Cleanup dirt, rocks, and debris left on street from construction vehicles.

G. Use designated existing on-site roads for construction traffic.

H. Maintenance:
   1. Maintain the traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
   2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain the paving and drainage in original, or specified, condition.

I. Removal, Repair:
   1. Remove temporary materials and at Substantial Completion.
   2. Remove underground work and compacted materials to a depth of 2 feet; fill and grade the site as specified.
   3. Repair existing and permanent facilities damaged by use, to the original or specified condition.

1.13 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain the site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other remote spaces, prior to enclosing the space.

C. Broom and vacuum clean the interior areas prior to the start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from the site daily, as necessary to prevent an on-site accumulation of waste material, debris, and rubbish, and dispose off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.14 PROJECT IDENTIFICATION

A. Project Identification Sign: One painted sign, 32 sq ft area, bottom 6 feet above the ground.
   1. Content:
      a. Project title, and name of the Owner as indicated on the Contract Documents.
      b. Names and titles of the authorities.
      c. Names and titles of the Design Agent and Consultants.
      d. Name of the Design Agent Contractor.
   2. Graphic Design, Colors, and Style of Lettering: 3 colors, as designated by the Design Agent during construction.

B. Project Informational Signs:
   1. Painted informational signs of same colors and lettering as the Project Identification sign, or standard products; size lettering to provide legibility at 100-foot distance.
   2. Provide sign at each field office, storage shed, and directional signs to direct traffic into and within site. Relocate as the Work progress requires.
   3. No other signs are allowed without the Owner's permission except those required by law.

C. Design all signs and their structures to withstand a 60-miles/hr-wind velocity.

D. Sign Painter: Experienced as a professional sign painter for a minimum of three years.

E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for the duration of construction.

F. Show content, layout, lettering, color, foundation, structure, sizes, and grades of members.

G. Installation:
   1. Install the project identification sign within 15 days after the date of receipt of the Purchase Order from State of Rhode Island Department of Administration, Division of Purchases.
   2. Erect at the designated location.
   3. Erect the supports and framing on a secure foundation, rigidly braced and framed to resist wind loadings.
   4. Install the sign surface plumb and level, with butt joints. Anchor securely.
   5. Paint exposed surfaces of the sign, supports, and framing.

H. Maintenance: Maintain the signs and supports clean, repair deterioration and damage.

I. Removal: Remove the signs, framing, supports, and foundations at the completion of the Project and restore the area.

1.15 TRAFFIC REGULATION

A. Signs, Signals, and Devices:
   1. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by local jurisdictions.
   2. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
   3. Flag person Equipment: As required by local jurisdictions.
   4. Police Details: Provide all police details as required by local jurisdictions, including payment directly to officers.

B. Flag Persons: Provide trained and equipped flag persons to regulate the traffic when construction operations or traffic encroach on the public traffic lanes.

C. Flares and Lights: Use flares and lights during the hours of low visibility to delineate the traffic lanes and to guide traffic.

D. Haul Routes:
   1. Consult with the authority having jurisdiction, establish the public thoroughfares to be used for haul routes and site access.

E. Traffic Signs and Signals:
   1. At approaches to the site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct the construction and affected public traffic.
   2. Install and operate automatic traffic control signals to direct and maintain the orderly flow of traffic in areas under the Contractor's control, and areas affected by the Contractor's operations.
   3. Relocate as the Work progresses, to maintain effective traffic control.

F. Removal:
   1. Remove equipment and devices when no longer required.
   2. Repair damage caused by installation.
   3. Remove post settings to a depth of 2 feet .

1.16 BARRIERS

A. Provide barriers to allow for the Owner's use of the site and to protect existing facilities and adjacent properties from damage from the construction operations, or demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way, or for public access to the building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

## 1.17 ENCLOSURES AND FENCING

A. Construction: Provide 6-ft. high commercial grade chain link fence around on-site equipment or areas of site disturbance for the period required to protect work and the public. Equip with vehicular and pedestrian gates with locks. Provide one set of keys to all gates and door locks to the Owner.

A. Perform adjustment to the proposed layout as may be directed by the Owner.

B. Interior Enclosures:
   1. Provide temporary partitions and ceilings as indicated to separate the work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to the existing materials and equipment.
   2. Construction: Framing and reinforced polyethylene, plywood, or gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces, as agreed with the Owner:
      a. Maximum flame spread rating of 75 in accordance with ASTM E84.

## 1.18 SECURITY

A. Security Program:
   1. Protect the Work, the existing premises, or the Owner's operations from theft, vandalism, and unauthorized entry.
   2. Initiate the program in coordination with the Owner's existing security system at mobilization.
   3. Maintain the program throughout the construction period until Owner occupancy of each designated area.

B. Entry Control: Coordinate the access of the Owner's personnel to the site in coordination with the Owner's security forces.

## 1.19 FIRE DETECTION

A. Before beginning any construction operation that can potentially trigger the existing fire alarm detection system, notify the Owner through use of the form provided in Section 01 1020.

B. Failure to so notify the Owner will subject the Contractor to a monetary fine for each occurrence, should the fire detection system be activated inadvertently by a construction activity.

C. Comply with FM Global insurance underwriting standards and insurer recommendations for Hot Work, sprinkler impairment, and site maintenance.

1.20 WATER CONTROL

A. Grade the site to drain. Maintain excavations free of water. Provide, operate, and maintain the pumping equipment.

B. Protect the site from puddling or running water. Provide water barriers as required to protect the site from soil erosion.

1.21 DUST CONTROL

A. Execute the Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.22 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 erosion and sedimentation.

B. Minimize the amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

E. Periodically inspect the earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.23 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by the construction operations.

1.24 PEST CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work, or entering the facility.

1.25 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent the contamination of soil, water, and the atmosphere from discharge of noxious, toxic substances, and pollutants produced by the construction operations.

1.26 RODENT CONTROL

A. Provide methods, means, and facilities to prevent rodents from accessing or invading the premises.

1.27 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials, prior to Substantial Completion.

B. Remove the underground installations to a minimum depth of 2 feet. Grade the site as indicated.

C. Clean and repair the damage caused by installation or use of temporary work.

D. Restore the existing and new facilities used during construction to their original condition.

E. Restore any temporary exterior laydown or storage areas to the original condition. After each use, regrade and reseed as required to meet this requirement.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used.

**END OF SECTION**

# 01 5010 TEMPORARY FACILITIES AND CONTROLS - ATTACHMENT A

1.01 SECTION INCLUDES

A. Temporary heating.
   1. Provide temporary steam and condensate lines, as depicted on the Contract Drawings. Costs for temporary steam and condensate lines shall be included in Contractor's base bid.

B. Barriers
   1. Provide all necessary temporary fencing and/or precast concrete barriers as required for traffic and pedestrian controls. Costs shall be included in Contractor's base bid.

**END OF ATTACHMENT**

## 01 5020 TEMPORARY FACILITIES AND CONTROLS - Attachment B

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. Delete all lines 1.01 A.1thru 8 and B.1 thru 6.

C. Delete 1.02 B, C, D and E. Delete 1.03 A and B. Power distribution work not required.

D. Delete 1.05, 1.07, and 1.08.

E. Delete subparagraphs 1.10 C and D. No field offices temporary utilities anticipated on small projects.

F. Delete subparagraphs 1.12 H and I.

G. Delete paragraphs 1.14, 1.15 and 1.16.

**END OF ATTACHMENT**

# SECTION 01 6000 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Product substitution procedures.

1.02 PRODUCTS

A. Products: Means new material, machinery, components, fixtures, or systems forming the Work; but does not include the machinery or equipment used for the preparation, fabrication, conveying, or erection of the Work. Products may include the existing materials or components required or specified for reuse.

B. Furnish products of qualified manufacturers suitable for the intended use. Furnish products of each type by a single manufacturer unless specified otherwise.

C. Do not use materials and equipment removed from the existing premises, except as specifically permitted by the Contract Documents.

D. Furnish interchangeable components of the same manufacturer for the components being replaced.

1.03 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with the manufacturer's instructions.

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

C. Provide equipment and personnel to handle the products by methods to prevent soiling, disfigurement, or damage.

1.04 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect the products in accordance with the manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to the product.

D. For exterior storage of fabricated products, place on sloped supports above the ground.

E. Provide bonded off-site storage and protection when the site does not permit on-site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent the condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store the products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of the products to permit access for inspection. Periodically inspect to verify that the products are undamaged and are maintained in acceptable condition.

1.05 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of the manufacturers named and meeting the specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.06 PRODUCT SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify the time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.

B. Substitutions may be considered after the bid only in the following circumstances:
1. when a product becomes no longer in production following the date of receipt of the Purchase Order for this Contract. Submit certification both that specified product was carried in Bid, and is no longer obtainable. Provide cost change documentation.
2. there is a significant cost savings offered to the Owner. Provide price comparison of both bid and offered substitution products as well as all collateral costs of the change.

3. Code changes or site conditions require a different item from that bid. Submit as for 2 above.

C. Document each request with complete data substantiating the compliance of a proposed Substitution with the Contract Documents.

D. A request constitutes a representation that the Bidder:
   1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the Substitution as for the specified Product.
   3. Will coordinate the installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Owner, including redesign.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse the Owner and the Design Agent for review or redesign services, including those associated with re-approval by the authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on the Shop Drawing or Product Data submittals, without a separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure, If Permitted Following Contract Award:
   1. Submit three copies of a request for Substitution for consideration, no later than 20 working days following date of receipt of the Purchase Order for this Contract. Limit each request to one proposed Substitution.
   2. Submit the Shop Drawings, Product Data, and the certified test results attesting to the proposed product equivalence. The burden of proof is on the proposer.
   3. The Design Agent will notify the Contractor in writing of a decision to accept or reject the request. Costs for review time on unsuccessful requests will be included in the next change order.

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

Not Used.

## END OF SECTION

## 01 6010 PRODUCT REQUIREMENTS - Attachment A

A. No variations in this section for this Project.

**END OF ATTACHMENT**

## 01 6020 PRODUCT REQUIREMENTS - Attachment B

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. No amendments are necessary in the Section due to project size. See Attachment A for project specific amendments.

**END OF ATTACHMENT**

# SECTION 01 7000 - EXECUTION REQUIREMENTS

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Examination.

B. Preparation.

C. Field Engineering.

D. Protection of adjacent construction.

E. Cutting and patching.

F. Special procedures.

G. Starting and adjusting of systems.

H. Demonstration and Instructions.

I. Testing, adjusting and balancing.

J. Protecting Installed Construction.

1.02 EXAMINATION

A. Acceptance of Conditions:
   1. Verify that existing applicable site conditions, substrates, or substrate surfaces are acceptable or meet specific requirements of individual specifications Sections, for subsequent Work to proceed.
   2. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
   3. Examine and verify specific conditions described in individual specifications Sections.
   4. Verify that utility services are available, of correct characteristics, and in correct locations.
   5. Beginning of new Work, that relies upon the quality and proper execution of Work of a preceding trade, means acceptance of that preceding Work as appropriate for the proper execution of subsequent Work.
   6. Acceptance of preceding Work that can be shown later to have adversely affected proper performance of new Work may result in removal and repeat performance of all Work involved at no cost to the Owner.

1.03 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply substrate primer, sealer, or conditioner, required or recommended by manufacturer, prior to applying any new material or substance in contact or bond.

D. Prior to the application, installation, or erection of any products and product components, perform any other preparatory operations, or surface or substrate modifications, as may be specified or directed by product manufacturers.

1.04 FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Rhode Island and acceptable to Design Agent and the Owner if required by subgrade work.

B. Locate and protect survey control and reference points. Promptly notify Design Agent of any discrepancies discovered.

C. Control Datum for survey is to be agreed to with the Design Agent.

D. Verify setbacks and easements, if any; confirm drawing dimensions and elevations.

E. Provide field-engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

F. Submit a copy of site drawings and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

G. Maintain a complete and accurate log of control and survey work as it progresses.

H. If required by the Owner, on completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

I. Protect survey control points prior to starting site work; preserve permanent reference point during construction.

J. Promptly report to Design Agent the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

K. Replace dislocated survey control point based on original survey control. Make no changes without prior written notice to Design Agent.

## 1.05 PROTECTION OF ADJACENT CONSTRUCTION

A. Protect existing adjacent properties and provide special protection where specified in individual Specification Sections.

B. Provide protective coverings at wall, projections, jambs, sills, and soffits of existing openings.

C. Protect existing finished floors, stairs, and other existing surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

D. Cover and protect furnishings, materials and equipment within the spaces receiving new work. Move items as necessary to install new work and return them to original locations at the close of construction in that area.

E. Repair adjacent properties damaged by construction operations to original condition to the satisfaction of the Owner.

F. Prohibit unnecessary traffic from existing landscaped areas.

G. Restore grassed landscaped areas damaged by construction operations to full healthy growth, by installing loam and sod to the requirements, and under the supervision of, the University's Associate Director of Lands and Grounds.

## 1.06 CUTTING AND PATCHING

A. Employ skilled and experienced installers to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements which affect:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   4. Visual qualities of sight-exposed elements.
   5. Existing construction, or Work of separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
   1. Fit the several parts together, to integrate with other Work.
   2. Uncover Work to install or correct ill-timed Work.
   3. Remove and replace defective and non-conforming Work.
   4. Remove samples of installed Work for testing.
   5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods that will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.

E. Cut masonry, concrete, and other rigid materials using masonry saw or core drill.

F. Remove ceiling tiles as necessary to access areas of work. Store and replace carefully to avoid damage. Replace all ceiling tiles damaged during the work with new tiles to match. Repair ACT grid damaged during the work in accordance with this section.

G. Restore Work with new Products in accordance with requirements of Contract Documents.

H. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.

I. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

J. At penetration of fire rated partitions, ceiling, or floor construction, completely seal voids with fire rated or fire resistant material in accordance with Specifications, to full thickness of the penetrated element.

K. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

L. Identify any hazardous substance or conditions exposed during the Work to the Owner and Design Agent for decision or remedy.

M. See General Conditions for additional requirements.

1.07 SPECIAL PROCEDURES

A. Materials: As specified in product Sections; match existing with new products, or salvaged products as appropriate, for patching and extending work.

B. Employ skilled and experienced installer to perform alteration work.

C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to provide installation of new Work and finishes.

G. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.

H. Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring products and finishes to original or specified condition.

I. Refinish existing visible surfaces to remain in renovated rooms and spaces to specified condition for each material, with a neat transition to adjacent finishes.

J. Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

K. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Design Agent for review.

L. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition to Design Agent for review.

M. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

N. Patch or replace portions of existing surfaces which are damaged, or showing other imperfections.

O. Finish surfaces as specified in individual product Sections, or as indicated on the Drawings.

1.08 STARTING AND ADJUSTING OF SYSTEMS

A. Coordinate schedule for starting and adjusting of various equipment and systems.

B. Notify Design Agent and Owner seven days prior to starting and adjusting of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.

D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute starting and adjusting under supervision of responsible Contractor's personnel or manufacturer's representative, in accordance with manufacturer's instructions.

G. Adjust operating Products and equipment to ensure smooth and unhindered operation.

H. When specified in individual specifications Section, require manufacturer to provide authorized representative to be present at the site to inspect, check, and approve equipment or system installation prior to starting, and to supervise placing of equipment or system in operation.

I. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

1.09 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manuals with Owner's personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate start-up, operation, control, adjustment, trouble shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled or agreed upon times, at equipment or system location.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.10 TESTING, ADJUSTING, AND BALANCING

A. Submit, for the Owner's approval, the name of an independent firm to perform testing of fire systems. The independent firm's services will be paid for by the Contractor.

B. The independent firm will perform services specified in individual specifications Sections.

C. Reports will be submitted by the independent firm to the Design Agent and the Owner indicating observations and test results, indicating compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.

1.11 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Repair or replace installed Work damaged by construction operations, as directed by the Design Agent.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used.

**END OF SECTION**

## 01 7010 EXECUTION REQUIREMENTS - Attachment A

A. Daily Attendance Form

1. Maintain Daily Attendance Form acceptable to the Department of Labor and Training for all projects with a contract value over $1Million. Submit as requested.

**END OF ATTACHMENT**

**01 7020 EXECUTION REQUIREMENTS - Attachment B**
**Small Project Changes**

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

**END OF ATTACHMENT**

# SECTION 01 7320

# WASTE MANAGEMENT

## PART 1 GENERAL

### 1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Land clearing debris, including brush, branches, logs, and stumps.
   6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   7. Glass.
   8. Gypsum drywall and plaster.
   9. Plastic buckets.
   10. Paper, including wrapping, newsprint, and office.

E. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports. Submit in accordance with Section 01 3300.

F. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

G. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

H. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

### 1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 7000 - Execution Requirements: Trash/waste prevention procedures related to

demolition, cutting and patching, installation, protection, and cleaning.

**1.03 DEFINITIONS**

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

**1.04 SUBMITTALS**

A. See Section 01 3300 for submittal procedures.

B. Waste Management Plan: Include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.

5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

C. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
2. Submit Report on a form acceptable to Owner.
3. Landfill Disposal: Include the following information:
   a. Identification of material.
   b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
   c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
4. Incinerator Disposal: Include the following information:
   a. Identification of material.
   b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
   c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
5. Recycled and Salvaged Materials: Include the following information for each:
   a. Identification of material, including those retrieved by installer for use on other projects.
   b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
   c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
6. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards.
   c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

## PART 2 PRODUCTS (not used)

## PART 3 EXECUTION

### 3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 1000 for list of items to be salvaged from the existing building for relocation in project or for Owner.

B. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

C. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.

D. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

E. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

**3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION**

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, Owner's Recycling and Solid Waste Coordinator, and Design Agent.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
1. Pre-bid meeting.
2. Pre-construction meeting.
3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
1. Provide containers as required.
2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

**END OF SECTION**

## 01 7330 WASTE MANAGEMENT - Attachment A

A. No variations in this section for this Project.

**END OF ATTACHMENT**

## 01 7331 WASTE MANAGEMENT - Attachment B
## Small Project Changes

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. Delete paragraphs 1.01 F and 1.04 B. Change heading at 3.02 to be "WASTE MANAGEMENT PROCEDURES. Delete paragraphs 3.02 A, B and D. No Waste Management Plan will be required.

C. Delete lines 1.04 C.4c, .4d, .5c, .5d and .6c. Required back-up is reduced.

**END OF ATTACHMENT**

# SECTION 01 7800 - CLOSEOUT REQUIREMENTS

## PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Closeout procedures.

B. Quality assurance.

C. Maintenance service.

D. Operations and maintenance manuals.

E. Materials and finishes manuals.

F. Equipment and systems manuals.

G. Spare parts and maintenance materials.

H. Product warranties and product bonds.

I. Project Record documents.

1.02 CLOSEOUT PROCEDURES

A. Submit a written certification that the Contract Documents have been reviewed, the Work has been inspected, and that the Work is complete in accordance with the Contract Documents and is ready for the Owner's review.

B. Provide submittals to Design Agent that are required by governing or other authorities, including
abatement invoices correctly prepared as proscribed in the abatement plan. Failure to include correctly prepared abatement invoices will delay issuing of final payment.

C. Provide submittals to Design Agent that are required by the governing or other authorities, including
the following closeout documents:
1. AIA Document G706 - Contractor's Affidavit of Payment of Debts and Claims
2. AIA Document G706A - Contractor's Affidavit of Release of Liens
3. AIA Document G707 - Consent of Surety to Final payment

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

E. The Owner will occupy all portions of the building after Substantial Completion as specified in Section 01 1000.

1.03 QUALITY ASSURANCE

A. Employ personnel assembling submittals experienced in the maintenance and the operation of the described products and systems.

1.04 MAINTENANCE SERVICE

A. Submit a contract for furnishing service and maintenance of the components indicated in the specification Sections for one year from date of Substantial Completion, or during the warranty period, whichever period of time is the longest.

B. Provide for an examination of the system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include a systematic cleaning, examination, adjustment, and lubrication of the components. Repair or replace the parts whenever required. Use the parts produced by the manufacturer of the original component.

D. Do not assign or transfer the maintenance service to an agent or Subcontractor without the prior written consent of the Owner.

1.05 OWNER'S MANUALS

A. Submit the data for Operations and Maintenance, Materials and Finishes, and Equipment and Systems Manuals bound in 8-1/2 x 11 inch text pages, in minimum 2 inch size three D side ring commercial quality binders with durable cleanable plastic covers.

B. Prepare binder covers with the printed title of the manual, title of the project, and the subject matter of binder. Label each spine with the following: Building, project or facility name, OCP project number, submission date.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Drawings: Provide with reinforced punched binder tab. Bind in with the text; fold the larger drawings to the size of the text pages.

E. Submit two copies of a preliminary draft of the proposed formats and outline of the contents before the start of work. The Design Agent and its consultants will review drafts and return one copy with comments.

F. Submit one copy of the completed volumes 15 days prior to final inspection for final review. This copy will be reviewed and returned after final inspection, with the Design Agent's comments. Revise the content of the document sets as required prior to final submission.

G. Submit three sets of revised final volumes plus electronic copy in final form within ten days after final inspection.

## 1.06 OPERATIONS AND MAINTENANCE MANUALS

A. Contents: Prepare the Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. **Part 1:** Directory, listing the names, addresses, and telephone numbers of the Design Agent, its Consultants, Contractor, Subcontractors, and major equipment suppliers.
   2. **Part 2:** Operation and maintenance instructions, arranged by system and subdivided by the specification Section. For each category, identify the names, addresses, and telephone numbers of the Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. **Part 3:** Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Originals of warranties and bonds.
   4. **Part 4:** Scan entire manual and provide 3 copies on disc in electronic PDF format.

## 1.07 MATERIALS AND FINISHES MANUALS

A. Building Products, Applied Materials, and Finishes: Include product data, with the catalog number, size, composition, and the color and texture designations. Include information for re-ordering custom manufactured products.

B. Instruction for Care and Maintenance: include manufacturer's instructions for cleaning agents and methods, precautions against detrimental agents and methods, and a recommended schedule for cleaning and maintenance.

C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.

D. Additional Requirements: As specified in the individual product specification Sections.

E. Include a listing in the Table of Contents for design data, with a tabbed flysheet and a space for the insertion of data.

1.08 EQUIPMENT AND SYSTEMS MANUALS

A. For equipment, or component parts of equipment put into service during construction and operated by the Owner, submit documents within 10 days after acceptance.

B. Each Item of Equipment and Each System: Include a description of the unit or system, and the component parts. Identify the function, normal operating characteristics, and limiting conditions. Include performance curves, with priming data and tests, and complete nomenclature and model number of replaceable parts.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color-coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

G. Include a servicing and lubricating schedule, and a list of lubricants required.

H. Include the manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by the controls manufacturer.

J. Include the original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Include control diagrams by the controls manufacturer as installed.

L. Include the Contractor's coordination drawings, with color-coded piping diagrams as installed.

M. Include charts of valve tag numbers, with the location and function of each valve, keyed to the flow and control diagrams.

N. Include a list of the original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

O. Include test and balancing reports as specified in Section 01400.

P. Additional Requirements: As specified in the individual product specification Sections.

1.09 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products (attic stock) in the quantities specified in the individual specification Sections.

B. Deliver to the Project site and place in a location as directed by the Owner; obtain a receipt prior to final payment.

1.10 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by the responsible subcontractors, suppliers, and manufacturers, within 10 days after the completion of the applicable item of work.

B. Execute and assemble the transferable warranty documents and bonds from the subcontractors, suppliers, and manufacturers.

C. Verify that the documents are in the proper form, contain full information, and are notarized.

D. Co-execute the submittals when required.

E. Include in the Operations and Maintenance Manuals within the appropriate material specification section.

F. Submit prior to the final Application for Payment. For items of Work for which acceptance is delayed beyond the Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.

1.11 PROJECT RECORD DOCUMENTS

A. Maintain on the site one set of the following record documents; record actual revisions of the Work for all trades:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instructions for assembly, installation, and adjusting.

B. Ensure the entries are complete and accurate, enabling future reference by the Owner.

C. Store the record documents separate from the documents used for construction.

D. Record information concurrent with the construction progress, not less than weekly.

E. Specifications: Legibly mark and record at each product Section description of the actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record the actual construction including:
   1. Measured horizontal and vertical locations of the underground utilities and appurtenances, referenced to permanent surface improvements. Include the locations and description of any existing utility lines and other existing installations of any kind or description encountered during construction. Note all changes in size, material, location, and elevation of all new or abandoned underground utility lines and pertinent work, including site grading. Document topography and drainage changes. Show the location of all valves, manholes, etc. and include dimensions to permanent features such as building corners. Note direction of each new valve opening. Show clearances between new utilities and existing crossed lines. Locate all bends, thrust blocks, and other restraints.
   2. The placement, size, and type of any fire extinguishers.
   3. Measured locations of internal utilities and appurtenances concealed in the construction.
   4. Field changes of dimension and detail.
   5. Details not on the original Contract drawings.

G. Legibly marked Specifications, and legibly marked Record Drawings and Shop Drawings shall constitute the Project Record Documents in paper form.

H. At completion of the Work of the Contract, the Contractor shall retain competent drafting personnel to transfer the information from the Project Record Documents in paper form to editable electronic formats to create “As-Built” Documents on base files provided by the Design Agent. The record construction drawings shall be produced in both AutoCAD format plus a record PDF copy of each drawing. AutoCAD files shall include all XREF, font, image, shape, and plot files. PDF files shall be saved full sheet size. The record Project Manual shall be in Microsoft Word form plus a record PDF of the entire manual. The electronic media containing this information will constitute the Project Record Documents in digital form, sometimes referred to as the “As-Built” Documents. Acceptable media are write-protected CD-R format discs or flash drives. Submit one full size printed set of drawings and specifications on 20 lb. white bond made from the As-Built files in addition to the electronic media.

I. Associated materials including but not limited to the following are also required to be submitted at project close-out: shop drawings and cut sheets, RFIs, correspondence and meeting minutes, LEED scorecards, construction progress photographs, DEM permits including generator permits, certificates including Final Certificate of Occupancy, boiler and elevator certificates, easement rights, National Grid Rebate Applications, test and inspection documentation including fire pump test data, asbestos abatement plans and manifests. These materials may be

submitted in either paper or PDF digital format, organized by specification number, and clearly labeled. If paper copies are submitted, each box must be clearly labeled as to specific contents.

J. If the project required geotechnical, archeological, or other miscellaneous studies or other reports, these shall also be submitted as Record Document in either paper or digital format.

K. Labeling: In all cases, paper or digital submissions must contain the following information: Building, project or facility name, OCP Project number, submission date, and specific content index.

L. No review or receipt of Project Record Documents by the Design Agent or the Owner shall be interpreted as a waiver of any deviation from the Contract Documents or Shop Drawings, or in any way relieve the Contractor from responsibility to perform the Work in accordance with the Contract Documents and the Shop Drawings.

M. Update the on-site Project Record Documents on a regular basis. Monthly payments will not be processed if Project Record Documents are not maintained up to date.

## PART 2 - PRODUCTS

Not used.

## PART 3 - EXECUTION

Not used.

## END OF SECTION

## 01 7810 CLOSEOUT REQUIREMENTS - Attachment A

A. No variations in this section for this Project.

**END OF ATTACHMENT**

## 01 7820 CLOSEOUT REQUIREMENTS - Attachment B
## Small Project Changes

A. The following amendments are made to this Section in order to facilitate execution of smaller projects at URI. They apply to the work of this project. All portions of the specification Section not deleted or amended remain in full force and effect for this project.

B. Delete subparagraph 1.02 A. Additional certification is not required.

C. Delete lines 1.02 C.1 and 3. Only the final release of liens remains as a requirement from this paragraph.

D. Delete paragraph 1.03. General knowledge of construction is sufficient.

E. Delete subparagraph 1.05 E. No preliminary submittal is required.

**END OF ATTACHMENT**

# Division 02 - Existing Conditions

# SECTION 02 22 00

# GENERAL EXISTING SITE CONDITIONS

## PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 0 and Division 1 Specification Sections, apply to this Section.

B. A comprehensive utility location survey was completed as part of the design process. Detailed figures and CAD files with results of the utility location survey are available to the Contractor upon request.

1.2 SUMMARY

A. Provide all labor, materials and equipment, as necessary, to complete all General Existing Site Conditions Work as indicated on the Contract Documents, herein specified, or both. The work of this Section includes, but is not limited to, coordination and control of all site related work.

1.3 RELATED SECTIONS

A. General Contract Conditions and Requirements.

B. Division 23 for HVAC Work.

C. Division 31, 32 and 33 for Site Work.

1.4 SUBMITTALS

A. Submittal procedures shall be in accordance with Specification Section 01 3300.

B. Any Material, Labor or Equipment provided by the Contractor for this Project that has not first been approved by the Engineer shall be deemed to be provided solely at the Contractor's risk.

C. Administrative Submittals

1. Contractor to submit Dig Safe System Inc. clearance numbers as necessary.

## PART 2 PRODUCTS

NOT USED

## PART 3 EXECUTION

3.1 GENERAL

A. Contractor shall visit the site and acquaint himself with existing conditions prior to beginning work.

B. The Contractor, by submitting a proposal, acknowledges that he has investigated the project site to determine the type, quantity, quality and character of Site Work to be performed.

3.2 LICENSES REQUIRED

A. Prior to beginning any Site Work, Contractor shall ensure that the operators of all equipment used in the Site Work are properly and currently licensed to operate such equipment.

3.3 PERMITS

A. Before beginning any work in any public highways, streets or ways, confirm through the Owner that all necessary permits relating to such work have been obtained.

3.4 EXCAVATIONS – GENERAL

A. Dig Safe System, Inc. (Call 811)

1. Contractor shall be aware of and comply with all laws governing work in areas of existing underground utilities on Federal, State, Municipal and privately-owned land.
2. Prior to beginning any demolition, excavation or other Site Work, Contractor shall verify the locations of all underground utilities shown on the Contract Documents by any and all means necessary.
3. Contractor shall be responsible for contacting individual utility companies to check for any additional utility lines not shown.

3.5 PROTECTION OF EXISTING UTILITIES

A. In addition to the requirements of Divisions 0 and 1 and those specified elsewhere, and in coordination with the Owner, protect all existing utility lines and utility ways from any and all damage throughout the work of this Project, using only means and methods approved in advance by the applicable utility companies and the Engineer.

B. Proceed only with utmost caution in areas of existing underground, above ground and aerial utilities, as prescribed by the pertinent utility companies and by applicable law. Immediately repair or replace any damaged utility lines and ways per the utility companies involved, at no additional cost to the Owner.

## 3.6 MAINTENANCE OF EXISTING UTILITIES

A. In addition to the requirements in Division 0 and 1 and those specified elsewhere, and in coordination with the Owner, take all necessary measures to ensure that all existing utilities remain active and available to the community throughout the construction period.

B. When any utility must be temporarily disrupted for any approved reason, Contractor shall provide 5-days advance notice to the Owner and Engineer and to the utility company involved.

## 3.7 AWARENESS OF HISTORICAL ARTIFACTS

A. Prior to and during any excavation performed by the Contractor or his forces, the Contractor shall immediately notify the Owner and the Engineer should any of the following be encountered:

1. Charcoal, bones, sea shells, rocks that appear to have been burned, and any obvious evidence of prior human habitation, such as arrowheads, pottery shards, hewed timber, etc.
2. No additional excavation work shall take place in the areas of such discoveries until the Contractor has been directed by the Engineer to proceed.

