

Project Manual

Town of Stonington Invitation to Bid #2018-004

Underground Storage Tank Replacement Project

Town of Stonington, Connecticut
Department of Public Works

May 2018

Tighe&Bond

Underground Storage Tank Replacement Project
Town of Stonington
Stonington, Connecticut
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DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS

SECTION 00100

ADVERTISEMENT FOR BIDS

TOWN OF STONINGTON

STONINGTON, CONNECTICUT

INVITATION TO BID ITB#2018-004

Sealed Bids for the construction of the “Town of Stonington, Underground Storage Tank Replacement Project” will be received by the Director of Finance at the Town Hall, 152 Elm Street, Stonington, CT 06378 until 2:00 p.m. local time on June 6, 2018 at which time the Bids received will be publicly opened and read. Sealed Bids must have outer envelope marked as “Town of Stonington, Underground Storage Tank Replacement Project #2018-004.” Please see full Invitation to Bid for exact specifications on the Town’s website, under <http://www.stonington-ct.gov/bids-rfps> or on the CT DAS contracting portal.

Any addenda will be posted to the Town’s website along with the CT DAS contracting portal. All firms are responsible for checking for new addenda

The Town of Stonington reserves the rights to amend or terminate this Invitation to Bid, to reject any or all proposers, to request additional information, to waive any informalities or non-material deficiencies in a response, to determine qualifications exclusively and finally in its sole discretion, to select any proposal based on any combination of factors, including the amount bid and the Town's best interests, to select parts of any one or more proposals, to negotiate with any person submitting a proposal for different or additional terms, and to take any and all other action that, in the Town’s sole judgment, will be in its best interests.

The work consists of the removal of five underground storage tanks (USTs), closure-in-place of one UST, and installation of three USTs and two aboveground storage tanks (AST) at various sites within the Town. The locations and volumes of the tanks that are to be removed and installed are detailed in Table 1. Bids shall be on lump sum and unit price basis.

TABLE 1
Fuel Storage Tank Replacement Schedule

Location	Type	Volume (gallons)	Contents	Project Scope
Town Dock	UST	20,000	Diesel	Removal
Town Dock	UST	20,000	Diesel	Installation
DPW Garage	UST	6,000	Diesel	Removal
DPW Garage	UST	4,000	Gasoline	Removal
DPW Garage	UST	10,000		Installation
		Compartmentalized		
		6,000	Diesel	
		4,000	Gasoline	
Pawcatuck Middle School	UST	10,000	Heating Oil	Closure-in-place
Pawcatuck Middle School	UST	10,000	Heating Oil	Installation
BOE Administration Building	UST	10,000	Heating Oil	Removal
BOE Administration Building	2 ASTs	330 Each	Heating Oil	Installation
West Broad Street School	UST	10,000	Heating Oil	Removal

Bidding Documents may be examined at the Stonington Department of Public Works, located at 152 Elm Street, Stonington, CT, between the hours of 7:00 a.m. and 3:30 p.m., Monday through Friday, legal holidays excluded.

A bid deposit shall be furnished in accordance with the Instructions to Bidders.

State of Connecticut wage rates apply to this project. The State Wage Determination is included as an attachment to Section 00800. It is the responsibility of the Contractor, before Bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed Work under this Contract.

A mandatory pre-Bid conference will be held on May 23, 2018 at 10:00 am. The meeting will begin at the Town Hall located at 152 Elm Street, Stonington, CT and will include a tour of each facility.

TOWN OF STONINGTON, CONNECTICUT

Consulting Engineer:

Tighe & Bond, Inc.

213 Court Street, Suite 1100

Middletown, CT 06457

860-704-4760

END OF SECTION

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SECTION 00200

INSTRUCTIONS TO BIDDERS

SECTION 00200

INSTRUCTIONS TO BIDDERS

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ARTICLE 1 DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions.

ARTICLE 2 COPIES OF BIDDING DOCUMENTS

- 2.1 Refer to Advertisement for Bids for information on examination and procurement of documents.
- 2.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.3 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 3 QUALIFICATIONS OF BIDDERS

- 3.1 Bidders shall be experienced in the kind of Work to be performed, shall have the necessary equipment, and shall possess sufficient capital to properly execute the Work within the time allowed. Bids received from Bidders who have previously failed to complete Work within the time required, or who have previously performed similar Work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show that he has the necessary ability, plant and equipment to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the time specified. A Bid may be rejected if Bidder is already obligated for the performance of other Work which would delay the commencement, prosecution or completion of the Work.
- 3.2 Bidders shall have a minimum of 10 years of experience and shall have successfully completed 5 underground storage tank removal and installation projects of similar scope within the past 2 years. Submit with the bid a summary of experience and representative projects and references to show compliance with these qualifications.
- 3.3 Bidders may be investigated by Owner to determine if they are qualified to perform the Work. All Bidders shall be prepared to submit within five days of Owner's or Engineer's request, written evidence of such information and data necessary to make this determination. The investigation of a Bidder will seek to determine whether the organization is adequate in size, is authorized to do business in the jurisdiction where the project is located, has had previous experience and whether available equipment and financial resources are adequate to assure Owner that the Work will be completed in accordance with the terms of the Agreement. Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of such Bidder fails to satisfy Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein.

**ARTICLE 4 SITE AND OTHER AREAS; EXISTING SITE CONDITIONS;
EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT
THE SITE**

- 4.1 The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any

additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment are to be obtained and paid for by Contractor.

4.2 Existing Site Conditions

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:
 - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. those drawings known to Owner of physical conditions in or relating to existing surface and subsurface structures at the Site (except Underground Facilities).
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
2. Copies of reports and drawings referenced above will be made available for review at Engineer's office. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in paragraph 5.06 of the General Conditions.

4.3 Site Visit and Testing by Bidders

- A. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- B. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- C. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- D. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.4 Other Work at the Site

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work for which a Bid is to be submitted. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 BIDDER'S REPRESENTATIONS

5.1 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, including any Addenda, data, and referenced items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, or performance of the Work;
- D. carefully study all reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or adjacent to the Site which have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and carefully study all reports and drawings relating to a Hazardous Environmental Condition, if any, at or adjacent to the Site which have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

- E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on 1) the cost, progress, and performance of the Work; 2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, , and 3) Bidder's safety precautions and programs;
- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the Work to be performed by Owner and others at the site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and finishing of the Work; and
- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 PRE-BID CONFERENCE

- 6.1 A mandatory pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are required to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective. Any bid submitted by a firm that does not attend the pre-Bid Conference and sign the pre-Bid Conference attendance sheet will be disqualified.

ARTICLE 7 INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the meaning or intent of the Bidding Documents shall be submitted in writing to Barbara McKrell, PE – Director of Public Works via email at: bmckrell@stonington-ct.gov, with a copy to James Sullivan, Director of Finance at jsullivan@stonington-ct.gov.

In order to receive consideration, questions must be received by the Town at least five days prior to the date fixed for the opening of Bids. Interpretations or clarifications considered necessary by the Town in response to such questions will be issued by

Addenda to all parties recorded by the Town as having attended the pre-Bid Conference not later than three days prior to the date fixed for the opening of Bids. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. Questions and answers will be posted as addenda to the invitation to bid on the Town's website, under <http://www.stonington-ct.gov/bids-rfps> and/or on the CT DAS contracting portal.

- 7.2 Addenda may be issued to clarify, correct, supplement or change the Bidding Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in paragraph 7.1.
- 7.3 The Bidder must acknowledge receipt of each Addendum, if any, in the space provided on the Bid Form.

ARTICLE 8 BID DEPOSIT

- 8.1 In the Bidding Documents, the terms "Bid security" and "Bid deposit" shall have the same meaning.
- 8.2 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% of Bidder's maximum Bid price (including any additive alternates) and in the form of a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.3 All Bid deposits of General Bidders, except those under consideration by Owner, will be returned within 5 days, excluding Saturdays, Sundays and legal holidays, after the opening of General Bids. Other Bid deposits will be returned upon the execution and delivery of the Agreement. The Bid deposit of the Successful Bidder will be retained until such bidder has furnished the required contract security and executed the Agreement, whereupon the bid deposit shall be returned. If the Successful Bidder fails to furnish the required contract security within 15 days after the Notice of Award and execute the Agreement within 5 days after receipt from Owner, Owner may annul the Notice of Award and the Bid deposit of that Bidder will be forfeited to Owner as liquidated damages for such failure.

ARTICLE 9 CONTRACT TIMES

- 9.1 The number of days within which, or the dates by which, the Work is to be:
 - A. substantially completed, and/or
 - B. completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 LIQUIDATED DAMAGES

- 10.1 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 SUBSTITUTE AND "OR EQUAL" ITEMS

- 11.1 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or equal" item of material or equipment, application for such acceptance

may not be made to and will not be considered by Engineer until after the effective date of the Contract.

ARTICLE 12 PREPARATION OF BID

- 12.1 A Bid must be made on the Bid form included with the Project Manual. The Bid form shall not be altered in any way.
- 12.2 The Bid form must be completed in ink. Blank spaces in the Bid form must be filled in correctly where indicated, and the Bidder must state, both in words and numerals, the prices for which he proposes to complete each and every item of Work. Ditto marks shall not be used.
- 12.3 A Bidder shall execute his Bid as stated below.
- A. A Bid by an individual shall show the Bidder's name and official address.
 - B. A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature) accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
 - C. A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature) and must be accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the corporate secretary. The state of incorporation and the official corporate address shall be shown.
 - D. A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
 - E. A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
 - F. All names must be printed in ink below the signature.
- 12.4 The Bid shall contain an acknowledgment of the receipt of all Addenda in the space provided on the Bid form.
- 12.5 Postal and email addresses and telephone number to which communications regarding the Bid are to be directed shall be shown.
- 12.6 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.
- 12.7 In order to be considered for selection, the Bidder must submit a complete bid package in accordance with these Bidding Documents. Partial Bids will not be accepted. Refer to the Bid Form for a list of documents that shall be submitted in addition to the Bid Form.

- 12.8 Any deviations in completion of the Bid Form and accompanying documents from the instructions provided in this Article may be cause for rejection of the Bid.

ARTICLE 13 BASIS OF BID

13.1 Lump Sum

- A. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid form and include a separate price for each alternate described in the Bidding Documents as provided for in the Bid form..
- B. The price for alternates included in the Bid form will be the amount added to the base Bid if Owner selects the alternate. In the evaluation of Bids, alternates will be applied in the same order of priority as listed in the Bid form. The award will be based on the lowest eligible Bid including all selected alternates.

13.2 Unit Prices

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The “Bid Price” (sometimes referred to as the extended price) for each unit price Bid item will be the product of the “Estimated Quantity” (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding “Bid Unit Price” offered by the Bidder. The total of all unit price Bid items will be the sum of these “Bid Prices”; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.
- D. Unit prices for identical item numbers that are in more than one bid schedule shall be equal. Discrepancies will be resolved in favor of the lowest unit price.

ARTICLE 14 SUBMITTAL OF BID

- 14.1 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement for Bids and shall be enclosed in an opaque sealed envelope plainly marked with the Project title, the name and address of Bidder, and shall be accompanied by the Bid deposit and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation “BID ENCLOSED”. When using the mail or other delivery system, the Bidder is totally responsible for the mail or other delivery system delivering the Bid at the place and prior to the time indicated in the Advertisement for Bids. A mailed Bid shall be addressed to Owner at the address in the Advertisement for Bids.
- 14.2 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15 MODIFICATION OR WITHDRAWAL OF BID**15.1 Withdrawal Prior to Bid Opening**

- A. A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.2 Modification Prior to Bid Opening

- A. If a Bidder wishes to modify its Bid prior to the Bid opening, Bidder must withdraw its initial Bid in the manner specified in paragraph 15.1.A and submit a new Bid prior to the date and time for the opening of Bids.