## 3.8 ACCESS AND EGRESS

A. In addition to the requirements set forth in Divisions 0 and 1 the Contractor shall make whatever provisions are necessary to maintain unobstructed access to and egress from the site for both regular and emergency vehicular and pedestrian traffic.

B. Ensure that all proper authorities and the Owner have been notified before beginning any work that might impede vehicular traffic adjacent to the site or to and from the site.

**END OF SECTION**

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# Division 23 - Heating, Ventilation, and Air-Conditioning

TABLE OF CONTENTS

## 1.0 GENERAL

### 1.1 GENERAL CONDITIONS

A. Section includes general mechanical requirements for work specified in all other sections of Division 23, the drawings and schedules.

B. Subcontractor, unless otherwise qualified, shall mean the installer of the heating, ventilating and air conditioning work.

C. The work covered by this specification consists of furnishing all materials, labor, equipment and appurtenances to perform, and leave in satisfactory operating condition, all heating, ventilating, air conditioning work, complete, including all tests and adjustments, in strict accordance with the Specifications and the applicable drawings. Completely coordinate work of this section with work of other trades and provide a complete and fully functional installation.

D. Give notices, file plans, obtain permits and licenses, pay fees and charges, and obtain necessary approvals from authorities that have jurisdiction as required to perform work in accordance with all legal requirements of the contract documents.

E. Examine the site and all drawings before proceeding with the layout and installation of this work. Arrange the work essentially as shown, exact layout to be made on the job to suit actual conditions. Confer and cooperate with other trades on the job so all work will be installed in proper relationship. Precise location of parts to coordinate with other work is the responsibility of this subcontractor

F. As used in these Sections, "provide" means "furnish and install." "Furnish" means to purchase and deliver to the project site complete with every necessary appurtenance and support," and "install" means "to unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project."

### 1.2 SCOPE OF WORK

A. HVAC work, including but not limited to:

1. Hoisting, rigging, and crane rental as required to complete the HVAC work.

2. Sleeves, inserts, supports, hangers and vibration isolation equipment. This includes all structural steel hangers, pipe racks and accessories to fully carry all piping, ductwork and equipment.

3. Provision and installation of all new HVAC related equipment as described in the contract drawings and specifications.

4. Provision and installation of all new piping, valves, hangers, supports, insulation, and appurtenances as indicated on the contract documents and specified in 70867-23500 "HVAC Piping", 70867-23550 HVAC Pre-Fabricated Underground Piping and 70867-23090 "HVAC Pipe Hangers & Supports".

5. Provision and installation of all new pipe insulation and appurtenances as indicated on the contract documents and specified in 70867-23250 "HVAC Pipe & Equipment Insulation."

6. Provisions for the cleaning, start-up and testing of all HVAC piping systems.

7. Provisions of shop drawings, equipment submittals and as-built drawings.

8. Provision of installation, operation, and maintenance manuals, and startup instructions.

9. All scaffolding as required for work.

10. Provisions for tags and identification of HVAC systems.

11. The Mechanical Contractor shall be responsible for all concrete core drilling and saw cutting required to install the ductwork, piping, equipment, etc. as indicated in the contract drawings and specifications.

12. The Mechanical Contractor shall be responsible for providing all concrete equipment pads required for all pad mounted equipment.

13. The Mechanical Contractor shall be responsible for all excavating and backfilling required for the completion of the HVAC work.

14. Temporary light, power, water, and heat, gas and sanitary facilities for use during construction and testing.

1.3 CONTRACT DOCUMENTS

A. Listing of Drawings does not limit responsibility of determining full extent of work required by these Contract Documents. Refer to Architectural, HVAC, Plumbing, Fire Protection, Electrical, Structural, Site Utility and all other Drawings and other Sections that indicate types of construction in which work shall be installed and work of other trades with which work of this Section must be coordinated.

B. Drawings are diagrammatic. They are not intended to be absolutely precise; they are not intended to specify or to show every offset, fitting, and component. The purpose of the drawings is to indicate a systems concept, the main components of the systems, and the approximate geometrical relationships. Based on the systems concept, the main components, and the approximate geometrical relationships, the contractor shall provide all other components and materials necessary to make the systems fully complete and operational without extra charge to the Owner.

C. Where drawings and specifications conflict or are unclear, advise Engineer in writing before proceeding with work.

D. Where drawings and specifications do not coincide with manufacturer's recommendations, or with applicable codes and standards, alert Engineer in writing before installation.

E. Certain details indicated on the Drawings are general in nature and specific labeled detail references to each and every occurrence of use are not indicated; however, such details by their titles shall be applicable to every occurrence on the Drawings.

F. Drawings and Specifications form complementary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure, and complete installation.

G. Work shall be performed as described in the Specifications except where specific deviations are indicated and/or noted on the Drawings.

H. Where specific conflicts occur between the Specifications and the Drawings, the Specifications shall take precedence.

I. All measurements and dimensions indicated on the contract documents shall be field verified before installation. Notify Engineer of any discrepancies that affect the installation before proceeding.

1.4 CODES AND STANDARDS

A. The latest published issue of Standards or Recommendations of the following listed Societies, Associations or Institutes in effect three months prior to the date of this contract are part of this Specification. These shall be considered as minimum requirements. Specific requirements of this Specification and/or Drawings shall have precedence. In case of conflict between published requirements, the Owner's Representative or Engineer shall determine which is to be followed.

B. Where standards or codes are mentioned in these specifications, the latest edition of the revision shall be followed. Where provisions of the contract documents conflict with any standards, codes, laws, rules or regulations, the latter shall govern. Where the contract requirements are in excess of applicable standards, codes, law, rules or regulations the former shall govern, unless otherwise directed. Extra payment will not be allowed for work or changes required by local code or enforcement authorities.

C. Prior to commencement of work, notify applicable authorities as required and submit all of the required notifications for construction, operation and/or demolition.

D. Abbreviation and the title of national, state and industry standards, technical societies, associations and institutes and other organizations used throughout this division lists as follows:

(Abbreviation - Title of Organization)

AABC Associated Air Balance Council

ACGIH American Conference of Governmental Industrial Hygienists

ADC Air Diffusion Council

AMCA Air Moving and Conditioning Association

ANSI American National Standards Institute

ARI Air-Conditioning and Refrigeration Institute

ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

ASME American Society for Mechanical Engineers

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| FM | Associated Factory Mutual Fire Insurance Companies |
| IBC | 2015 International Building Code with R.I. addendums |
| IEC | 2015 International Energy Code with R.I. addendums |
| IFC | 2015 International Fire Code with R.I. addendums. |
| IMC | 2015 International Mechanical Code with R.I. addendums. |
| MCAA | Mechanical Contractors Association of America |
| MSBC | Massachusetts State Building Code |
| MSS | Manufacturer's Standardization Society of the Valve and Fittings Industry, Inc. |
| NAPHCC | National Association of Plumbing, Heating, Cooling Contractors |
| NBS | National Bureau of Standards |
| NEBB | National Environmental Balancing Bureau |
| NEC | National Electric Code |
| NEMA | National Electrical Manufacturers Association |
| NFC | National Fire Code |
| NFPA | National Fire Protection Association |
| OSHA | Occupational Safety and Health Association |
| SMACNA | Sheet Metal and Air Conditioning Contractors, National Association, Inc. |
| TIMA | Thermal Insulation Manufacturers Association |
| UL | Underwriters' Laboratories, Inc. |

E. Perform work strictly as required by rules, regulations, standards, codes, ordinances, and laws of local, state, and Federal governments, and other authorities that have legal jurisdiction over the site.

F. Equipment and installation must comply with requirements set forth by Owner's Insurance Underwriter.

G. Equipment shall bear Underwriters' Laboratories labels where applicable.

H. Installation shall comply with all local and state plumbing regulations.

I. All materials furnished and all work installed shall comply with the rules and recommendations of the National Fire Protection Association with all requirements of local utility companies, with the recommendations of the Fire Insurance Rating Organization having jurisdiction and with the requirements of the State of Rhode Island and local town codes.

J. Any materials or workmanship called for in the above referenced requirements not specified or shown on the drawings shall be furnished and installed by the subcontractors as though the same had been specifically indicated or mentioned. Any work installed in conflict with these requirements shall become the sole responsibility of the subcontractor, who shall assume the expense to rectify the installation to the Engineer's satisfaction.

K. The subcontractor shall notify the Engineer of any deviations from the above referenced requirements pertaining to work indicated or specified before the installation of this work is affected.

1.5 COORDINATION WITH THE BUILDING TRADES

A. Structural members and building openings for ducts, piping, etc., for use by the mechanical subcontractor shown on the architectural plans are the coordination responsibility of these subcontractors. Any changes in the above requirements after letting and accepting the respective contract will be paid for by the mechanical subcontractor. Any additional costs incurred due to the information not being provided on time or in error will be paid for by the responsible subcontractor.

1.6 GUARANTEE

A. Guarantee the Work of this Section in writing for one year following the date of Acceptance of systems by Owner & Engineer of Record. The guarantee shall repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Owner's satisfaction and correct damage caused in making necessary repairs and replacements under guarantee within Contract Price.

B. In addition to guarantee requirements of Division 1 and Subparagraph A above, obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in Owner's name.

C. Submit copies of equipment and material warranties to Owner before final payment.

D. At end of guarantee period, transfer manufacturers' equipment and material warranties still in force to Owner.

E. This Paragraph shall not be interpreted to limit Owner's rights under applicable codes and laws and under this Contract.

F. Use of systems provided under this section for temporary services and facilities shall not constitute Final Acceptance of work nor beneficial use by Owner, and shall not institute guarantee period.

1.7 SHOP DRAWINGS AND SUBMITTALS

A. General

1. Shop Drawings are information prepared by the subcontractor to illustrate portions of the work in more detail than shown in the Contract Documents.

   a. Accompany submittal with transmittal letter containing project name, subcontractor's name, number of samples or drawings, titles, and other pertinent data. Outline deviations, if any, in submittals from requirements of Contract Documents.

2. Each individual submittal item shall be marked to show the specifications section and paragraph number which pertains to the item.

3. Shop drawings shall include printed catalogue specifications and printed capacity data to enable confirmation of capacities and specifications which may be shown on certified prints. Where catalogues or data submitted are applicable to several different sizes or types of similar equipment, the vendor shall clearly indicate which piece of equipment or

4. material is to be provided under this contract. If the submittal is not properly marked it will be returned NOT APPROVED.

5. If the subcontractor fails to submit properly marked, complete and prudently timed, shop drawings and thus, causing delays in re-submittal or project schedules, it is the subcontractor's responsibility to do whatever is necessary to meet schedules at no additional cost to the Owner.

6. Shop drawings, catalogue specification data and capacity ratings of the following items shall be submitted to the Engineer for approval prior to purchase or installation of any work:

   a. All equipment scheduled on the drawings. Submittals shall contain, as a minimum, all performance data as listed on schedules so that the Engineer can easily compare manufacturer's data. Submittals not meeting these criteria shall be disapproved.

   b. As specified in other Division 23 Sections.

7. Engineer's review of shop drawings is for general conformance with the design concept and contract documents. Marking or comments shall not be construed as relieving the subcontractor from compliance with the project plans and specifications, nor departures there from. The subcontractor remains responsible for details and accuracy.

8. This subcontractor is responsible for the dimensions and arrangement of equipment as it is applied to this project. Any adaptation, modification, or additions is the responsibility of and be paid for by this subcontractor and shall be approved by the Engineer before execution. Any openings in the building required for the execution of this contract is the responsibility of this subcontractor to coordinate. The number of copies of shop drawings shall be as per the General Conditions of the Specifications.

B. Submittal Procedures and Format

1. Review submittal packages for compliance with Contract Documents and then submit to Engineer for review. Submit transparency and two blue- or black line reproductions of each Shop Drawing larger than 8 ½ x 11. Submit six sets of each smaller shop drawing. After review, transparency original of each large Shop Drawing and four sets of each small shop drawing will be returned with reviewer's marks.

2. Shop Drawings showing layouts of systems shall contain sufficient plans, elevations, sections, details and schematics to describe work clearly. They shall be 1/4" = 1'-0" scale unless specified otherwise. Sheetmetal shop drawings shall be 1/4" =1'-0" and shall

3. indicate work of other Sections where physical clearances are critical and where interferences are possible. Provide larger scale details as necessary. Sheet metal drawings shall show exposed ductwork, walls, partitions, diffusers, registers, grilles, dampers, sleeves and other aspects of construction as necessary for coordination.

4. Shop drawings showing manufacturer's product data shall contain detailed dimensional drawings, accurate and complete description of materials of construction, manufacturer's published performance characteristics and capacity ratings (performance data alone is not acceptable), electrical requirements and wiring diagrams. Drawings shall clearly indicate location (terminal block or wire number), voltage and function for all field terminations, and other information necessary to demonstrate compliance with all requirements of Contract Documents.

C. Acceptable Manufacturers

1. The Engineer's mechanical design for each product is based on the single manufacturer listed in the schedule or shown on the drawings. Alternate acceptable manufacturers are listed below the schedules on the contract documents. No other manufacturers will be acceptable. Alternate manufacturers shall meet the following:

   a. Meet all performance criteria listed in the schedules and outlined in the specification.

   b. Have identical operating characteristics to those called for in the specification.

   c. Fit within the available space it was designed for, including space for maintenance and component removal, with no modification to either the space or the product. Clearances to walls, ceilings and other equipment will be at least equal to those shown on the design drawings. The fact that a manufacturer's name appears as acceptable shall not be taken to mean that the Engineer has determined that the manufacturer’s products will fit within the available space - this determination is solely the responsibility of the subcontractor.

   d. For rooftop mounted equipment and for equipment mounted in areas where structural matters are a consideration, the products must have a weight no greater than the product listed in the schedules or specifications.

   e. Products must adhere to all architectural considerations including but not limited to: being of the same color as the product scheduled or specified, fitting within architectural enclosures and details, and for diffusers, lighting and plumbing

fixtures - being the same size and of the same physical appearance as scheduled or specified products.

D. Deviations

1. Concerning deviations other than substitutions, proposed deviations from Contract Documents shall be requested individually in writing whether deviations result from field conditions, standard shop practice, or other cause. Submit letter with transmittal of Shop Drawings which flags the deviation to the attention of the Engineer.

2. Approval of proposed deviations, if any, will be made at discretion of the Engineer of Record.

E. Schedule

1. Incorporate shop drawing review period into construction schedule so that work is not delayed. Subcontractor shall assume full responsibility for delays caused by not incorporating the following shop drawing review time requirements into his project schedule. Working days listed reference the time in the Engineer's office. It does not include transmittal or review time of subcontractor or Architect. Allow at least 5 working days, exclusive of transmittal time, for review each time shop drawing is submitted or resubmitted.

F. Responsibility

1. Intent of Submittal review is to check for capacity, rating, and certain construction features. Subcontractor shall ensure that work meets requirements of Contract Documents regarding information that pertains to fabrication processes or means, methods, techniques, sequences and procedures of construction; and for coordination of work of this and other Sections. Submittal review shall not diminish responsibility under this Contract for dimensional coordination, quantities, installation, wiring, supports and access for service, nor the shop drawing errors or deviations from requirements of Contract Documents. The Engineer's noting of some errors while overlooking others will not excuse the subcontractor from proceeding in error. Contract Documents requirements are not limited, waived nor superseded in any way by review.

2. INFORM SUBCONTRACTORS, MANUFACTURERS, SUPPLIERS, ETC. OF SCOPE AND LIMITED NATURE OF REVIEW PROCESS AND ENFORCE COMPLIANCE WITH CONTRACT DOCUMENTS.

G. Resubmission

1. Subcontractor shall make corrections and changes indicated for rejected submissions; resubmit in same manner specified above. This procedure shall be repeated until all corrections are made to the satisfaction of the Engineer and the Owner.

1.8 FEES AND PERMITS

A. Apply for, obtain and pay for all required permits and inspection certificates.

1.9 EQUIPMENT IDENTIFICATION

A. Equipment and component parts thereof shall bear manufacturer's nameplates, giving manufacturer's name, size, type model number or serial number, and electrical characteristics, to facilitate maintenance and replacements. Nameplates of distributors or subcontractors are not acceptable. Electrical equipment shall be UL listed as applicable.

B. All labels and tags shall conform to ANSI/ASME A13.1.

C. Identify all HVAC equipment including, air handling units, fans, heating devices, etc. with plastic tags. Plastic tags shall be laminated three-layer plastic with engraved black letters on light, contrasting background color. Tag size shall be 1-1/2” square or diameter minimum with 3/8" minimum high text.

D. Identify piping as indicated in specification 70867-23500 "HVAC Piping."

1.10 RECORD DRAWINGS

A. The Engineer will furnish the subcontractor one set of drawing files in AutoCAD or REVIT 2021 format of the mechanical drawings as issued for this contract. Change these drawings to indicate accurately and neatly, any deviation in the actual installation from the Drawings as issued, including work installed as a modification or addition to the original design. Include actual location of existing utilities if they differ from design documents.

B. Record drawings shall show record condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and make and model numbers of final equipment installation.

C. THE ENGINEER WILL NOT CERTIFY THE ACCURACY OF THE RECORD DRAWINGS - THIS IS THE SOLE RESPONSIBILITY OF THE SUBCONTRACTOR.

D. Each trade shall submit the record drawings for approval by the Engineer of Record and the Owner.

1.11 INSTALLATION, OPERATION & MAINTENANCE MANUAL INSTRUCTIONS

A. Obtain at time of purchase of equipment, three copies of operation, installation and maintenance manuals for all items. Assemble literature in coordinated manuals with additional information describing combined operation of field assembled units, including As-Built wiring diagrams. Manual shall contain names and addresses of manufacturers and local representatives who stock or furnish repair parts for items or equipment. Divide manuals into three sections or books as follows:

1. Directions for and sequence of operation of each item or mechanical system, e.g. pumps, fans, etc. Sequence shall list valves, switches, and other devices used to start, stop and control system. Detail procedure to be followed in case of malfunctions.

2. Detailed maintenance and troubleshooting manuals containing data furnished by manufacturer for complete maintenance. Include copy of an approved balancing report.

3. Lubrication instructions detailing type of lubricant, amount, and intervals recommended by manufacturer for each item of equipment. Include additional instructions necessary

for implementation of first-class lubrication program. Include approved summary of lubrication instructions in chart form, where appropriate.

4. Manufacturer's literature describing each equipment item and containing final approved copies of shop drawings of each item listed.

5. Copy of each automatic control diagram, with respective sequences of operation, consisting of final approval shop drawings, corrected to "as-installed".

6. Manufacturer's installation instructions and detailed parts list for each major equipment item.

7. Complete list of spare parts as recommended by each equipment manufacturer for each item of equipment on the project.

8. 11x17 scale down set of the as-built documents.

B. Furnish three copies of manuals to Engineer for approval and distribution to Owner. Deliver manuals no less than 30 days prior to acceptance of equipment to permit Owner's personnel to become familiar with equipment and operation prior to acceptance.

C. Operating instructions: Upon completion of installation or when Owner accepts portions of building and equipment for operational use, instruct Owner's operating personnel in any or all parts of various systems. Instructions shall be performed by factory trained personnel. Owner shall determine which systems require additional instructions. Duration of instructions shall take equipment through complete cycle of operation. Make adjustments under operating conditions.

1.12 PROTECTION OF EQUIPMENT & MATERIALS & PREMISES

A. Each subcontractor shall be responsible for his work and equipment until finally inspected, tested, and accepted. Carefully store materials and equipment which are not immediately installed after delivery to site. Close open ends of work with temporary covers or plug during construction to prevent entry of obstructing material.

B. Each separate subcontractor shall protect the work and material of other trades that might be damaged by his work or workmen and make good all damage thus caused.

C. All floors, walls, ceilings and furniture shall be properly protected from damage by this subcontractor during the installation via plywood and/or plastic covering. Relocation of furniture shall not be done without the approval from the Owner. Any damage caused by the installation shall be remedied by this sub-contractor at no additional cost to the owner.

1.13 INSTRUCTION TO OWNER'S PERSONNEL

A. After completion of work and tests, the subcontractor shall provide necessary skilled personnel to operate the entire installation for a total period of one 8-hour day. During the operating period the subcontractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.14 SELECTION AND ORDERING OF MATERIALS

A. General

1. Arrange for purchase and delivery of materials and equipment required in ample quantities and at proper time. Immediately notify the Architect/Engineer of any inability to obtain suitable delivery of any apparatus or materials required.

B. Products

1. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

2. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

3. Provide interchangeable components of the same manufacturer, for similar components.

C. Transportation and Handling

1. Transport and handle products in accordance with manufacturer's instructions.

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

3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

D. Storage and Protection

1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

2. For exterior storage of products, place on sloped supports, above ground.

3. Provide off-site storage and protection when site does not permit on-site storage or protection.

4. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

5. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.15 WORKING HOURS & STEAM TIE-INS

A. All work shall be performed during normal working hours with the exception of the temporary system tie-ins and disconnections.

B. Temporary Tie-ins of the steam & condensate systems shall be coordinated with URI and scheduled 10 business days in advance with approval in writing from URI. All tie-in work will be done during 2nd or 3rd shifts. This contractor shall carry the premium cost for this shift for the following.

1. HPS, PC tie-ins at the Steam Vaults and at the buildings. Steam shut-downs need to be kept to a minimum.

2. Temporary steam and pumped condensate lines are indicated on the contract drawings as needed to keep steam operational in the Eddy and Browning bldgs. These lines will be removed once the new steam lines are online.

**2.0 PRODUCTS**

2.1 MATERIALS

A. All materials, except as otherwise specified, shall be new, of current production, first quality, and the best of each class specified.

B. Required materials not covered by the detailed specifications shall be of a suitable class, grade, and type and shall be subject to the approval of the Engineer. Where two or more units of the same class of equipment are required, these units shall be the products of a single manufacturer. All equipment and materials shall be installed and constructed to operate safely, as designed, without leakage, undue wear, noise, vibration or corrosion.

2.2 SLEEVES

A. Provide sleeves in locations where pipes or conduits pass through floors, walls, partitions, structural members and roof. Do not make openings which impair strength, function or esthetics of the work. Notify Construction Manager prior to any cutting work. Coordinate responsibilities with structural.

2.3 ACCESS PANELS

A. Do not place products requiring regular maintenance including valves, traps, controls, unions, dampers, coils, air distribution boxes, actuators, cleanouts at locations that will be inaccessible after construction is completed. Maintain accessibility for all components in systems.

B. Provide access doors complying with architectural specifications for items concealed above finished ceilings, behind finished walls or floors.

C. Unless specified in architectural specifications, provide access doors of following sizes: 14 x 14 inches for readily accessible equipment, 18 x 18 inches where partial body access is required and 24 x 24 inches where entire body access is required.

D. Locate access panels for walls, ceilings and floors at locations indicated on drawings or as required to permit access for adjustment, removal and replacement, and servicing of all concealed HVAC equipment.

2.4 SUPPLEMENTARY STEEL, CHANNELS AND SUPPORTS

A. Furnish and install all supplementary steel and structural supports required for the proper installation, mounting and support of all equipment.

B. Supplementary steel and channels shall be firmly connected to building construction in a manner approved by the Engineer, as specified.

C. The type and size of the supporting steel shall be determined by the installer and shall be of sufficient strength and size to allow only a minimum deflection in conformance with the manufacturer's requirements.

D. All supplementary steel shall be installed in a neat and workmanlike manner parallel to the walls, floor and ceiling construction. All turns shall be made with 90 degree and 45 degree fittings, as required to suit the construction and installation conditions.

E. All supplementary steel supports and fitting shall be galvanized structural steel or galvanized roll formed steel as manufactured by Unistrut, Power-Strut, or approved equal.

**3.0 EXECUTION**

3.1 PREPARATION

A. Arrangements shall be made to have the openings, inserts, sleeves and such other incidentals set in place ahead of the construction work, where practical, to eliminate the need of cutting and patching. If cutting becomes necessary for installation of the work, it shall be done under this Section. All holes shall be neatly patched and approved by the Engineer. All cutting shall be performed in a manner approved by the Engineer. All cutting shall be performed in a manner not to weaken the structural parts and in the manner and method which shall meet the approval of the Engineer and code.

3.2 WORKMANSHIP

A. All work shall be coordinated with the work to be performed or installed under other Sections of these Specifications.

B. All work shall be executed in a workmanlike manner by workmen skilled in this type of work and shall present a neat appearance when completed.

C. Where required to avoid interference with other work, to increase headroom, or to improve the appearance of duct runs, offsets shall be provided as required. All duct supports, structural members, hangers and other apparatus necessary to support firmly and substantially the various components of the systems shall be provided under this Section.

D. Nameplates, catalog numbers and rating identifications shall be securely attached to equipment with screws or rivets. Adhesives or cements will not be permitted.

E. This subcontractor shall be responsible for the protection of the work from injury and shall protect all apparatus with suitable enclosures.

## 3.3 ERECTION AND INSTALLATION

A. Installation and workmanship requirements are specified hereinafter.

B. This subcontractor shall be responsible for the furnishing and installing of all support steel, hangers, rods, clamps, etc., to provide adequate support of all mechanical equipment specified herein.

C. Provide all transportation, freight, loading, and unloading, and provide all labor necessary for erecting in place all material and equipment shown, specified or required for completion of the HVAC work.

D. The work shall be performed in a timely manner so as to cause no delay in job progress. Cooperate with the other phases of construction so that the work is installed in the most beneficial sequence for proper project completion.

E. Install all work so that all parts required are readily accessible for inspections, operation, maintenance, and repair. Minor deviations from the drawings may be made for this purpose, but changes of magnitude shall not be made without prior written approval of the Engineer.

## 3.4 CLEANING OF SYSTEMS AND PREMISES

A. Before the systems are tested and balanced, ducts and all air handling equipment shall be thoroughly cleaned so that no dirt, dust, or other foreign matter will be deposited in or carried through the systems.

B. At all times, keep the premises clear of undue accumulation of rubbish.

C. On completion of each day's work, remove all rubbish and debris resulting from this contract, and dispose of same. At any time should the Construction Manager/Owner be dissatisfied with the performance of clean-up responsibilities, he may elect, after proper notification, to undertake this operation and charge this subcontractor accordingly.

D. The work of each section includes removing tools, providing daily clean-up of work area, scaffolding, surplus materials, barricades, temporary walks, debris and rubbish from the project promptly upon completion of that portion of the work. Leave the area of work clean and free of these items.

E. Disconnect, clean and whenever necessary, remove obstructions from any system and reconnect system. Repair or replace work damaged in the course of removing obstructions, at no cost to Owner.

F. Protect all finished work against physical damage during the course of construction and until completion and acceptance by Owner.

G. During construction, cap all lines and equipment so as to prevent the entrance of debris and dirt. Protect against moisture, plaster, cement, paint and other work by covering the polyethylene sheets.

3.5 FIRESTOPPING

A. Firestopping: unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with an approved firestopping material.

1. Firestopping material shall be UL listed and tested silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics; upon exposure to heat above 250° F shall expand to not less than five times its original volume to form a fireproof envelope UL rated for 2- and 3-hour protection, when applied in accordance with the manufacturer's recommendation.

2. Floor slots and openings shall be closed with 16 gauge galvanized steel sheet supported on 1-inch by 1-inch by 1/8-inch structural angle drilled or supported with powder-driven studs into the building structure. Firestop with a layer of silicone elastomer not less than 1-inch thick which completely fills the opening. The top surface of the silicone elastomer shall be approximately 1-inch below the finished floor slab.

3. Openings in walls shall be closed with 16 gauge galvanized steel sheet securely attached at the midpoint of the wall thickness and firestopped on both sides of the steel sheet with not less than 1/8-inch thick layer of non-sagging silicone elastomer to fully cover the opening.

4. Single or multiple pipes passing through walls and floors shall have the annular space between pipes or between pipes and structure filled with silicone elastomer to provide a 3-hour rated firestop for floors and walls.

B. Pipe and Ducts: The annulus between exposed pipe and ductwork and walls or floors in finished spaces shall be filled, sealed, and painted to match adjacent surfaces.

C. Future Slots: Identify unused sleeves and slots for future use by permanently anchored brass nameplates identifying size and purpose of the covered slot.

3.6 START UP AND TESTING

A. General

1. Completion of start up and commissioning is a prerequisite for substantial completion. See commissioning requirements listed in this specification.

2. Operate and maintain systems and equipment until final acceptance by the Owner.

3. All guarantees and warranties shall not begin until final acceptance of the systems and equipment by the Owner. Acceptance requires, at a minimum, complete systems commissioning.

B. Comprehensive Work Plan

1. Provide detailed, methodical, scheduled start up, and commissioning procedures and execution of same for every system and piece of equipment provided.

2. Develop and submit for approval a specific start up check out and sign off form for each and every system.

3. Systems shall be operated under actual or stimulated full load conditions. Identify the operating conditions in the work plan.

4. Do not cover or conceal work before testing and inspection and obtaining approval.

5. Leaks, damage and defects discovered or resulting from startup and testing shall be repaired or replaced by this contract to like-new condition with acceptable materials. Tests shall be continued until system operates without adjustments or repairs.

6. For each piece of equipment, copy nameplate data and include in report.

3.7 MAINTENANCE

A. Maintain equipment and systems until Final Acceptance. Ensure adequate protection of equipment and material during delivery, storage, installation and shutdown and during delays pending final test of systems and equipment because of seasonal conditions.

B. Subcontractor shall be responsible for cleaning air handling equipment. Clean fan interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheels, cabinets, and coils entering air face.

3.8 SPECIAL RESPONSIBILITIES

A. Cooperate and coordinate with work of other Sections in executing work of this Section.

1. Perform work such that progress of entire project including work of other Sections shall not be interfered with or delayed.

2. Provide information as requested on items furnished under this Section which shall be installed under other Sections.

3. Obtain detailed installation information from manufacturers of equipment provided under this Section.

4. Obtain final roughing dimensions or other information as needed for complete installation of items furnished under other Sections or by Owner.

5. Keep fully informed as to shape, size and position of openings required for material or equipment to be provided under this and other Sections. Give full information so that openings required by work of this Section may be coordinated with other work and other openings and may be provided for in advance.

3.9 MATERIALS AND WORKMANSHIP

A. Work shall be neat and rectilinear. Install material and equipment as required by manufacturers. Installation shall operate safely and without leakage, undue wear, noise, vibration, corrosion or water hammer. Work shall be properly and effectively protected, and pipe and duct openings shall be temporarily closed to prevent obstruction and damage before completion.

B. References to manufacturers and to catalog designation are intended to establish standards of quality for materials and performance but imply no further limitation of competitive bidding.

C. Finish of materials, components and equipment shall be as approved by Engineer and shall be resistant to corrosion and weather as necessary.

3.10 CUTTING AND PATCHING

A. Do not cut existing construction without prior approval of Construction Manager.

B. Provide sleeves, caps, plates, escutcheons, flashing and similar materials required to fill or close openings. Provide final grouting, finish and other materials as required. Make repairs in like and kind to ensure exact patching of surfaces and finishes.

3.11 EQUIPMENT BASES AND SUPPORT

A. Unless otherwise indicated on structural drawings, provide housekeeping pads of concrete, minimum four inches thick, extending six inches beyond equipment supported.

B. Provide templates and accessories for mounting and anchoring equipment.

C. Construct supports of steel members or steel pipe and fittings. Brace and Fasten with flanges bolted to surface.

3.12 PROJECT CLOSE OUT

A. General

1. It shall be each subcontractor's responsibility to personally hand-deliver all of the required project close-out checklist items and to obtain owner's authorized representative(s) signed receipt on all items requiring owner sign-off.

B. Project Close-Out Checklist

1. Review requirements of each section of the specifications and submit for approval to Engineer the sign-off forms which shall become the project close-out checklist. These at a minimum shall include the following information shown in attached Project Closeout Checklist Example. The Owner may incorporate additional specific items to the following checklist which shall become part of the project requirements.

2. Close-Out Checklist Example

| PROJECT: | | | |
|---|---|---|---|
| DIVISION NO.: | | | |
| SUBCONTRACTOR: | | | |
| ITEM[1] | DATES | | OWNER'S SIGN-OFF |
| | COMPLETED | RECEIVED BY OWNER | |
| Permits | | | |
| City and County Inspection | | | |
| Manufacturers Warranties | | | |
| Contractors Warranties | | | |
| State Fire Rating Data | | | |
| Copy of Final Shop Drawings | | | |
| List and Possession of Spare Parts | | | |
| Pressure Tests | | | |
| Equipment Tests Required by Specs | | | |
| O & M Manuals | | | |
| Record Documents | | | |
| Coordination Drawings | | | |
| Commissioning Reports/Letters | | | |
| On Site Training Complete | | | |
| Final ATC Installation Drawings | | | |
| Insurance Underwriters Approvals | | | |
| Final Punch List (Initialed by subcontractor that items are complete) | | | |
| Building Certificate of Occupancy (CO) | | | |

[1] Provide separate line item for each specified item (do not group items).

+ + END OF SECTION 23 0000 + +

TABLE OF CONTENTS

## 1.0 GENERAL

A. This specification covers supports and hangers for all mechanical piping systems.

B. This section shall include all tools, equipment and materials needed to install the hangers and supports listed in the contract documents and/or this specification.

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-Hanger shield inserts.
5. Fastener Systems.
6. Pipe Stands.
7. Pipe positioning systems.
8. Equipment supports.
9. Inserts and Anchors

C. The Mechanical Contractor (hereafter the Contractor) shall furnish and install hangers and supports (as required for piping systems) and any miscellaneous steel required for supporting the piping and for attachment of hangers and supports.

D. The work shall be designed and installed with regard to appearance and convenience as well as in compliance with all applicable laws, regulations, and industry standards. Details of all attachments are subject to the approval of the Owner or Owner's Representative.

E. The contractor shall obtain approval by the owner or owner's representative before proceeding with the drilling or punching of any holes in the building structure. Written approval must be obtained.

F. Attachment of supports or hangers to columns or beams which require fire proofing shall be coordinated with the fire proofing contractor. Fire proofing removed by the contractor shall be replaced at their cost.

G. This contractor shall own the design of the pipe expansion anchors, guides and loops based on the installation of the piping systems. A third party Vendor shall be hired to review the pipe expansion and flexibility and provide recommendations on the location and needs of anchors, guides and swing joints. No pipe expansion from the yard area shall be allowed to grow into the building. All calculations and drawings shall be submitted to the Engineer of Record for review.

### 1.1 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipments supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Where not fully called for in the contract documents, design of hangers and supports shall conform to accepted engineering practice using factor of safety of 2-1/2.

D. All pipe hangers and supports shall conform to ANSI B31.1- Power Piping, ASME B31.9 – Building Services Piping and Documents MSS SP-58 and SP-69 of the manufacturer's standardization Society of the Valve & Fittings Industry.

E. Hangers and supports shall be sized for the pipe and insulation thickness. No shaving of the pipe insulation will be allowed. See pipe insulation specs for insulation thickness requirements.

1.2 SUBMITTALS

A. Submit each item in this Specification according to the conditions of the Contract and Division 1 Specification Sections.

1. Steel pipe hangers and supports.
2. Thermal-hanger shield inserts.
3. Powder-actuated fastener systems.
4. Pipe positioning system.
5. Inserts & Anchors
6. Pipe Anchors and Guide product and installation details.

B. Shop drawings are to include fabrication and installation details and include calculations for the following.

1. Trapeze pipe hangers. Include product data for components.
2. Metal framing systems. Include product data for components.
3. Pipe stands. Include product data for components.
4. Equipments support.
5. Drawings covering all specially designed hanger assemblies and fabrications.
6. Welding Certificates

1.3 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1 “Structural Welding Code-Steel.”

B. Welding Qualify procedures and personnel according to the following:

1. AWS D1.1, “Structural Welding Code—Steel.”
2. AWS D1.2, “Structural Welding Code—Aluminum.”
3. AWS D1.3, “Structural Welding Code—Sheet Steel.”
4. AWS D1.4, “Structural Welding Code—Reinforced Steel.”
5. ASME Boiler and Pressure Vessel Code: Section IX.

C. Listing and Labeling: Provide products specified in this Section that are UL listed and labeled.

1.4 DESIGN AND SELECTION INSTRUCTIONS

A. Piping shall be supported, anchored, or guided to prevent undue line deflection or excessive vibration, and to protect piping connected to equipment from excessive loading and expansion stresses. Provide submittal showing pipe expansion calculations for approval and location of anchors and guides that match the exact installation of the piping systems.

B. Supports for all lines are to be selected by the contractor unless otherwise indicated on the drawings or specified herein.

C. Where ever possible pipes shall be supported in groups at a common support elevation using resting type structural supports or rack framing.

D. Non insulated lines shall rest on support member.

E. Steel shoes shall be used for anchors, guides, and resting supports on lines insulated for heat conservation unless otherwise specified or indicated on the drawings.

F. All lines routed in pipe racks (horizontal and vertical) must be guided. Spacing of guides not to exceed 25 ft for lines ≤ 21/2"Ø and 40 ft for lines ≥ 3"Ø unless otherwise noted on drawings.

G. Individual lines may be suspended via hanger rod assemblies (when not supported in common groups) see section 2.0 for additional details.

H. Concentrated point loads, such as control valves, duplex strainers, line mounted instruments, etc., shall be individually supported.

I. Loads at pump suction and discharges shall be supported in a manner that will comply with manufacturer's recommendations per vendor drawings.

1. When manufacturer's allowable loads are not available, utilize API Std. 610 allowable loads for comparison with reaction load due to thermal expansion. Considerations should be made for lower than API allowable loads for ANSI pumps. Mechanical Loads (dead wt.) shall be handled by adequate support location.

J. Adjustable supports are required on piping connections to pumps, turbines, and compressors.

1. Rod hangers or adjustable type base supports shall be used to ease equipment strain and facilitate erection. When space does not permit adjustable type base support, then rigid stanchion may be used provided leveling nuts are specified under base plates.

K. Supports shall be located as near as practical (2ft. maximum) to all changes in direction (horizontal and vertical).

L. The design and selection of supports shall ensure that bare lines do not rest on concrete so as to avoid accelerated corrosion of piping at the point of contact.

M. Where rigid supports cannot be used due to vertical expansion of piping, it is necessary to provide spring assemblies which will allow the piping to move and still maintain support. Design of these type supports shall be by this Contractor.

N. Where there is horizontal movement at a hanger location, the vertical angle of the rod shall be limited to 4 degrees.

O. For movement greater the 2" set shoes off center half the amount of expansion at point of support in the opposite direction of movement.

P. Notify Owner if pipe support loads exceed 2000 lb. at column lines. Loads between column lines will transfer to the column line and are to be considered as part of the column line load. Attachments to building structural elements shall be mechanical. Welding to building steel is per specific approval by owner.

1.5 SUPPLY, FABRICATION, AND INSTALLATION INSTRUCTIONS

A. Pipe supports may be shop or field fabricated. The contractor shall be responsible for purchasing all pipe support materials required to complete construction.

B. Pipe supports, such as trunnions and base ells, for shop fabricated with the piping.

C. Hanger rods shall be set vertically plumb.

D. Structural steel shoes for anchors, guides, and resting supports shall be set in place under pipe and offset adjusted per section 1.4 of this specification before welding pipe.

E. Rod hangers and spring assemblies are to be shipped completely assembled.

F. During hydrostatic testing of lines supported by springs, counterweights, etc., temporary rigid supports or blocking must be installed to prevent excessive strain on piping and equipment, and overloading of spring devices.

G. All Shoes, trunnions, and other metal to metal type sliding supports shall be cleaned by wire brushing to ensure unrestricted movement.

H. Shipping rods on expansion joints are to be removed after installation of joints.

I. Pipe must be properly anchored and guided before testing lines with expansion joints.

J. Where tie rods are used, care should be taken to see that they are locked in proper position before testing and readjusting.

K. The Contractor may suggest alternative support methods to those shown on piping drawings if a more cost effective or practical method would result, however, alternative methods may not be implemented until expressly approved by the engineer.

L. Compression spring hangers and supports are shipped to the jobsite assembled, with the spring compressed.

1. The contractor shall adjust the spring to the cold load as indicated on the pipe support sketch. Cold setting should take place after hydro test and mechanical completion, but prior to final alignment of associated equipment.

1.6 SEISMIC REQUIREMENTS

A. General

1. Seismic bracing shall be provided as required by the applicable Building Code for this project.

2. Seismic bracing support details shall be chosen from the typical bracing details provided on the drawings. Correct sizing, spacing, and materials for restraints shall be chosen from the B-line Seismic Restraint catalogue, produced by Cooper B-Line. A copy of the seismic Restraint Manual shall be kept on the job site for the duration of the project.

3. Submit working plans and details, reviewed, signed and stamped by a professional structural engineer registered in the State of R.I. certifying that the plan and details meet all seismic requirements established by the local authorities having Jurisdiction over the project.

B. Seismic restraints may be omitted from piping supports if all of the following conditions are satisfied.

1. The piping is made of ductile material with ductile connections.

2. Lateral motion of the piping does not cause impact of fragile appurtenances (e.g. sprinkler heads), equipment, piping, building structure or structural member.

3. Lateral motion of piping does not cause loss of the system vertical support.

4. Rod hung supports of less than 12" in length have top connections that cannot develop moments.

5. Support members cantilevered up from the floor are checked for stability.

C. Seismic restraints may be omitted for the following conditions where flexible connectors are provided between components and the associated piping:

1. Fuel piping less than one inch inside diameter.

4. All other piping less than 2.067 inches inside diameter except medical gas piping (including vacuum)

3. All piping suspended 12" or less from top of pipe to bottom of structural support.

## 2.0 PRODUCTS

### 2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pipe Hangers and Supports

a. Hanger shall be Carpenter and Patterson, F&S, or Grinnell Co. Figure numbers of Carpenter and Patterson are specified to establish standards of quality for performance and materials.

b. Hangers and Pipe shields shall be sized for the pipe and insulation thickness. No shaving will be allowed. See pipe insulation Specs for insulation thickness requirements.

c. All pipe hanger supports and fasteners shall be galvanized steel.

### 2.2 INSERTS, ANCHORS AND BEAM SUPPORTS

A. Where support rod sizes exceed 7/8" diameter or where the load exceeds the recommended load for the insert or anchor, use two inserts or anchors with trapeze-type connecting member below the concrete.

B. Where installation can be made before the concrete is poured, use Figure 650 or 650N.

C. Where installation is made after the concrete is in place, use Phillips "Red Head" expansion anchors, raw studs, raw self- drilling anchors, Hilti Kwik-Bolts.

D. Plastic, lead or fiber screw anchors, lag screws and expansion shields are not acceptable.

E. Where continuous inserts are required, they shall be Unistrut or approved equal, formed from not less than 12 gauge galvanized steel with anchors spaced on not less than 6" center, and with end caps, splice plates, bolts and nuts as required by conditions. In rooms with defined environmental requirements, more sanitary provisions must be made as called for on the drawings or elsewhere in these specifications.

F. For attachment to beams, use Figures 82,217,268,297,314 or 702

2.3 SINGLE PIPE HANGERS

A. Single pipe hangers shall be supported by hangers suspended by galvanized steel rods from structural steel members, concrete ceilings and beams, bottom of trapeze hangers and wall mounted steel angle brackets.

B. Hanger rods shall be hot rolled steel, machine threases and galvanized after fabrication. The strength of the rod shall be based on its root diameter.

C. Except as otherwise specified herein, pipe hangers for 3" piping and smaller shall be adjustable clevis type similar to Carpenter and Patterson Figure Number 100. Hangers shall be carbon steel with a galvanized finish. For piping 4" and above use pipe roll hangers with adjustable steel rod hangers, sized to accommodate insulation similar to Fig. 74.

D. Pipe supports for 3" and larger pipe shall have high density insulation inserts for cold service or welded inserts equal to the pipe insulation thickness on hot service piping to prevent compression of the insulation.

E. Where pipes are near walls, beams, columns, etc. and located an excessive distance from ceilings or underside, of beams, welded steel wall brackets similar to Carpenter and Patterson Figure number 69-68, 84 or 139 shall be used for hanging pipe. Brackets shall be galvanized. Where single pipes rest on top of bracket pipe supports, attachments shall meet requirements as specified under multiple pipe hangers.

2.4 MULTIPLE PIPE HANGERS

A. Suspended multiple pipes, running parallel in the same horizontal plane, which are adjacent to each other shall be suspended by trapeze type hangers or wall brackets. Trapeze hangers shall consist of galvanized structural steel channel supported from galvanized threaded rod or attached to concrete walls, columns or structural steel support members as required to meet the intent of this specification. Channel shall be similar to F&S Figure 710, rods, concrete inserts; "C" Clamps, beam clamps, welded beam attachments, and expansion shields shall be as specified in 2.3 Single Pipe Hangers.

B. Except as otherwise specified herein pipe anchors used for attaching pipe to trapeze or multiple pipe wall brackets shall be anchor or pipe chair similar to F&S Figures 158, 419, 160A, or 160B as required. Materials of construction shall be galvanized steel. Chair "U" bolts shall be tightened to allow freedom of movement for normal expansion and contracting except when pipe must be anchored to control direction of movement or act as a thrust anchor.

2.5 SINGLE AND MULTIPLE PIPE SUPPORTS

A. Single pipes located in a horizontal plane close to the floor shall be supported by one of the methods specified herein or as shown on the drawings.

B. Pipes 3” diameter and larger shall be supported by adjustable stanchions similar to F&S Figure 427, constructed of galvanized steel. Stanchions shall provide at least 4” adjustment and flange mounted to floor.

C. Pipes less than 3” in diameter shall be held in position by supports fabricated from steel C channel, welded post base similar to Unistrut Figure p2072A and pipe clamps similar to Unistrut Figures P1109 thru P1126. Where required to assure adequate support, fabricate supports using two vertical members of sufficient load capacity to support pipe. Wherever member to provide horizontal rigidity. More than one pipe may be supported from a common fabricated support. All supports unless specified elsewhere shall be galvanized.

D. Where required, pipe shall be supported using concrete anchor posts. Pipe shall be securely fastened to concrete anchor posts using suitable metal straps as required and approved by the engineer.

2.6 WALL SUPPORTED PIPES

A. Single or multiple pipes located adjacent to walls, columns or other structural members shall, whenever deemed necessary, be supported using welded steel wall brackets similar to Carpenter and Patterson figure numbers 69-78, 84, 134 or “C” Channel with steel brackets similar to Unistrut pipe clamps. All members shall be securely fastened to wall column, etc. using double expansion shields or other method as approved by the engineer.

B. Pipe shall be attached to supports using methods herein before specified to meet the intent of this specification.

C. All supports shall be galvanized.

2.7 VERTICAL PIPE SUPPORTS

A. Vertical pipes shall be supported in one of the following methods.

1. For pipes ¼” to 2” in diameter, an extension hanger ring shall be provided with an extension rod and hanger flange. The rod diameter shall be as recommended by the manufacturer for the type of pipe being supported. The hanger ring shall be galvanized steel or PVC clad depending on the supported pipe. The hanger ring shall be equal to Carpenter & Paterson Figure number 81 or 81CT. The anchor flange shall be galvanized malleable iron similar to Carpenter & Paterson Figure number 85.

2. For pipes equal to or greater than ½” in diameter extended pipe clamps may be used. The hanger shall be attached to concrete structures using double expansion shields, or to steel support numbers using welding lugs similar to Carpenter & Patterson figure number 220.

3. Pipe riser clamps shall be used top support all vertical pipes extending through floor slabs. Riser clamps shall be galvanized steel similar to Carpenter & Patterson figure number 126. Copper clad or PVC coated clamps shall be used on copper pipes. Insulation shall be removed from insulated pipes prior to installing riser clamps.

4. Unless otherwise specified, shown, or specifically approved by the engineer, vertical runs exceeding 11 ft, pipes shall be supported by approved pipe collars, clamps, brackets or wall rests at all points required to insure a rigid installation.

2.8 SPECIAL SUPPORTS

A. Pipe supports shall be provided for closely spaced vertical piping systems as shown on the drawings or as otherwise required to provide a rigid installation. The support system shall consist of a framework suitably anchored to floors, ceilings and walls and be as manufactured by the Unistrut Corporation, Globe-strut as manufactured y the Metal Products Division of U.S. Gypsum, or equal.

B. Vertical and Horizontal supporting members shall be U shaped channels similar to Unistrut Series P1000. Vertical piping shall be secured to the horizontal members by pipe clamps or pipe straps equal to Unistrut Series P1100M and Series P2558. All components shall be of mild steel.

C. The assemblies shall be furnished complete with all nuts, bolts, and fittings required for a complete assembly including end caps for all members.

D. The design of each individual framing system shall be the responsibility of the Contractor. Shop drawings, as specified above shall be submitted and shall show all details of the installation, including dimensions and types of supports. In all instances the completed frame shall be adequately braced to provide a complete rigid structure when all the piping has been attached.

E. Any required pipe supports for which the supports specified in this section are not applicable shall be fabricated or constructed from standard structural steel shapes in accordance with AISC Specifications, have anchor hardware similar to items previously specified herein, shall meet the minimum requirements listed below and the subject to the approval of the engineer.

1. Pipe support systems shall meet all requirements of this section and all related sections of the specification.

2. Complete design details of the entire pipe support systems shall be provided, for review by the engineer.

3. The pipe support system shall not impost loads on the supporting structures in excess of the loads for which the supporting structure is designed.

2.9 PIPE GUIDES & ANCHORS

A. Pipe guides shall be split sleeve type, constructed of carbon steel and similar to Carpenter & Paterson Fig. 1007. Pipe guide shall be sized for pipe and insulation thickness.

B. Pipe anchors shall be structural steel that is field welded to the piping and fastened to the concrete or structural steel structure. Details to be submitted to the engineer for approval. All supplementary steel required to properly anchor the piping shall be provided and installed by this contractor. See drawings for proposed locations.

## 3.0 EXECUTION

3.1 DELIVERY AND STORAGE

A. All supports and hangers shall be crafted, delivered and uncrated so as to protect against any damage.

B. All parts shall be properly protected so that no damage or deterioration shall occur during a prolonged delay from the time of shipment until installation is completed.

C. Finished iron or steel surfaces not galvanized or painted shall be properly protected to prevent rust corrosion.

3.2 INSTALLATION

A. The Contractor shall furnish and install all structural supports, anchors, and hangers required for the suspension and placement of the piping required for this installation. Pipe hangers and supports shall be installed to allow for expansion and contraction, and placed close to fittings, valves, and heavy equipment. They shall be installed so that piping will be free from vibration, sagging or movement other than caused by heat expansion or contraction. Piping shall be pitched as specified in individual service specifications.

B. Anchor piping where shown on Drawings and as required to localize expansion or to prevent undue strain on piping and branches. Anchors to be entirely separate from hangers. All anchor designs to be submitted for approval and to include piping reactions which respective anchors are capable of supporting. Provide all indicated or required expansion loops.

C. Pipe guides shall be installed immediately before and after expansion loops as indicated on drawings.

D. Piping shall be supported directly from the structures and not from the supporting systems or equipment of other trades.

E. Pipe may be supported by trapeze hangers and/or in tiers, but there shall be sufficient room for installation of fittings, insulation, etc., and for future rearrangement work or maintenance.

F. There shall be no cutting, drilling or welding on the building steel except as shown on the contract drawings or as instructed by the owner's rep.

G. Hanger rods shall be connected to beam clamps, concrete inserts or expansion anchors. "C" clamps shall not be allowed. Offset suspension by hangers is not permitted.

H. Hanger rods shall be installed with double nut arrangement both at the lower end where the hanger is attached, and at the top where it fastens to the clamp or insert. Where rod sizes are not listed, the rod size shall confirm to the following table.

| Pipe size, in. | Rod size, in. |
|---|---|
| 2 and smaller | 3/8 |
| 2-1/2 to 3-1/2 | 1/2 |
| 4 and 5 | 5/8 |
| 6 | 3/4 |
| 8 to 12 | 7/8 |
| 14 and 16 | 1 |

I. Inserts shall be provided as specified elsewhere in this specification. When through bolts are used, plates or large washers shall be provided under the heads.

J. Piping related equipment (e.g., filters, meters) shall be located as shown on contract drawings or as instructed by the owner's representative. All such equipment which must be secured to concrete walls, ceiling slabs, columns, other building masonry, and floors shall be attached by means of approved insert and/or fasteners as listed in paragraph 3 of this specification.

K. Maximum spans between hangers for straight horizontal runs of steel and copper pipe shall be in compliance with the following table:

| Nominal Pipe Size (inches) | Maximum Span (feet) | Nominal Pipe Size (inches) | Maximum Span (feet) |
|---|---|---|---|
| 1/2 | 5 | 4 | 14 |
| 1 | 5 | 6 | 14 |
| 1-1/2 | 8 | 8 | 14 |
| 2 | 10 | 10 | 14 |
| 2-1/2 | 10 | 12 | 14 |
| 3 | 10 | 14 | 14 |

Additional hangers shall be provided where concentrated weights such as valves or heavy fittings occur, and where changes in direction of the piping system occur between hangers or as noted on the drawings.

L. Reduce spacing to a maximum of 10'-0" apart, regardless of pipe size, as necessary for fittings, valves and other concentrated loads.

M. Hangers for horizontal lines shall be vertically adjustable to obtain pitch requirements indicated elsewhere in this specification.

N. Hangers and supports that are in direct contact with copper shall be copper-plated or plastic-coated to prevent any electrolytic reaction.

3.3 HANGER SUPPORT INSTALLATION

A. Thermal-hanger Shield Installation: Install in pipe hanger or shield for Insulating pipe.

B. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

C. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

D. Install lateral bracing with pipe hangers and supports to prevent swaying.

E. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads including valves, flanges, strainers, NPS 2-1/2" and larger and at changes in direction of piping. Install Concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

F. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

H. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.

   a. Piping operating above ambient air temperature: Clamp may project through insulation.

   b. Piping operating below ambient air temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.

   c. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.

2. Install MSS Sp-58, type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

   a. Option: Thermal hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers

4. Shield dimensions for pipe: not less than the following:

   a. NPS ¼ to NPS 3 ½: 12" long and .048" thick.
   b. NPS 4: 12" long and .06" thick.
   c. NPS 5 and NPS 6: 18" long and .06" thick.
   d. NPS 8 to NPS 14: 24" long and .075" thick.
   e. NPS 16 to NPS 24: 24" long and .105" thick.

5. Insert Material: Length at least as long as protective shield.

6. Thermal-hanger Shields: Install with insulation same thickness as piping insulation.

3.4 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.5 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welded work, and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.6 ADJUSTING

A. Hanger adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length if continuous threaded hanger support rods to 1-1/2”

3.7 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint of miscellaneous metal are specified in Division 9 painting sections.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

+ + END OF SECTION 23 0900 + +

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## 1.0 GENERAL

### 1.1 INTRODUCTION

A. This Specification is intended to establish the minimum requirements, acceptable materials, and application techniques for the insulation of all piping, vessels, valves, instruments, equipment and other components as identified on the referenced drawings and equipment lists.

B. This standard does not cover building insulation or insulation for noise attenuation.

### 1.2 DEFINITIONS

A. Vessels: Includes tanks, drums, reactors, towers, heat exchangers, and any other large cylindrical process items.

B. Equipment: Includes compressors, pumps, filters, or other small complex mechanical items.

C. The word "interior" shall be taken to mean any ductwork or insulation which is located inside a structure, not exposed to weather.

D. The word "exterior" shall be taken to mean any ductwork or insulation which is located outside of a structure, or is otherwise subjected to the weather.

### 1.3 CODES, REGULATIONS, AND STANDARDS

A. This specification shall supplement but not supersede all applicable legal requirements which may be more severe in application. The Insulation Contractor (hereafter the Contractor) shall be responsible for verifying that the materials furnished, and work performed under this specification conform to all local, provincial, and national codes or laws currently in effect at the plant location. Any conflicts shall be referred to the Owner or Owner's Representative for resolution.

B. The latest published issue of standards, recommendations, or requirements of the societies, associations, or institutions listed below shall be followed and considered as minimum requirements.

| | |
|---|---|
| A&SC | Adhesive and Sealant Council |
| API | American Petroleum Institute |
| ASTM | American Society for Testing and Materials |
| FM | Factory Mutual |
| NFPA | National Fire Protection Association |
| NAIMA | North American Insulation Manufacturer's Association |
| OSHA | Occupational Safety and Health Association |
| UL/UL-C | Underwriter's Laboratory |

### 1.4 SCOPE OF WORK

A. All work covered by this specification is indicated on the HVAC drawings

B. All surface cleaning, painting, and labeling of insulated surfaces will be performed by others.

C. The Contractor shall furnish all materials, labor, supervision, and equipment necessary to perform a complete, expeditious, and workmanlike installation of thermal insulation within the scope of this specification. This shall include, but is not limited to, the following:

1. Furnish all insulation, jacketing, and finishing materials including bands, wiring, supports, and any other fasteners required to secure the insulation to piping and equipment, and to protect the insulation from weather and moisture penetration.

2. Delivery, receiving, unloading, storage, weather protection, and on-site movement of all materials from point of delivery to installation location. The Contractor shall visit the site and acquaint himself with the location and conditions of the job. The Owner or Owner's Representative will allocate warehouse space for storage of materials, provided such storage space is available. If there is no warehouse space available, the subcontractor shall include in his bid the cost of erection and removal, including materials, of a suitable warehouse to meet his requirements.

3. Furnish all supervision, labor, construction equipment, tools, scaffolding, and rigging required for the insulation installation. This shall include any temporary buildings required for office space, change rooms, storage, or fabrication. All of the above shall be removed by the Contractor at the completion of the work.

4. Coordinate with the Owner or Owner's Representative with regard to scheduling of the installation and obtain clearance before beginning work. The intent is to make sure that all lines and equipment are tested and free of leaks and that all surfaces are clean, dry, and free of scale, dirt, oil or other foreign substances prior to being insulated.

5. Surfaces to be insulated should require no surface preparation by the Contractor, other than to brush off any loose scale or dirt not tightly adhering to the surface. Surface preparation beyond this should be brought to the attention of the Owner or Owner's Representative.

6. Insulate surfaces and finish the insulation with the applicable materials as specified in this document. This work includes providing anchorage and support as required for insulation on vessels and mechanical equipment. Clearance shall be obtained from the Owner or Owner's Representative before any drilling, cutting, or welding for the supports is done. No modification of an ASME or ABSA code-stamped vessel will be permitted.

7. Repair and replacement of any existing insulation that is removed and/or damaged during the demolition and installation of piping systems.

8. Provide pipe insulation submittals with jacketing for approval. Include pipe insulation schedule of thicknesses, jacketing material and type along with data sheets for all materials being used. Include insulation data sheet with all thermal performance for insulation thickness listed.

## 1.5 OWNER INSPECTION

A. An inspector representing the Owner shall have the right to inspect all work and material at the factory or at the site, and any work or material found to be defective or which does not meet the requirements of this specification shall be replaced by the Contractor at his own expense. Such inspection shall not relieve the Contractor from full responsibility for the quality and correctness of his materials and work. Final inspection is required during initial plant operation to determine accuracy of thermal expansion and contraction provisions.

## 2.0 INSULATION MATERIALS

### 2.1 FIBERGLASS INSULATION

A. Pipe insulation shall be rigid, premolded, resin-bonded fiberglass pipe covering manufactured by Schuller, Owens-Corning, CertainTeed, Knauf or approved equal. All fiberglass pipe insulation shall have a thermal conductivity not to exceed 0.24 BTU-in/hr-ft$^2$-0°F at 75°F (.0345 W/m-°K at 24°C).

B. For insulation to be used in cold or hot/cold service (i.e. minimum temperature less than 20°F) the insulation shall be furnished with a factory applied vapor barrier coating. The vapor barrier shall be Kraft paper backed aluminum foil with fiberglass reinforcing and without gaps. Other equally effective barriers (water vapor transmission rate of .02 perms or less) may be substituted after approval by the Owner or Owner's Representative.

C. Manufacturer's recommended system of sealing butt joints, pipe cover longitudinal seams, fitting covers, nozzle projections, and pipe support penetrations, must be followed. Insulation for hot service only does not need the factory-applied vapor barrier and can rely on the jacketing for moisture resistance.

D. When fiberglass is used in cold service and valves or joints are to be left temporarily uninsulated, the open ends of insulation must be sealed against moisture infiltration.

### 2.2 EQUIPMENT INSULATION

A. Apply insulation after systems have been tested, proved tight and approved by the Owner/Engineer of Record. Remove dirt,scale, oil, rust and foreign matter prior to installation of insulation.

B. No leaks in vapor barrier or voids in insulation will be accepted.

C. Insulation shall be fibrous glass rigid block or semi-rigid board rated for temperature intended. Insulation shall be formed or fabricated to fit equipment. Bevel edges and butt stagger joints.

D. Secure with bands or wires at intervals recommended by manufacturer, no more than 12" centers. Provide corner angles.

E. Apply two coats of adhesive with fibrous glass cloth embedded in first coat before application of second. Dry film thickness of finish shall be 1/8". Apply insulation cement over coated insulation; do not coat reamovable sections.

F. Equipment which needs servicing, such as pumps and plate heat exchangers shall be provided with removable insulation sections.

G. See section 3.6 for thickness requirements.

## 3.0 EXECUTION

3.1 GENERAL REQUIREMENTS

A. All insulation material adhesives, finishes, and accessories shall be fire resistive, having a flame spread rating of 25 or less and a smoke rating of 50 or less when tested by ASTM E-84 or UL. The Insulation Contractor shall furnish the UL label, listing, or a certified test report for each material to verify that the above fire hazard ratings are not exceeded. No asbestos or materials containing asbestos shall be used.

B. For vessels, all fiberglass, calcium silicate, and cellular glass insulation shall be installed and supported such that it meets the standards of the API and NFPA 30 with regard to staying intact, attached, and protective of the subsurface under fire exposure conditions.

C. All surfaces to be insulated shall be clean and dry. Insulation shall not be applied on damp or frosty surfaces. Surfaces shall be warm (above 40˚ F/4˚ C), if possible, and in no case shall insulated surface temperature fall outside the insulation manufacturer's recommended range during application. Insulation materials shall be brought to the manufacturer's recommended application temperature range before installation.

D. Valves, flanges, fittings, and other in-line items in insulated lines shall be insulated unless specified otherwise by the owner. Insulation thickness and materials shall be the same as the adjacent piping. The insulation shall be readily removable for maintenance without disturbing adjacent insulation.