ARTICLE 16 OPENING OF BIDS

16.1 Bids will be opened as indicated in the Advertisement for Bids and publicly read aloud.

16.2 In order to be considered for selection, Bids must arrive at the designated location on or before the date and time specified in the Advertisement for Bids. Bidders mailing their Bids should allow for normal mail delivery time to ensure timely receipt of their Bids by Owner.

16.3 Bids received by mail or otherwise after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.

16.4 No responsibility will attach to Owner, its employees or the Engineer for premature opening of a Bid not properly addressed and identified in accordance with the Bidding Documents.

ARTICLE 17 DISQUALIFICATION OF BIDDERS

17.1 More than one Bid for the same Work from an individual, or a firm, partnership, corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder is interested.

ARTICLE 18 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.1 All Bids will remain subject to acceptance for the period of time stated in the Bid form, but Owner may, in its sole discretion, release any Bid and return the Bid deposit prior to the end of this period.

ARTICLE 19 EVALUATION OF BIDS AND AWARD OF CONTRACT

19.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities, and the right to disregard all nonconforming, nonresponsive or conditional Bids.

19.2 Owner reserves the right to reject any Bid not accompanied by specified documentation and Bid deposit.

19.3 Owner reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.

- 19.4 Owner reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.
- 19.5 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.6 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.
- 19.7 If the Owner awards the Contract for the Work, such award shall be to the responsible Bidder (who has neither been disqualified nor rejected pursuant to Article 18 or this Article 19) submitting the lowest Bid per criteria in Article 13.
- 19.8 Contents of the Bid of the Successful Bidder will become part of any contract awarded.
- 19.9 The Town will not award the proposal to any business that or person who is in arrears or in default to the Town with regard to any tax, debt, contract, security or any other obligation.

ARTICLE 20 CONTRACT SECURITIES

- 20.1 Performance and payment bonds shall be furnished by the successful Bidder. The amounts of and other requirements for performance and payment bonds are stated in Article 6 of the General Conditions. Performance and payment bonds submitted shall be posted by a recognized surety company having a place of business in the State of Connecticut. All performance and payment bonds signed by an agent must be accompanied by a certified copy of the authority to act. Performance Bonds and Payment Bonds shall be submitted on the forms included in Sections 00610 and 00615, respectively, of the Contract Documents. Additional requirements may be stated in the General or Supplementary Conditions.
- 20.2 Within 15 days from the date of the Notice of Award, the Successful Bidder shall deliver to Owner and Engineer, for review and approval, the performance bond and the payment bond he proposes to furnish at the time of the execution of the Agreement.
- 20.3 The required contract securities will become part of the Contract Documents.

ARTICLE 21 CONTRACT INSURANCE

- 21.1 The requirements for insurance to be provided by the Successful Bidder are stated in Article 6 of the General Conditions and in the Supplementary Conditions.
- 21.2 Within 15 days from the date of the Notice of Award, the Successful Bidder shall deliver evidence of required insurance to Owner and Engineer.
- 21.3 The required insurance certificates will become part of the Contract Documents.

ARTICLE 22 SIGNING OF AGREEMENT

- 22.1 The Owner will transmit the required number of unsigned Agreements to the Successful Bidder with the Notice of Award. Within 15 days of the date of the Notice of Award, the Successful Bidder shall sign the Agreements and return them to the Owner. The Owner will return one executed Contract to the Successful Bidder.

ARTICLE 23 SALES TAXES

- 23.1 Owner is exempt from Connecticut State sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. The exemption certificate will be provided to the Successful Bidder.

ARTICLE 24 CONNECTICUT PREVAILING WAGE RATES

- 24.1 Minimum Wage Rates as determined by the Connecticut State Labor Commissioner as required under Section 31-53(g) of the Connecticut General Statutes as amended, apply to this project unless the total Bid is less than \$400,000 for new construction or \$100,000 for remodeling, refinishing, refurbishing, rehabilitation, alteration or repair projects. The Wage Rate Determination is included in Part II of the Supplementary Conditions.
- 24.2 It is the responsibility of the Bidder before bid opening to request any additional information on Minimum Wage Rates for those tradespeople who may be employed for the proposed Work under this Contract.

END OF SECTION

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SECTION 00410

BID FORM

SECTION 00410

FORM FOR GENERAL BID #2018-004

PROJECT IDENTIFICATION:

Underground Storage Tank Replacement Project

Town of Stonington, Connecticut

TABLE OF ARTICLES

1. Bid Recipient
2. Bidder's Acknowledgements
3. Bidder's Representations
4. Bidder's Certifications
5. Basis of Bid
6. Time of Completion
7. Attachments to This Bid
8. Bid Submittal

ARTICLE 1 - BID RECIPIENT

- 1.1 This Bid is submitted to:

Town of Stonington
Department of Finance
152 Elm Street
Stonington, CT 06378

- 1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS

- 2.1 Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders, including without limitation, those dealing with the disposition of Bid deposit. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

- 3.1 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:
- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents and hereby acknowledges the receipt of all Addenda.

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- K. Bidder is aware that the estimated quantities on the Bid Form are subject to Article 13.03 of the General Conditions (Section 00700).

ARTICLE 4 - BIDDER'S CERTIFICATION

- 4.1 Bidder certifies that, under penalty of perjury, Bidder is not presently debarred from doing public construction work in the State of Connecticut under the provisions of Section 31-53a of the Connecticut General Statutes or any other applicable debarment provisions of any other chapter of the General Statutes or any rule or regulation promulgated thereunder; and

is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

- 4.2 Bidder hereby certifies under the penalties of perjury, to the best of Bidder's knowledge and belief, that Bidder has filed all State tax returns and paid all State taxes required by law.
- 4.3 Bidder certifies that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
- 4.4 Bidder certifies that Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- 4.5 Bidder certifies that Bidder has not solicited or induced any individual or entity to refrain from bidding.
- 4.6 Bidder certifies that Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:
 - A. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - B. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of the Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - C. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - D. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 - BASIS OF BID

- 5.1 Bidder proposes to furnish all labor and materials required for construction of the Underground Storage Tank Replacement Project, Stonington, CT in accordance with the accompanying Bidding Documents prepared by Tighe & Bond, Inc., for the Contract Price specified below, subject to additions and deductions according to the terms of the Bidding Documents.
- 5.2 This Bid includes Addenda numbered _____.
- 5.3 The proposed Base Bid is (including Items 1 through 15, excluding alternates):
 _____ dollars
 (words)
 (\$ _____)
 (figures)

Alternate No. 1 – Veeder Root TLS 350 at Town Dock

Add \$ _____ dollars

Alternate No. 2 – Fuel Master FMU 3500 at Town Dock

Add \$ _____ dollars

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
1	Mobilization and Demobilization, per lump sum, the price of: _____ (\$ _____) Not to exceed 5 percent of the total Base Bid price	Lump Sum =	\$ _____
2	Town Dock – Removal of one 20,000-gallon single-walled steel underground storage tank, piping, and ancillary equipment, as shown on the Drawings: _____ (\$ _____)	Lump Sum =	\$ _____
3	Town Dock – Installation of one new 20,000-gallon UL 2085 listed underground storage tank, piping, pipe rack, transition sumps, remote fill, concrete pad, fence, and ancillary equipment, to include associated site work, as shown on the Drawings: _____ (\$ _____)	Lump Sum =	\$ _____
4	Department of Public Works – Removal of one 6,000-gallon and one 4,000-gallon single-walled fiberglass underground storage tanks, piping, and ancillary equipment, as shown on the Drawings: _____ (\$ _____)	Lump Sum =	\$ _____

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
5	Department of Public Works – Installation of one new 10,000-gallon compartmentalized (4,000/6,000-gallon) double-walled fiberglass, brine filled underground storage tank, electronic monitoring system, two new dispenser sumps, piping, and ancillary equipment, to include associated site work, as shown on the Drawings:		

	(\$ _____)	Lump Sum =	\$ _____
6	Department of Public Works – Temporarily provide one 3,000-gallon UL2085 aboveground storage tanks, piping, dispensers, and ancillary equipment for diesel fleet fueling for the duration of time the Department of Public Works system is non-operational including concrete cure time, as shown on the Drawings:		

	(\$ _____)	Lump Sum =	\$ _____
7	Pawcatuck Middle School - Closure-in-place of one 10,000-gallon single-walled steel underground storage tank; piping, and ancillary equipment:		

	(\$ _____)	Lump Sum =	\$ _____
8	Pawcatuck Middle School - Installation of one new 10,000-gallon double-walled fiberglass, brine filled underground storage tank, electronic monitoring system, piping, and ancillary equipment, to include associated site work, as shown on the Drawings:		

	(\$ _____)	Lump Sum =	\$ _____
9	BOE Administration Building – Removal of one 10,000-gallon single-walled steel underground storage tank, piping, and ancillary equipment, to include associated site work:		

		Lump Sum =	\$ _____

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
	(\$ _____)		
10	BOE Administration Building – Installation of two new 330-gallon UL 80 listed aboveground steel fuel storage tank, piping, and ancillary equipment, as shown on the Drawings:		
	(\$ _____)	Lump Sum =	\$ _____
11	West Broad Street School – Removal of one 10,000-gallon single-walled steel underground storage tank, piping, and ancillary equipment, to include associated site work:		
	(\$ _____)	Lump Sum =	\$ _____
12	Removal, transportation, and disposal of residual fuel and sediment from tank removal/closure, per gallon, the price of:		
	(\$ _____)	x 1,800 gallons	\$ _____
13	Removal, transportation, and disposal of up to 1,000 tons of contaminated soil, per ton, the price of:		
	(\$ _____)	x 1,000 tons	\$ _____
14	Backfilling and compaction of contaminated soil excavation areas, per ton, the price of:		
	(\$ _____)	X 1,000 tons	\$ _____

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
15	Bituminous concrete pavement for restoration of contaminated soil excavation areas, per square foot, the price of:		
	_____	X 3,000 sf	\$ _____
	(\$ _____)		

ARTICLE 6 - TIME OF COMPLETION

- 6.1 Bidder agrees that the Work will be substantially completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.2 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times as stated in the Agreement.

ARTICLE 7 - ATTACHMENTS TO THIS BID

- 7.1 The following documents are attached to and made a condition of this Bid:

Bid deposit in the amount of _____ dollars (\$ _____), consisting of a bid bond in the amount of five percent of the total amount of Bid

- A. Evidence of authority to sign
- B. List of Project References
- C. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids
- D. Evidence of Bidder's qualifications in accordance with Article 3 of Section 00200

BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By:

[Signature]

[Printed name]

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

[Signature]

[Printed name]

Title:

Submittal Date:

Address for giving notices:

Telephone Number:

Fax Number:

Contact Name and e-mail address:

Bidder's License No.:

(where applicable)

END OF SECTION

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SECTION 00430

BID BOND

BID BOND

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

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____ By: _____
Signature Signature (Attach Power of Attorney)

Print Name Print Name

Title Title

Attest: _____ Attest: _____
Signature Signature

Title Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00520

AGREEMENT

SECTION 00520

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION
CONTRACT

This Agreement is made this _____ day of _____ in the year two thousand eighteen between the Town of Stonington, Connecticut, and the Stonington Board of Education, hereinafter called Owner and _____ hereinafter called Contractor.

Owner and Contractor hereby agree as follows:

ARTICLE 1 WORK

- 1.1 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described with the following title: "Town of Stonington, Underground Storage Tank Replacement Project".

ARTICLE 2 ENGINEER

- 2.1 The part of the Project that pertains to the Work has been designed by Tighe & Bond, Inc
- 2.2 The Owner has retained Tighe & Bond ("Engineer") to act as Owner's representative, assuming all duties and responsibilities, rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 3 CONTRACT TIMES

3.1 Time of the Essence

- A. All time limits for Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

3.2 Substantial Completion and Final Payment

- A. The Work will be substantially completed within 220 days from the date of the Notice to Proceed and completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions within 250 days from the date of the Notice to Proceed.
- B. All Work must be completed at the West Broad Street School and Pawcatuck Middle School between July 1, 2018 and August 17, 2018.
- C. All Work must be completed at the Town Dock between September 3, 2018 and October 5, 2018.
- D. Work at the Department of Public Works, including cure time for concrete, shall be completed prior to October 31, 2018.

3.3 Liquidated Damages

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 3.1 above and that Owner will suffer financial and other losses if the Work is not completed within the times specified in Paragraph 3.2 above, plus any extensions

thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner \$500 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 3.1 above for Substantial Completion until the Work is substantially complete.
2. Complete and Ready for Final Payment: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the Work within the Contract Time (as duly adjusted pursuant to the Contract), for completion and readiness for final payment, Contractor shall pay Owner \$1,000 for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 4 CONTRACT PRICE

- 4.1 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount equal to the prices stated in Contractor's Bid, attached hereto as an exhibit, subject to adjustment under the Contract.

ARTICLE 5 PAYMENT PROCEDURES

- 5.1 Applications for Payment shall be processed in accordance with Article 15 of the General Conditions.
- 5.2 Owner shall make progress payments on account of the Contract Price on the basis of processed Applications for Payment monthly during construction, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All progress payments will be measured by the Schedule of Values established as provided in the General Conditions, or in the event there is no schedule of values, as provided elsewhere in the Contract.
- 5.3 Owner shall retain from progress payments 5 percent of the value of Work completed.
- 5.4 Substantial Completion
 - A. Upon Substantial Completion at the request of the Contractor, Owner shall pay an amount sufficient to increase total payments to Contractor to ninety-nine percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment. Total fee not to exceed without prior written authorization by the Town.
- 5.5 Final Payment

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 6 CONTRACTOR'S REPRESENTATIONS

6.1 Contractor makes the following representations:

- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
- B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.
- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 7 CONTRACT DOCUMENTS

7.1 Contents

- A. The Contract Documents consist of the following:
1. This Agreement (pages 00520-1 to 00520-7, inclusive);
 2. Performance Bond (pages 1 to 3, inclusive);
 3. Payment Bond (pages 1 to 3, inclusive);
 4. General Conditions (title pages, table of contents, and pages 1 to 65, inclusive);
 5. Supplementary Conditions (pages 00800-1 to 00800-13, inclusive);
 6. Specifications (Divisions 1 through 16);
 7. Drawings (not attached but incorporated by reference) consisting of a cover sheet and sheets numbered 1 through 9, inclusive, with each sheet bearing the following general title: Underground Storage Tank Replacement Project;
 8. Addenda (numbers _____ to _____, inclusive);
 9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 00410-1 to 00410-7, inclusive);
 10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed;
 - b. Work Change Directives;
 - c. Change Order(s);
 - d. Field Orders
- B. The documents listed in Paragraph 7.1.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 8 MISCELLANEOUS

8.1 Terms

- A. Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

8.2 Assignment of Contract

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

8.3 Successors and Assigns

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

8.4 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.5 Contractor Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.5:
 - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.6 Other Provisions

- A. Owner stipulates that the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and Owner has plainly shown all modifications to the standard wording of such published document to the Contractor in the Supplementary Conditions.

8.7 Designated Representatives

- A. Owner (The Town) designates Barbara McKrell, Director of Public Works, as its designated representative for the work to be performed at sites under the control of the Town, and designates Bill King, Director of Operations and Facilities, as its designated representative for the work to be performed at sites under the control of the Board of Education, under this Agreement. Such designation may be changed by Owner from time to time by written notice to Contractor.

The Contractor designates _____ as its designated representative under this Agreement. Such designation may be changed by the Contractor from time to time by written notice to the Owner.

8.8 Legal Jurisdiction/Waivers

- A. This Agreement shall be governed by the laws of the State of Connecticut both as to interpretation and performance. In the event of a dispute, the parties shall negotiate in good faith. Should the dispute remain unresolved after such good faith effort, either party may pursue their legal remedies in the Superior Court of the State of Connecticut, New London County, for all purposes in connection with any action or proceeding which arises from or relates to this Agreement.
- B. THE CONTRACTOR AND OWNER HEREBY EXPRESSLY WAIVE ANY AND ALL RIGHTS THEY MAY HAVE TO TRIAL BY JURY OF ANY CLAIM, DEMAND, ACTION OR CAUSE OF ACTION (1) ARISING UNDER THIS AGREEMENT OR ANY OTHER INSTRUMENT, DOCUMENT OR AGREEMENT EXECUTED OR DELIVERED IN CONNECTION HERewith, OR (2) IN ANY WAY CONNECTED WITH OR RELATED OR INCIDENTAL TO THE DEALINGS OF THE PARTIES HERETO OR ANY OF THEM WITH RESPECT TO THIS AGREEMENT OR ANY OTHER INSTRUMENT, DOCUMENT OR AGREEMENT EXECUTED OR DELIVERED IN CONNECTION HERewith, OR THE TRANSACTIONS RELATED HERETO OR THERETO, IN EACH CASE WHETHER NOW EXISTING OR HEREAFTER ARISING, AND WHETHER SOUNDING IN CONTRACT OR TORT OR OTHERWISE; AND THE CONTRACTOR HEREBY AGREES AND CONSENTS THAT ANY SUCH CLAIM, DEMAND, ACTION OR CAUSE OF ACTION SHALL BE DECIDED BY COURT TRIAL WITHOUT A JURY, AND THE OWNER MAY FILE AN ORIGINAL COUNTERPART OR A COPY OF THIS SECTION WITH ANY COURT AS WRITTEN EVIDENCE OF THE CONTRACTOR'S CONSENT TO THE WAIVER OF ITS RIGHT TO TRIAL BY JURY. Except as prohibited by law, the Contractor waives any right which it may have to claim or recover in any litigation referred to in the preceding sentence any special, exemplary, punitive or consequential damage or any damages other than, or in addition to, actual damages. The Contractor (a) certifies that neither the owner nor any representative, agent or attorney of the owner has represented, expressly or

otherwise, that the owner would not, in the event of litigation, seek to enforce the foregoing waivers, and (b) acknowledges that, in entering into the Agreement, the owner is relying upon, among other things, the waivers and certifications contained in this Section 8.8.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. This Agreement will be effective on _____, _____ (which is the Effective Date of the Contract).

OWNER #1:

By: _____

Name: Mr. Rob Simmons

Title: First Selectman

Town of Stonington, CT

By: _____

[CORPORATE SEAL]

Attest: _____

Title: Town Clerk

Address for giving notices:

Mr. Rob Simmons, First Selectman

152 Elm Street

Stonington, CT 06378

CONTRACTOR:

By: _____

Title: _____

[CORPORATE SEAL]

Attest: _____

Title: _____

Address for giving notices:

Attn:

License No. _____

(If Contractor is a corporation or a partnership,
attach evidence of authority to sign.)

OWNER #2:

By: _____

Name: Dr. Van Riley

Title: Superintendent of Schools

Stonington Board of Education

By: _____

[CORPORATE SEAL]

Attest: _____

Title: _____

Address for giving notices:

Dr. Van Riley

49 No. Stonington Road

PO Box 479

Old Mystic, CT 06372

Certified as to the availability of funds:

Date

Signed

Title

END OF SECTION

J:\S\S5015 Stonington\001-UST Project\Design\Specifications\00520.docx

SECTION 00610

PERFORMANCE BOND

PERFORMANCE BOND

CONTRACTOR *(name and address):*

SURETY *(name and address of principal place of business):*

OWNER *(name and address):*

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract):*

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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

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

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

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

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

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

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

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

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

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

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence,

to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

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

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

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

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

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

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

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

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

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

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

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

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

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

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

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims

for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

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

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

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

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

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

16. Modifications to this Bond are as follows:

SECTION 00615

PAYMENT BOND

PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the

Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

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

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

16. Definitions

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

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

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

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

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

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

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

18. Modifications to this Bond are as follows:

SECTION 00700

GENERAL CONDITIONS

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 2. a preliminary Schedule of Submittals; and

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

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

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

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

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

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

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
 - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

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

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

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

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

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

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

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

- B. *Cash Allowances*: Contractor agrees that:
 - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

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

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

- A. *Application for Payment:*
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work:*** The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:*** Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00800

SUPPLEMENTARY CONDITIONS

SECTION 00800

SUPPLEMENTARY CONDITIONS

PART 1 AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

The address system used in the Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Delete paragraph 1.01A.38 in its entirety and insert the following in its place:

1.01A.38. Specifications – Sections included under Division 1 through Division 16 of the Project Manual.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02 Delete paragraph 2.02A in its entirety.

ARTICLE 3 –DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01 Replace paragraph 3.01E with the following paragraph:

3.01E In the event of conflicts, inconsistencies or discrepancies among the Contract Documents, to the extent applicable, the better quality or greater quantity of work shall be provided without change to the Contract Price. In the event of such conflicts, inconsistencies or discrepancies which do not relate to the quality or quantity of work, the Contractor shall request clarifications or interpretations from the Engineer as provided herein.

SC-3.01 Add the following new paragraph immediately after paragraph 3.01E:

3.01F Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Delete paragraph 4.01A in its entirety and insert the following in its place:

4.01A The Contract Times will commence to run on the date specified in the Notice to Proceed.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.03 Add the following new paragraphs immediately after paragraph 5.03B.3:

5.03C The following drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) are known to the Owner. Copies of these items may be examined by appointment at Owner's office during regular business hours.

5.03C.1 The Drawings below represent the historical documentation of the conditions of the sites. All of the information in such drawings constitutes "technical data" on which Contractor may rely.

Additions and Alterations to Stonington Town Hall, dated December 2005, prepared by Jacunski Humes Architects, LLC.

Stonington Town Dock, Stonington, CT, dated October 2008, prepared by the Town of Stonington Department of Public Works.

Topographic Survey Stonington Town Docks, Stonington, Connecticut, dated March 2009, prepared by Resource Management and Mapping.

5.03D The reports and drawings identified above are not part of the Contract Documents, but the Technical Data contained therein on which the Contractor may rely, as expressly identified and established above, are incorporated in the Contract Documents by reference. Contractor is not entitled to rely upon any other information and data known to or identified by Owner or Engineer.

ARTICLE 6 - BONDS AND INSURANCE

SC-6.03 Add the following new paragraph immediately after paragraph 6.03B.3:

6.03B.4 Insurance certificate(s) shall also contain the following:

1. Confirmation that the General Liability policy covers only the Work under this Contract, with project specific limits.

2. Confirmation that automobile insurance covers all Scheduled, Hired and Non-Owned vehicles.
3. Names of all additional insureds as specified herein.

SC-6.03 Add the words “and Paragraph 6.04” after the words “Paragraph 6.03” in Paragraph 6.03I.