E. Install 2" thick canvas, removable jacket for the balancing valves 1 ½" and larger. Purchase as an accessory from the valve manufacturer.

F. Where insulation of valves is specified, gate and globe valve bodies shall be insulated up to the packing gland. Insulation shall not interfere with adjustment or removal of packing gland and shall be sealed to valve body with suitable mastic. Ball, plug and butterfly valves will be supplied with extension stems so that the entire body may be insulated.

G. All nameplates, code inspection plates, stampings or similar identification marks, instrument readouts, and view ports must remain visible after insulation is applied.

H. Where openings in the insulation are required for flanges, nameplates, and other access-requiring items, the surrounding insulation shall be carefully beveled and sealed against moisture penetration.

I. Insulation shall be continued through walls, partitions, floors, and sleeves unless otherwise noted. A minimum clearance of one inch shall be maintained between insulation surfaces and any obstructions such as stairs, platforms, or other piping.

J. Insulation shall be of the best grade and the installation should be of high quality with smooth and even surfaces. All materials shall be new and furnished to the job site in factory-sealed containers. Scrap pieces of insulation shall not be used in lieu of full length pieces. All insulation, adhesives, sealers, and vapor barrier coatings shall be compatible and shall not soften, corrode, or otherwise attack each other or the insulated surface, either wet or dry.

K. The Contractor is responsible for adequate weather protection of all materials before and during application. Any materials damaged by weather, or if applied insulation gets wet before it is weatherproofed, shall be replaced by the Contractor at no cost to Owner.

L. Installation of all insulating materials, accessories, and finishes shall be in accordance with the manufacturer's latest published recommendations and instructions. Manufacturer's instructions that are more severe than this specification shall take priority. All conflicts shall be referred to the Owner or Owner's Representative for resolution.

M. The design of the insulation system shall include provisions to allow for the thermal dimensional changes in the piping and equipment. Expansion joints shall be installed per the insulation manufacturer's recommendations to prevent damage to vapor barriers and jacket materials. The thermal resistance and mechanical integrity of the insulation system shall not be affected by normal vibration or movement of the piping and equipment.

N. At all times during the work, the Contractor shall organize his equipment, tools, scaffolding, and materials in a neat and workmanlike manner so as to avoid interference with the work of other trades working on the project. He shall protect all adjacent surfaces of equipment, structures, piping, walks, and roads against fouling or staining by his materials and shall remove all debris, drips, splatter, and the like from the working area promptly. He shall continuously police the area and shall leave the area free of all debris at the end of each working day. The contractor is responsible for proper disposal of all debris and leftover material.

O. Instrument lead lines shall be insulated as shown on instrument installation drawings. Pressure gauge piping, control valves, flow indicators, etc., when installed in lines that are insulated, shall be insulated.

P. The materials listed in this specification represent Owner's acceptable products. Where materials are identified by trade names, materials considered to be equivalent may be used only when approved by the Owner's insulation engineer in writing.

Q. On pre-insulated equipment, the Contractor is responsible for continuing pipe insulation up to the equipment insulation and making a moisture-tight joint between the pipe and equipment insulation jacketing.

R. The preferred method of support of insulated pipe, particularly for cold service, is to use saddles or hangers exterior to the insulation. The Contractor shall refer to the insulation manufacturer's recommendations with regard to the spacing of supports and the use of reinforcing metal saddles and/or sections of high density insulation at supports. Where piping must be insulated around supports, the insulation shall cover the support out to a distance of four inches from the pipe.

S. Any pressure/leak testing must be completed prior to the application of the insulation.

3.2 ANTI-SWEAT INSULATION

A. Except where specifically noted in the project documents, all lines and equipment operating below 60°F/15°C shall be insulated for the control of condensation. Thickness of insulation will be as indicated in Appendix A of this specification.

3.3 JACKETING

A. All insulation shall be covered by jacketing. In general, insulation jacketing shall be gloss white heavy gage PVC or manufacturers standard all service jacket. See Insulation Thickness Schedule for requirements.

B. Jacketing on small equipment, such as pumps and exchangers, shall be removable-type.

C. Jacketing on irregular surfaces shall use either white sheet plastic or white mastic with fiberglass cloth reinforcing (whichever will provide the best installation).

D. For PVC jacketed piping where indicated in paragraph 3.6, both indoors and outdoors, the Contractor shall furnish and install Zeston 300 series, Knauf-Proto, or approved substitute gloss white UV resistant PVC jacketing and fitting covers. Minimum thickness for outdoor application shall be .030"(0.76 mm), and .020" (0.5mm) for indoor applications.

1. Zeston Perma-Weld 300 solvent welding adhesive, or approved equal (suitable for hot or cold service), shall be used to permanently seal all PVC lap joints in the system. Cementing is the only approved method of fastening plastic jackets and fitting covers.

2. Application of jacketing system shall strictly conform to manufacturer's instructions for installation and sealing to gain USDA acceptance.

3. Seams of adjacent fittings and piping jackets should be straight, and in line with each other and the main axis of the pipe. Diagonal seams are not acceptable.

4. End caps are required at all terminations of insulation.

5. Caulking is required at termination points and breaks in insulation, such as at diaphragm valves and pipe supports on insulated sanitary stainless steel tubing systems. Caulk is applied to the end of the insulation and filleted all around the adjacent tubing. Immediately thereafter, before the caulking has set-up, the end cap is installed, allowing some of the caulk to 'ooze' from between cap I.D. and tubing. Finally, using plastic spoon or equivalent item, smooth the bead of caulking and wipe up any excess caulk. Only FDA approved caulking of white or transparent color is to be used, suitable for the temperatures listed in the line table.

3.4 HARDWARE

A. Hardware materials (wire, bands, seals, clips, pins, washers and screws) shall be:

1. 304 stainless steel for use with stainless steel and PVC jacketing

B. Hardware shall be sized as follows:

1. For piping, up to 30" (762 mm) diameter, use banding 1/2" (13 mm) wide by 0.020" (0.5 mm) thick.

2. For vessels use banding 3/4" (20 mm) wide by 0.020" (0.5 mm) thick.

3. Expansion springs shall be Type 18-8 stainless steel 2" (50 mm) long. Acceptable suppliers are Childers and Techalloy or approved equal.

4. "S" clips shall be fabricated of 3/4" (20 mm) wide by 0.020" (0.5 mm) thick banding.
5. Weld pins and speed washers shall be 20 gauge size. Self-locking washers may be 2" (50 mm) round or square.
6. Sheet metal screws for fastening the metal weatherproofing to steel supports shall be 1/4" (6.4 mm) diameter by 1/2" (13 mm) long, Style B, hexagonal head, self-tapping and with neoprene washer under head.

3.5 INSPECTION

A. Inspect all insulation and accessory materials to be certain they are applied in conformance with this specification and manufacturer's recommendations. Joints should be tight, sealing and flashing shall be thorough and watertight, and finishes uniform and free of defects.

3.6 PIPE & EQUIPMENT INSULATION THICKNESS SCHEDULE (ABOVE GROUND)

| Pipe Service | System Designation | Insulation Description | ≤ 1 ½" | > 1 ½" | Max Operating Temp. |
|---|---|---|---|---|---|
| High Pressure Steam | HPS | Fiberglass with ASJ | 2.5" | 4.5" | 350°F |
| High Pressure Cond. | HPC | Fiberglass with ASJ | 2.5" | 4.5" | 350°F |
| Pumped Cond. | PC | Fiberglass with ASJ | 2.5" | 3.0" | 250°F |
| High Pressure Steam in Vaults | HPS | Fiberglass with ASJ & .020 Aluminum Jacketing | 2.5" | 4.5" | 350°F |
| High Pressure Cond. in Vaults | HPC | Fiberglass with ASJ & .020 Aluminum Jacketing | 2.5" | 4.5" | 350°F |
| Pumped Cond. in Vaults | PC | Fiberglass with ASJ & .020 Aluminum Jacketing | 2.5" | 3.0" | 250°F |

+ + END OF SECTION 23 2500 ++

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## 1.0 GENERAL

A. It is the intent of this specification to provide the Contractor with the necessary information to enable him to provide the HVAC piping systems as noted herein. These items shall be the Contractor's standard design modified as required to meet the operation and design requirements given herein and in the attached Specifications and Contract Drawings.

B. Compliance with the specification does not relieve the Contractor or manufacturer from the responsibility to furnish piping system of proper design and construction suitable for all operational conditions.

1.1 SCOPE OF WORK

A. The Contractor shall furnish labor, supervision, tools, equipment and materials for the HVAC piping work as per Division 23 Specifications and the Contract Drawings.

B. The Contractor shall furnish and install steam & condensate piping, as described herein, and piping accessories as shown on the drawings and as described in these specifications.

C. This Contractor shall include the following work:

1. Furnish and install steam & condensate piping and valves as shown on the drawings.

2. Mechanical contractor shall be responsible for all concrete core drilling and saw cutting required for the installation of the new piping systems.

3. Mechanical contractor shall provide for the expansion and contraction of the piping system.

D. The Contractor is responsible for all shop and field fabrication, field erection, rigging, installation, pressure testing, and documentation of the HVAC piping systems.

E. The Contractor shall coordinate closely with the ATC Contractor and all other trades as needed.

F. The Contractor shall provide all start-up services required by the specifications.

G. All fabrication shall be in accordance with the applicable sections of the latest edition of the ANSI/ASME Codes, specifically B31.9 “Building Services Piping.”

H. All piping systems installed under this contract are to be labeled with piping service codes.

I. All valves and instruments installed under this contract are to be tagged.

J. All installation activities will require coordination with other Contractors, including the General Contractor.

K. Where not fully called for in the contract documents, design of hangers and supports shall be the Contractor’s responsibility. Design shall conform to accepted engineering practice, using factor of safety or 2-1/2.

**L. Provide domestic components (non-foreign), acceptable by state standards, approvals throughout and Engineer of Record.**

M. Pitching of all piping associated with the entire system including existing to remain piping, & all

new work where needed by applicable codes and standards.

N. Provide chain operators for all valves that are located above 10'-0" or higher and/or inaccessible with an 8'-0" ladder.

O. Refer to spec section 70867-23550 "HVAC Pre-Fabricated Underground Piping" for piping requirements for underground piping.

1.2 REFERENCE DOCUMENTS

A. CODES AND STANDARDS

1. All piping systems shall meet the requirements of the latest applicable ASME, ANSI, and ASTM Codes.

- ANSI American National Standards Institute
- API American Petroleum Institute
- ASME American Society of Mechanical Engineers
- ASTM American Society for Testing and Materials
- AWS American Welding Society
- MSS Manufacturer Standardization Society of the Valve and Fitting Industry.
- NFPA National Fire Protection Association

B. CONTRACT DRAWINGS

1. The Owner is responsible for the accuracy of supplied contract drawings and the Contractor is to install the piping systems to reflect the configuration, dimensions, elevations, slope requirements, pipe insulation and pipe supports as indicated on contract drawings.

2. It is the responsibility of the Contractor to, upon review of contract drawings and existing site conditions, notify the construction manager, prior to any relative fabrication or installation, of any problems or situations requiring modification to piping as indicated on contract drawings.

1.3 SUBMITTALS

A. The Contractor shall submit shop drawings for all equipment, piping systems, and product data for all piping fittings, valves and specialties. Include maintenance data for hydronic specialties, special duty valves to include in the Operation and Maintenance Manual specified in Specification Section 70867-15000.

B. All materials submitted should not be procured until reviewed and approved by the engineer of record.

C. The Contractor shall be responsible for including all piping information on the coordination drawing.

D. All submittal procedures shall be as specified in Specification Section 70867-15000.

E. Piping layout drawings (1/4" = 1'-0") showing proposed pipe routing with elevations and sections as required. Layout shall show all expansion compensation supports, anchors and guides.

F. Manufacturer's Data Sheets on all catalogued valves, and fittings being used.

G. Manufacturer's Data Sheets on all catalogued pipe supports being used.

H. Drawings covering all specially designed hanger assemblies and fabrications.

I. Piping Isometrics showing bill of materials, valves, and pipe cut lengths for hook-ups to equipment.

J. All applicable welding procedures.

K. A copy of welder qualification status, W-102.

L. Prefabricated underground piping with materials layout, details, stress analysis all using exact field dimensions.

M. Pipe sleeves and link seals

1.4 QUALIFICATION OF WELDING

A. Qualifications of the welding procedures to be used and the performance of welders and welding operators shall be in accordance with ASME B31.9 except as follows:

1. Copies of the applicable welding procedure specifications including the Procedure Qualifications Records (PQR), along with the welder/welding operator qualification test records and certificates, shall be submitted by the Contractor to Engineer of record at least (5) business days prior to performing any welding work.

2. Welder and welding operator performance qualification from other employees is not acceptable.

B. The Owner’s representative shall be notified 24 hours in advance of tests.

C. Welders or welding operators shall apply their assigned symbols near each weld they make as a permanent record as for indication of their work only. No code welding, ASME inspection, or x-ray of welds is required.

D. A fire watchman with an approved fire extinguisher shall be posted at the site of the welding work, during that work, and for a minimum of 30 minutes after the work is completed, to see that sparks or drops of hot metal to cause a fire.

E. Smoke detectors shall be covered and protected from false alarming for any welding done while the building is occupied.

F. Contractors shall have not less than (5) five years experience as a Mechanical Contractor with specific experience in piping fabrication techniques, application and installation of the material types and sizes as referenced herein, and as shown on the engineering drawings and/or as referenced in the bid documents. Any materials the Contractor has not had specific working experience with shall be made known to The Engineer of Record with the submittal of the bid documents. The Owner reserves the right to verify all Contractors' qualifications, or to require that the Contractor provide specific work experience documentation.

G. All pipe fitters shall be licensed in the State of R.I. and all welders shall have welding certificates. This shall be required for all installers and given to the RIC and the Engineer Of Record before any work is performed. The welds will be inspected by the RIC and the Engineer to ensure quality. The installing contractor will be responsible for any defects or imperfections found in the welds and will be responsible for any cost to repair or redo the welds to RIC or Engineers' satisfaction.

1.5 WELDING REQUIREMENTS

A. All welds in pressure piping (and all welds to pressure piping for structural attachments) shall be in accordance with ASME B31.9 and the following:

1. The weld at the perimeter of branch connection reinforcing pads shall be a continuous full fillet weld unless otherwise approved by the Owner or Owner's Representative.

2. Ends of valves and unions of socket welding construction shall be welded by an electric arc process to minimize distortion.

3. Valves shall be closed during welding.

4. Non-metallic valve seats shall be removed during welding unless otherwise stated in the manufacturer's literature.

5. Welding on piping systems shall be performed using the Shielded Metal Arc Welding (SMAW) process, Gas Tungsten Arc Welding (GTAW) process, Gas Metal Arc Welding (GMAW) process and/or the Flux Cored Arc Welding (FCAW) process may be used.

6. The Submerged Arc Welding (SAW) process may be used in the shop for automatic machine welding operations .

7. The weld procedure and welder qualification shall specify which process will be used on what piping and/or support system for approval by the Engineer of Record.

B. General

1. As a general rule, the width of the weld puddle should be about twice the thickness of the metal being welded.

2. Where insert flanges are being used, the insert shall be attached using two separate welds. Four stitch welds, with a total length equal to one-half the pipe circumference, are to be made between the back of the insert and the outside of the pipe. This will provide strength while indicating if the seal weld is leaking. Filler wire is to be added only when necessary. A face or seal weld shall be made between the end of the pipe and the interior of the insert. The insert face shall be extended 1/8" beyond the end of the pipe. None of the groves on the inside of the insert are to be exposed.

3. If valves which contain heat-sensitive parts, such as plastic or rubber, are being welded into the system, these parts are to be removed during welding to prevent heat damage. Heat sinks must be used for welding valves where recommended by the valve manufacturer and in the manner prescribed.

4. The welder shall strive to minimize the Heat Affected Zone (HAZ) by controlling heat (amperage) input, technique and cooling. No more heat than is necessary for full penetration should be used; in other words, the amperage should be kept as low as

possible and still melt the inside edge of the pipe wall.

C. SMA Welding

1. Welding equipment shall be inverter type, of a size and type suitable for the work and shall be maintained in such a condition as to ensure acceptable welds by direct, reverse or alternating current.
2. SMA welding shall be direct current, reverse polarity.

D. TIG Welding

1. Welding equipment shall be of a size and type suitable for the work and shall be maintained in such a condition as to ensure acceptable welds.

2. Electrodes shall be 1/16" or 3/32" diameter, 2% thoriated tungsten conforming to AWS-ASTM, EWTh2 classification. They are to be sharpened to a pencil point with a fine abrasive wheel and re-sharpened often enough to keep them clean. Tungsten should be held parallel to the direction of rotation of the grinding wheel. Filler wire must be stored in a dry location until ready for consumption.

3. The electric current for welding shall be direct current, straight polarity (electrode negative). For wall thicknesses up to and including 0.083 inches, the suggested settings are 12 to 14 volts and 30 to 40 amperes. These may be varied somewhat according to the welder's capabilities, but any value chosen must be within the recommended range as provided by the electrode manufacturer and produce welds of acceptable quality.

4. Automatic welding is preferred for all shop welds.

1.6 DELIVERY, STORAGE AND HANDLING

A. Handle materials in a manner that will not cause overstress, warp, twist or other damage.

B. Take precautions to prevent damage to protective coatings on surfaces of materials.

C. Store and protect materials at the site from damage, deterioration and corrosion. If necessary, store materials in weather tight enclosures.

D. Packaged materials shall be stored in their original unbroken container.

E. Remove accumulations of mud, dirt and other foreign substances from materials immediately prior to erection.

F. In the event of damaged items or previously opened packaged materials, immediately repair and/or replace such items as is necessary, to the Owners approval, at no extra cost.

G. All piping items shall be segregated upon receipt and stored in an orderly manner. Materials shall be kept clean and elevated above grade or floor by timbers, structural steel or other suitable method. Unprotected piping, fittings and components shall be sloped to allow drainage. Materials stored outside shall be protected from damage due to weather conditions.

H. Stainless steel components shall not be stored in contact with carbon steel, storage rack bends or other carbon steel items. All basic material groups shall be segregated according to material type (i.e. carbon steel, stainless steel, copper, etc.).

## 2.0 PRODUCTS

A. All materials shall be in accordance with the Piping Material Specifications table. In this specification.

B. All material shall be new, unused, and free of defects and imperfections, and shall be supplied in strict accordance and with the applicable Piping Material Specifications. All materials shall be domestic in nature no substitutions are permitted without written consent from the engineer of record.

C. Mechanical piping, fittings, and appurtenances shall be domestic in origin. Foreign manufacturers shall not be allowed unless otherwise specified.

D. All pipe, fittings and valves shall be supplied marked by the manufacturer in accordance with the marking sections of the standards to which reference is made in the Piping Material Specifications, or in accordance with the requirements of MSS SP-25: "Standard Marking System for Valves, Fittings, Flanges and Unions of the Manufacturers Standardization Society of the Valve and Fitting Industry."

E. All material items shall be carefully inspected upon receipt at the jobsite. The Contractor shall examine all components for compliance with the applicable material class specification, ASTM identification and markings, purchase order compliance including shortages, and over shipments and any damaged or flawed items (i.e. scarred flange faces, bent pipe, damaged threads, beveled ends, etc.), and shall report his findings to the Site Engineer. Items failing to meet this criteria shall be rejected and held in a separated area for disposition

F. Pipe in sizes 24" and smaller shall conform dimensionally to ANSI B36.10 for carbon steel, and ANSI B36.19 for stainless steel. Pipe wall thickness shall be as indicated in the Piping Material Specifications.

G. All steel screwed and socket welding fittings shall conform to ANSI B16.11.

H. All carbon steel butt-welding fittings shall conform dimensionally to ANSI B16.9, with wall thickness at least equal to that of the pipe on the same service. Where the fitting is heavier than the pipe, ends of fittings shall be beveled to meet code requirements.

I. Mitered joint elbows and field fabricated reducers are not permitted unless approved by the Engineer of Record.

J. Schedule 80 piping shall be color coded by the Contractor painting yellow stripes around the pipe at 3’-0” intervals for the Engineer of Record and other pipe fitters to clearly and easily identify the differences between schedule 40 and 80 pipe.

2.1 PIPE MATERIAL TABLES

A. PC – Pumped Condensate

**MATERIAL: Carbon Steel (ANSI 150# R.F.)**
**PRESSURE: Range 0 to 100 psig**
**TEMPERATURE: Range 32°F to 350°F**

| Item | Size | Description | Remarks |
|---|---|---|---|
| Pipe | 1/2" thru 2" | Carbon steel Schedule 80 ASTM A-106 Grade B seamless ANSI B36.10 | |
| | 2-1/2" thru 24" | Carbon steel standard weight ASTM A-106 Grade B seamless beveled ends ANSI B36.10 | |
| Type of Joint | 1/2" thru 2" | Screwed NPT | |
| | 2-1/2" thru 24" | Butt welded | |
| Fittings | 1/2" thru 2" | Class 125 cast iron, banded type, threaded, ASTM A126 | |
| | 2-1/2" thru 24" | Seamless steel, buttweld, beveled ends, long radius elbows, ASTM A234/A 234M – Schedule 80. | |
| Nipples | 1/2" thru 2" | Carbon steel ASTM A-106 Grade B Schedule 80 threaded both ends | |
| Unions | 1/2" thru 2” | Malleable iron 150 class, brass trim, ground joint, threaded ends, ASTM A197/A 197M, ANSI B16,3 | Note 1 |
| Flanges | 1/2" thru 2" | Screwed forged steel ANSI 150# class ASTM A-105 raised face ANSI B16.5 | |
| | 2-1/2" thru 24" | Weld neck forged steel ANSI 150# class ASTM A-105 standard bore raised face ANSI B16.5 | |
| | Exception: | Use flat face flanges when mating with flat faced flanges on valves or equipment | |
| Gaskets | 1/2" thru 24" | 1/8" ring gasket: Spiral-wound with a preformed Type 304 stainless steel strip and a filler consisting of 99.9 percent carbon, with no binder, respirable fibers, lubricant or other additive. Outer ring shall be .125 inch thick carbon steel.<br>Approved Gaskets:<br>Flexitallic style CG with super Flexicarb filler material | Note 3 |
| Thread Sealant | | Teflon ribbon 1/2" wide x 4 mils thick | |
| Bolts | | Stud Bolts - Alloy Steel ASTM A-193/A-193M Grade B7; Thread ANSI B1.1 Class 2A; Heavy Hex Nuts - Alloy Steel ASTM A-194/A-194M Grade 2H; Thread ANSI B1.1 Class 2B | Note 1 |
| | Exception: Use cadmium plated bolts and nuts for outdoor installations | | |

| Item | Size | Description | Remarks |
|---|---|---|---|
| Ball Valves | 1/2" thru 2" | Ball Valve 600# WOG rating<br><br>Body: Bronze ASTM B-61<br>Trim: Stainless steel<br>Seats: Reinforced TFE<br>Seals: TFE<br>Ends: Screwed<br>Features: Blow-out proof stem<br>2-1/4" stem extension<br>150 PSIG rating at 366°F<br>Approved Valves:<br>Milwaukee BA-1005 with kit 8672<br>Nibco T-580-66-NS<br>Apollo 70-140-64<br>Jamesbury A-1136-MT<br>Worcester 4416-RT-SE-V48 | |
| Check Valves | 1/4" thru 2" | Check Valve 200# class swing type<br><br>Body: Bronze ASTM B-61<br>Trim: Bronze<br>Ends: Screwed, NPT<br>Features: Renewable disc integral seats<br>Horizontal or vertical installation<br>Approved Valves:<br>Powell 560<br>Stockham B-345<br>Milwaukee 508<br>Nibco T-453-B<br>Kitz 19 | |
| Check Valves | 2-1/2" thru 12" | Check valve ANSI 125# class swing type (IBBM)<br><br>Body: Cast iron ASTM A-126 Class B<br>Trim: Bronze<br>Ends: Flanged FF 125# class ANSI B16.1/B16.10<br>Features: Swing type Bolted cap<br>Horizontal or vertical installation<br>Approved Valves:<br>Milwaukee F-2974<br>Nibco F-918-B<br>Powell 559<br>Stockham G-931 | |
| Gate Valves | 1/4" thru 2" | Gate Valve 200# class<br><br>Body: Bronze ASTM B-61<br>Trim: Bronze disc and stem SS seat rings<br>Ends: Screwed NPT<br>Features: Inside screen<br>Rising stem<br>Solid wedge disc<br>Approved Valves:<br>Milwaukee 1174<br>Nibco T-174-SS<br>Powell 2375-S | |

| Item | Size | Description | Remarks |
|---|---|---|---|
| Gate Valves | 2-1/2" thru 24" | Gate Valve ANSI 125# class<br>200# (-20 to 150°F) WOG rating<br><br>Body: IBBM cast iron ASTM A-126<br>Trim: Bronze seat and stem<br>Ends: Flanged FF ANSI B16.1<br>Features: OS&Y Bolted bonnet<br>Rising stem<br>Solid wedge disc<br>Approved Valves:<br>Nibco F-617-0<br>Milwaukee F-2885<br>Powell 1793<br>Stockham G-623 | |
| Globe Valves | 1/4" thru 2" | Globe Valve 200# class<br><br>Body: Bronze ASTM B-62<br>Trim: Stainless steel seat ring and disc<br>Ends: Screwed NPT<br>Features: Union bonnet Rising stem<br>Renewable disc and seat rings<br>Approved Valves:<br>Milwaukee 592A<br>Nibco T-256-AP<br>Powell 2608A<br>Stockham B-62 | |
| Globe Valves | 2-1/2" thru 10" | Globe Valve 125# class (IBBM)<br><br>Body: Cast iron ASTM A-126 Class B<br>Trim: Bronze seats disc and stem<br>Ends: Flanged F.F. ANSI B16.1<br>Features: Bolted bonnet Rising stem<br>Solid disc<br>Approved Valves:<br>Milwaukee F-2981<br>Nibco F-718-B<br>Powell 241<br>Stockham G512 | |

| Item | Size | Description | Remarks |
|---|---|---|---|
| Strainers | 1/4" thru 2" | Strainer Bronze ASTM B-62<br>(Alternate B-61)<br><br>Features: "Y" pattern<br>Threaded end connections<br>Self-cleaning<br>0.033 perforated SS screen<br>Rating: 400# WOG @ 150°F<br>300# Steam @ 350°F<br>Alternate: Monel<br>Approved Strainers:<br>R-P&C 59<br>Armstrong F1SC<br>Mueller 352<br>Yarway 911<br>Keckley Style F | |
| Strainers (Alternate) | 1/4" thru 2" | Strainer Ductile Iron ASTM A-395<br><br>Features: "Y" pattern<br>Threaded end connections<br>Self-cleaning<br>0.033 perforated SS screen<br>Rating: 450# @ 650°F<br>640# @ 100°F<br>Alternate: Monel<br>Approved Strainers:<br>R-P&C 534S<br>Mueller 251-DI | |
| Strainers (Alternate) | 2-1/2" thru 10" | Strainer Cast Iron ASTM A-48 Class 30<br><br>Features: "Y" pattern<br>250# flanged ends<br>Self-cleaning<br>0.045 perforated SS screen<br>Rating: Up to 12": 500# WOG @ 150°F<br>250# Steam @ 450°F<br>Over 12": 200# Steam @ 406°F<br>Alternate: Monel<br>Approved Strainers:<br>R-P&C F2<br>Armstrong A1FL-250<br>Mueller 752<br>Keckley Style A | Note 2 |
| Temporary Strainers | 2-1/2" thru 12" | Strainer Stainless Steel Conical Strainer<br><br>Features: ANSI 150#, flanged ends<br>1/8" perforated 14 gauge screen<br>Approved Strainers:<br>Mack Iron Works Series PC R/FF<br>Self Cleaning Strainer Co. (Padget) | |

Notes:
1. To avoid seizing of bolts and unions, use Chesterton "785" anti-seizing compound.
2. Use 300# FF flanges in lieu of the 150# flanges as specified when mating with 250# FF on strainer STR-07 and as noted on engineering drawings.
3. Dielectric gaskets shall be "Pikotek" style PGE; gasket and washer material shall be PK-91; gasket seal shall be teflon; bolt sleeve material shall be Nomex; and back-up washer material shall be zinc plated steel. The dielectric gasket assembly shall be rated for 1,000 psi at 450°F, continuous service. Dielectric gaskets shall be as manufactured by Pikotek, P.O. Box 260438, Lakewood, CO 80226; phone (303) 988-1242.