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:
 6.03.K The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers’ Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

Workers’ Compensation:	<u>Statutory</u>
Employer’s Liability:	
Bodily injury, each accident	<u>\$500,000</u>
Bodily injury by disease, each employee	<u>\$500,000</u>
Bodily injury/disease aggregate	<u>\$500,000</u>

2. Contractor’s Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate	<u>\$3,000,000</u>
Products - Completed Operations Aggregate	<u>\$3,000,000</u>
Personal and Advertising Injury	<u>\$1,000,000</u>
Each Occurrence (Bodily Injury and Property Damage)	<u>\$1,000,000</u>
Damage to Rented Premises	<u>\$300,000</u>
Medical Expenses	<u>\$10,000</u>

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury:	
Each person	<u>\$1,000,000</u>
Each accident	<u>\$1,000,000</u>
Property Damage:	
Each accident	<u>\$1,000,000</u>
[or]	
Combined Single Limit of	<u>\$1,000,000</u>

4. Excess or Umbrella Liability:

Per Occurrence	<u>\$5,000,000</u>
General Aggregate	<u>\$5,000,000</u>

5. Contractor's Pollution Liability:

Each Occurrence	<u>\$1,000,000</u>
General Aggregate	<u>\$1,000,000</u>

☐ If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

6. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following:

- a. Tighe & Bond, Inc.
213 Court Street, Suite 1100
Middletown, CT 06457
- b. Town of Stonington
152 Elm Street
Stonington, CT 06378
- c. Town of Stonington Board of Education
49 No. Stonington Road
Old Mystic, CT 06372

SC-6.04 Delete paragraph 6.04 in its entirety and insert the following in its place:

6.04 Contractor shall purchase and maintain a separate Owner's Protective Liability policy, issued to Owner at the expense of Contractor, including Owner and Engineer as named insureds. This insurance shall provide coverage for not less than the following amounts:

Bodily Injury	<u>\$1,000,000</u>	Each Occurrence
	<u>\$1,000,000</u>	Aggregate
Property Damage	<u>\$1,000,000</u>	Each Occurrence
	<u>\$1,000,000</u>	Aggregate

- A. Insurance coverage for the Contractor's Comprehensive General and Excess Liability policies and for the Owner's Protective Liability policy shall be written by one and the same insurance company to avoid the expense of duplicate and/or overlapping coverage and to facilitate and expedite the settlement of claims.
- B. The Owner's Protective Liability policy shall protect from claims which may arise from operations under the Contract, including operations performed for a named insured by independent contractors and general

inspection or monitoring by a named insured. The policy also shall protect against Automobile Non-Ownership Liability in connection with the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

SC-6.05 Add the following new subparagraph after subparagraph 6.05.A.1:

6.05.A.1.a In addition to Owner, Contractor, and all Subcontractors, include as insureds the following:

- 1) Tighe & Bond
213 Court Street, Suite 1100
Middletown, CT 06457
- 2) Town of Stonington
152 Elm Street
Stonington, CT 06378
- 3) Town of Stonington Board of Education
49 No. Stonington Road
Old Mystic, CT 06372

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Add the following new paragraph immediately after paragraph 7.02B.

7.02C Whenever Owner shall notify Contractor in writing that any person on the Work appears to be incompetent, disorderly, or otherwise unsatisfactory, such person shall be removed from the Project and shall not again be employed on it except with the consent of Owner.

SC-7.07 Delete paragraph 7.07B in its entirety and replace it with the following:

7.07B Not used.

SC-7.08 Delete the word "Owner" in the last sentence of Paragraph 7.08A and replace with the word "Contractor."

SC-7.09 Add the following sentence at the end of paragraph 7.09.A.

All materials provided under this Contract are exempt from the Sales and Use Taxes of the State of Connecticut. The exemption certificate will be provided to the Contractor.

SC-7.18 Add the following new paragraph immediately after paragraph 7.18.C.

7.18D If, through acts of neglect on the part of Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the Work, Contractor

shall settle with such other Contractor or Subcontractor by agreement or arbitration if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against Owner on account of any such damage alleged to have been sustained, Owner shall notify Contractor, who shall indemnify, defend, and save harmless Owner against any such claim.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

- B. On this Project, by agreement with the Owner, Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

SC-11.06 Insert the following sentence at the end of Paragraph 11.06.A.2:

If Engineer does not take action on the Change Proposal and neither Owner nor Contractor submit a letter to the other party indicating that the Change Proposal is deemed denied, then the Change Proposal shall be deemed denied after 60 days of Engineer’s receipt of the Contractor’s supporting data, thereby commencing the time for appeal of the denial under Article 12.

ARTICLE 13 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01 Delete the word “superintendents,” in the second sentence after the word “limitation,” in paragraph 13.01B.1.

SC-13.01 Delete paragraph 13.01B.5.c in its entirety and replace with the following:

13.01B.5.c The fair rental and operating cost of all machinery and equipment used on the extra work for the period of such use. The fair rental and operating cost for all machinery and equipment shall be based upon the most recent edition of “Rental Rate Bluebook for Construction Equipment” (the “Bluebook”), published by Equipment Watch (equipmentwatch.com), or a similar publication approved by Engineer and adjusted for regional and age adjustments as specified in the “Bluebook.” Rental periods corresponding to the overall period of use shall be used, except if a piece of equipment used on extra work is already on the job, or has previously been rented for a long period of time (months), then the long-term rental rate (monthly) shall be used in determining costs. The hourly rental rate for long-term rental equipment will be determined by the monthly rental rate divided by 176.

For the situation where equipment is on the job and available for use but cannot be used due to a delay or suspension of a portion or all of the Contract activities, a rental standby rate may be paid if the Contractor can conclusively demonstrate to the satisfaction of the Engineer that: (1)

the equipment cannot be used elsewhere on the Project or demobilized and remobilized at a cost lower than the cost of standby time, (2) that the equipment cannot be put in use due to factors beyond the Contractor's control, and (3) the equipment on standby would have been used as part of the Work that is suspended or put on hold. The standby rate will be calculated as no more than 50% of the rental rate as listed in the "Bluebook" and adjusted for regional and age adjustments. Lesser standby rates may apply if the Owner or Engineer can demonstrate that the Contractor's standby cost is less than this rate. The standby rate will not include operating costs. A standby rate will not be paid for equipment which is being employed for portions of the Work which are still underway. A standby rate will also not be paid for equipment which is readily demobilized including construction equipment categorized as "shop tools" or "miscellaneous" in the "Bluebook." Standby rates for durations of less than four hours will not be considered.

SC-13.01 Insert in the first sentence after the word "architects," the word "superintendents," in paragraph 13.01C.1

SC-13.01 Add the following new paragraph immediately after paragraph 13.01C.5:

13.01C.6 Costs of or rental of small tools; costs of or rental of buildings.

SC-13.03 Delete Paragraph 13.03B in its entirety and replace it with the following:

13.03B Since subject to change upon determination of actual quantities, estimated quantities of items of Unit Price Work are not guaranteed and serve to facilitate comparison of Bids and to determine an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-14.02 Insert after the word "notice" the words "(minimum 24 hours)" in paragraph 14.02A.

SC-14.03 Delete paragraph 14.03B in its entirety and replace with the following:

14.03B *Engineer's Authority:* At any time during the progress of the Work, Engineer shall have the authority to determine whether Work is defective, and reject defective Work, even though such work has been previously inspected and paid for.

SC-14.06 Add the following new paragraph immediately after paragraph 14.06A.

14.06B If Owner stops work under Paragraph 14.06, Contractor shall not be entitled to an extension of Contract Time nor to an increase in Contract Price.

ARTICLE 15 - PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01 Insert the following sentence at the end of paragraph 15.01B.1:

The Certificate of Insurance for stored materials must list Tighe & Bond and the Town of Stonington as additional insureds.

SC-15.01 Delete paragraph 15.01D.1 in its entirety and insert the following in its place:

15.01D.1 Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

SC-15.03 Delete the second sentence in Paragraph 15.03A in its entirety.

SC-15.03 Delete paragraph 15.03C in its entirety and insert the following in its place:

15.03C If, after consultation with Owner, Engineer considers and the Owner agrees that the Work is substantially complete, Engineer will prepare and deliver to Contractor, in a form approved by Owner, a Certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be included with the certificate a list of items to be completed or corrected before final payment.

SC-15.03 Delete the word "preliminary" from paragraph 15.03D.

SC-15.04 Add the following new paragraph immediately after paragraph 15.04A.3:

15.04A.4 Owner may at any time request Contractor in writing to permit Owner to take over operation of any part of the Work although it is not substantially complete. A copy of such request will be sent to Engineer, and within a reasonable time thereafter Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If Contractor does not object in writing to Owner and Engineer that such part of the Work is not ready for separate operation by Owner, Engineer will finalize the list of items to be completed or corrected and will deliver such lists to Owner and Contractor together with a written recommendation as to the division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, maintenance, utilities, insurance, warranties, and guarantees for that part of the Work which will become binding upon Owner and Contractor at the time when Owner takes over such operation (unless they shall have otherwise agreed in writing and so informed Engineer). During such operation and prior to Substantial Completion of such part of the Work, Owner shall allow Contractor reasonable access to complete or correct items on said list and to complete other related Work.

Paragraph 15.04.A.4 shall be renumbered to 15.04.A.5

SC-15.06 Delete paragraph 15.06.D in its entirety and insert the following in its place:

- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, or other time period in accordance with applicable laws and regulations, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

SC- 16.02 Add the following new paragraph immediately after paragraph 16.02.A.4:

- 16.02.A.5 If Contractor abandons the Work, or sublets this Contract or any part thereof, without the previous written consent of Owner, or if the Contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified.

ARTICLE 18 - MISCELLANEOUS

SC-18.08 Add the following new paragraphs immediately after paragraph 18.08.

18.09 Wage Rates

- A. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of these Contract Documents. Copies of the wage schedules are included in Part II of these Supplementary Conditions. If it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials administering the laws mentioned above. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation.
- B. The schedules of wages referred to above are minimum rates only, and Owner will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of the applicable rate contained in these Contract Documents. All disputes in regard to the payment of wages in excess of those specified in the schedules shall be resolved by Contractor.

- C. The said schedules of wages shall continue to be the minimum rates to be paid during the life of this Agreement and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the work.

PART II – FEDERAL AND STATE GOVERNMENT PROVISIONS

Federal and State Government Provisions referenced or included herein, have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with paragraph 3.01.F of the Supplementary Conditions.

1.0 STATE PROVISIONS

- 1.1 Applicable provisions of Connecticut General Statutes and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Code of Federal Regulation exist, the more stringent requirements shall apply.
- 1.2 This project is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR, Part 1926 and to all subsequent amendments, and to the Connecticut Department of Labor Regulations. Contractors shall be familiar with the requirements of these regulations
- 1.3 Connecticut Prevailing Wage Rates are included in Attachment B of these Supplementary Conditions.

END OF SECTION

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ATTACHMENTS TO SUPPLEMENTARY CONDITIONS

**ATTACHMENT A
CONNECTICUT STATE WAGE RATES**



Prevailing Wage Rates System

Annual Adjusted July 1st Rates

[DOL Web Site](#) ● [Wage and Workplace Issues](#) ● [Wage Rates](#) ● [Building Rates - Stonington](#)

Building Rates - Stonington (effective July 1, 2017)

Classification	Hourly Rate	Benefits
1a) Asbestos Worker/Insulator (Includes application of insulating materials, protective coverings, coatings, & finishes to all types of mechanical systems; application of firestopping material for wall openings & penetrations in walls, floors, ceilings)	\$38.25	27.96
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	\$39.00	28.76
2) Boilermaker	\$38.34	26.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	\$33.48	30.61 + a
3b) Tile Setter	\$34.90	24.69
3c) Terrazzo Mechanics and Marble Setters	\$31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	\$26.70	21.02
3e) Plasterer	\$33.48	30.61
-----LABORERS-----		
4) Group 1: Laborers (common or general), acetylene burners, carpenter tenders, concrete specialists, wrecking laborers, fire watchers.	\$29.25	19.50
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	\$29.50	19.50
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	\$29.75	19.50
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the m	\$29.75	19.50
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	\$29.75	19.50
4e) Group 6: Blasters, nuclear and toxic waste removal.	\$31.00	19.50
4f) Group 7: Asbestos/lead removal and encapsulation (except its removal from mechanical systems which are not to be scrapped).	\$30.25	19.50
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	\$28.38	19.50
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	\$27.86	19.50
4i) Group 10: Traffic Control Signalman	\$16.00	19.50
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	\$32.60	25.34

5a) Millwrights	\$33.14	25.74
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	\$39.15	25.17+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	\$50.14	31.585+a+b
-----LINE CONSTRUCTION-----		
Groundman	\$25.93	6.5% + 8.53
Linemen/Cable Splicer	\$47.14	6.5% + 20.98
8) Glazier (Trade License required: FG-1,2)	\$35.58	20.15 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	\$35.47	33.39 + a
----OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	\$39.30	24.05 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	\$38.98	24.05 + a
Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive pow	\$38.24	24.05 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	\$37.85	24.05 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	\$37.26	24.05 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	\$37.26	24.05 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	\$36.95	24.05 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrell).	\$36.61	24.05 + a
Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	\$36.21	24.05 + a
Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).	\$35.78	24.05 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	\$33.74	24.05 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	\$33.74	24.05 + a
Group 12: Wellpoint operator.	\$33.68	24.05 + a
Group 13: Compressor battery operator.	\$33.10	24.05 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	\$31.96	24.05 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	\$31.55	24.05 + a
Group 16: Maintenance Engineer/Oiler.	\$30.90	24.05 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	\$35.21	24.05 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	\$32.79	24.05 + a
-----PAINTERS (Including Drywall Finishing)-----		

10a) Brush and Roller	\$32.02	20.15
10b) Taping Only/Drywall Finishing	\$32.77	20.15
10c) Paperhanger and Red Label	\$32.52	20.15
10e) Blast and Spray	\$35.02	20.15
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	\$41.62	30.36
12) Well Digger, Pile Testing Machine	\$33.01	19.40 + a
13) Roofer (composition)	\$34.92	19.28
14) Roofer (slate & tile)	\$35.42	19.28
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	\$37.18	34.29
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	\$41.62	30.36
-----TRUCK DRIVERS-----		
17a) 2 Axle	\$29.13	22.32 + a
17b) 3 Axle, 2 Axle Ready Mix	\$29.23	22.32 + a
17c) 3 Axle Ready Mix	\$29.28	22.32 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	\$29.33	22.32 + a
17e) 4 Axle Ready Mix	\$29.38	22.32 + a
17f) Heavy Duty Trailer (40 Tons and Over)	\$29.58	22.32 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	\$29.38	22.32 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	\$43.92	15.84 + a
19) Theatrical Stage Journeyman	\$25.76	7.34

Welders: Rate for craft to which welding is incidental.

*Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.

**Note: Hazardous waste premium \$3.00 per hour over classified rate.

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:

- 1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)
- 2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
- 3) Cranes (under 100 ton rated capacity)

- Crane with boom including jib, 150 feet - \$1.50 extra.
- Crane with boom including jib, 200 feet - \$2.50 extra.
- Crane with boom including jib, 250 feet - \$5.00 extra.
- Crane with boom including jib, 300 feet - \$7.00 extra.
- Crane with boom including jib, 400 feet - \$10.00 extra.

~ ~ ~ All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen

hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journey person instructing and supervising the work of one apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ctdol.state.ct.us.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage.

All Persons who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

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

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

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DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Work of the Contract is shown and described in Drawings and Project Manual entitled:

Underground Storage Tank Replacement Project
Town of Stonington
Department of Public Works

Tighe & Bond, Inc.
Consulting Engineers
Middletown, Connecticut

2. The Work includes the following major items:
 - a. Removal of one 20,000-gallon underground fuel storage tank system located at the Town Dock.
 - b. Installation of one 20,000-gallon underground fuel storage tank system at the Town Dock.
 - c. Removal of one 4,000-gallon and one 6,000-gallon underground fuel storage tank system located at the Department of Public Works.
 - d. Installation of one 10,000-gallon (Compartmentalized 6,000/4,000-gallon) aboveground fuel storage tank systems at the Department of Public Works.
 - e. Temporary installation of one 3,000-gallon tanks for diesel fleet fueling at the Department of Public Works.
 - f. Closure in place of one 10,000-gallon underground fuel storage tank system located at Pawcatuck Middle School.
 - g. Installation of one 10,000-gallon underground fuel storage tank system at Pawcatuck Middle School.
 - h. Removal of one 10,000-gallon underground fuel storage tank system located at the BOE Administration Building.
 - i. Installation of two 330-gallon aboveground fuel storage tank system in the BOE Administration Building.
 - j. Removal of one 10,000-gallon underground fuel storage tank system located at West Broad Street School.

B. Related Requirements

1. Section 00700 – General Conditions
2. Section 00800 - Supplementary Conditions

1.2 SUBMITTALS

A. Informational Submittals

1. Submit copies of permits or approvals required for the Work, prior to initiating the Work.

1.3 EXISTING SYSTEM DESCRIPTION

- A. Town Dock: The 20,000-gallon underground fuel storage tank and concrete vault below that is to be removed is constructed of single-wall steel with steel piping. This tank provides fuel to two dispensers on the Dock for boat fueling. The exact locations of the buried piping and conduit are not known, locations shown on the plan are assumed. Soil contamination originating from the existing tank or a pre-existing tank has been identified.
- B. Department of Public Works: The 6,000-gallon and 4,000-gallon underground fuel storage tanks that are to be removed are constructed of single-wall fiberglass with steel piping. Each tank provides fuel to a dispenser for fleet fueling. The exact locations of the buried piping and conduit are not known, locations shown on the plan are assumed.
- C. Pawcatuck Middle School: The 10,000-gallon underground fuel storage tank that is to be closed-in-place is constructed of single-wall steel with copper and steel piping. This tank provides backup/alternative fuel to the school's boiler. The boiler typically burns natural gas. The exact locations of the buried piping and conduit are not known, locations shown on the plan are assumed. The tank is located within close proximity to the school's walls on the north, east, and south sides of the tank. The building section to the north of the tank was constructed on a concrete slab foundation; the building sections to the east and south of the tank have basements. A generator and transformer are located within 20 feet to the south of the underground storage tank system. A catch basin with drainage from the roofs is located within 20 feet to the east of the underground storage tank system.
- D. BOE Administration Building: The 10,000-gallon underground fuel storage tank that is to be removed is constructed of single-wall steel with copper and steel piping. This tank provides backup/alternative fuel to the building's boiler. The exact locations of the buried piping and conduit are not known, locations shown on the plan are assumed.
- E. West Broad Street School: The 10,000-gallon underground fuel storage tank that is to be removed is constructed of single-wall steel with copper and steel piping. This tank has been removed from operation. The exact locations of the buried piping and conduit are not known, locations shown on the plan are assumed.

1.4 PROJECT/SITE CONDITIONS

A. Permits

1. Obtain the permits and approvals listed below:
 - a. Installation permits from the Town of Stonington Fire Department for the proposed fuel tanks.
 - b. Permits and licenses of a temporary nature necessary to perform the Work.
 - c. Permits for disposal of construction wastes including disposal of cleared and grubbed materials.

- d. Other permits or licenses required for the Contractor's operations or required elsewhere in the Contract Documents and not included herein.
 - 2. Obtain required time extensions to permits obtained by the Contractor, if construction authorized by permits has not been completed by the expiration date noted on these permits.
 - 3. Obtain permits and approvals from appropriate jurisdictional agencies and property owners for use of premises not furnished by the Owner, and for all off-site areas.
 - 4. Submit copies of permits prior to performance of Work authorized by permits.
- B. Existing Conditions
- 1. Use of Premises and Off-site Work
 - a. The Work shall occur on the Owner's property within the limits of Work shown on the Drawings.
 - b. Land owned by the Owner is available for staging and is shown on the Drawings.
 - c. Obtain permits and approvals for use of any land and access thereto that is deemed necessary for the Work, where such land is not available for use by the Owner, including land for temporary construction facilities, access and egress, or for storage of materials. Confine apparatus and storage to such additional areas.
 - d. Obtain permits and written approvals from appropriate jurisdictional agencies for the use of premises not available for use by the Owner, including all offsite staging areas, borrow pits and waste areas. Submit copies of all permits and approvals to the Owner prior to using areas.
 - e. Provide for the disposal of waste materials off-site in accordance with all applicable laws.
 - f. Adhere to the limits of Work as indicated to minimize obstruction to traffic and inconvenience to the Owner, general public, and residents in the vicinity of the Work, and to protect people and property. Keep fire hydrants on or adjacent to the Work accessible to fire fighting equipment at all times.
 - g. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.
 - h. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.
- C. Other Requirements
- 1. Comply with Connecticut Department of Energy & Environmental Protection regulations regarding the removal, transportation, and disposal of underground storage tanks.

PART 2 PRODUCTS

2.1 MATERIALS FURNISHED BY OWNER

- A. The Owner will not furnish any materials, labor or equipment under this Contract.

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01140**WORK RESTRICTIONS****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Work Schedule
- B. Related Requirements
 - 1. Section 01310 - Coordination
 - 2. Section 01325 - Scheduling of Construction

1.2 SUBMITTALS

- A. Incorporate the requirements of this Section in the project schedule submitted under Section 01325.

1.3 WORK SCHEDULE

- A. Conduct the Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 4:00 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above. No equipment or machinery may be started at the sites before 7:30 a.m. and all equipment must be shut off by 3:30 p.m.

PART 2 PRODUCTS – NOT USED**PART 3 EXECUTION****3.1 CONSTRUCTION CONSTRAINTS**

- A. The following are constraints for the Work. Incorporate these constraints into the schedule required to be submitted under Section 01325.
 - 1. All components of the existing buildings must remain in operation throughout construction of the new facility unless otherwise specified herein or in Section 01310.
 - 2. Work at Pawcatuck Middle School and West Broad Street School shall be scheduled between July 1, 2018 and August 17, 2018. Work outside of this timeframe is not acceptable.
 - 3. Work at the Town Dock shall be scheduled to commence on or after September 4, 2018. Work at the Town Dock prior to September 3, 2018 is not acceptable.
 - 4. Work at the Department of Public Works, including cure time for concrete, shall be completed prior to October 31, 2018.

END OF SECTION

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SECTION 01230

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Alternate No. 1 – Veeder Root TLS 350 at Town Dock
 - 2. Alternate No. 2 – Fuel Master FMU 3500 at Town Dock
- B. Related Requirements
 - 1. Section 13426 – Fuel Tank Monitoring and Fuel Management Systems

1.2 DEFINITIONS

- A. Alternate: An amount proposed by Bidder and stated on the bid form for certain work defined in this section 01230 that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change in the scope of construction to be completed either in quantity or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Price to incorporate the Alternate into the Work. No other adjustments are made to the Contract Price.

1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely integrate the Alternate into the Work.
 - 1. Include as part of each Alternate miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of the Alternate.
- B. Execute accepted Alternates under the same conditions as other Work of the Contract.

1.4 ALTERNATES

- A. Alternate No. 1 – Veeder Root TLS 350 for Town Dock
 - 1. Alternate No. 1 includes all work and incidentals required for providing a Veeder Root TLS 350 system for fuel monitoring at the Town Dock as specified in Section 13426 and in Drawings. If Alternate No. 1 is not selected, new wiring shall be connected to existing Veeder Root system.
- B. Alternate No. 2 – Fuel Master FMU 3500 for Town Dock
 - 1. Alternate No. 2 includes all work and incidentals required for providing a Fuel Master FMU 3500 system for fuel monitoring at the Town Dock as specified in 13426 and in Drawings..