B. HPS, HPC

**MATERIAL:** **Carbon Steel (ANSI 300# R.F.)**
**PRESSURE:** **Range 166 to 400 psig (All welded construction)**
**TEMPERATURE:** **Range 32°F to 650°F**

| Item | Size | Description | Remarks |
|---|---|---|---|
| Pipe | 1/2" thru 2" | Carbon steel Schedule 80 ASTM A-106 Grade B seamless ANSI B36.10 | |
| | 2-1/2" thru 16" | Carbon steel standard weight ASTM A-106 Grade B seamless beveled ends ANSI B36.10 | |
| Type of Joint | 1/2" thru 2" | Socket weld | |
| | 2-1/2" thru 16" | Butt welded | |
| Fittings | 1/2" thru 2" | Forged carbon steel ASTM A-105 3000# ANSI B16.11 socket weld ends | |
| | 2-1/2" thru 16" | Carbon steel ASTM A-234 WPB standard weight ANSI B16.9 | |
| Nipples | 1/2" thru 2" | Carbon steel ASTM A-106 Grade B Schedule 80 threaded both ends | |
| Unions | 1/2" thru 2" | Forged carbon steel 3000# class ASTM A-105 ANSI B16.11 integral seat socket weld ends | Note 3 |
| Flanges | 1/2" thru 2" | Socket weld Schedule 80 bore Forged steel ANSI 300# class ASTM A-105 Raised face ANSI B16.5 | |
| | 2-1/2" thru 16" | Weld neck forged steel ANSI 300# class ASTM A-105 standard bore raised face ANSI B16.5 | |
| Gaskets | 1/2" thru 16" | 1/8" ring gasket: Spiral-wound with a preformed Type 304 stainless steel strip and a filler consisting of 99.9 percent carbon, with no binder, respirable fibers, lubricant or other additive. Outer ring shall be .125 inch thick carbon steel. Approved Gaskets: Flexitallic style CG with super Flexicarb filler material | Note 2 |
| Bolts | | Stud Bolts - Alloy Steel ASTM A-193/A-193M Grade B7; Thread ANSI B1.1 Class 2A; Heavy Hex Nuts - Alloy Steel ASTM A-194/A-194M Grade 2H; Thread ANSI B1.1 Class 2B | Note 3 |

| Item | Size | Description | Remarks |
|---|---|---|---|
| Check Valves | 1/4" thru 2" | Check valve ANSI 800# class<br><br>Body: Forged carbon steel ASTM A-105<br>Trim: 12-13% chrome<br>Ends: Socket weld<br>Features: Piston check<br>Horizontal spring loaded<br>Bolted bonnet<br>Approved Valves:<br>R-P&C F95D<br>Vogt SW 701<br>Smith C80SW<br>Velan W2034B-02TY<br>Rockwell-Edward 838Y | |
| Check Valves | 2-1/2" thru 12" | Check valve ANSI 300# class<br><br>Body: Cast carbon steel ASTM A-216 WCB<br>Trim: 13% chrome to hard facing<br>Ends: 300# RF flanged ANSI B16.5<br>Features: Bolted bonnet<br>Renewable disc Swing type<br>Approved Valves:<br>Velan F1114C-02TY<br>Dewrance F32EZ-PFDA<br>Stockham 30-SF-U<br>Powell 3061 | |
| Gate Valves | 1/2" thru 2" | Gate Valve ANSI 800# class<br><br>Body: Forged carbon steel ASTM A-105<br>Trim: 12-13% chrome<br>Ends: Socket weld<br>Features: OS&Y Bolted bonnet<br>Renewable seat<br>Solid wedge disc<br>Approved Valves:<br>R-P&C EF57D<br>Vogt SW 12111<br>Smith 800 SW<br>Velan W2054B-02TY | |
| Gate Valves | 2-1/2" thru 16" | Gate Valve ANSI 300# class<br><br>Body: Cast carbon steel ASTM A-216 WCB<br>Trim: 13% chrome to hard facing<br>Ends: Butt weld<br>Features: OS&Y Bolted bonnet<br>Flexible disc<br>Approved Valves:<br>Stockham 30-OW-U<br>Powell 3003N W.E.<br>Dewrance P31EH-NFDA<br>Velan B1064C-02TY | Note 1 |

| Item | Size | Description | Remarks |
|---|---|---|---|
| Gate Valves (alternate) | 2-1/2" thru 16" | Gate Valve ANSI 300# class<br><br>Body: Cast carbon steel ASTM A-216 WCB<br>Trim: 13% chrome to hard facing<br>Ends: 300# RF flanged ANSI B16.5<br>Features: OS&Y Bolted bonnet<br>Flexible disc<br>Approved Valves:<br>Stockham 30-OF-U<br>Powell 3003N F.E.<br>Dewrance P32EH-NFDA<br>Velan F1064C-02TY | Note 1 |
| Globe Valves | 1/2" thru 2" | Globe Valve ANSI 800# class<br><br>Body: Forged carbon steel ASTM A-105<br>Trim: 12-13% chrome<br>Ends: Socket welded<br>Features: OS&Y Bolted bonnet Loose disc<br>Integral hard faced seat<br>Approved Valves:<br>R-P&C F81D<br>Vogt SW 12141<br>Smith G80 SW<br>Velan W2074B-02TY<br>Rockwell-Edward 848Y | |
| Globe Valves | 2-1/2" thru 6" | Globe Valve ANSI 300# class<br><br>Body: Cast carbon steel ASTM A-216 WCB<br>Trim: 13% chrome to hard facing<br>Ends: 300# RF flanged ANSI B16.5<br>Features: Bolted bonnet<br>Renewable seat ring and disc<br>Approved Valves:<br>Stockham 30-GPF-U<br>Powell 3031 F.E.<br>Velan F1074C-02TY<br>Rockwell-Edward 318Y | |

| Item | Size | Description | Remarks |
|---|---|---|---|
| Strainers | 1/4" thru 2" | Strainer Cast Carbon Steel ASTM A-216 WCB<br><br>Features: "Y" pattern<br>ANSI 600#<br>Socket welded end connections<br>Self-cleaning<br>0.033 or 0.045 perforated SS screen<br>Alternate: Monel<br>Approved Strainers:<br>R-P&C 531-SW<br>Armstrong B1SW<br>Mueller 862<br>Keckley Style SB | |
| Strainers | 2-1/2" thru 10" | Strainer Cast Steel ASTM A-216 WCB<br><br>Features: "Y" pattern<br>ANSI 300#, flanged ends<br>Self-cleaning<br>0.045 perforated SS screen<br>Alternate: Monel<br>Approved Strainers:<br>R-P&C 531-30<br>Armstrong B1FL-300 (2-1/2"-6")<br>Mueller 762<br>Keckley Style SA | |
| Temporary Strainers | 2-1/2" thru 12" | Strainer Stainless Steel Conical Strainer<br><br>Features: ANSI 300#, flanged ends<br>1/8" perforated 14 gauge screen<br>Approved Strainers:<br>Mack Iron Works Series PC R/FF<br>Self Cleaning Strainer Co. (Padget) | |

Notes:

1. Use butt-welding end gate valves except where hazardous environment precludes welding.
2. Dielectric gaskets shall be "Pikotek" style PGE; gasket and washer material shall be PK-91; gasket seal shall be teflon; bolt sleeve material shall be Nomex; and back-up washer material shall be zinc plated steel. The dielectric gasket assembly shall be rated for 1,000 psi at 450°F, continuous service. Dielectric gaskets shall be as manufactured by Pikotek.
3. To avoid seizing of bolts and unions, use Chesterton "785" anti-seizing compound.

2.5 PRESSURE GAUGES AND THERMOMETERS

A. Pressure gauges shall be Trerice 500X, 4½ inches in diameter, cast aluminum case, screw driver pointer adjustment, stainless steel movement, and bronze bourbon tube. Provide fittings and ball valves at gauges and fluid fill. Thermowells shall be 304 stainless steel with 2" lag extensions to clear insulation.

B. Except for HPS, thermometers shall be Trerice Model B856 5" diameter, cast aluminum case, screwdriver pointer adjustment, stainless steel movement, bimetal actuation. Provide with S.S. stem sized to clear insulation. HPS steam thermometer shall be capable of 1000º F temperature.

C. Scale Ranges

1. Thermometers

a. 50 to 300 deg F with 2 degree scale divisions for service.

2. Pressure Gauges (Water)
   a. 0 to 100 psig- Pump discharge
   b. 30" Hg to 60 psig- Pump Suction
   c. Provide gauge cock

3. Pressure Gauges (Steam)
   a. 0-160 psig (HPS)
   b. 0-60 psig (MPS and LPS)
   c. Provide gauge cock and siphon

**3.0 EXECUTION**

3.1 PREPARATION

A. The Contractor shall carefully review the engineering drawings of all disciplines, and check for obstructions and interferences. This shall be done during the bid period and prior to proceeding with installation to avoid unnecessary rework later on. In addition, the Contractor shall become familiar with the drawings and make note of locations where walls, partitions, ceilings, structural members, etc., are called to be closed-in or to be furred. He shall coordinate this work with other contract trades to avoid interferences or delays in construction.

B. Any questionable information in the specifications and/or on the plans, or conflicts with codes, shall be called to the attention of the Engineer of Record for clarification before proceeding with fabrication or erection of the parts affected. If, in the opinion of the Contractor, any additional detail drawings are necessary, he shall prepare them at his own expense, together with all bills of material.

3.2 ARRANGEMENT AND ALIGNMENT

A. Arrange and align all piping in accordance with the drawings. Elevations as given must be held. Floor elevations where given are to high points of floor. Dimensions must be held as closely as possible. Field check all dimensions for accuracy before pipe is fabricated.

B. Install all piping straight and as direct as possible, generally forming right angles with, or running parallel with, walls or adjacent piping. All piping shall be neatly spaced, with risers and drops running plumb and true.

C. Drawings are generally made to scale. Piping and equipment are located in the drawings by dimensioning their center lines to building columns, and/or to other pipes, and by giving center line or bottom of pipe elevations, or, in the case of underground piping, by the invert elevation. In order to clarify the work, however, some of the piping may be shown on the Owner's drawings slightly out of place, in which case sufficient dimensions are given to indicate the desired arrangement. The Contractor shall use figured dimensions and elevations to prepare his shop and spool drawings. All dimensions shall be checked in the field by the Contractor before final connections are fabricated.
NOTE: Do not scale drawings.

D. Drawings showing piping 1-1/2" and smaller are in general diagrammatic and the exact location of these lines shall be determined by the Contractor from field measurements taken by him. The actual arrangement of the small size piping, when erected, shall follow the general locations shown on the drawings as far as practicable. The installation made in this way shall be neat in appearance and convenient to operate, and shall provide for appropriate expansion and drainage.

E. Coordinate installation of piping systems with other work and/or with existing facilities, to avoid blocking building openings, light fixtures, etc. Piping shall not interfere with access to valves or equipment and shall not obstruct passageways. In general, minimum headroom clearance shall be considered as 7'-0" clear under all piping, coverings, and appurtenances. Piping shall be installed with sufficient clearance for operation, inspection/ replacement of valves, etc.

3.3 GENERAL

A. Install all piping systems for expansion and/or contraction under start-up, operating, shut-down, and steam-out conditions, without overstressing piping, valves or equipment. Pipe anchors, guides, hangers and supports shall be provided as required in accordance with pipe support drawings and specification 70867-15090 “HVAC Pipe Hangers & Supports”.

B. Install anchors where shown on the plans. Furnish guides on each side of all expansion loops, off-sets, swing joints and expansion joints whether or not detailed on the plans.

C. Cold springing of the pipe, where indicated on the drawings, shall be done with anchors, hangers and sliding supports in place.

D. Piping which is furnished as part of packaged equipment shall conform to the requirements of this specification and the applicable Piping Material Specification.

E. The Contractor, prior to fabrication in the shop or the field, shall remove all the loose rust, scale and foreign material from inside the pipes. The Contractor shall use power or manual brushes and/or grinders to clean the inside of the pipes prior to erection and connection to other piping and/or equipment.

F. Special precaution shall be taken at all times during fabrication and erection to prevent entrance of any foreign matter into piping or equipment.

G. Open end of pipes shall be plugged after fabrication. All openings in pipe or equipment left overnight or for future connection shall be covered to keep foreign particles out of the system. A plastic type plug or cap should be used for temporary protection. Rags or waste are not to be used because they will deposit lint in the openings.

H. System components which require observation, operation or maintenance -- such as valves, traps, gauges, controls, strainers, dirt pockets, cleanouts, unions and flanges, etc. -- shall be located to be readily accessible. They shall not be concealed in chases or above ceilings without provision for

access. Valves which require frequent operation, or which may require emergency operation, and are not accessible from normal working level, should be installed with appropriate provisions such as chain wheels, extension stems, ladders or platforms. If the plans fail to meet this requirement of accessibility, the discrepancy shall be called to the attention of Engineer of Record for clarification prior to fabrication or erection.

I. Provide all pipe openings through walls, partitions and slabs with sleeves having an internal diameter at least 1" larger than the outside diameter of uninsulated pipes or of the insulation for insulated services. When pipe is fitted with restraining rods, the sleeve shall be oversized to accommodate the rods. Holes for sleeves in existing buildings are to be neatly cut.

J. Install sleeves through interior walls and partitions flush with finished surfaces; sleeves through outside walls are to project 1/2" on outside of the finished wall. Floor sleeves are to project 2" above finished floors.

K. Set sleeves in place before pouring concrete or securely fasten and grout in with cement.

L. Sleeve Construction:

1. Interior Partitions: No. 22 gauge galvanized sheet steel with soldered joint.

2. Interior Masonry Walls and Floors: Standard weight galvanized steel pipe, or stainless steel where shown on drawings.

3. Exterior Walls: Standard weight galvanized steel pipe.

M. Sleeve Caulking:

1. Interior walls and floors: Fill the space between outside of pipe or insulation and the inside of the sleeve, or framed opening, with fiber glass, seal both ends with expanded foam.

2. Exterior walls (above ground): Pack with oakum, seal with lead and watertight mastic or asphalt; or install a modular mechanical seal "Link-Seal" as manufactured by the Thunderline Corporation.

3. Exterior walls (underground): See section 3.4.13.

4. Fire Rated walls and floors: Run pipe through a sleeve 1" larger than the outside diameter of the pipe or insulation (if insulated pipe is called for). The insulation shall be fire resistant. Fill space between the sleeve and the pipe completely with fiberglass wool and grout the ends. When pipe penetration will be exposed to view an escutcheon plate shall also be furnished and installed.

N. Any existing floor sleeves which are being abandoned as part of this work are to be cut off flush and plugged watertight.

O. Provide escutcheons on both sides of wall, floor, ceiling, and partition penetrations for all pipes exposed to view in finished areas, whether or not insulated, unless otherwise shown on the drawings. For pipes passing through floors, escutcheons shall fit over the sleeves. Escutcheons plates shall be stainless steel or chrome plated and fabricated in one piece.

P. Roof Caulking: Provide caulking, sealants, compressible fillers, flashings and/or rain covers as detailed on the architectural drawings. Coordinate work with roofing contractor.

Q. Additional Requirements

1. Provide blow-off valve on each strainer.

2. Provide unions for threaded end valves to facilitate removal from pipe.

3. Install dielectric nipples or unions between dissimilar metals.

4. Route piping in order manner and maintain proper grades. Install to conserve headroom and interfere as little as possible with use of space. Run piping parallel to walls. Group piping whenever practical at common elevations. Install concealed pipes close to building structure to keep furring to a minimum.

5. Slope water piping 1 inch in 40 feet (1/480) and arrange to drain at low points.

6. Install piping to allow for expansion and contraction without stressing pipe or equipment connected.

7. Provide clearance for installation of insulation and for access to valves, air vents, drains and unions.

8. Slope steam piping 1/2 inch in 10 feet (1/240) in direction of flow and condensate return piping 3/4 inch in 10 feet (1/160). Provide drip trap assembly at low point and point where condensate may back up in front of control valves. Run condensate lines from traps to nearest condensate receiver. Where condensate lines form a trap, provide vent loop over the trapped section.

9. Piping containing liquid shall not be installed above light fixtures, bus duct or other electrical devices and shall not pass through or above ceiling of Electrical Rooms, Elevator Equipment Rooms and Telephone Rooms.

10. Remove all newly installed strainers and clean and reinstall strainers before final acceptance of system.

11. Leave at least one inch clearance between surface of pipe, flange, fittings, or insulation and adjacent wall or other building structure.

12. Leave piping systems clean and in condition to receive pain or insulation.

13. Make reductions in horizontal pipes with eccentric reducer fittings. Install with flat on top for water systems and flat on bottom for steam systems.

14. All pipe elbows shown on drawings shall be long radius type.

15. Ream Pipes after cutting and clean before installing. Cap or plug equipment and openings during construction. All open ended pipes shall be capped sealed at the end of the day.

R. Connections:

1. Provide eccentric reducing couplings to bring pipes flush on top for water service.

2. Nipples shall be same material, make and thickness as pipe with which they are used.

Close nipples shall not be used.

3. Make piping connections 2" diameter and smaller to valves and equipment with 300 psi brass seat unions on steel piping and with heavy semi-flushed brass unions on copper tubing.

4. Make screw joints tight with Teflon (Polytetrafluoroethylene) tape for water or lighargeglycerin mixture for steam applied to male threads. Use tapered threads.

5. All connections to mains with exception of low point drains and drip legs shall be made at the top of the pipe.

6. Provide swing joint elbows as needed to allow for pipe expansion.

3.4 INSTALLATION - ABOVEGROUND PIPING

A. Provide unions or flanges at all piping connections to coils, equipment, control valves, pressure reducing valves, steam traps, etc., at all locations as shown on the drawings, and generally as required to disconnect piping from equipment and apparatus. Arrange connections so that the equipment served may be removed without disturbing the piping. Where valves serve to isolate equipment or specialties, the unions or flanges shall be located between valves and equipment or specialties. Unions shall generally be used for pipe sizes 2" and smaller, and flanges for pipe sizes 2-1/2" and larger.

B. Unless otherwise shown on the plans, install all piping to coils, pumps and other equipment including valves and strainers therein, at line size. If a reduction is required at a pump or control valve, the reducer shall be installed abutting the inlet and/or outlet of the pump or valve. Piping at pump and driver nozzles shall be arranged to permit removal of pump or driver without removing block valves.

C. Piping shall not be covered or closed in until completion of the piping cleaning, testing and until the installation is approved by the Engineer of Record. Piping that has been covered or concealed without cleaning, testing and approval, shall be exposed at the contractor's expense.

D. Flanges:

1. As piping is being installed and after it is positioned and pressure tested, all flanges and connections to mechanical rotating equipment (i.e., centrifugal compressors, pumps, turbines, etc.) shall be unbolted and checked for alignment. Flanges shall be parallel within 1/64 inch per foot of flange diameter and shall not put any strain on equipment casings. Dial indicators shall be utilized to insure strain free piping to equipment casing connections. All the work described above, reconnection and any corrective work, shall be done at the Contractor's expense.

2. Except for removable sections of pipe and for piping requiring dismantling for cleaning, use of companion flanges in piping shall be limited to connections at flanged equipment. Field joints may be flanged construction where expedient and economical to avoid field welding of joint requiring heat treatment and examination.

3. The location of flanged joints are shown on piping drawings. Bolt holes of flanges shall straddle the center lines of pipe unless otherwise shown and noted on drawings. Each piping material specification describes the type of flanges to be used and gives

the rating, material, facing, etc. When a different type of flange is used, its location and description is shown on the drawings.

4. Blinds shall be provided as indicated on piping drawings and Piping and Instrument Diagrams. Material shall be the same as the piping in the line where it is used. Blinds shall be accessible from grade or platforms.

5. All orifice flanges shall be welding neck type, ANSI Class 300 minimum rating, and 2" minimum pipe size. Orifice plates shall be 1/8" thick for lines 12" and smaller, and 1/4" for lines 14" and larger, unless otherwise noted. The preferred installation of orifice flanges is in a horizontal line.

E. Piping:

1. All assembled piping shall be worked in place without springing or forcing, except as specified on the drawings, to properly clear all openings and equipment. All piping shall be installed to permit free expansion and contraction without damage to joints, hangers, or to insulation where it is applied.

2. All piping shall be erected and supported in a manner that will not put undue strain on pumps, tanks, or equipment. Cutting or other weakening of the building structure to facilitate piping installation will not be permitted.

3. Install piping with minimum clearance of at least one inch between extreme projections of piping, flanges, fittings, valves, etc., to allow for insulation, pipe expansion and the like.

4. Full lengths of pipe shall be used wherever possible. Short lengths of pipe with couplings or welds will not be permitted. After cutting pipe, ends shall be reamed and cleaned to eliminate foreign matter and burrs.

5. Lines shall not be extended by means of a dead end branch for the purpose of providing support.

6. Long radius elbows shall be used wherever possible.

7. Reductions in line size shall be made with butt-welding reducers, swage nipples, screwed or socket weld reducers.
Do not use bushings.

8. Use eccentric reducing fittings or eccentric reducing couplings where required to prevent pocketing of liquid or non-condensibles.

9. Eccentric reducers with the straight side on top shall be installed, when required, on suction side of pumps. Eccentric reducers with the straight side on the bottom shall be installed on pipe racks.

10. Make all branch connections with tees, except that on steel piping, forged steel "Weldolets," "Sockolets" or "Threadolets" as manufactured by Bonney Forge may be used when the branch pipe is smaller than one-half the size of the main pipe (nominal sizes).

11. Where a line with lower rating connects to pipe or equipment with a higher rating, it shall take the higher rating to and including the first block valve, block and check

valve, or to and including the second valve when double block valves are used. For alloy lines, the alloy material may terminate with the first valve.

12. In some cases the process or user may require different materials for final isolating valve and terminal piping between final valve and equipment. If there are any questions in this respect, the Contractor shall verify with the Engineer of Record before installing valve and piping.

F. Instruments:

1. Instrument connections on piping and equipment such as local mounted pressure and temperature instruments, gage glass and level controls, shall be accessible from grade, platforms or ladders.

2. Instruments (i.e. pressure gauges, thermometers, orifice plates, etc.) are shown on the drawings in their approximate locations. Exact location shall consider visibility and any special installation requirements, and shall be as approved by Engineer of Record. Any relocation required because Contractor failed to obtain approval shall be done at Contractor's expense.

3. Furnish and install 1/2 inch size, 3,000 lb., forged steel weldolets, threadolets, elbowlets or weld couplets with nipples and root valves for all the pressure measuring instruments to be mounted in the piping systems, as shown on the Piping and Instrument Diagrams. Nipples shall be long enough to clear the pipe insulation. Fittings, nipples and valves shall comply with the Piping Material Specification of each piping system.

4. Furnish and install 3/4 inch size 3,000 lb., forged steel weldolets, threadolets, threaded elbowlets or threaded weld couplets for the thermowells for all the temperature measuring instruments to be mounted in the piping systems, as shown on the Piping and Instrument Diagrams.

5. The length of the thermowells shall be at least half the diameter of the pipe in which they are to be inserted up to a maximum of 6 inch in length. The thermowells shall be furnished with lagging extensions to clear the insulation in the piping systems. Thermowells for all services shall be made of stainless steel.

G. Vents and Drains:

1. Vents and drains shall be provided for the piping and equipment as indicated on the Piping and Instruments Diagrams and on the physical drawings. Vents and drains shall also be provided, in addition to those shown on the drawings, when the arrangement of the piping results in high and low points that cannot be vented or drained through connections shown.

2. Each drain point shall have a valve and a capped nipple. Unless otherwise shown on the drawings, the size of the drains shall be:

| Pipe Size | Drain Size |
|---|---|
| Headers 2" and smaller | 1/2" |
| 2-1/2" thru 4" | 3/4" |
| 6" thru 16" | 1-1/2" |
| 18" and larger | 2" |

3. All drains shall be run to the nearest floor drain. All drains emptying into floor drains or open hubs shall terminate at a point one drain line inside diameter, but not less than 2 inches and not more than 4 inches, above the top of the floor drain or hub. Inside a diked area furnished with a floor or hub drain, the pipe shall be terminated as described before, above the top of the dike. The end of a pipe discharging into floor drains or hub drains, shall be cut at 45°.

4. Manual vents shall have a 1/2" valve for headers 16" and smaller, and a 1" valve for 18" and larger, and shall be piped to a floor drain, or arranged so that blow-off water can be caught in a bucket. Automatic air vents, where used, shall be installed with 1/4" tubing to a suitable drain.

5. Pump casing vents and drains shall be provided as shown on Piping and Instrument Diagrams.

6. Sample connections shall be 3/4" size and be made either on top or side of main line, never on the bottom.
Sample lines shall be as short as possible.

7. Steam and condensate piping shall be sloped 1" per 40 feet. Filtered steam, high quality steam, and clean steam piping shall be sloped 1" per 10 feet. The line shall be pitched in the direction of flow.

8. Vent pipes that discharge live or flash steam (such as, relief valve vent stacks, flash tank vents, condensate receiver vents, deareator vents, etc.) shall be extended 7'- 0" above the roof level. End of pipe shall be cut at a 45° angle.

3.5 FABRICATION - CARBON STEEL

A. Fabrication of all piping systems shall be in accordance with the Code for Pressure Piping ANSI B31.3; with the exception of steam, condensate, boiler feed water and pumped condensate piping that shall be fabricated in accordance with the Code for Pressure Piping ANSI B31.1

B. All welding shall be accomplished using welding procedure specifications and welders/welding operators which have been qualified in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications."

C. Copies of the applicable welding procedure specifications, including the procedure qualification records (PQR), along with the welder/welding operator qualification test records shall be submitted to the Engineer of Record for approval prior to performing any work.

D. All welding performed by the Contractor or fabricator shall be visually inspected to assure compliance to the requirements of the applicable code or standard, (e.g., ASME Section I, ANSI B31.1 or ANSI B31.3).

E. Other nondestructive testing, such as radiographic, magnetic particle or liquid penetrant examination, shall be performed as required by the applicable code, or engineering design specification.

F. The Engineer of Record reserves the right to inspect work performed by the Contractor/Fabricator at any time during the manufacturing or erection process. If, as a result of this inspection, a certain welder's work is frequently rejected, RIC will require that the welder be removed from this work and that all work performed by that welder be inspected until the Engineer of Record is

satisfied that the quality of the welder's work meets the requirements of the applicable code, standard, or engineering design specification.

G. Any welds found defective as a result of field inspections, shall be replaced at no cost to RIC.

H. The root bead of open root butt welds requiring any degree of Radiographic (RT) or Ultrasonic (UT) testing or services requiring a high degree of cleanliness such as ammonia, carbon dioxide, nitrogen, diesel fuel oil No. 6 - hot, lube oil, sodium hydroxide, sulfuric acid, single media systems (Syltherm XLT, Therminol D-12), etc., shall be made using the Gas Tungsten Arc Welding (GTAW) process, unless the inside of the joint is accessible for backgrinding and welding.

I. Base Materials: For carbon steel welding the base materials shall be restricted to carbon steels, wrought or cast forms, which have a minimum specified tensile strength of 70 KSI or less, and which are found in the following codes and tables:

| Codes | Tables |
|---|---|
| ANSI B31.1 | Appendix A Table A-I Carbon Steel |
| ANSI B31.3 | Appendix A Table I Carbon Steel |
| ASME Section I | PG-23.1 Carbon Steel |
| ASME Section VIII | UCS-23 Carbon Steel |

J. Filler Materials:

1. All covered electrodes, bare wire and rods, flux, and consumable inserts, shall conform to the SFA requirements of ASME Section II, Part C, ASME Section IX Weld Metal Analysis Number A-1.

2. Tungsten electrodes used for the GTAW process shall conform to the requirements of AWS A5.12-69, Class EWTH-1 or EWTH-2.

3. Backing rings and consumable inserts are not to be used without specific approval by the Engineer of Record.

4. Power piping (high-pressure steam or water per ANSI B31.3) welds shall utilize a TIG root pass with a GTAW cover pass, utilizing a 7018 electrode.

5. All other SMAW shall utilize a 6010 root with 7018 cover passes, except where an E309 rod is required for joining dissimilar metals or stainless steel structures. Flux cored GMAW in the “pulsed spray arc” mode is acceptable for weld-out in lieu of 7018 rod.

6. For TIG welds , filler metal may not be used on tubing or schedule 5 & 10 pipe with all thickness up through 0.083". These welds are to be made in one pass, fusing the ends together. Above 0.083", where two passes are required (see 7 below), filler metal is to be used on the second pass.

7. Diameter of filler metal should be 1/16" to 1/8", depending on pipe size.

K. Preparation of Base Metal:

1. The joint edges shall be prepared by machining, grinding, shearing, oxygen-fuel cutting, or carbon arc air gouging. Regardless of which method of joint preparation is used, the welding groove shall be smooth, sound metal free of slag, scale and oxides.

2. The joint preparation and adjacent base metal surfaces for one inch adjacent to each edge of the joint preparation shall be free of grease, rust, scale, dirt, paint, lacquer, or other material detrimental to the weld. Cleaning may be accomplished by wire brushing, abrasive blasting, grinding with rubber or resin bonded alumina or silicon carbide grinding wheels, or carbide tools, or by an approved solvent cleaner.

3. For butt weld fittings, the angle of bevel will be acceptable provided it is in accordance with ANSI B16.25, or if it is not less than 30° nor more than 40° measured from a square cut across the pipe.

4. Before starting to weld, the pipe and fittings must be spotlessly and unconditionally clean, inside and out, for at least 1-1/2" on each side of the weld zone (for new pipe and fittings). When used pipe or fitting are being welded, cleaning should be extended to 3" on each side of the weld zone, inside and out. This cleaning shall be accomplished by mechanical means - careful mechanical brushing with a wire brush (of the same material as the pipe) rubbing with emery cloth or silicon carbide grit sandpaper, and final wiping with clean rags. Never use an abrasive containing iron or iron oxide for cleaning purposes. No grease, oil, dust, dirt, paint, sugar or other contaminating materials may be left on the pipe.

L. Fit-up and Tack Welding:

1. Fit-up shall be accomplished using clamps, alignment lugs, tack welds or other appropriate means to properly align the joint for welding. Whenever possible, mechanical means for alignment should be used. If alignment, lugs and/or temporary attachments are used, the material must be of carbon steel.

2. The inside surfaces of piping components to be joined by butt welding shall be aligned so that the misalignment at any point on the inside circumference does not exceed 1/16 inch or 1/4 of the nominal thickness of the component with the thinnest wall, whichever is smaller.

3. If required, to meet fit-up tolerances, material surfaces may be built up by buttering with weld metal in accordance with an approved procedure.

4. Tack and temporary attachment welds shall be made by a qualified welder or shall be removed.

5. Tack welds which are not removed shall be made with an electrode which is the same as the electrode to be used for the first pass.

6. Tack welds must be thoroughly cleaned, ground smooth, carefully examined for cracks, and all cracks removed before additional metal may be deposited.

7. No metal shall be tack-welded inside the pipe for alignment purposes.

8. Tack welds shall be kept to a minimum number and size. When tack welds in open butt single bevel pipe joints are to be incorporated into the production weld, their ends shall be feathered.

9. For TIG butt welds without filler metal, the ends should be butted tight together and tacked using at least 3 or 4 tacks evenly spaced around the joint.

10. For SMAW or TIG with filler metal, one tack should be applied for every 12” of weld, with a minimum of 3 tacks on any weld.

11. Alignment should be rechecked after tacking. All internal and external shielding requirements shall apply to tacking as well as to welding. All tacks shall be carefully cleaned before welding proceeds

M. Shielding

1. All SMAW (stick) welds shall be shielded by standard flux covering on the rod.

2. All TIG welds on carbon steel shall use A75 or $CO_2$ shield gas.

3. All TIG welds on Stainless steel shall be shielded with welding grade argon, or argon/hydrogen mix.

4. All TIG welds on Hasteloy shall be shielded with welding grade argon 65% / helium 35% mix.

5. Gas shall be introduced at a controlled rate through a flow meter. The suggested normal rate is 15 cu.ft. (420 liters) per hour through a No. 5 cup. A gas lens cup is recommended. The gas is to be stored in the containers in which it is supplied. When a strong draft is blowing in the work area, the welding operation is to be protected so that the shielding gas is effective.

6. In addition to shielding the weld area, the inside of the pipe is to be purged with the shielding gas to prevent oxidation of the inner surface. Initial purging to displace the air in the pipe should be done at a rate of approximately 20 cu.ft. (560 liters) per hour until a volume of argon equal to about 6 times the volume of the piping has been used. The gas is to be introduced through a sealed connection at one end of the pipe and bled off through a small hole at the other end. One way to accomplish this, is by the use of paper masking tape with a small hole punched in the exit and near the top of the pipe. After the initial purge is complete, the gas flow rate should be reduced, during the welding operation, to the level outlined in the welding procedure supplements.

7. Two separate gas cylinders are to be used: One for purging the inside of the pipe and the other for shielding the electrodes.

8. Where more than one pass is required, the pipe shall be internally purged during all passes, not just the first.

N. At least one pass per 1/8" of wall thickness shall be made. Downward welding will not be permitted. The finished weld shall be uniform, with the toe or edge of the weld merging smoothly into the base metal. Butt welds shall have slight reinforcement built up gradually from toe or edge toward the center of the weld. Fillet welds may be slightly concave on the finished surface. No undercutting or overlapping is permitted.

O. All welds shall be full penetration, homogeneous with no voids.

P. In all cases, the welding procedure used shall be one which will produce a weld having an inside surface which is smooth and free from cracks, crevices, or "icicles."

Q. All slag or flux remaining on any bead of welding shall be removed before laying down the next successive bead. The finished pass shall be cleaned thoroughly of all flux by first wire brushing, then lightly chipping, and then wire brushing the weld for final cleaning.

R. Heating of pipe and fittings for straightening will not be permitted without prior approval of the Owner's representative.

S. Minimum preheat and interpass temperature shall comply with the applicable piping design code (i.e., ANSI B31.1 or ANSI B31.3) latest edition.