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01290

APPLICATION AND CERTIFICATE FOR PAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Definition and description of measurement and payment to be used for the Work
2. Payment procedures
3. Payment requests for stored materials

B. Related Requirements

1. Section 01295 - Schedule of Values

1.2 GENERAL

- A. The following paragraphs describe payment procedures for the work to be done under the respective items in the Bid Form.
- B. Each lump sum and unit price will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor's overhead and profit for each separately identified item.
- C. Except as provided for in Section 01295, no separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the Contract Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.
- D. Division 2 through Division 16 Work will be measured and paid for at the Contractor's unit Bid price as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

1.3 LUMP SUM ITEMS

A. Item 1 – Mobilization and Demobilization

1. Measurement

- a. There will be no measurement for the mobilization and demobilization to the Site as this Work will be on a lump sum basis.

2. Payment

- a. Payment of the lump sum Bid price will be paid in two equal installments. The first installment will occur at the time the first payment

requisition is submitted after the Contractor has initiated full-time construction activity. The second installation will be paid when the Contractor has completed all construction activity including final cleanup and punchlist items. In no case will the total of both installment exceed 5% of the Base Bid price.

B. Item 2 – Town Dock, Removal of 20,000-gallon fiberglass underground storage tank, concrete vault, and equipment.

1. Measurement

- a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for removing, transporting and disposing of the underground storage tank, concrete vault, and associated equipment, in its entirety as detailed in the Contract Documents.

C. Item 3 – Town Dock, Installation of one new 20,000-gallon underground storage tank and equipment

1. Measurement

- a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the construction of the 20,000-gallon underground storage tank and equipment. The Work shall include fuel tank electrical improvements, construction of concrete pads, piping and all related improvements not listed in other bid items as detailed in the Contract Documents.

D. Item 4 – Department of Public Works, Removal of one 6,000-gallon and one 4,000-gallon fiberglass underground storage tanks and equipment

1. Measurement

- a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for removing, transporting and disposing of the underground storage tanks and associated equipment, concrete demolition, sumps and related debris, in its entirety as detailed in the Contract Documents.
- E. Item 5 – Department of Public Works, Installation of one new 10,000-gallon compartmentalized underground storage tank and equipment
1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the construction of the 10,000-gallon compartmentalized underground storage tank and equipment. The Work shall include fuel tank electrical improvements, construction of the concrete pads, drive mat, piping and all related improvements not listed in other bid items to as detailed in the Contract Documents.
- F. Item 6 – Department of Public Works, Provide temporary fuel storage tank and dispensing equipment
1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the temporary installation of one 3,000-gallon UL 2085 aboveground storage tank and equipment for diesel fleet fueling for the duration of time the system is non-operational including concrete cure time. The Work shall include a fuel tank, dispense, temporary electrical connections and all related work not listed in other bid items to as detailed in the Contract Documents.
- G. Item – 7 – Pawcatuck Middle School, Closure-in-place of one 10,000-gallon steel underground storage tank

1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for cleaning, preparing the tank for confined space entry and entering the tank (if necessary), cutting penetrations required for sample collection, filling the tank with flowable fill, removing the piping and tank top manways of the underground storage tank and restoring the site, in its entirety as detailed in the Contract Documents.
- H. Item 8 – Pawcatuck Middle School, Installation of one new 10,000-gallon underground storage tank and equipment
1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the construction of the 10,000-gallon underground storage tank and equipment. The Work shall include fuel tank electrical improvements, construction of the concrete pad, piping and all related improvements not listed in other bid items to as detailed in the Contract Documents.
- I. Item 9 – BOE Administration Building, Removal of one 10,000-gallon steel underground storage tank and equipment
1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for removing, transporting and disposing of the 10,000-gallon underground storage

tank and restoring the site to include backfilling, compaction and site restoration, in its entirety as detailed in the Contract Documents.

J. Item 10 – BOE Administration Building, Installation of two new 330-gallon UL 80 listed aboveground steel fuel storage tank, piping, and ancillary equipment

1. Measurement

- a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the construction of the two new 330-gallon aboveground steel fuel storage tank, piping, and ancillary equipment. The Work shall include fuel tank electrical improvements, and all related improvements not listed in other bid items to as detailed in the Contract Documents.

K. Item 11 – West Broad Street School, Removal of one 10,000-gallon steel underground storage tank and equipment

1. Measurement

- a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of this work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for removing, transporting and disposing of the 10,000-gallon underground storage tank and restoring the site to include backfilling, compaction and site restoration, in its entirety as detailed in the Contract Documents.

1.4 UNIT PRICE ITEMS

- A. Each unit price stated in the Bid form shall constitute full compensation for all labor, equipment and materials necessary and required to complete the Work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.

- B. Payment of the unit price items will only be made for the actual quantity of Work performed in accordance with the Contract Documents.

C. Item 12 – Residual Fuel and Sediment Removal, Transportation, and Disposal

1. Measurement

- a. Measurement for UST residual fuel and sediment transportation and disposal will be on a per gallon basis as documented on waste disposal documents provided by the receiving disposal facility.
 - 2. Payment
 - a. Payment of the bid price for residual fuel and sediment transportation and disposal will be full compensation for all residual fuel and sediment transported and disposal in accordance with Section 02115, and all labor, equipment and materials required for or incidental to the work.
- D. Item 13 – Contaminated Soil Excavation, Transportation, and Disposal
 - 1. Measurement
 - a. Measurement for contaminated soil excavation and disposal will be on a per ton basis as documented on waste disposal documents provided by the receiving disposal facility.
 - 2. Payment
 - a. Payment of the bid price for contaminated soil excavation, transportation, and disposal will be full compensation up to 1,000 tons for all excavation, removal and proper off-site disposal of the contaminated material in accordance with Section 02120, and all labor, equipment and materials required for or incidental to the work.
- E. Item 14 – Backfilling and Compaction of Contaminated Soil Excavations
 - 1. Measurement
 - a. Measurement of backfill material installed and compacted will be on a per ton basis as documented on weight tickets provided by the material provider.
 - 2. Payment
 - a. Payment of the bid price for backfilling and compaction will be full compensation up to 1,000 tons for all materials, installation, and compaction in accordance with Section 02315, and all labor, equipment and materials required for or incidental to the work.
- F. Item 15 – Bituminous Concrete Pavement for Restoration of Contaminated Soil Excavation Areas
 - 1. Measurement
 - a. Measurement for bituminous concrete pavement for restoration of contaminated soil excavation areas will be on a per square foot basis as measured in the field by Engineer and Contractor.
 - 2. Payment
 - a. Payment of the bid price for materials and installation of bituminous concrete will be full compensation up to 3,000 square feet for all materials and installation in accordance with Section 02740, and all labor, equipment and materials required for or incidental to the work.

1.5 PAYMENT PROCEDURES

- A. Informal submittal: Unless otherwise directed by the Engineer:
 - 1. Make an informal submittal of request for payment by filling in pertinent portions of EJCDC C-620, Contractor's Application for Payment, plus continuation sheet or sheets.
 - 2. Make this preliminary submittal to the Engineer at the end of each month.
 - 3. Revise the preliminary submittal as approved by the Engineer and incorporate the approved payments into the formal submittal.
- B. Formal submittal: Unless otherwise directed by the Engineer:
 - 1. Make formal submittal of request for payment by filling in the agreed data, by typewriter or electronically on EJCDC C-620, Contractor's Application for Payment, plus continuation sheet or sheets.
 - 2. Sign and notarize the Application for Payment.
 - 3. Submit the original of the Application for Payment, plus six identical copies of the continuation sheet or sheets, to the Engineer.
 - 4. The Engineer will compare the formal submittal with the approved informal submittal and, if acceptable, will sign the Contractor's Application for Payment, and present the Application to the Owner.
 - 5. Provide a signed and notarized Certificate for Stored Materials and proof of storage in a dry, watertight, heated and insured warehouse facility.

1.6 PAYMENT REQUESTS FOR STORED MATERIALS

- A. Requests for payment for stored materials shall be made in accordance with Section 00700 and shall be accompanied by the attached "Certificate for Stored Materials" form. Payment for stored materials shall not exceed the value actually paid by the Contractor for the stored materials as evidenced by the accompanying bill of sale, invoice, or other documentation.
- B. Partial payment requests for materials stored or so-called "engineering costs" by equipment manufacturers will not be allowed. All such costs shall be distributed proportionately among the various items of equipment/hardware to be furnished.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

J:\S\S5015 Stonington\001-UST Project\Design\Specifications\01290 Application and Certification for Payment.docx

CERTIFICATE FOR STORED MATERIALS_____
Tighe & Bond Project No.

We, _____, request payment for materials and/or equipment not incorporated in the work included under our firm's contract with _____ as listed below.

We hereby certify under penalty of perjury, that the materials not incorporated in the work have been delivered and are securely stored at the site or at _____ and that we have title to said materials free and clear of all Liens, as evidenced by the attached bill of sale, invoice, or other documentation.

We also certify that an inventory of said materials and/or equipment has been compiled for the purposes of this monthly partial payment request. This list of materials and/or equipment, including unit prices for said material not incorporated in the work for which payment is hereby requested, consisting of _____ pages and dated _____, is signed and attached hereto.

We acknowledge that payments made based on this request for materials and/or equipment not incorporated in the work does not relieve the contractor of its responsibility for furnishing all materials and equipment required for the satisfactory completion of the project pursuant to the contractual requirements.

We further certify that we can and will adequately protect said materials and/or equipment until they are incorporated in the work; that they meet the requirements of the specifications, and that they will be needed for incorporation in the work in the near future.

IN WITNESS WHEREOF, we, the said _____ h-
ereunto set our hand and seal this _____ day of _____, 20__.

Contractor's Firm Name

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

By _____

Title _____

Notary Public

SCHEDULE OF STORED MATERIALS

Job No. _____
 Contract No. _____
 Contractor: _____
 Location: _____

Date _____
 Pay Estimate _____

Item	Description	Supplier/Manufacturer	Quantity Stored and not Incorporated	Unit \$	Certified Value

Signature: _____
 Contractor's Principal

Total Amount Due for Stored Materials _____

Title: _____

SCHEDULE OF STORED MATERIALS

Job No. _____
Contract No. _____
Contractor: _____
Location: _____

Date _____
Pay Estimate _____

Item	Description	Supplier/Manufacturer	Quantity Stored and not Incorporated	Unit \$	Certified Value

Signature: _____
Contractor's Principal

Total Amount Due for Stored Materials _____

Title: _____

SECTION 01295**SCHEDULE OF VALUES****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Schedule of Values

1.2 SUBMITTALS**A. Action Submittals**

1. Submit an electronic copy of the Schedule of Values for approval within 10 days after the Effective Date of the Agreement.

1.3 SCHEDULE OF VALUES

- A. Schedule of Values shall be a detailed breakdown of the lump sum and unit price Work items included on the Form for General Bid, showing values allocated to the various elements of the Work, including each item listed on the Bid Form.
- B. The format of the Schedule of Values shall be a breakdown by Specification Section and content and shall be submitted on EJCDC C-620, Contractor's Application for Payment. The Engineer may require additional detailed documentation to support the values in the form of executed purchase orders, subcontracts, or other agreements.
- C. The Engineer will determine the level of breakdown and detail required. The breakdown shall include materials, installation, and start-up for equipment and controls where applicable. The final document will be the basis of payment requests for the duration of the Contract. No progress payment will be made until the Schedule of Values is approved by the Engineer.
- D. An unbalanced Schedule of Values providing overpayment on items of work performed first will not be accepted.