T. Welding Repairs:

1. Cracks or blow holes or any other weld defects shall be removed by grinding, carbon arc air gouging, or thermal cutting and the prepared cavity shall be so that the angle permits easy electrode manipulation. Care shall be exercised to remove the minimum amount of material necessary to eliminate the defect. Peening to cover defects shall not be allowed.

2. A weld technique sheet per this procedure shall be used in making weld repairs. The contour and dimensions of the repair cavity may differ from the original joint.

U. For carbon steel welding each welder shall identify his production welds by stamping his regularly assigned identification number on the pipe adjacent to the weld on all carbon steel material. Stamps shall be low stress type with a round or "U" shaped cross section.

V. Number of Passes

1. TIG on pipe with wall thickness of up to and including 0.083" is to be welded in one pass, using no filler metal. Above 0.083" through 0.120", a single pass is to be used if the ends are square, and two passes if the ends are beveled. Above 0.120” two or more passes must be made.

2. SMAW shall have a number of passes as outlined in the welding procedure supplements, minimum 2 passes.

W. Cleaning of Welds

1. All tacks and passes are to be cleaned on the outside with a 3M abrasive pad or grinder.

2. If polished or finished welds are required, the finish must be blended to match the finish of the adjacent pipe. No finishing operation may be allowed to cut into the weld in such a way as to weaken it or cause leakage. Wall thicknesses may not be reduced be finishing operations by more than 5% of the nominal wall thickness. Jeweler's rough or other materials containing iron or iron oxide may not be used in the polishing operation. 3M - green abrasive pads on a die grinder are preferred for polishing.

X. Appearance of Finished Welds

1. GTAW welds should have a uniform cover pass with a “row of dimes” finished appearance.There shall be a moderately raised appearance with no apparent voids, porosity or undercuts All spatters or slag shall be removed.

2. All tacks and passes are to be cleaned on the outside with a 3M abrasive pad or grinder.

3. TIG welds shall be smooth and even, with as little build-up or undercut as possible. There should be no undercut or inside sag or more than 1/64". The weld must be free of pits, crevices and cracks. There must be full penetration.

4. TIG welds on stainless or Hasteloy piping, which is exposed in process areas, shall be "pickled" and/or polished to remove discoloration from the welding process.

3.6 FABRICATION - FLANGED JOINTS

A. Flange dimensions and drilling are to conform to ANSI Standards for the pressure classes involved.

B. All bolt holes shall straddle normal horizontal and vertical centerlines of flanges unless noted otherwise on the drawings. All bolt holes are to be spot faced.

C. Steel flanges which are to be bolted to flat faced flanges on valves or equipment shall be flat faced and furnished with full face gaskets.

D. All flange facings shall be protected from damage. Any flange facings marred or otherwise damaged shall be refaced.

E. All flange facings shall be in alignment before bolting is begun. All bolts in flanged joints shall be coated with antiseize thread compound and uniformly tightened. Care shall be taken to obtain uniform pressure on all gaskets and avoid overstressing of bolts or dishing of flanges.

F. Flanges in piping runs shall not be out of square more than 3/64 inch per foot of outside diameter of flange. Angular tolerances shall be plus or minus 1/2 degree.

G. The materials of bolts and nuts shall be as specified in the Piping Material Specification for each particular system.

H. On distilled water, deionized water or other services where sanitation is extremely important, the inside diameter of gaskets must match the inside diameter of flanges, to minimize pockets.

3.7 FABRICATION - SCREWED JOINTS

A. All pipe threads shall be concentric with the outside of the pipe and conform to ANSI B2.1. The ends shall be reamed after cutting to remove all fines and burrs.

B. Threading on hydraulic piping shall be in accordance with JIC Standards.

C. For pipe materials (such as carbon steel to carbon steel, brass to brass, etc.) teflon tape, as specified in the piping material specification, shall be used on make end only, except when seal welding or brazing, etc., is specified.

D. Seal welding of screwed joints shall not be used unless so specified on the drawings. Where welding is specified, pipe tape shall not be used in the joint and the weld should cover all exposed threads.

E. On all screwed connections, and particularly at screwed valves, care shall be exercised to guard against overly long threading which would allow the pipe to be screwed into the valve so deeply that seating surfaces could be distorted.

F. Screwed connections at instrument shall not be seal welded.

G. Orifice flange taps shall be seal welded in all socket weld piping classes.

3.8 END PREPARATION

A. Where cuts are necessary, pipe end shall be square cut using an abrasive wheel, or a metal saw with a Tri-clover saw guide. The blades and/or wheels used must be new at the start of the job and be used for cutting similar material only.

B. Burrs on the inside and outside of pipe shall be removed with a grinder. The direction of grinding is to be around the pipe wall, not in and out. The result is to be a chamfered edge and square cut land for schedule 40 welds utilizing filler metal (see weld data sheet) or a square butt edge without chamfer for TIG butt welding of schedule 5, 10 or tubing.

C. Before starting to weld, the pipe and fittings must be spotlessly and unconditionally clean, inside and out, for at least 1-1/2" on each side of the weld zone (for new pipe and fittings). When used pipe or fitting are being welded, cleaning should be extended to 3" on each side of the weld zone, inside and out. This cleaning shall be accomplished by mechanical means- careful mechanical brushing with a wire brush (of the same material as the pipe) rubbing with emery cloth or silicon carbide grit sandpaper, and final wiping with clean rags. Never use an abrasive containing iron or iron oxide for cleaning purposes. No grease, oil, dust dirt, paint, sugar or other contaminating materials may be left on the pipe.

D. Ends of valves or other accessories are to be machined to match pipe wall thicknesses.

3.9 PIPE & VALVE IDENTIFICATION

A. Upon completion of work, attach engraved laminated tags to all valves. Valve tags shall have black characters on white face, consecutively numbered and prefixed by letter "V". Equipment tags shall have black characters on white face, with labels corresponding to drawing schedule numbers.

B. Embossed or engraved aluminum or brass tags may be substituted if desired. Tags shall be at least 1/8" thick.

C. Valve tags shall be at least 1" in diameter with numerals at least 3/8" high and attached by "S" hooks or chains. Equipment tags shall be at least 2" diameter securely attached to apparatus.

D. Pipe Identification:

1. provide color-coded pipe identification markers on piping installed under this Section. Pipe markers shall be snap on laminated plastic protected by clear acrylic coating.

2. Provide arrow with each pipe content marker to indicate direction of flow. If flow can be in either direction then use a double headed arrow marker.

3. Mains shall be labeled at points of entrance and exit from mechanical room, outside chiller areas, adjacent to each valve, on each riser, at each tee fitting, at least once in each room, and at intervals no longer than 20 ft. Where pipe penetrates a wall, markers shall be placed near each side of the wall.

4. Size of legend letters on markers and length of color field shall be per the latest edition of ANSI.

5. Markers shall be “Setmark” by Seton Name Plate Corp. or approved equal.

6. The following piping systems shall be identified:

| Drawing Abbreviation | Pipe Identification Symbol |
|---|---|
| HPS | HPS - 100 psig |
| HPC | HPC - 100 psig |
| PC | PC |

3.10 PIPE CLEANING & FLUSHING

A. All new piping shall be cleaned and flushed prior to system connection by the following methods.

1. Representative from an approved chemical company hired by the piping contractor shall supply chemicals and witness all pipe cleaning.

2. When water/chemical mixture is attained it shall be circulated for four (4) hours, minimum.

3. After Cleaning, lines shall be flushed with water until clear.

4. Pipe cleaning shall be documented by this contractor and witnessed by URI.

5. Confirm what chemicals can be used in the piping systems with URI before using to avoid contamination of the campus boiler plant.

6. Submit a plan for disposal of the chemical cleaning effluent to the Owner for approval. Obtain written permission from the Owner to drain effluent on the site from cleaning and flushing operations. Otherwise, dispose of effluent offsite in a manner acceptable to all codes and regulations.

7. Complete flushing before cleaning piping systems. Cleaning shall be performed in accordance with the following procedures:

A. For Steam and Condensate Piping: Clean with live steam at peak design velocity and pressure. Discharge steam from each main and branch to atmosphere for five minutes. Provide bypass lines, spool pieces, and valves required to accomplish steam cleaning,

3.11 PRESSURE TESTING OF WATER & STEAM PIPING SYSTEMS

A. All new piping systems shall be tested at a pressure of 150 psig for a period of 8 hours.

B. Preparation for testing:

1. All joints shall be visually examined for proper installation.

2. All piping shall be left un-insulated.

C. Testing Procedure

1. Steam & Water Piping shall by hydro tested for pressure and duration as specified.

2. Precautions shall be taken to keep non-essential personnel clear of the piping system undergoing test.

3. Where leaks occur they shall be marked and identified for repair after termination of test. Where major leaks or additions are made to the piping system after the pressure test, affected piping shall be retested.

4. Provide testing records for each pressure test. Records shall include:

   a. Date of Test
   b. Identification of piping tested
   c. Test medium
   d. Test pressure and total time held at test pressure.
   e. Signature of witness (Owner or Engineer).

5. Schedule of Test Requirements

   a. Pumped Condensate: Hydrostatic, 150 psig at high point of system for (8) hours duration.
   b. Low and Medium pressure steam, drip and condensate piping: 150 psig hydrostatic pressure for (8) hour duration.
   c. High pressure steam, drip and condensate piping: 150 pig hydrostatic pressure for (8) hour duration.

3.12 DOCUMENTATION REQUIREMENTS

A. This contractor shall provide the as-built/certified documents in an indexed contractor turnover package with signatures from the Contractor's representative certifying the accuracy of the information and compliance with this specification.

++END OF SECTION 23 5000++

TABLE OF CONTENTS

## 1.0 GENERAL

### 1.1 WORK INCLUDED

A. Work Included: This Section establishes the criteria for field survey work, design, engineering, approvals,products coordination, installation, and testing of a complete underground low- pressure steam and pumped condensate conduit distribution system.

B. Perform work and provide material and equipment as indicated on the Drawings and as specified or indicated in this Section. Coordinate work of this Section with work of other trades and provide a complete and fully functional installation.

C. Give notices, file plans, obtain permits and licenses, pay fees and back-charges, and obtain necessary approvals from authorities having jurisdiction as required to perform work in accordance with legal requirements and with the Contract Documents.

D. In general, the work of this Section shall include, but not be limited to:

1. Design and preparation of underground steam and condensate conduit distribution system working plans.
2. Obtaining approvals.
3. Complete underground steam and condensate conduit distribution system.
4. Wall penetration sleeves and seals.
5. Submitting drawings and obtaining necessary approvals, permits, and certificates.
6. Hydrostatic testing of steam and condensate carrier pipes.
7. Air testing of outer conduits.
8. Cutting and Patching: Openings in masonry, concrete, tile, and other parts of structure
9. Selective Demolition.
10. Piping, fittings, flanges, insulation, valves, expansion joints, steam traps, supports, anchors and restraints inside manholes and buildings.
11. Basic Mechanical Requirements.

### 1.1 SYSTEM DESCRIPTION

A. Design and provide exterior underground factory-prefabricated and pre-insulated steam and condensate piping distribution system, complete and ready for operation. Design ratings of system components: Steam maximum design pressure at 100 psig at 338 ºF, and condensate at 50 psig at 200ºF.

### 1.3 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. All related Specification sections shall be used in conjunction with this Section.

C. Civil/Site Specifications

D. All other Division 23 specifications

1.4 SPECIAL COORDINATION

A. Before beginning any work, the Contractor shall study the Drawings and visit the site to become thoroughly familiar with all the details of the work and working conditions, and to verify all dimensions in the field. The Architect/Engineer shall be informed of any discrepancy before commencing with the work. The Contractor shall be responsible specifically for the coordination and proper relation of his work to the existing building structures and existing work on site. The conduit manufacturer is not authorized or responsible to field verify field dimensions and or layout.

B. Protect the work sites, surrounding areas and occupants from damage or injury during the execution of this work. The Contractor shall take all necessary precautions to prevent injury of workers, Owner's personnel, or passerby at all times. It is the Contractor's responsibility to determine the nature of these requirements and provide the proper level of protection.

C. The Contractor shall physically examine all materials/items for conformance to specifications. Permanently remove nonconforming items from the work site.

D. Remove all debris from the work site and dispose of in a proper manner according to local codes and per direction of the Owner.

1.5 REFERENCES

A. ASME - Boiler and Pressure Vessel Codes, SEC 9 - Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.

B. ASME/ANSI B16.9 - Factory-Made Wrought Steel Buttwelding Fittings.

C. ASME B16.11 - Forged fittings, Socket-Welding and Threaded.

D. ASME B31.1 - Power Piping.

E. ASME B31.9 - Building Services Piping.

F. ASTM A36 – Structural Steel.

G. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.

H. ASTM A106 – Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.

I. ASTM A139 – Electric-Fusion (Arc) Welded Steel Pipe.

J. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation.

K. AWS B2.1 - Welding Procedure and Performance Qualification.

L. AWS D1.1 - Structural Welding Code.

M. Most recent editions of applicable specifications and publications of the following organizations form part of the Contract Documents:

1. American National Standards Institute (ANSI).
2. American Society of Mechanical Engineers (ASME).
3. American Welding Society (AWS).

1.6 QUALITY ASSURANCE

A. ASME Compliance: Fabricate and install steam and condensate piping in accordance with ASME B31.1 – Power Piping and ASME B31.9 Building Services Piping as appropriate. Prefabricated conduit system shall comply with ASME B31.1 Power Piping.

B. Qualify welding procedures, welders and operators in accordance with ASME B31.1, as applicable for shop and project site welding of piping work.

C. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum ten years' experience.

D. Welders: Certify in accordance with ASME SEC 9 and AWS D1.1.

E. Notify owner twenty-four (24) hours in advance of testing and backfilling.

1.7 SUBMITTALS

A. Submit shop drawings, product data, operation and maintenance manuals, record drawings and warranties.

B. Provide copies of welding procedures, documentation to demonstrate that employees are trained and certified to their procedure. Also, provide a weld map of all welding work done on the pipe and identify the welder.

C. Submit the following for the underground steam and condensate System:

1. Complete erection drawings.
2. Pipe and fittings.
3. Prefabricated underground piping system.
4. Conduit-to-wall and conduit-to-floor penetration sleeves and seals.
5. Warning tapes.
6. Concrete thrust blocks.
7. Pipe stress analysis calculations

D. Contractor's Material and Test Certificates: Complete Certificates in their entirety and submit for review and approval before final submission of Operation and Maintenance Manuals. Incomplete Certificates will be rejected. If requested information on Certificate is not applicable, indicate "N/A."

E. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

F. Pipe Sleeves and Link Seals

1.8 REGULATORY REQUIREMENTS

A. Conform to ASME B31.9 code for installation of piping system.

B. Welding Materials and Procedures: Conform to ASME SEC 9 and applicable state labor regulations.

C. Provide certificate of compliance from authority having jurisdiction indicating approval of welders.

1.9 MANUFACTURER'S SERVICES

A. The Contractor shall utilize the services of a trained representative of the prefabricated pipe conduit system manufacturer to instruct the Contractor's work forces in the installation procedures to ensure that the system is installed in accordance with the manufacturer's instructions and the plans and specifications. The manufacturer's representative shall be a person who is regularly engaged in providing such services for the manufacturers. Notify the Owner at least two (2) days in advance of when the on-site manufacturer's services will be provided.

1.10 DELIVERY AND STORAGE AND HANDLING

A. After delivery to the jobsite, all materials and equipment shall be protected from anything which could cause damage to the material or equipment. All pipes and prefabricated conduit shall be sealed at each end to keep the interior clean and free of dirt and debris. Fittings shall be kept together and their interior surfaces shall remain clean. Insulation shall be kept dry and clean.

B. Deliver, store, protect and handle products to site under provisions of Division 01.

C. Accept valves and fittings on site in shipping containers with labeling in place. Inspect for damage.

D. Provide temporary protective coating on cast iron and steel valves.

E. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

F. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

## 2.0 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

A. Rovanco Insul-800 High Temp Conduit Elite - Basis of Bid.

B. Other manufacturers "Subject to the solicitation's Rules for Submitting Offers and Instruction to Bidders" include:

1. Perma-Pipe, Thermacore,

2. Tricon, Insul-Tek

### 2.2 PREINSULATED UNDERGROUND STEAM AND CONDENSATE CONDUIT SYSTEM

A. Rovanco Insul-800 Elite High Temp pre-insulated single line conduit system,

B. General: Underground pre-insulated high-pressure steam and pumped condensate conduit distribution piping shall be furnished in separate steel conduits with outer polyethylene jacket and HT-450 polyisocyanurate foam conduit insulation, Pyrogel XT-E carrier pipe insulation, and steel carrier pipes. Straight sections, fittings, anchors, and other accessories shall be factory prefabricated to job dimensions and designed to minimize the number of field welds. Where possible, straight sections shall be supplied in maximum 40-foot random lengths with 6 inches of exposed piping at each end for field fabrication. Each system layout shall be computer analyzed by the piping system manufacturer to determine the stresses and movements of the service pipe. The system shall be in strict conformance with ANSI B31.1 latest edition. Submittal drawings and stress-analysis calculations shall be stamped by a State of Rhode Island registered professional engineer.

C. System Design Operating Conditions: 100-psig High-Pressure Steam at 338-degrees F and 50-psig Pumped Condensate at 200-degrees F.

D. Carrier Pipes: Steam carrier pipe shall be Schedule-40 black steel, ASTM A106, Grade B, seamless , pumped condensate carrier pipe shall be Schedule-80 black steel, ASTM A106, Grade B, seamless.

E. Refer to piping specification for additional information on fittings, valves, gaskets, etc.. above ground/vault piping, valves and fitting shall also meet the requirements of 23500 – HVAC Piping Systems.

F. Carrier Pipe Insulation:

1. Insulation shall be Pyrogel XT-E high temperature insulation blanket of silica Aerogel and reinforced with a non-woven, glass-fiber batting sectional molded pipe insulation, as manufactured by Aspen Aerogel. The insulation shall have a thermal K-factor of 0.19 at a mean temperature of 200ºF. Insulation shall comply with ASTM C 1728, Type III, Grade 1A.

2. Insulation shall be banded on the carrier pipe with aluminum or stainless-steel banding on 18-inch centers.
3. The minimum carrier pipe insulation thickness shall as specified below.

| Carrier Pipe Size/Service | Minimum Thickness |
|---|---|
| 6" HPS | 1.38" (235mm) |
| 4" HPS | 0.98" (25mm) |
| 3" PCR | 0.19" (5mm) |
| 2-1/2" PCR | 0.19" (5mm) |
| 2" PCR | 0.19" (5mm) |

G. Inner Pipe Supports: Carrier pipes shall be aligned and supported within the outer conduit with galvanized steel supports spaced on centers approximately 10 feet. The insulated carrier pipe shall bear directly on the steel support. The support shall be designed as to permit drainage and free air passage. Piping passing through the supports shall be insulated. Concrete type supports shall not bepermitted.

H. Inner Conduit Casing:
1. The inner conduit shall be spiral butt welded, smooth wall, 10-gauge steel, conforming to the requirements of ASTM A139.
2. The interior surface of the inner conduit shall be smooth to permit free moisture drainage and removability of the inner assembly.
3. The inner conduit shall be sized to provide a 3/4" inch minimum annular space between the outer surface of the carrier pipe insulation material and the interior surface of the conduit.
4. The minimum inner conduit casing size shall be as specified below.

| Carrier Pipe Size/Service | Minimum Conduit Size (O.D.) |
|---|---|
| 6" HPS | 12.750" |
| 4" HPS | 8.625" |
| 3" PCR | 6.625" |
| 2-1/2" PCR | 6.625" |
| 2" PCR | 4.500" |

I. Inner Conduit Casing Insulation:

1. Conduit insulation shall be foamed-in-place HT-450 closed cell polyisocyanurate foam for both steam and condensate service, as manufactured by HiTherm, LLC, and capable of continuous operating temperatures of 400 ºF with intermittent service to 450 ºF. Spray-applied or sectional preformed insulation and those having lower temperature limitations shall not be acceptable.
    a. Initial Thermal Conductivity (k-Value): 0.130 at 75 deg F., ASTM C-518-91.
    b. Continuous Service Temperature: -100 deg F to +400 deg F.
    c. Closed Cell Content: 90%, ASTM D-2856.
    d. Minimum Density: 2.0 lb/cu.ft., ASTM D-1622.
    e. Compressive Strength, Parallel to Rise: 30 psig, ASTM D-1621.

2. The minimum inner conduit casing insulation thickness shall as specified below:

| Carrier Pipe Size/Service | Minimum Thickness |
|---|---|
| 6" HPS | 1.38" |
| 4" HPS | 1.73" |
| 3" PCR | 1.51" |
| 2-1/2" PCR | 1.51" |
| 2" PCR | 1.57" |

J. Outer Jacket: Preformed heavy duty seamless HDPE casing conforming to ASTM D3350-12, minimum cell classification of PE334360C, and containing a minimum of 2% carbon black. Minimum thickness shall be 175 mils. Spiral wrap or jackets extruded over the insulation are not acceptable.

1. Thermal Stability: 428 deg. F (220 deg. C), ASTM D3350.
2. Minimum Radial Tensile Elongation (@ yield): 200%, ASTM D638.
3. Tensile Value (@ yield): 2,500 psi, ASTM D638.
4. The minimum outer jacket size and wall thickness shall be as specified below:

| Carrier Pipe Size/Service | Minimum Jacket Size (O.D.) |
|---|---|
| 6" HPS | 15.87" |
| 4" HPS | 12.43" |
| 3" PCR | 10.00" |
| 2-1/2" PCR | 10.00" |
| 2" PCR | 8.00" |

K. Outer Conduit Closures:

1. Carrier pipe insulation shall be Pyrogel XT-E of the same thickness as prefabricated units and banded on the pipes with stainless steel banding and clips.
2. Inner conduit casing closures shall consist of 10-gauge steel suitably rustproofed and in cylindrical form with two horizontal splits and shall be field welded over adjacent prefabricated units.
3. Inner Conduit Casing Insulation shall be pre-formed Polyisocyanurate hard-shell insulation covered with HDPE jacketing having the same physical characteristics as the prefabricated units.
4. After successful completion of testing, cover exposed closures in the field with 60-mil minimum thickness cross-linked high-density polyethylene heat shrink material.

L. Expansion Loops and Elbows:

1. Expansion loops and expansion elbows shall be determined and designed by the manufacturer. The manufacturer shall submit for approval a complete stress analysis calculation supporting their design.
2. Expansion loops and expansion elbows shall be furnished and enclosed in the same type of casing as those furnished for the standard straight sections of the system. They shall be of a size to permit the inner pipe to move without damage to the insulation material.
3. Expansion loops and expansion elbows shall be prefabricated and shipped to the job site in as few pieces

as possible, in accordance with manufacturer's recommendations.

4. Cold springing of the carrier pipes shall not be acceptable.

M. Anchors:

1. Anchors shall be prefabricated onto the piping units and shall be equipped with drainage and vent openings at the top and bottom of the anchor plate.
2. Anchor plates shall be fabricated from 3/4 inch thick steel plate conforming to ASTM A36.

N. End Seals and Gland Seals:

1. Terminal ends of conduit system inside manholes, pits, or building walls shall be equipped with end seals consisting of a steel bulkhead plate welded to the carrier pipe and outer conduit.
2. Where there is no anchor within 5 feet of a terminal end, conduits shall be equipped with gland seals consisting of a packed stuffing box and gland follower, mounted on a steel plate welded to the end of the outer conduit.
3. End seals and gland seals shall be fabricated from 3/8" inch thick steel plate with vent and drain openings located diametrically opposite on the vertical centerline of the mounting plate and shall be shipped to the job site with threaded plugs in place.

O. Terminate conduits 2 inches beyond the inside face of entry walls to protect any exposed pipe insulation from damp wall condensation.

P. Corrosion Protection Overlay:

1. Amerlock 2 two-component high solids epoxy corrosion protection coating with Amercoat 880 glass flake additive, as manufactured by PPG Industries, Inc., shall be factory applied on all exposed surfaces of anchors, end seals and gland seals.
2. The steel surfaces must be shot-blasted with abrasives to SSPC SP-10 cleanliness prior to application.
3. Amerlock coating shall be rated to a dry temperature resistance of 450-degrees F.

## 2.3 WALL/FLOOR SLEEVES AND SEALS

A. Pipes passing through walls and or floors shall have standard weight steel pipe sleeves of size as recommended by the wall seal supplier. Properly sized core-drilled penetrations may be utilized where field conditions allow.

B. Wall seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening to provide a watertight seal. Seal shall be constructed to provide electrical isolation between pipe and wall.

C. Wall seals shall be Link-Seal, Type "T" for 400 deg. F service, as manufactured by Pipeline Seal & Insulator, Inc., Houston, Texas.

D. For wall thickness up to 9 inches use one seal, for thicker walls use two seals.

## 2.4. UNDERGROUND WARNING TAPES

A. Underground warning tape shall be 0.004 inch thick polyethylene tape with magnetic core. Tape shall be 6 inches wide and be printed with repetitive warnings along its length. Tapes shall be yellow in

color with black letters. Tape coloring and letters shall not be affected by moisture or other substances contained in the backfill material.

## 3.0 EXECUTION

### 3.1 GENERAL

A. Installation of the prefabricated conduit piping system shall be done in accordance with the appropriate publications including ANSI B31.1, the following specifications and instructions, and the manufacturer's instructions.

B. Piping shall be accurately cut to measurement established at the construction site and shall be worked into place without springing or forcing, properly clearing all openings and equipment. Excessive cutting or other weakening of structural members to facilitate piping installation shall not be permitted. Pipe ends shall have burrs removed by reaming and shall be installed to permit free expansion and contraction without damage to joints. Good workmanlike procedures shall be followed.

C. All piping, unless otherwise indicated, shall be pitched with a grade of not less than 1 inch in 40 feet toward the drain points.

D. Open ends of pipe lines and equipment shall be properly capped or plugged during installation to keep dirt or other foreign matter out of the system.

E. The conduit system manufacturer shall oversee the delivery, storage, installation and testing of the system. Work shall be in strict accordance with the requirements specified herein and with the printed instructions of the manufacturer. Printed instructions shall be available at the job site prior to delivery of system components.

### 3.2 TRENCHING

A. Piping shall not be installed in filled or disturbed earth until earth has finally settled or been otherwise properly compacted.

B. All trenches shall be dry and clean when pipe is being laid. the trench bottom shall be smooth and free from stones and rocks. The trench shall be over-excavated 6 inches and bedded with select earth, sand or screenings. The sub-grade shall be checked with a grade pole to assure that the bedding has been placed to the proper thickness.

### 3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate the general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Remove standing water at bottom of trench.

C. Do not insulate piping or backfill piping trench until field quality control testing has been completed and results approved.

D. Install piping at a uniform grade downward in the direction of flow.

E. Install components with pressure rating equal to or greater than system operating pressure.

F. Install piping free of sags or bends.

G. Do not disturb the bottom of the trench; otherwise, compact and stabilize it to ensure proper support.

H. Ream pipe and tube ends. Remove burrs.

I. Remove scale and dirt on inside and outside before assembly.

J. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.4 FIELD WELDING

A. Welding in trenches should be minimized. Welding procedures shall be in accordance with specifications, ANSI B31.1, AWS D10.12M/D10.12, using qualified processes and welding operators and good welding practice.

B. Test carrier piping and inner conduit welds prior to assembling field joint closures.

3.5 EXCAVATION, TRENCHING, AND BACKFILLING

A. Perform excavation, trenching, and backfilling as required by the system manufacturer's design and as specified in other Sections.

B. Beach sand or any sand with large amounts of chlorides shall not be permitted. Place system on a 4 to 6-inch thick sand bed, and backfill on all sides with 12-inch thick sand as measured from the outside of the conduit casings. Backfill with 12-inch thick sand over top of conduit casing, as measured from outside of largest conduit.

C. Foundation for conduit system shall be firm and stable. Foundation and backfill must be free from rocks or substances that could damage the system coating.

D. Install concrete anchor and thrust blocks on undisturbed earth.

E. Pressure test the conduit system for both the carrier pipes and the inner conduit casings, to the satisfaction of the manufacturer's representative, prior to backfilling shall commence after the conduit system has been satisfactorily.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service:

1. The conduit manufacturer shall furnish the services of a trained representative for three (3) site visits to instruct the contractor's personnel in proper installation techniques and requirements.

2. The manufacturer's field service technician shall submit a report to the owner's representative at each visit to the job site certifying that the underground piping is being

installed in accordance with the manufacturer's requirements and shall report to the Owner's representative, immediately, any deviation from accepted installation procedures.

3. At completion of the installation, the Contractor shall furnish to the Engineer, certification from the conduit manufacturer that the system was installed in accordance with the manufacturer's requirements.

B. The field service representative shall be present when the following work isperformed.

1. Inspection of concrete anchors and thrust blocks.
2. Field joint closure, initial instruction.

## 3.7 TESTING

A. Prepare steam and condensate piping for testing in accordance with ASME B31.1 and as follows.

1. Leave joints, including welds, uninsulated and exposed for examination during testing.

2. Isolate equipment. Do no subject equipment to test pressure.

3. Fill system with water.

4. Install vents at high points to release trapped air while filling system. Use drip legs installed at low points for complete removal of liquid.

5. Hydrostatically test carrier pipes at 1-1/2 times system design pressure or 150 psig, whichever is higher, for a period of no less than 8-hours prior to insulating joints and closing outer conduit casing. Repair leaks bywelding and retest the system.

6. Air test inner steel conduit casings with compressed air at 15 psig before backfilling for hours. Test field closure joints with a soap and water solution. Repair leaks by welding.

7. Furnish necessary equipment and labor to perform the air test, including air compressor, gauges, conduit caps, temporary pipe and connections, and other accessories, and complete the test to the satisfaction of the Engineer.

8. Once testing is complete the contractor shall insulate and jacket the conduit closure sleeve in accordance with the manufacturer's installation manual and in accordance with instructions provided by the service technician.

## 3.8 CLEANING

A. Flush buried conduit system pipes prior to connecting to the building interior pipes.

B. After completion, fill, clean, and treat systems.

3.6 JOINT CONSTRUCTION

A. After testing insulate steam carrier pipe weld joint areas with mineral wool insulation secured with stainless steel banding.

B. Weld split 10 gauge steel connector band halves to each other and to adjacent conduit unit ends.

C. Test connector band welds prior to assembling outer conduit insulation and jacket closures.

D. Install outer conduit insulation and jacket closures, and seal watertight with heat-shrink materials in accordance with manufacturer's written instructions.

3.7 IDENTIFICATION

A. Install continuous plastic underground warning tapes during backfilling of trenches for steam and condensate piping. Locate tapes 6 to 8 inches below finished grade, directly over piping.

3.8 DOCUMENTATION REQUIREMENTS

A. This contractor shall provide the as-built/certified documents in an indexed contractor turnover package with signatures from the Contractor's representative certifying the accuracy of the information and compliance with this specification.

B. System needs to be signed off by the manufacturer, URI and Engineer of Record for proof of acceptance before buried.

++END OF SECTION 23 5500++

# Division 31 - Earthwork

# SECTION 31 10 00

# SITE PREPARATION

## PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Divisions 0 and 1 Specification Sections, apply to this Section.

B. All work specified in this Section shall conform to the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, Amended August 2013, with compilations and the attached supplementary specifications.

C. RELATED SECTIONS

1. 31 2500 – Erosion and Sedimentation Controls
2. 31 8000 – Earthwork Utilities

1.2 DESCRIPTION OF WORK

A. This work shall consist of clearing and grubbing, clean-up, cutting and removing isolated trees and stumps, stripping and stockpiling topsoil, removing and disposing of all vegetation, bollards, fence posts, cut off fence posts and associated concrete foundations, hazard markers, signs, sign posts and any other obstructions and undesirable materials within project site which are not designated or permitted to remain.

B. Refer to Specification Section 31 8000 Earthwork Utilities for earthwork controls; not part of this section.

C. Refer to specification Section 31 2500 Erosion and Sedimentation Controls for erosion control measures; not part of this section.

1.3 PROTECTION

A. Storage of construction materials and construction vehicle parking shall be allowed only in areas designated by Engineer and approved by Owner. Any damaged plant materials resulting from neglect by the Contractor shall result in a monetary and/or plant material exchange.

B. All other non-treed areas indicated to remain in their natural state shall also be protected by the Contractor. Any resulting damage due to the Contractor's neglect shall be restored to the satisfaction of the Engineer. If restoration is not

satisfactory, then sufficient monies to cover damages shall be withheld from the Contractor.

C. Contractor shall protect treed and environmentally sensitive areas by installing tree and shrub protective devices, or any such barriers necessary to protect these areas. Trees and shrubs to be saved within work area shall be protected by tree protective devices or snow fence. Refer to the Contract Drawings for locations and details.

1.4 RESTRICTIONS

A. It is the declared and acknowledged intention that, other than those areas required for existing and new building and physical structures, roads, storm drainage facilities, walks, parking areas, and site grading, the remainder of site shall remain in its natural state.

1.5 SAFETY

A. All operation required under this section shall be conducted in a safe manner employing whatever means are necessary to provide safety to all persons on the project site.

## PART 2 PRODUCTS

2.1 TREE PROTECTION DEVICE

A. Wood framing shall consist of nominal lumber 6 feet in length; the width and thickness shall vary from 2-inch by 2-inch to 2-inch by 6-inch, depending on trunk diameter. Binding material shall consist of single strand 9 gauge wire or ½-inch strapping.

2.2 SHRUB PROTECTION DEVICE

A. Standard snow fence, 4 feet in height, installed around the shrub or grouping of shrubs to be protected. Standard steel posts shall be utilized to maintain the position of the fencing. Steel posts shall be a minimum of 6 feet in length.

## PART 3 EXECUTION

3.1 CLEARING

A. Clearing shall consist of felling and cutting up or trimming of trees, and satisfactory disposal of trees together with downed timber, snags, brush, shrubs, fences, logs, rubbish, rock walls or other debris occurring within areas indicated on the plans as new construction.

B. Trunks of trees may not be cut off more than 6" above original ground surface, in areas to be cleared where grubbing is not required.

C. Trunks of trees at the top of slopes, where rounding of slopes occur to meet existing ground and tree line, shall be cut off flush with or below the final slope line.

3.2 GRUBBING

A. Grubbing shall consist of removal and satisfactory disposal of stumps and buried roots larger than 1-1/2" diameter, to a depth of 18" below surface of original ground, except stumps within proposed structural foundation areas shall be entirely removed.

3.3 ISOLATED TREES

A. Isolated trees and stumps designated to be removed shall be cut and their stumps as well as any other designated stumps shall be removed by excavation or grinding.

B. Brush, shrubs or other vegetation designated to be removed shall be cut at ground level and disposed as indicated elsewhere in these Specifications.

3.4 DISPOSAL OF CLEARED AND GRUBBED MATERIAL, ISOLATED TREES, STUMPS AND OTHER VEGETATION

A. The Contractor shall dispose of trees, brush, shrubs and other perishable material by any of the following methods:

1. The Contractor may sell or salvage all merchantable timber from clearing and grubbing operations.
2. The Contractor may chip trees on the site, for use as directed by Engineer. All surplus chips shall become the property of the Contractor.

B. All trees and brush to be cleared shall become the property of the Contractor. The satisfactory disposal of this material off site will be the Contractor's responsibility. Disposal must be in accordance with all applicable federal, state and local community requirements.

C. No burning of trees, brush, shrubs or perishable material will be permitted. The Contractor will not be allowed to haul trees, brush, shrubs or perishable material from the Project for the purposes of burning.

D. Stumps, roots and perishable material shall be removed from the Project site prior to the commencement of any earthwork operations.

3.5 STRIPPING

A. The Contractor shall remove to the extent ordered and satisfactorily, transport and store all suitable topsoil for use as loam.

B. Storage area shall be on site. If no storage areas are indicated on plans or available on-site, the Contractor shall make provisions to store topsoil elsewhere for use of the Project. Engineer's approval of storage areas will be required.

C. All stripped topsoil shall remain the property of the Owner (unless otherwise stipulated in writing) and no material shall be hauled off-site until the Engineer is notified. Failure of the Contractor to notify the Engineer prior to hauling any topsoil off-site shall result in forfeiture of payment for this work.

D. Stripped topsoil shall be obtained from open fields or grassed areas containing organic material suitable for loaming operations. The depth of stripping shall vary based on subsurface information provided elsewhere in these specifications and on actual site conditions. In any event, soils shall be removed to the minimum depth of topsoil. Mixing of subsoil shall be accepted. The depth of soil removal shall be verified in the field. All stripped topsoil shall be screened and tested for suitability for use under lawns and adjusted as required.

E. Any stripped topsoil not required for this project shall remain the property of the Owner unless Contractor is directed to remove surplus topsoil from site, which he shall do at no additional cost to the Owner.

3.6 TREE AND SHRUB PROTECTION DEVICE

A. TREE PROTECTION DEVICES

1. This work shall consist of applying wood framing around the trunk or trunks of the tee from the ground level to a height of 6 feet.
2. The wood framing shall be placed around the trunk in sufficient quantity to protect the trunk from mechanical damage. The binding material shall be tight enough to prevent the wood from being moved. None of the binding materials shall come in contact with the trunk or any portion of the tree. In no instance shall nails or any other type of fasteners enter the tree. The wood framing shall be removed when all mechanical work within the surrounding area has been completed.

A. SHRUB PROTECTION DEVICE

1. This work shall consist of furnishing and installing of standard snow fence around the shrub or grouping of shrubs designated to be protected as indicated on the plan details or as directed by the Engineer.
2. All installations will include reflective tape on the guy wires or ropes as warning devices for vehicular or pedestrian traffic. Each guy wire or rope is to be marked with a minimum of two 12" long by 1' wide strips of reflective tape.
3. Upon completion of construction, with the approval of the Engineer; protective devices are to be dismantled and removed from the site.

**END OF SECTION**

# SECTION 31 23 11

# SOIL AND AGGREGATE MATERIALS

## PART 1 GENERAL

### 1.1. SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

C. Section includes:

1. Requirements for furnishing and placing materials including, but not limited to, gravel borrow, common borrow, bedding, clean sand, ¾-inch crushed stone.
2. Locations of specified materials as detailed on the Drawings or as directed by the Engineer for excavation below normal depth, utility support, replacement of unsuitable material or elsewhere, as directed.

D. Related sections:

1. Section 31 8000 – Earthwork Utilities
2. Section 32 1216 – Asphalt Paving
3. Section 32 1413 – Curbing
4. Section 33 4000 – Storm Drainage Utilities

### 1.2. REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
1. T 27, Sieve Analysis of Fine and Coarse Aggregates
2. T 11, Materials Finer than No. 200 Sieve in Mineral Aggregate by Washing

B. American Society for Testing and Materials (ASTM):
1. D 1557, Standard Test Methods for Laboratory Compaction

Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft$^3$)

1.3. SUBMITTALS

A. In accordance with 01 3300 - Shop Drawings, Product Data and Samples.

B. Samples: Furnish one (1) five-gallon pail of a representative soil sample for each material proposed for fill and/or backfill, including location of source on Transmittal.

C. Shop Drawings:
1. For each material proposed for fill and/or backfill, provide sieve analysis in accordance with AASHTO T 27 and T 11 when gradation requirements are given in these specifications.
2. For each material proposed for fill and/or backfill, provide compaction test report in accordance with ASTM D 1557-12 Method C Modified when compaction requirements are given in the specifications.

1.4. DELIVERY, STORAGE AND HANDLING

A. The Contractor shall be responsible for taking all necessary precautions to store and protect all materials and equipment brought to the site for incorporation into the Work. This includes, but is not limited to, protecting materials from weather and theft.

**PART 2 PRODUCTS**

2.1 GENERAL

A. All fill and backfill materials shall be free of debris, cinders, combustibles, frost, ice, roots, sod, wood, cellulose, organic material, and any otherwise deleterious material.

2.2 MATERIALS

A. Gravel Borrow
1. Gravel borrow shall conform to the requirements of Section M.01.02 and M.01.09 of the Rhode Island Standard Specifications.
2. Material used for bedding utility pipes, shall conform to the requirements of Section M.01.04 and M.01.09 of the Rhode Island Standard Specifications.

B. Common Borrow
1. Common borrow shall conform to the requirements of Section M.01.01 of the Rhode Island Standard Specifications.

C. Clean Sand
1. Clean sand shall consist of natural sand, manufactured sand, or a combination thereof.
2. Clean sand shall be in accordance with the following gradation requirements:

| Sieve | % Passing |
|---|---|
| 3/8” | 100 |
| No. 4 | 95 – 100 |
| No. 8 | 80 – 100 |
| No. 16 | 50 – 85 |
| No. 30 | 25 – 60 |
| No. 50 | 10 – 30 |
| No. 100 | 2 – 10 |
| No. 200 | < 2 |

3. Not more than 45% passing any sieve shall be retained on the next consecutive sieve.
4. Fineness modulus shall be between 2.3 and 3.1.

D. 3/4-Inch Crushed Stone
1. 3/4-Inch Crushed Stone shall conform to the requirements of Section M.01.07 and M.01.09 of the Rhode Island Standard Specifications.

2.3 SOURCE QUALITY CONTROL

A. Testing, Inspection
1. The Engineer may elect to sample materials supplied at the source. Assist the Engineer in obtaining samples.

## PART 3 EXECUTION

3.1 INSTALLATION

A. Gravel Borrow
1. Methods of placement, shaping and compaction of gravel borrow shall conform to Section 301 of the Rhode Island Standard Specifications and shall be in accordance with the following:
a) Spread in layers of uniform thickness not exceeding 8 inches

before compaction and moistened or allowed to dry as directed.

b) Compact thoroughly by means of suitable power-driven tamper or other power-driven equipment.
c) Compaction shall conform to 95 percent of the maximum dry density per ASTM D 1557-12 and shall be within 2 percent of optimum moisture content.
d) The percolation rate for the compacted gravel borrow shall not exceed 5 minutes per inch.

2. Prior to placing pavement, all backfill shall have been properly compacted to eliminate settling of backfill. No pavement shall be placed over poorly compacted backfill. Backfill and base course shall be compacted, brought to the proper elevation, and dressed so that new pavement construction shall be at the required grade. The Contractor shall maintain the surfaces of all excavated and disturbed areas until the pavement is placed. If there is a time lapse of more than 24 hours between the completion of preparation of subgrade or placing of gravel borrow base course and placing of paving, or if subgrade of gravel borrow base course has been eroded or disturbed by traffic, the subgrade or base course shall be restored before placing paving.
3. The Contractor shall remove and stockpile of all surplus material and remove and acceptably dispose of all unsuitable material.
4. Before permanent paving is installed, the base shall be brought up to grade, and temporary pavement and excess gravel shall be removed.

B. Common Borrow

1. Methods of placement, shaping and compaction of common borrow shall conform to the requirements of Section 200 of the Rhode Island Standard Specifications and shall be in accordance with the following:
   a) Spread in layers of uniform thickness not exceeding 8 inches before compaction and moistened or allowed to dry as directed.
   b) Compact thoroughly by means of suitable power-driven tamper or other power-driven equipment.
   c) Compaction shall conform to 92 percent of maximum dry density per ASTM D 1557-12 and shall be within 2 percent of optimum moisture content.

C. Clean Sand

1. Clean sand shall be placed in layers of uniform thickness not exceeding 8 inches before compaction and moistened or allowed to dry as directed.
2. Compact by means of suitable power-driven tamper of other power-driven equipment.
3. Compaction shall conform to 92 percent of the maximum dry density per ASTM D 1557-12 and shall be within 2 percent of optimum moisture content.

D. 3/4-Inch Crushed Stone
   1. Methods of placement, shaping and compaction of ¾" Crushed Stone shall conform to Section 703 of the Rhode Island Standard Specifications.

3.2 FIELD QUALITY CONTROL

A. Refer to Specification Section 01 40 00 - Quality Control Services for Testing and Inspection requirements.

3.3 TOLERANCES

A. See Rhode Island Standard Specifications.

**END OF SECTION**

# SECTION 31 25 00

# EROSION AND SEDIMENTATION CONTROLS

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 and 1 Specification Sections, apply to this Section.

B. All work specified in this Section shall conform to the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, amended August 2013, with compilations and the attached supplementary specifications.

C. Related sections:

1. 31 10 00 – Site Preparation

### 1.2 DESCRIPTION OF WORK

A. Furnish and install temporary control measures as shown on the plan or as needed during the progress of the work or as ordered by the Engineer during the life of the contract to control water pollution through use of mulches, grasses, netting, fiber mats, silt fences, brush and baled hay checks, and sand bags and filter fabrics and other erosion control devices and methods.

B. The Contractor shall attend a pre-construction meeting to discuss in detail his intended construction sequence and accompanying soil erosion and sediment control program.

C. The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control by the Contractor who shall submit plans showing the methods of control to be utilized prior to commencing of work depicting the various areas to assure economical, effective and continuous erosion control throughout the construction and post construction period.

D. Plans include specific requirements on erosion and sediment control including requirements of regulatory agencies and limits on area of soil which can be disturbed during any one time period for this project.

### 1.3 SUBMITTALS

A. All submittals shall be in accordance with the general provisions of the Contract and shall include the following:

1. Manufacturer’s specifications and product data.

## PART 2 PRODUCTS

2.1 MATERIALS

A. Silt Fence: Silt fence shall be Enviro Fence by Mirafi, Propex Silt Stop manufactured by Amoco Fabrics Company, or approved equal.

B. Catch Basin Inserts: Catch basin sediment traps shall be Siltsack manufactured by Terrafix Geosynthetics, Inc. or approved equal.

## PART 3 EXECUTION

3.1 PREPARATION

A. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface area of erodible earth material exposed by excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other water courses, lakes, ponds or other areas of water impoundment. Such work may involve the use of temporary mulches, mats, seeding, check dams or other control devices or methods as necessary to control erosion. Cut slopes shall be seeded and mulched as the excavation proceeds, to the extent considered desirable and practicable.

B. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time. Temporary pollution control measures will be used to correct conditions that develop during construction, that were not foreseen during the design stage, that are needed prior to installation of permanent pollution control features, or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project, at no additional cost to the Owner.

C. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise temporary erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time, by stripping of topsoil, exceed five (5) acres without review by the Engineer.

D. Contractor shall have on-site all necessary silt fence and storm drainage piping etc., prior to undertaking any work that may cause erosion.

E. The Engineer will limit the area of excavation, borrow and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current. Should seasonal limitations make such coordination unrealistic,

temporary erosion control measures shall be taken immediately to the extent feasible, justified and indicated on plans at no additional costs to Owner.

F. If overland water flow becomes a problem in the construction progress then the Contractor shall take it upon himself to construct any and all ditches, temporary roads, fills and pipe culverts as necessary to alleviate a water problem which may affect progress of work. This work shall be performed at no additional expense to the Owner.

G. Under no circumstances shall the amount of surface area of erodible earth material exposed at one time by excavation, borrow or fill within the right of-way exceed one (1) acre without prior review by the Engineer.

H. The Engineer may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions.

I. In the event of conflict between these requirements and pollution control laws, rules and regulations of the federal, state or local agencies, the more restrictive laws, rules, or regulations shall apply.

J. Silt Fence:

1. Unless directed otherwise, silt fences shall be placed as indicated on project plans or as directed by the Engineer.
2. Installation shall be per plan details.

3.2 SILT FENCE

A. Unless directed otherwise, silt fences shall be placed at the locations indicated on the plans.

3.3 CATCH BASIN INSERTS

A. Install catch basin inserts in accordance with manufacturer’s recommendations.

B. Catch basin inserts shall be inspected every two weeks and after every storm event.

3.4 SPECIAL INSTRUCTIONS

A. Silt fence shall be inspected during storm events, after each rainfall of one-inch magnitude or greater, prior to weekends, and prior to any forecasted storm events.

B. In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense.

C. It is also the Contractor's responsibility to maintain the placement of silt fences and other erosion control devices remove silt from ditches and culverts and to repair any erosion of ditches and slopes.

D. In case of repeated failures on the part of the Contractor to control erosion, pollution, and/or siltation, the Engineer reserves the right to employ outside assistance or to use his own forces to provide the necessary corrective measures. Such incurred direct cost plus project engineering costs will be charges to the Contractor and appropriate deductions made from the Contractor's monthly progress payment.

E. Any erosion, siltation or general damage resulting from neglect by the Contractor to undertake temporary and permanent erosion control measures as required or directed shall result in the responsibility of the Contractor to correct the areas as determined by the Engineer.

F. Contractor shall also be required to install and maintain temporary erosion control measures within a time frame agreeable to the Engineer.

G. Temporary pollution control may include construction work outside the project limits where such work is necessary as a result of utility installations and equipment storage sites,

H. The erosion control features installed by the Contractor shall be acceptable maintained by the Contractor.

I. When a reasonable ground cover has been established, with the approval of the Engineer, the Contractor will remove all temporary erosion control measures, and the Contractor shall regrade and seed the area from which these measures were removed. Grading and seeding will be by hand if access for mechanical equipment is not possible.

**END OF SECTION**

# SECTION 31 00 00
# EARTHWORK

## PART 1 GENERAL

### 1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. All work specified in this Section shall conform to the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, amended August 2013, with compilations and the attached supplementary specifications.

### 1.2. SPECIAL CONDITIONS

A. The Contractor shall notify "Dig-Safe" in Rhode Island at 1-888-344-7233, prior to any excavation. The "Dig-Safe" number shall be provided to the Engineer.

B. RELATED SECTIONS

31 1000 Site Preparation
31 2311 Soil and Aggregate Materials
32 1216 Flexible Paving
32 1313 Cement Concrete Sidewalks
32 9200 Loam & Seed
33 4000 Storm Drainage Utilities

### 1.3. DESCRIPTION OF WORK

A. Work under this section includes, but is not necessarily limited to, the following:

1. Preparing and grading subgrades for prefabricated vaults, drainage appurtenances, sidewalks, pavements, and landscaping.

2. Excavating all materials and backfilling structures and trenches, including open cut rock excavation and trench rock excavation for installation of site utilities.

3. Filling, backfilling, and compacting fill to the satisfaction of a qualified soils testing laboratory engineer conforming to these specifications where applicable.

4. Rough grading to required tolerances.

5. Filling, as directed, excess cut under footings, foundations, and trenches.

6. The placing of earth for forming, shaping and compaction of embankments.

7. Maintaining benchmarks, monuments, and other reference points, obtaining accurate replacement of final grade of any disturbed or destroyed, or that must be removed due to the nature of the work, furnishing certification by a professional surveyor that all disturbed items have been accurately relocated.

8. Written notice of readiness of excavation subgrades, fill materials, fill areas, compacted fills, and items requiring review and/or inspection.

9. Maintain excavations and trenches free of water.

10. Excavating, stock piling and placing material suitable for filling and backfilling.

11. Remove from site all debris, unsuitable material and excess excavated material as specified and/or as directed by the Engineer.

12. Restoration to original grades and condition, properties damaged by any activity related to the work, taking adequate precautions to avoid settlement or cave-in of properties higher than site, silting, erosion, or other damage to properties lower than site.

1.4. OTHER WORK

A. All excavation for trenches required for high pressure steam and pressurized condensate return lines, prefabricated vaults, and the like shown on the site or HVAC drawings or specified herein or in the HVAC division of these specifications, shall be the responsibility of this Contractor.

## PART 2 PRODUCTS

2.1. MATERIALS

A. Fill and backfill materials shall be in accordance with Section 31 2311 – Aggregate and Soil Materials unless specifically indicated otherwise.

## PART 3 EXECUTION

### 3.1. GENERAL EXCAVATION REQUIREMENTS

A. Where used herein, "Finished Grade" refers to final grade at elevation indicated. Spot elevations govern contour elevations. Subgrade under lawn areas shall be maintained at 6" lower than "Finished Grade", unless indicated otherwise.

B. The extent of excavation open at any one time shall be controlled by the conditions, but shall always be confined to the limits prescribed by the Engineer.

C. No excavated material shall be placed on lawns, driveways or other private property without written consent of Owner. All disturbed areas shall be restored by the Contractor at no cost to Owner.

D. The Contractor shall take all necessary measures to protect trees not to be removed from the site of the work against damage from machinery and from excavated material. Branches and roots shall not be cut unless permitted by the Engineer.

E. Trees, cultivated plants, shrubs and hedges which might be damaged by the Contractor's operations shall be protected or shall be transplanted, maintained, watered and replanted. Trees to be saved shall be protected by the installation of a snow fence installed at the drip line. If such trees, plants, shrubs or hedges are damaged to the degree that their growth or beauty is affected, they shall be replaced by the Contractor at his own expense. All surfaces which have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found just prior to the start of construction. Damaged trees shall be replaced at a cost of six hundred dollars per caliper inch.

F. The restoration of existing property shall be done as promptly as practicable and not left to the end of the construction work.

G. All existing pipes, poles, wires, curbing, property line markers, fences, walls, or other structures which, in the opinion of the Engineer, must be preserved in place without relocation shall be carefully supported and protected by the Contractor. In the event of damage they shall be restored to their original condition by the Contractor at his own expense.

H. As excavation approaches existing utilities or other underground structures, digging with machinery shall cease and the excavation shall be done manually, as directed.

I. Excavation and backfill operations adjacent to existing utilities, structures and

construction shall be done in such a manner as will prevent the loss of ground or caving in of excavations, the undermining, damage or disturbing or existing pipelines, utilities and structures or any completed construction of the project. Backfill shall be placed, compacted, and done in such a manner as to prevent future settlement and damage to the existing pipelines, utilities, structures, or construction. Existing pipelines, utilities, structures, new construction, or property damaged due to excavation, backfilling and settlement of the backfill, shall be the responsibility of the Contractor and shall be corrected in a manner satisfactory to the Engineer at no additional expense to the Owner.

J. Surplus suitable material shall be the property of the Owner and stored on site as directed, or at the Owner's request, this material shall be removed from the site by the Contractor at no additional cost to the Owner.

K. Boulders over 10 inches in length, if encountered, shall be removed from subgrade of cut areas. Remove obstructions to depth of 12 inches below subgrade.

L. If excavation goes beyond lines shown in details, Contractor shall replace material with Gravel Borrow as defined in Section 31 2311.

M. Excavations shall be carried to design depths.

N. If excavation is carried beyond line or below grade, except as directed, or subgrade is made unsatisfactory by act or neglect of Contractor, he shall remove such unsatisfactory material. No extra payment will be made for replacement with satisfactory fill, additional concrete, or other suitable materials as directed.

O. Contractor shall provide adequate dust control during earthwork operations. Public ways and haul routes shall be cleaned and swept daily if required by intensity of the work, traffic and weather. Contractor to wet down areas as required and requested by the Engineer or Owner. Provide off-site water as necessary.

P. Contractor shall provide and maintain temporary barricades and traffic controls as required and as defined elsewhere in these Specifications.

## 3.2. PREPARATION

A. Protect existing structures, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and facilities.

## 3.3. PROJECT CONDITIONS

A. "Dig-Safe" Damage Prevention System: All Contractors performing drilling, boring, auguring, jetting, sheeting or pile installation, demolition, excavation or like work shall, prior to commencement of these activities, contact utility companies having responsibility for underground transmission systems for information relative to locations of existing underground transmission systems for information relative to locations of existing underground utilities and/or appropriate dig-safe damage prevention and notification agency. Provide Dig-Safe number to Owner in writing prior to start of excavation.

B. Adequate protection measures shall be provided to protect workmen and pedestrians passing by the site. Streets adjacent property shall be fully protected throughout the operations.

C. Shoring, sheeting, and bracing and/or prefabricated trenching boxes shall be provided to prevent caving, erosion, or gullying sides of excavation.

D. Provide for surface drainage and erosion control during the period of construction in a manner to avoid creating a nuisance to adjacent areas. Keep all excavations free of water during the entire progress of the work, regardless of the cause, source, or nature of the water.

## 3.4. CUTTING PAVEMENT

A. Excavations made on pavement shall be made in a careful manner so as to cause the least amount of damage to the pavement. Roadway pavement in state highways, local roads, sidewalks, and easements having bituminous concrete pavement shall be cut prior to trench excavation. Pavement and/or cement concrete will be cut 6 inches either side of the maximum allowable trench width. Any damage to the cut line due to the excavations, backfilling or removal of temporary pavement shall be re-cut to neat lines at no additional cost to the Owner, prior to replacement of the specified finished pavement. The width of pavement removed shall be kept as narrow as practicable. Existing pavement and base course disturbed or damaged beyond the payment lines indicated shall be replaced by the Contractor to match existing pavement and base course, at no additional cost to the Owner.

B. Contractor shall remove and dispose of existing bituminous concrete pavement off-site as is necessary to perform work of this contract as indicated. Removal of pavement shall be done in a neat manner by saw cutting a neat edge.

C. Contractor shall saw cut, remove and provide off-site disposal of concrete and bituminous walk pavement as is necessary to perform the work of this contract. Removal of concrete and bituminous walks shall be performed in a neat manner at the nearest joint of the remaining walk pavement.

D. Excavated pavement shall not be mixed with other excavated material which is to be used as backfill, and shall be removed immediately from the site of the work.

## 3.5 EXCAVATION, GENERAL

A. Explosives and blasting are not permitted for this project. Rock and/or ledge, if encountered, shall be removed by mechanical means only.

B. All excavations shall be classified as “earth excavation” or “rock excavation”.

C. Definition of “earth excavation” shall include the removal of all suitable and unsuitable soils not otherwise classified herein, and the removal of boulders and rock fragments less and one (1) cubic yard in volume, from the following areas:
   1. Within the design excavation sections.
   2. Beyond the design excavation sections where unsuitable materials are encountered.

D. Definition of “rock excavation” shall include the following:
   1. Rock excavation shall consist of removal of intact bedrock and boulders or detached bedrock fragments which have a volume of one (1) cubic yard or more. Boulders and detached rock fragments which have a volume of less than one (1) cubic yard are considered “earth excavation”.
   2. Materials that cannot be removed effectively with soil excavating equipment, such as rock material or aggregate conglomerate deposits so firmly cemented as to possess the physical characteristics of solid rock.
   3. Concrete or masonry structures larger than one (1) cubic yard in volume, and not less than 13-inches in the least dimension.
   4. Reinforced concrete larger than one (1) cubic yard in volume, reinforcement area more than ½ percent of cross-sectional area perpendicular to reinforcement in either direction, and not less than 8-inches in the least dimension.
   5. Soft or disintegrated rock or hardpan which can be removed with a hand pick or power operated excavating machine, or loose or previously blasted rock, will not be considered “rock excavation”.

F. When, during excavation, material is encountered that the Contractor may classify as rock excavation, such material shall be uncovered and the Engineer notified by the Contractor. The Contractor shall not proceed with excavation of this material until the Engineer has classified material as earth excavation or rock excavation. Failure on the part of the Contractor to uncover such material and notify the Engineer will cause forfeiture of the Contractor's right of claim for payment of rock excavation.

G. Before rock removal commences, the Contractor shall uncover all ledge to be removed. Elevations shall be taken by a registered land surveyor not employed by the Contractor. Surveyor will be paid by the Contractor. After completing rock removal, elevations shall be taken again by the surveyor. Amounts of ledge removed will be agreed to by Contractor and Owner.

H. A RI Registered Land Surveyor, not an employee of the Contractor but paid for by the Contractor, shall develop cross sections to show and determine rock quantities for payment purposes. Cross sections shall be reviewed by the Engineer. Payment for rock removal shall be based on "Methods of Measurement" or "pay lines" as stated within the project specifications and drawings. The Contractor shall be paid only in accordance with calculated quantities and not for actual rock removed.

I. Wherever rock is shattered below grade and is unfit for foundations, the shattered rock shall be removed and replaced as specified. No extra payment will be made for overbreak or backfill as required.

J. Definition of "unsuitable soils" shall include those soils due to their consolidation properties, degree of saturation, gradation or other deleterious characteristics will not provide a stable subgrade or side slopes; cannot be used as, or support embankment, or cannot be placed and compacted as backfill, or do not otherwise conform to the requirements of these Specifications.
   1. If the Contractor believes unsuitable soils have been encountered, he shall uncover/expose unsuitable soils, then immediately stop excavation activities and contact the Engineer. Contractor shall not proceed with the excavation of this material until the Engineer has classified the material as unsuitable.
   2. The limits of unsuitable material removal will be determined in the field by the Engineer. Unsuitable excavated material shall systematically be separated from suitable material to the satisfaction of the Engineer.
   3. Unsuitable material shall be removed and disposed of off-site.
   4. Failure on part of Contractor to uncover such material and notify the Engineer will cause forfeiture of Contractor's right of claim for payment of unsuitable material.

## 3.6. TRENCH EXCAVATION

A. Trenches shall be excavated in such a manner and to such widths as will give suitable space to allow pipes to be laid and joints to be formed and to allow for sheeting and shoring, dewatering and for removing and replacing unsuitable materials. Trenches shall be excavated to lines and grades shown on the drawings.

B. Final decision as to suitability of excavated material for use as backfill or fill shall be made by the Engineer. If, in the judgment of the Engineer the excavated material is unsuitable, the Contractor shall import bank run gravel to make up the deficiency.

C. Comply with all Federal, State and local codes, ordinances and requirements of authorities having jurisdiction to maintain stable excavations.

## 3.7. UNAUTHORIZED EXCAVATION

A. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction from the Owner or the Engineer.

B. Fill unauthorized excavations with materials approved by the Engineer at no additional cost to the Owner.

C. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Engineer, at no cost to the Owner.

## 3.8. APPROVAL OF SUBGRADE

A. Notify the Engineer when excavations have reached the required subgrade.

B. When the Engineer determines that unforeseen unsatisfactory soil is present, continue excavation and replace with systematically placed and compacted backfill or fill material as directed. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer at no cost to the Owner.

D. Compacted fill surfaces which become disturbed, contaminated or otherwise unacceptable to the Owner or the Engineer shall be removed and replaced with acceptable fill at no additional cost to the Owner.

E. Cold Weather Subgrade Protection

1. When the atmospheric temperature is less than 32 degrees Fahrenheit, the Contractor shall protect excavation subgrades and lean concrete from freezing. Cold weather subgrade protection may consist of an earth fill cover, hay cover, insulation cover, heating or other means of protecting the subgrade materials from freezing.

2. Subgrades, which have been permitted to freeze by the Contractor, will be judged to be unsuitable for placement of concrete, pavement or fill by the Owner, Owner's Representative or Engineer. The Contractor, at his own expense, shall conduct additional excavation of frozen subgrade soil, and replacement with materials acceptable to the Owner, Owner's Representative or Engineer

## 3.9. STORAGE OF SOIL MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow material. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Provide erosion control measures around perimeter of stockpiles. Cover to prevent wind-blown dust.