PART 2 PRODUCTS – NOT USED**PART 3 EXECUTION – NOT USED****END OF SECTION**

J:\S\S5015 Stonington\001-UST Project\Design\Specifications\01295 Schedule of Values.docx

SECTION 01310

COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Project Management
 - 2. Coordination
 - 3. Project Meetings
- B. Related Requirements
 - 1. Section 01140 - Work Restrictions
 - 2. Section 01325 - Scheduling of Construction
- C. Related Work Not Included
 - 1. Operation of existing facilities will be performed by the Owner unless otherwise specified. The Owner will assist in arranging operation of any existing facilities or equipment required by the Contractor to connect to existing facilities, and the Contractor shall not operate existing valves or equipment. Only the Owner will operate Owner valves.

1.2 SUBMITTALS

- A. Incorporate the requirements of this Section, as well as Work which may impact the existing system operation, or the operations of any adjacent utility, in the project schedule submitted under Section 01325.
- B. Informational Submittals
 - 1. Submit to the affected utility company, the Owner, and the Engineer, in writing, all requests for temporary shutdowns of facilities or interruption of operations. No shutdowns of the facilities or interruptions to existing operations will be permitted except as outlined in this Section. Submit requests at least 2 weeks prior to the beginning of the Work requiring shutdown or interruption. No shutdown shall occur without the approval of the utility company or the Owner.
 - 2. At the pre-construction conference, supply to the Owner the cell phone number of a responsible person who may be contacted during off-hours for emergencies 24 hours a day, seven days a week.
 - 3. Prepare a contact list of phone numbers, including cell phone numbers, and emails for all Project personnel and submit to the Engineer at the pre-construction conference. Include Contractor, Owner, Engineer, and Town personnel including police, fire, and ambulance.

1.3 PROJECT MANAGEMENT

- A. Complete the Work in a continuous uninterrupted operation. Use sufficient personnel and adequate equipment to complete the Work within the Contract Time.

1.4 COORDINATION

- A. Do not interfere with the operation of the existing facilities.
- B. Coordinate with appropriate utility companies, as well as with the Owner, where the Work crosses or is adjacent to existing utilities.

1.5 PROJECT MEETINGS

A. Pre-Construction Conference

- 1. The Contractor shall be prepared to discuss the following subjects at the Pre-Construction Conference. Documentation for these items is required to be submitted within the time frames included in individual specification sections.
 - a. Project scheduling
 - b. Sequencing of critical path Work items
 - c. Shop Drawing procedures
 - d. Project changes and clarification procedures
 - e. Use of sites, access to Work areas, office and storage areas, security and temporary facilities
 - f. Contractor safety plan and representative
 - g. Progress payments and procedures
 - h. Required documentation
 - i. Project personnel contact list

B. Progress Meetings

- 1. Progress meetings will be held as requested by the Owner or as required by the Progress of the Work.
- 2. The Contractor's Superintendent shall attend all progress meetings.
- 3. At a minimum, progress meetings will review Work progress, schedule, Shop Drawing submission schedule, Applications for Payment, and other matters needing discussion and resolution.
- 4. Review the schedule with all parties to be affected by upcoming work.
- 5. Review the monthly construction report required under Section 01325.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. Notify Call Before You Dig at least 72 hours prior to any digging, trenching, rock removal, demolition, borings, backfill, grading, landscaping, or any other earth moving operations.

3.2 COORDINATION WITH THE OWNER'S OPERATIONS

- A. Notify the Owner and Engineer, in writing, a minimum of 1 week in advance of commencing Work on site. Work on site shall not occur until permits are obtained.
- B. Notify the Owner and Engineer, in writing, a minimum of 1 week before commencing any work which may affect the Owner's operations.
- C. Perform all construction activities so as to avoid interference with operations of the facility and the work of others.
- D. Coordinate the following operations with the Owner and the Engineer:
 - 1. Operation of existing valves. The opening and closing of existing valves will be performed by the Owner.
 - 2. Operation or disconnection of any piping or other infrastructure connected to equipment that will remain in service during the course of the Work.
- E. The Owner has the authority to order the Work stopped which could unreasonably result in stopping the necessary functions of the facilities. Any costs and/or delays associated with these work stoppages due to the Contractor's operation shall be borne by the Contractor.

3.3 SEQUENCE OF CONSTRUCTION

- A. Constructing the proposed improvements while maintaining existing operations will require a specific sequence of construction. The Contractor will be allowed reasonable flexibility in scheduling the construction activities. Provide a detailed construction schedule as required in Section 01325.

END OF SECTION

J:\S\S5015 Stonington\001-UST Project\Design\Specifications\01310 Coordination.docx

SECTION 01320**CONSTRUCTION PHOTOGRAPHS****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Photographs taken at specified intervals before, during and after construction.

1.2 SUBMITTALS**A. Informational Submittals**

1. Submit electronic files of each photograph on a CD or USB flash drive.

PART 2 PRODUCTS**2.1 CONSTRUCTION PHOTOGRAPHS**

- A. Electronic files shall be in .jpg format.

PART 3 EXECUTION**3.1 PRE-CONSTRUCTION PHOTOGRAPHY**

- A. Provide a minimum of 12 preconstruction photographs of each underground storage tank system and surrounding area.
- B. The view selection will be representative of all site features and equipment related to the Work.

3.2 PROGRESS PHOTOGRAPHY

- A. Take construction photographs daily of active work areas throughout the life of the Contract. The photographs shall be indicative of the work that is currently in progress. A minimum of 3 photographs shall be taken each day at each location where Work is in progress.
- B. Take photographs of each underground storage tank both during and after removal. The photographs shall show the entire excavation area and soil stockpile, if present.
- C. Take representative photographs of UST and AST installation work.
- D. Take photographs of all utility abandonments.
- E. Take photographs of all relocated utility connections.

END OF SECTION

J:\S\S5015 Stonington\001-UST Project\Design\Specifications\01320 Construction Photos.docx

SECTION 01325

SCHEDULING OF CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Progress Schedule
- B. Related Requirements
 - 1. Section 01140 - Work Restrictions
 - 2. Section 01310 - Coordination

1.2 PROGRESS SCHEDULE

- A. Graphically show the order and interdependence of activities, sequence of Work, how the start of a given activity depends on completion of preceding activities, and how completion of an activity may restrain the start of subsequent activities.
- B. The Work shall be planned by the Contractor and his Project field superintendent in coordination with all Subcontractors and Suppliers whose Work is shown on the Progress Schedule.
- C. Include, at a minimum, the following activities on the Progress Schedule:
 - 1. Project mobilization
 - 2. Submittal and approval of Shop Drawings
 - 3. Procurement of equipment and critical materials
 - 4. Removal schedule for each of the underground storage tank systems
 - 5. Installation of equipment and critical materials
 - 6. Fabrication of special equipment and material, and its installation and testing
 - 7. Final inspecting and testing
 - 8. Punchlist
 - 9. Final cleanup
 - 10. Other activities that may be critical to the Progress Schedule
 - 11. All activities of the Owner and the Engineer which affect progress and/or affect required dates for completion of the Work
- D. Take into consideration Shop Drawing submittal and approval time, the delivery times of equipment and materials, Subcontractors' Work, availability and abilities of workmen, weather conditions, any restrictions in operations at the Work site, and all other items that may affect completion of the Work within the Contract Time.
- E. The Progress Schedule shall reflect the requirements and constraints outlined in Section 01310, Coordination.

F. The Progress Schedule shall reflect Work restrictions outlined in Section 01140.

1.3 SUBMITTALS

A. Informational Submittals

1. Submit four paper copies or one electronic copy of the preliminary Progress Schedule prepared in accordance with Article 2.05 of Section 00700 and the requirements of this section. Progress schedule must be submitted within 10 days after the Effective Date of the Agreement. Progress Schedule must be approved by the Owner and Engineer before the first progress payment will be made.
2. Revised analyses - Within 10 days after receipt of the review comments, submit four prints of the Progress Schedule revised in accordance with those comments.
3. Before initiating the Work, submit an estimated monthly rate of Contractor payments for the project. If the payment schedule deviates from the original projection, submit a revised rate of expenditure schedule.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

J:\S\S5015 Stonington\001-UST Project\Design\Specifications\01325 Scheduling of Construction.docx

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Action Submittals
 - 2. Informational Submittals

1.2 DEFINITIONS

- A. Action Submittals – includes written and graphic information submitted by Contractor that requires Engineer's approval.
- B. Informational Submittals – includes information submitted by Contractor that does not require Engineer's approval. The Engineer will acknowledge receipt of such documents and provide comments when the submittals lack the detail required by the Contract Documents.

1.3 ACTION SUBMITTALS

- A. Shop Drawings
 - 1. Shop Drawings as defined in the General Conditions, and as specified in individual work sections include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation drawings, schedule information, piece part drawings, actual shop work manufacturing instructions, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certification, as applicable to the Work.
 - 2. Shop Drawings shall be of standardized sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard size drawings shall be
 - a. 24-inches by 36-inches
 - b. 22-inches by 34-inches
 - c. 11-inches by 17-inches
 - d. 8.5-inches by 11-inches
 - 3. Submit Shop Drawings at the proper time so as to prevent delays in delivery of materials. Coordinate submittals for related or interdependent equipment.
 - 4. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.
 - 5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or

otherwise in error shall be returned to the Subcontractors or Suppliers for correction before submission to the Engineer. Drawings that are current shall be marked with the date, name, and approval stamp of the Contractor.

6. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.
 7. Detailed installation drawings (tanks, equipment, piping, electrical conduits and controls, and plumbing, etc.) shall be drawn to scale and fully dimensioned.
 8. No material or equipment shall be purchased or fabricated until the required Shop Drawings have been submitted and approved. Materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by the Shop Drawings.
 9. Until the necessary approval has been given, do not proceed with any portion of the work, the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.
 10. If submitted equipment requires modifications to the structures, piping, layout, or other details shown on the Drawings, details of the proposed modifications must also be submitted for approval. If such equipment and modifications are approved, perform all Work necessary to make such modifications at no additional cost to the Owner.
- B. Product Data: Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.
- C. Operation and Maintenance Manuals: In accordance with Section 01770.
- D. Schedule of Values: In accordance with Section 01295.