1. Stockpile soils materials away from edge of excavations. Do not store within drop line of remaining trees. Establish soil and material stockpiles on site only at locations acceptable to the Owner.

## 3.10 BACKFILL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for record documents.
3. Testing, inspecting, and approval of underground utilities.
4. Concrete formwork removal.
5. Removal of trash and debris from excavation.
6. Removal of temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing supported walls.

B. Place backfill material in layers according to Section 31 2311 – Aggregate and Soil Materials to the required elevations in accordance with the drawings and as follows:

1. Under loam and seed areas, use common borrow material.
2. Under concrete sidewalks and bituminous concrete pavement, use gravel borrow.
3. Under drainage piping and drainage structures, use bedding material.

## 3.12. TRENCH BACKFILL

A. Trenches and other excavations shall not be backfilled until all required inspections have been satisfactorily performed and until the work as installed conforms to other requirements specified in the several sections covering the installation of the work. Trenches and other excavations shall be backfilled as soon as practicable with the specified material.

B. All pipes under this contract are to be laid in bedding material as indicated on the contract drawings. Prior to backfilling the trench, the space on the both sides of the pipe and beneath the pipe shall be backfilling with bedding material as indicated on the contract drawings. This layer shall be carefully tamped using tools acceptable to the Engineer to obtain maximum compaction around and under the pipe at the same time being extremely careful not to cause movement of the pipe in either a lateral or vertical direction.

C. In each trench, gravel borrow, as directed by the Engineer, which does not contain any stones, rock, or clay lumps that are in excess of 3” in their greatest dimension shall be deposited in the trench uniformly on both sides of the pipe and to a minimum height of 2" over the pipe for the entire width of the trench above the "Sand Fill" to the pipe spring line. This layer shall be thoroughly compacted to the above described requirements.

D. The balance of the backfill to subgrade or finish grade as indicated shall be made using trench excavated materials in loam and seed areas and gravel borrow under paved, parking lot areas, and under slabs on grade, unless the Contractor is otherwise directed by the Engineer. This layer shall be thoroughly compacted in accordance with Section 31 2311 – Aggregate Materials.

E. Compaction by water-jetting, puddling or ramming is prohibited. Where it is necessary to obtain maximum compaction, power tampers shall be used. The method of compacting shall be reviewed by the Engineer.

F. During filling and backfilling operation, pipelines will be reviewed by the Engineer to determine whether any displacement of the pipe has occurred. If the inspection of the pipelines shows poor alignment, displaced pipe or any other defects, the defects designated by the Owner shall be remedied in a satisfactory manner, by the Contractor, at no additional expense to the Owner.

G. Metallic tape, of the type designated in Specification Section 33 4020 – Marking Tape, shall be placed as directed in the trench backfill.

## 3.13. MOISTURE CONTROL

A. Uniformly moisten, moisten condition, or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace or scarify and air-dry satisfactory, soil material that is too wet to compact to specified density.
3. Fill materials shall not be frozen when placed, or be allowed to freeze prior to, or after compaction, or placement.
4. Soil bearing surfaces shall be protected against freezing. Frost protection shall be provided in a manner acceptable to the Owner and Engineer as soon as possible after foundations are constructed.
5. Do not excavate to full indicated depth when freezing temperatures may be expected, unless the mats, footing, or slab is poured immediately after the excavation has been completed. Protect the excavation from frost if placing of concrete is delayed. Concrete for foundations or slabs shall not be places on frozen soil. Where footings, slabs, or mud mats are exposed to freezing temperatures, they shall be protected to prevent damage to the concrete by freezing or frost penetration into the soil upon which they rest. Where foundations are exposed over the winter during construction, provide at least two and one-half (2.5) feet of earth cover above the bottom surface of concrete, plus hay or other protection if temperatures are severe, as directed by the Owner's Representative.

B. Wet weather: If fill material placement, spreading, rolling, or compaction operations are interrupted by heavy rain or other unfavorable conditions, do not resume such operations until ascertaining that the moisture content and density of the previously-placed soil are as required by these specifications.

## 3.13 COMPACTION

A. Compaction shall be in accordance with the requirements of Section 31 2311 – Aggregate and Soil Materials.

## 3.14 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and structures and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 0.10 foot.
2. Pavements: Plus or minus ½ inch.

## 3.15 COMPACTION EQUIPMENT

A. Contractor shall use, for compaction of subgrade and fill in designated areas, equipment at number of coverages stipulated depending upon suitability of equipment for the work, as follows:

1. Rubber-tired roller-compactor, having 4 wheel equipped with pneumatic tires of such size and ply as can be maintained at pressures between 80 and 100 psi with 25,000 lb. wheel load during rolling operation. Roller-wheels shall be located abreast, and so designed that each wheel will carry approximately equal load in traversing over even ground. Spacing of wheels shall be such that distance between nearest edges of adjacent tires will not be greater than one-half width of one tire at operating pressure for 25,000 lb. wheel load. Roller shall have body suitable for ballast loading such that load per wheel may be varied, if so directed, between 10,000 lb. and 25,000 lb. Roller shall be towed at speeds not exceeding 10 miles per hour.
2. Acceptable drum type vibratory compactor operating at not less than 2,000 vibrations per minute.
3. In any event, regardless of equipment used, compaction of soil shall meet the relative densities stated in this section.

## 3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace material to depth directed by the Engineer; reshape and re-compact at optimum moisture content to the required density.

C. Settling: Where settling occurs within one (1) year after project completion, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

## 3.17. FIELD QUALITY CONTROL

A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

B. Field in-place density tests may be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.

C. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, re-compact and retest until required density is obtained.

## 3.18. DISPOSAL OF SURPLUS AND WASTE MATERIAL

A. All unsuitable material, and suitable material not required for the proper completion of the contract, shall become the property of the Contractor, and shall be removed and properly disposed of off-site at no additional cost to the Owner.

B. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, debris, and pavement, and legally dispose of it off the Owner's property, at no additional cost to the Owner.

C. Reuse: Transport surplus satisfactory soil to designated storage areas on the Owner's property. Stockpile or spread soil as directed by the Engineer.
   1. Remove waste material, including unsatisfactory soil, pavement, trash, and debris, and legally dispose of it off the Owner's property, at no cost to the Owner. Contractor to obtain and pay for all necessary permits or licenses for off-site disposal.

**END OF SECTION**

# Division 32 - Exterior Improvements

# SECTION 32 12 16

# FLEXIBLE PAVING

## PART 1 GENERAL

### 1.1. SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

C. Section includes:

1. Class 9.5 Hot Mix Asphalt (HMA).
2. Class 12.5 HMA.
3. Tack coat.

D. Related sections:

1. Section 31 2311 – Soil and Aggregate Materials
2. Section 31 8000 – Earthwork Utilities

### 1.2. SUBMITTALS

A. In accordance with 01 3300 Shop Drawings, Product Data and Samples.
1. Shop Drawings: Include plans, elevations, sections, details, attachments to other work as necessary. RIDOT approved mix designs and certified laboratory test results including:
   a. Asphalt Content of HMA by Ignition Method (AASHTO T 308)
   b. Mechanical Analysis of Extracted Aggregate (AASHTO T 30)
   c. Bulk Specific Gravity of Compacted HMA (AASHTO T 166)
   d. Maximum Specific Gravity of HMA (AASHTO T 209)
   e. Volumetric Analysis

## PART 2 PRODUCTS

### 2.1 MATERIALS

A. Class 9.5 HMA and Class 12.5 HMA shall be RIDOT approved and shall conform to the requirements of Section 401 of the Rhode Island Standard Specifications. The HMA pavement shall consist of the layers and thicknesses as shown on the Plans.

B. Tack coat shall conform to the requirements of Section 403 of the Rhode Island Standard Specifications.

2.2 SOURCE QUALITY CONTROL

A. Testing, Inspection

1. The Engineer may elect to sample material supplied at the source. Contractor shall assist the Engineer in obtaining samples.

**PART 3 EXECUTION**

4.1. INSTALLATION

A. Methods of placing Class 9.5 HMA and Class 12.5 HMA shall conform to the requirements of Section 401 of the Rhode Island Standard Specifications.

B. Methods of placing tack coat shall conform to the requirements of Section 403 of the Rhode Island Standard Specifications. All vertical joints and saw cut vertical faces that are adjacent to the new HMA shall receive tack coat.

1. The application rate shall be 0.1 gallons per square yard, plus or minus 0.02 gallons per square yard.

C. Where existing surfaces are to be retained and are required to join the pavement constructed hereunder, the existing jointed edge shall be saw cut vertically to the full depth, not less than 1 foot back from their present locations or at the location as directed by the Engineer and/or as shown on the Drawings, and painted with tack coat.

3.2 HAULING EQUIPMENT

A. Cleaning of truck beds shall be done off site and will not be allowed in any area that will be paved.

3.3 TOLERANCES

A. See Rhode Island Standard Specifications.

**END OF SECTION**

# SECTION 32 13 13

# CEMENT CONCRETE SIDEWALKS

## PART 1 GENERAL

### 1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

### 1.2. SUMMARY

A. Section Included:

1. Cement concrete sidewalks and wheelchair ramps.

### 1.3. SUBMITTALS

1. In accordance with Section 01 3300 – Shop Drawings, Product Data and Samples.
2. Shop Drawings: Concrete mix design, field quality control test and inspection reports.

## PART 2 PRODUCTS

### 2.1 MATERIALS

A. Materials for cement concrete sidewalks and wheelchair ramps shall conform to the requirements of Section 905 of the Rhode Island Standard Specifications.

## PART 3 EXECUTION

### 3.1. INSTALLATION

A. Installation of cement concrete sidewalks and wheelchair ramps shall conform to the requirements of Section 905 of the Rhode Island Standard Specifications.

3.2 TOLERANCES

A. See Rhode Island Standard Specifications.

**END OF SECTION**

# SECTION 31 16 13

# CURBING

## PART 1 GENERAL

### 1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

### 1.2. SUMMARY

A. Section Included:

1. Precast concrete curb and transition curb.
2. Granite curb and transition curb.

### 1.3. SUBMITTALS

1. In accordance with Section 01 3300 – Shop Drawings, Product Data and Samples.
2. Shop Drawings: Concrete mix design, certified laboratory test results (concrete compressive strength), cut sheets.

## PART 2 PRODUCTS

### 2.1 MATERIALS

A. Materials for precast concrete curb and transition curb shall conform to the requirements of Sections 601 and 906 of the Rhode Island Standard Specifications.

B. Materials for granite curb and transition curb shall conform to the requirements of Sections 906, M.09.01 and M.09.02.

## PART 3 EXECUTION

3.1. INSTALLATION

A. Installation of granite and precast concrete curb and transition curb shall conform to the requirements of Section 906 of the Rhode Island Standard Specifications.

3.2 TOLERANCES

A. See Rhode Island Standard Specifications.

**END OF SECTION**

# SECTION 32 17 23

# PAVEMENT MARKINGS

## PART 1 GENERAL

1.1. SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

C. Section includes:
1. Epoxy resin white pavement arrows and legends.

D. Related sections:
1. Section 32 12 16 – Flexible Paving

## PART 2 PRODUCTS

2.1 MATERIALS

A. Materials for epoxy resin white pavement arrows and legends shall conform to the requirements of Section T.20 of the Rhode Island Standard Specifications.

## PART 3 EXECUTION

3.1. INSTALLATION

A. Installation of epoxy resin white pavement arrows and legends shall conform to the requirements of Section T.20 of the Rhode Island Standard Specifications.

3.2 TOLERENCES

A. See Rhode Island Standard Specifications.

**END OF SECTION**

# SECTION 32 92 00
# LOAM AND SEED

## PART 1 GENERAL

1.1. SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

1.2. RELATED SECTIONS

A. 31 8000 – Earthwork Utilities

1.3. QUALITY ASSURANCE

A. Subcontract seeding work to a firm specializing in such work unless Contractor is fully experienced and qualified.

B. Each seed bag or container shall display a label which identifies the contents as a true representation of the seed mix and percentages required by specification. No seed shall be applied to a site until the Owner's Representative has determined the mixture meets all requirements.

C. Do not make substitutions without written approval. If specified seed mixes are not available, obtain approval for substitution from the Engineer.

1.4. SUBMITTALS

A. In accordance with Specification Section 01 3300 submit the following:

1. Certifications and/or labels of proposed seed mixtures stating common and scientific names of grasses, percentages by weight, and percentages or purity and germination.

2. Submit test samples of loam or borrow material being used.

3. Product information for all proposed weed control chemicals.

1.5. DELIVERY, STORAGE AND HANDLING

A. Fertilizer

1. Delivered mixed as specified in standard size, unopened containers showing weight, analysis, and name of manufacturer.

2. Store in weatherproof place.

B. Seed

1. Protect all products from weather or other damaging or deteriorating conditions.

2. Seed mixes which have been damaged or have deteriorated in transit or storage are not acceptable.

1.6. WARRANTY

A. Maintenance of seeding to be performed by installer includes:

1. Watering.

2. Regrading and replanting eroded areas.

3. Seeding or patching sparse or bare areas.

B. Maintain seeded areas immediately after placement until grass is accepted.

**PART 2 PRODUCTS**

2.1. LOAM

A. Fertile, natural topsoil, typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in equal proportions. Free of stumps, roots, heavy or stiff clay, stones large than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.

B. Not less than 4 percent no more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

C. Loam test samples dried to constant weight at temperature of 230° F, plus or minus nine degrees.

D. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.

E. Approved suitable material from excavation within the project limits shall be used before new material is furnished.

2.2. LIME, FERTILIZER AND SEED

A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

B. Complete fertilizer, at least 50 percent of nitrogen derived from natural organic sources of urea form and containing following percentages by weight:

1. Nitrogen 10%

2. Phosphorus 10%

3. Potash 10%

C. Pure, live, fresh seed from commercial sources meeting and, labeled in accordance with State and Federal laws, rules and regulations. All seed to have a minimum germination rate of 85 percent.

1. Seeding mixture for lawn areas shall conform to the following grass types and percentages

| | **Minimum Proportion by Weight** | **Percent Purity** | **Percent Germination** |
|---|---|---|---|
| Palmer Perennial Ryegrass | 20% | 99% | 90% |
| Ranger Perennial Ryegrass | 20% | 99% | 90% |
| Baron Kentucky Bluegrass | 30% | 95% | 85% |
| Merion Kentucky Bluegrass | 30% | 95% | 85% |

Inert Materials 2.5% (maximum)

2.3. WEED CONTROL

A. Post-emergent weed control for seeding: apply "Trimec," or approved equal. Use of material must be approved prior to application.

2.4. WATER

A. Clean, fresh potable water.

**PART 3 EXECUTION**

3.1. GENERAL

A. Supply suitable quantities of water, hose and appurtenances.

3.2. LOAM

A. Spread loam on areas to a minimum depth of 4", or as indicated on the plans or as directed by the Engineer, fine grade and compact.

3.3. LIME, FERTILIZER AND SEEDING

A. Apply lime by mechanical means at rate of 3,000 pounds per acre.

B. Apply fertilizer at rate of pounds per acre.

C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation.

D. The approved seed mixture shall be applied at a rate of 6 pounds per 1,000 square feet by means of seeder device capable of penetrating ground to a depth of 1 inch. Seed machine shall be equipped with disc-type penetrating action and seeder tubes that plant seeds. Seeder shall be similar to Jacobson Model 524-100, 548-100 or equal.

E. Distribute seed over area in two separate passes, each one perpendicular to the other (north-south, east-west orientation). Each pass shall be in a linear progression, and shall conform to the field direction that permits the longest, straight line application procedure.

F. Broadcast seeding will be permitted only with written permission of the Owner. All requests shall be in writing with detailed and itemized procedure to be followed.

G. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period.

H. Seed during approximate time periods of March 15 to May 15 and August 15 to October 1, and only when weather and soil conditions are suitable for such work, unless otherwise permitted.

3.4. APPLICATION OF WEED CONTROL

A. Apply post-emergent weed control to new seeding areas only.

B. Apply post emergent weed control at 1.2 to 1.5 ounces per 1,000 square feet, or according to manufacturer's recommendations.

3.5. ACCEPTANCE OF SEEDING:

A. Provisional Acceptance: Provisional acceptance period shall be defined as the elapsed time, between application of seed and the establishment of a good, healthy uniform growth of grass.

1. Provisional acceptance will not occur until the seeded areas are well established, exhibiting a vigorous growing condition, devoid of bare spots greater than 1 square foot and have been mown at least twice.

2. It will be the Contractors responsibility to maintain seeding areas in an approved condition until provisional acceptance.

3. The Contractor shall keep all seeded areas watered and in good condition, reseeding if and when necessary, during the provisional acceptance period.

4. The following guidelines shall be adhered to when mowing all newly seeded areas. These guidelines, while inclusive of all four growing seasons, does not necessarily imply that the Contractor is responsible for mowing throughout all four seasons, as provisional acceptance may be granted if grass is determined to be satisfactory after as few as two complete mowings.

a. Initial or spring mowing: Shall take place when lawn areas (new seeding, established lawns,) have grown to a blade height of 2 inches. Turf shall be cut using a mower with sharp cutting blades. Height of cut shall be set at

1-1/2 inches. This height of cut shall be maintained through spring period of growth (April through mid-June). Frequency of mowing during this growth period shall be at every 7 days, or whenever grass growth exceeds 1-1/2 inches. Regardless of how quickly the turf grows during this period, NO MORE THAN ONE-THIRD of the leaf shall be removed in any one mowing. Adherence to this procedure shall require additional and more frequent mowings beyond the established regimen (once every 7 days, etc.), especially during and after rainy periods, or climatic conditions promoting rapid growth.

b. Summer: The height of cut shall be raised to 2 to 2-1/2 inches commencing with the start of summer. This height of cut shall be maintained until the return of cooler temperatures in early September. Frequency of mowing during this summer period shall be once every 7 to 10 days. A longer interval than 7 days may be necessary if turf growing rate slows down in response to summer heat, drought, etc.; Contractor shall be responsible for determining the proper cutting interval that conforms best to local growing conditions and climatic factors, but period between cuts shall not exceed 10 days without prior approval of Owner.

c. Fall: The height of cut shall be reduced to 1-1/2 inches in mid-September when there is a noticeable change towards cooling daytime temperatures, usually between September 10 and 20, Beginning on September 10, the frequency of cut shall be set at 1 cut every 7 days; This schedule shall remain in. effect until mid-October.

d. Late Fall: Between mid-October (October 15) and November 10, the Contractor_ shall begin to lower the height of cut in incremental stages so that the final cut shall establish the winter dormant height of turf at 1 inch. Mowing frequency during this period shall be set at one cut every 12 to 15 days depending on turf growth rates. Starting on October 15, it is expected that the Contractor shall need no more than 3 cuts to lower the grass to its final height of 1 inch. NO more than one-third of the leaf shall be removed in any one mowing operation. Final cut shall be performed on or prior to November 10, unless an extension date is approved by Owner.

e. Grass clippings shall be returned to the turf surface during regular mowing operations.

5. During this period, water turf as necessary, to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is the equivalent of 1 inch of absorbed water per week that is delivered at weekly intervals in the form of natural rain or is augmented as required by periodic watering.

6. It shall be the Contractor's responsibility to obtain necessary documentation to show that provisional acceptance has been granted. This shall be done upon written request to inspect grass work on site submitted by the Contractor to the Engineer. Provisional acceptance will not be granted until Contractor has obtained, in writing, a statement from the Engineer indicating that grass is satisfactory under the terms of the provisional acceptance.

B. Final Acceptance: Final acceptance period shall be defined as the elapsed time between provisional acceptance and final closeout of the project.

1. All seeded areas shall be guaranteed by the Contractor for not less than one growing season from the time of provisional acceptance. Growing season shall be defined as follows:

   a. If provisional acceptance is received during April, May, June or July, next growing season shall end on October 15.

   b. If provisional acceptance is received during September, October, November or December, next growing season shall end on June 1.

2. At the end of the guarantee period, inspection will be made by the Engineer upon written request submitted by the Contractor at least 10 days before the anticipated date. Lawn areas not demonstrating satisfactory stands as outlined above, (except if damaged by vandalism) as determined, by the Engineer shall be renovated, re-seeded, and maintained meeting all requirements as specified herein.

3. After all necessary corrective work has been completed, the Engineer shall certify in writing the final acceptance of the lawn area.

4. Decision of Owner as to necessity to replace lawns or repair any defects on workmanship, or cause of any destruction or loss, impairment or failure to flourish, shall be conclusive and binding upon Contractor. Replacements shall be the same as specified. All replacements shall be planted as specified herein at Contractor's expense.

5. "Vandalism," as noted above, is intended to mean any acts, whether intentional or accidental, by other persons, which clearly result in damage, and which may reasonably be considered to be beyond the Contractor's reasonable control, as determined by the Owner's Representative.

C. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Re-seed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

## 3.6. TEMPORARY COVER CROP

A. Sow a temporary cover crop of buckwheat, domestic rye grass or other acceptable seed if there is insufficient time in the planting season to complete seeding, fertilizing, and permanent seeding at the option of Contractor or order of Engineer. Cut and water cover crop as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into soil, the areas shall be fertilized and permanent seed crop sown as specified.

**END OF SECTION**

# Division 33 - Utilities

# SECTION 33 40 00
# STORM DRAINAGE UTILITIES

## PART 1 GENERAL

### 1.1. SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

C. RELATED SECTIONS

1. 31 80 00 – Earthwork Utilities

### 1.2. DESCRIPTION OF WORK

A. Extent of Storm Sewage Systems Work is indicated on drawings and schedules, and by requirements of this section.

### 1.3. QUALITY ASSURANCE

A. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with storm sewage work similar to that required for project.

### 1.4. CODES AND STANDARDS

A. Plumbing Code Compliance: Comply with applicable portions of national standard plumbing code pertaining to selection and installation of storm sewage system's materials and products.

B. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm sewage systems.

### 1.5. SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation

instructions for storm sewage system materials and products.

B. Shop Drawings: Submit shop drawings for all precast components of storm sewage systems.

1.6. DELIVERY, STORAGE AND HANDLING

A. The Contractor shall arrange for the delivery of the products at approved locations in the vicinity of the portion of the project in which the products are to be installed. To this end, he shall do such work as is necessary for access and for delivery of the products. All products shall be stored in an approved, orderly manner so that there will be a minimum of re-handling from the storage area to the final position in the trench and so that there is a minimum of obstruction and inconvenience to any kind of traffic. Deliveries shall be scheduled so that the progress of the work is at no time delayed and also so that large quantities of products shall not be stored for excessive lengths of time in crowded locations or in locations where large storage areas might be considered objectionable. Storage of products will be restricted to approved or permitted areas.

B. Products shall not be stored on areas over the newly laid pipeline or other pipelines which might be damaged by the superimposed load. Products may be strung out along the route of the job but shall be laid between work limits. Products may not be stored on private property unless permission to do so has been granted by the property owner.

C. Products may not be stored in any areas of vehicular or pedestrian traffic,

## PART 2 PRODUCTS

2.1. PIPES AND PIPE FITTINGS

A. General: Provide pipes of one of the following materials, of weight/class indicated. Provide pipe fittings and accessories of same material and weight/class as pipes, with joining method as indicated.

B. Contractor shall use push-on joint type ductile iron pipe unless otherwise indicated on the plans.

C. All ductile iron pipe shall be designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151.

D. Unless otherwise indicated or specified, ductile iron pipe shall be Pressure Class 350 and thickness Class 52.

## PART 3 EXECUTION

### 3.1. PROJECT CONDITIONS

A. Dig-Safe Damage Prevention System: All Contractors or Contractors performing drilling, boring, auguring, jetting, sheeting or pile installation, demolition, excavation or like work shall, prior to commencement of these activities, contract utility companies having responsibility for underground transmission systems for information relative to locations of existing underground utilities and/or an appropriate dig-safe damage prevention and notification agency.

### 3.2. INSPECTION

A. All storm sewage system products shall be subject to inspection and approval by the engineer at the place of manufacture and/or at the site after delivery. The products shall be subject to rejection at any time due to failure to conform to the specifications. Rejected products shall be removed from the site immediately. All the products shall be carefully examined for defects, and if any are found to be broken or defective, prior to or after being placed they shall be removed and replaced by the Contractor without any further compensation.

### 3.3. PRODUCT HANDLING

A. Each product shall be handled into its position in the trench in such a manner and by such means as the manufacturer recommends as satisfactory, and these operations will be restricted to those considered safe for the workmen and such as to cause no injury to the project or any property.

B. The Contractor will be required to furnish slings, straps and/or other 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 injury to the product. The products shall not be dropped from trucks or into the trench.

C. The Contractor shall have on the job-site with each crew, all the proper tools to handle the projects being installed. The use of hammer and chisel, or any other method which results in rough edges, chips and damages, shall be prohibited.

### 3.4. CONTROL OF ALIGNMENT AND GRADE

A. All work shall be constructed in strict accordance with the lines and grades shown on the contract drawings and the Contractor shall be held fully responsible for keeping correct alignment and grade.

B. All lines, grades, measurements, layout staking and reference staking necessary

for the proper location and satisfactory completion of the pipeline, appurtenances and other construction, shall be the responsibility o the Contractor.

C. All stakes, references and batter boards including original, additional or replacement, which may be required for the construction operation, shall be furnished, set and properly referenced by the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans, specifications or special provision shall be called to the engineer's attention by the Contractor for correction or interpretation prior to proceeding with the work.

D. Upon request of the engineer, the Contractor shall furnish copies of all data used in setting and referenced all stakes and other layout markings used by the Contractor.

E. All staking shall be performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout and staking of the type required under the contract and who are acceptable to the engineer. The personnel shall perform this staking under the direct supervision of a land surveyor registered within the state within which the work occurs.

F. The Contractor shall use a laser beam to assist in setting the pipe, provided he can demonstrate satisfactory skill in its use.

G. The use of string levels, hand levels, carpenters' levels or relatively cured devices for transferring grade or setting pipe will not be permitted.

H. During construction, the Contractor shall provide the engineer, at his request, all reasonable and necessary materials, opportunities and assistance for checking the control of the work, as established by the Contractor. The Contractor will be informed of the results of these checks, but the engineer by so doing, in no way relieves the Contractor of his responsibility for the accuracy of the layout work. The Contractor shall, at his expense, correct or replace as required, and deficient layout and construction work which may be the result of inaccuracies in his staking operations or of his failure to report inaccuracies found in work done by the engineer or by others. If, as a result of these inaccuracies, the engineer is required to make further studies, redesign, or both, all expenses incurred by the engineer due to such inaccuracies will be deduced from any monies due to the Contractor.

I. The Contractor's field survey notes shall be kept neat, orderly and in conformance with accepted practice. Copies of all field survey books and notes shall be made available to the engineer upon request.

J. The Contractor shall carefully preserve bench marks, reference points and stakes, and in case of willful or careless destruction, by his own men, he 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.

## 3.5. INSTALLATION OF PIPE AND PIPE FITTINGS

A. General: Install piping in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated.

1. Inspect Piping: Before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.

2. Lay Piping: Beginning at low point of system, true to grades and alignment indicated, with unbroken continuity of invert.

3. Place Bell Ends: of piping facing upstream.

4. Install Gaskets: In accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements.

5. Cleaning Piping: Clear interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed.

a. In large, accessible piping, brushes and brooms may be used for cleaning.

b. Place plugs in ends of uncompleted conduit at end of day or whenever work stops.

c. Flush lines between manholes if required to remove collected debris.

## 3.6. FIELD QUALITY CONTROL

A. Testing: Perform testing of completed piping in accordance with local authorities having jurisdiction.

**END OF SECTION**

# SECTION 33 40 20

# UNDERGROUND UTILITY MARKING TAPE

## PART 1 – GENERAL

1.1 SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to this Section.

B. Materials and construction methods shall conform, in so far as applicable, to the requirements of the Standard Specifications for Road and Bridge Construction of the Rhode Island Department of Transportation, amended August 2013, together with all the errata, addenda, additional revisions, and supplemental specifications.

1.2 SECTION INCLUDE

A. Requirements for furnishing and installing metallic (detectable) and non-metallic (non-detectable) marking tape over buried pipelines and conduits.

B. REFERENCES

1. A.P.W.A. - American Public Works Association.

1.3 SUBMITTALS

A. In accordance with requirements of the general provisions of the Contract, submit the following:

1. Two sets of manufacturer’s literature on the materials, colors and printing specified herein, shall be submitted to the Engineer for review.

3.2 DESCRIPTION

A. General

1. Marking tape to be installed over all pipe lines and conduits installed under this Contract.
2. Marking tape for non-ferrous pipe or conduits to be detectable, magnetic type.
3. Marking tape for ferrous pipe or conduits to be non-detectable, non-magnetic type.
4. Tape to be 6 inches wide.

## PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Underground utility marking tape to be:
1. Detectable: Magnatec by THOR Enterprises, Inc., Sun Prairie, WI.
2. Non-detectable: Shieldtec by THOR Enterprises, Inc., Sun Prairie, WI.
3. Or product deemed equal by the Engineer.

3.2 MATERIALS

A. Detectable Underground Utility Marking Tape
1. Minimum overall thickness: 5.0 mil (0.005").
2. Aluminum foil core: 35 gauge (0.00035") minimum.
3. Foil visible from both sides of tape.
4. Protective plastic jacket applied to both sides of foil.
5. Jacket adhesive applied directly to the film and foil.
6. No printing to extend to the edges of the tape.
7. No dilutants, pigments or contaminants in the adhesive.
8. Adhesive formulated to resist degradation by elements normally found in soil.

B. Non-detectable Underground Utility Marking Tape
1. Minimum overall thickness: 4.0 mil (0.004").
2. Polyethylene plastic film: 100% virgin, low density acid and alkali-resistant.
3. Printing: Permanent, black, environmentally safe.
4. Coloring: color-fast, lead free, organic pigments suitable for direct burial and prolonged exposure to the elements normally found in soil.

C. Marking
1. Tape to printed with "BURIED *UTILITY* LINE BELOW" replacing the word "*UTILITY"* with the word "WATER," "SEWER," "DRAIN," "ELECTRIC," "GAS," or otherwise appropriate, repeating continuously every 30 inches maximum.

D. Color Code in accordance with A.P.W.A. Standards as follows:

| | |
|---|---|
| 1. Safety Red | Electric power and high voltage lines |
| 2. High Visibility Safety Yellow | Gas and oil distribution/Transmission<br>Dangerous materials/Steam |
| 3. Safety Alert Orange | Fiber optic/telephone/CATV |
| 4. Safety Precaution Blue | Water and irrigation lines |

| | |
|---|---|
| 5. Safety Green | Sewer/storm/sanitary systems/non-potable water |
| 6. Safety Brown | Force mains and effluent lines |
| 7. Alert Purple | Reclaimed and effluent re-use lines |

## PART 3 – EXECUTION

3.1 INSTALLATION

A. Install marking tape directly above the pipe line or conduit tape is to identify, approximately 18 inches to 24 inches below the proposed finished grade.

B. Install marking tape in accordance with manufacturer's recommendations.

C. Install marking tape over existing utilities disturbed by the Contractors operation.

**END OF SECTION**