1.4 INFORMATIONAL SUBMITTALS

- A. Schedule of Submittals
1. Submit a preliminary Schedule of Submittals within 10 days of the Effective Date of the Agreement in accordance with Article 2.05 of Section 00700.
- B. Schedule of Manufacturers and Suppliers

1. Submit a schedule of manufacturers and Suppliers within 7 days after Notice to Proceed including the names and addresses of the manufacturers and Suppliers of materials and equipment to be incorporated into the Work.
- C. Schedule of Major Products
1. Submit a schedule of major products within 15 days after Notice to Proceed including a complete list of major products proposed for use, with specification section number, name of manufacturer, trade name, and model number of each product.
- D. Product Listing and Manufacturers Qualifications
1. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards. Specifically identify the products, the anticipated schedule for delivery and storage, and the estimated value thereof for materials which the Contractor intends to request approval for off-site storage.
- E. Certificates of Compliance
1. Welding: Submit in accordance with individual Specification sections.
 2. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency, or when specified in individual Specification sections.
 3. Manufacturer's Certificate of Compliance: In accordance with individual Specification sections.
- F. Application for Payment
1. Submit applications for payment in accordance with Section 01290, Application and Certificate for Payment.
 2. Submit schedule of stored materials when requesting payment for materials not yet installed.
- G. Construction Photography: Provide preconstruction, progress, and post-construction photography in accordance with Sections 01320.
- H. Contract Closeout Submittals: In accordance with Section 01770.
- I. Contractor Design Data
1. Written and graphic information
 2. List of assumptions
 3. List of performance and design criteria
 4. Summary of loads or load diagram
 5. Calculations
 6. List of applicable codes and regulations
 7. Name and version of software

8. Information requested in individual Specification section
- J. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- K. Schedules - Submit construction progress schedules and schedule updates in accordance with Section 01325.
- L. Statement of Qualifications: Submit evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty subcontractor, trade, specialist, consultant, installer, and other professionals.
- M. Submittals Required by Laws, Regulations, and Governing Agencies
1. Submit promptly notifications, reports, certifications, payrolls, and other required information as may be required, directly to the applicable federal, state, or local governing agency or their representative.
 2. Transmit to Engineer for Owner's records, one copy of correspondence and transmittals (including enclosures and attachments) between Contractor and governing agency.
- N. Test and Inspection Reports
1. Submit test and inspection reports as required by individual Specification sections.
 2. Test and inspection reports shall contain signature of person responsible for test or report.
 3. Reports shall include identification of product and Specification, project name, date and time of test, type of test, location, test results, corrective action required if report indicates test is not in compliance with Contract Documents, interpretation of test results, and other information as required in individual Specification sections.
- O. Equipment Data: Submit information on equipment to be used in the performance of the Work as required by individual Specification sections.
- P. Testing and Start-up Data: Prepare and submit testing procedures proposed to perform testing required by individual Specification sections.
- Q. Vendor Training Plan: At least two weeks prior to scheduling training of Owner's personnel, submit lesson plans for vendor training in accordance with individual Specification section and manufacturer's Operations and Maintenance Manuals.
- R. Health & Safety Plans: When specified in individual Specification sections, prepare and submit a Health and Safety Plan modified or supplemented to include job-specific considerations.
- S. Submittals stamped by another Professional Engineer: When specified in individual Specification sections, prepare and submit calculations and/or drawings stamped by a Professional Engineer licensed in the State where the work is being performed.

- T. Coordination Drawings: When specified in individual Specification sections, prepare and submit drawings to show how multiple system and interdisciplinary work will be coordinated. Examples are conduit routing diagrams, duct layouts, utility coordination drawings, sprinkler plans etc.
- U. Work Plans: When specified in individual Specification sections, prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities.
- V. Erosion Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of erosion control plans.
- W. Shutdown Requests: Submit notification of any outages required (electrical, flow processes, etc.) as may be required to tie-in new work into existing facilities. Unless otherwise specified, provide outage requests a minimum of 7 days notice shall be provided.
- X. Equipment Data: When specified in other Specification sections, information on equipment used by the Contractor to complete the Work, such as compaction equipment and closed-circuit television inspection equipment.

1.5 PROCEDURES

A. Coordination

- 1. Prepare and submit documentation in advance of fabrication and product manufacturer, so that the installation will not be delayed, other related work can be properly coordinated, and there is adequate time for review and resubmission, if required.
- 2. Provide no less than 15 days for review of submittals from the time received by the Engineer. For submittals of major equipment, that require more than 15 days to review, due to complexity and detail or those requiring review by multiple engineering disciplines, Engineer will notify Contractor of the circumstances and identify the anticipated date when the submittal will be returned.
- 3. Re-submittals will be subject to same review time.
- 4. No extension of time will be authorized due to failure to provide approvable submittals sufficiently in advance of the Work.

B. Review Shop Drawings, product data, and samples prior to submission and verify and determine:

- 1. Field measurements
- 2. Conformance with the Contract Documents. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.
- 3. Delete or strike out information that is not applicable to the Work.

C. Upload the electronic submittal files via Procore. Access to Procore will be provided by the Engineer. Files must be in .pdf format. The submittals will be returned in electronic .pdf format via Procore.

- D. Numbering: Submissions shall be accompanied by a transmittal form referencing the project name and applicable Specification section. Submittals shall be numbered sequentially, with the applicable Specification section and a hyphen preceding the number. (*e.g.* Submittal number 11330-01) Resubmittals shall bear the same transmittal number with a sequential letter suffix commencing with "A". (*e.g.* Submittal number 11330-01A)
- E. Provide a copy of the Submittal certification form (copy attached at the end of this section) which shall be attached to every copy of each Submittal as required under Article 7.16 A.2 of Section 00700. Apply the Contractor's stamp and initials or signature certifying that the submission has been thoroughly reviewed for completeness, compliance with the Contract Documents, coordination with adjacent construction and dimensional compatibility. Items submitted without the stamp or that are incomplete will be returned by the Engineer for rework and resubmission.
- F. Provide a copy of the P.E. certification form (copy attached at the end of this section) which shall be attached to every copy of each Submittal stamped by another Professional Engineer. Items submitted without the completed certification form will be returned by the Engineer for resubmission.
- G. Distribute copies of reviewed submittals along with the Engineer's transmittal to concerned parties with instructions to promptly report any inability to comply with the provisions or integrate the requirements with interfacing work.
- H. Partial and Incomplete Submittals
 - 1. Shop Drawings shall be submitted as a complete package by Specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials, and samples associated with each Specification section be included as a single submittal for the Engineer's review.
 - 2. Engineer will return entire submittals if preliminary review deems it incomplete including:
 - a. Missing or incomplete Submittal certification form
 - b. Insufficient number of copies
 - c. Missing content
 - 3. Partial submittals may be considered, at Engineer's option, only when necessary to expedite the Project.
 - 4. Partial submittals shall be clearly identified as such on the transmittal to identify missing components.
- I. Submittals not required by the Specification will be returned without review or action code.
- J. Resubmission
 - 1. Make corrections and modifications required by the Engineer and resubmit until approved.

2. Clearly identify changes made to submittals and indicate other changes that have been made other than those requested by the Engineer.
3. A maximum of two re-submissions of each shop drawing will be reviewed, checked and commented upon without charge to the Contractor (total of 3 submittals). Any additional submissions which are required by the Engineer to fulfill the stipulations of the Contract Documents will be charged to the Contractor as described in paragraph 7.16.E.2 of Section 00700.

K. Distribution

1. Distribute approved Shop Drawings and approved product data to the Project Site and elsewhere as required to communicate the information to Suppliers, Subcontractors, and field personnel.

1.6 ENGINEER'S REVIEW

- A. The Engineer will review submittals for design, general methods of construction and detailing. The Engineer's review and approval of submittals shall not be construed as a complete check nor does it relieve the Contractor from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Engineer's attention to such deviations at the time of submission. It will not extend to means, methods, technique, sequences, or procedures of construction (except where specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.
- B. The Engineer's review of the submittals shall not relieve the Contractor from the responsibility for proper fitting of the Work, or the responsibility of furnishing any work required by the Contract Documents which may not be indicated on the submittals. The Contractor shall be solely responsible for any quantities shown on the submittals.
- C. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall provide written notice to the Engineer at least 7 working days prior to release for manufacture.
- D. When the submittals have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- E. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:
 1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.
 2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.

3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.
 4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.
- F. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:
1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.
 2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SUBMITTAL CERTIFICATION FORM

PROJECT: _____
ENGINEER: _____ ENGINEER'S PROJECT NO.: _____
CONTRACTOR: _____ CONTRACTOR'S PROJECT NO.: _____

TRANSMITTAL NO.: _____ SUBMITTAL NO.: _____
SPECIFICATION NO.: _____ DRAWING NO.: _____
DESCRIPTION: _____
MANUFACTURER: _____

The above referenced submittal has been reviewed by the undersigned and I/we certify that the materials and/or equipment meets or exceeds the project specification requirements; that field measurements, dimensions, quantities, specified performance criteria, installation requirements, materials, catalog numbers and related materials have been verified; that all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the work has been determined and verified; that review includes all information related to the contractor's sole responsibility for means, methods, techniques, sequences, and procedures of construction and safety; and item has been coordinated with the overall project with:

☐ NO DEVIATIONS

☐ A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

SUBMITTED BY: _____ DATE: _____

GENERAL CONTRACTOR'S STAMP

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a professional engineer registered in the State of Connecticut and that he/she has been employed by

_____ to design
(Name of Contractor)

(Insert P.E. Responsibilities)

In accordance with Specification Section _____ for the

(Name of Project)

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

(Insert Name of Owner)

or Owner's representative within seven days following written request therefor by the Owner.

P.E. Name

Contractor's Name

Signature

Signature

Title

Title

Address

Address

SECTION 01350**HEALTH & SAFETY PLAN****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Furnish all labor, equipment and materials and perform all operations in connection with monitoring air quality, decontaminating equipment and providing worker health and safety protection for all Contractor personnel.
2. Develop a site-specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered at each location where work is to be performed. This plan shall meet all OSHA requirements.
3. Review the requirements and data presented and supplement the program with any additional measures deemed necessary to fully comply with regulatory requirements and adequately protect personnel on the site.

1.2 REFERENCES

- A. OSHA Regulation 29 CFR 1910.120
- B. OSHA Regulation 29 CFR 1926.62

1.3 DEFINITIONS

- A. Site Safety Official (SSO) - The individual located on a hazardous waste site who is responsible to the Contractor and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.
- B. Uncontrolled Hazardous Waste Site - An area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal, state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both.

1.4 SUBMITTALS**A. Informational Submittals**

1. Submit the following within ten (10) days after the Effective Date of the Agreement.
 - a. Site-specific HASP including the Emergency Response Plan for review, including provisions for decontamination and a contingency plan for unforeseen emergencies. The Engineer's review is only to determine if the HASP meets basic regulatory requirements and the minimum requirements of this section. The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.

- 1) The HASP must be reviewed, approved, and signed by a Certified Industrial Hygienist (CIH) or a Certified Safety Professional (CSP).
 - b. Current certification of employee's health and safety training and certification of employee's baseline medical exam status.
 - c. Certification of additional required health and safety training for supervisors.
 - d. Qualifications and experience of the SSO for approval.
2. Submit minutes of weekly safety meetings at periodic progress meetings.

1.5 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor and anyone directly or indirectly employed by any of them.
- B. Work under this contract is not being performed on an "Uncontrolled Hazardous Waste Site," as defined in 29 CFR 1910.120 and Article 1.3 B, above. Develop and follow a site-specific Health & Safety Plan (HASP) in accordance with the requirements of 29 CFR 1910.120 and paragraph 1.6.
- C. Provide a full-time SSO regardless of whether or not the Work is at a defined Uncontrolled Hazardous Waste Site.
- D. Pre-arrange emergency medical care services at a nearby hospital, including establishment of emergency routes of travel.
- E. Conduct weekly safety meetings with all site personnel, documenting attendance and topics covered.
- F. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR 1910.120.
- G. In areas where contaminated media are likely to be encountered, monitor air quality in and around work area using appropriate air monitoring equipment, as indicated in Part 2. Record all readings and maintain record on site. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded. Ensure that degree and type of respiratory protection provided is consistent with the monitored concentrations and individual chemical parameters. Lawfully dispose of all contaminated clothing and equipment that cannot be decontaminated.
- H. At all times, prevent oil or other hazardous substances from entering the ground, sewers, drainage areas and piping systems.

1.6 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The following items shall be addressed in the HASP:
 1. safety and health hazard assessment;
 2. procedures for emergency medical treatment and first aid;

3. map indicating route to hospital for emergency medical care;
4. equipment decontamination procedures;
5. air monitoring procedures and action levels;
6. personal protective equipment and decontamination;
7. physical hazard evaluation and abatement including:
 - a. equipment operation;
 - b. confined space entry;
 - c. slips and falls;
 - d. building collapse;
 - e. falling debris;
 - f. encountering unmarked utilities;
 - g. cold and heat stress;
 - h. hot work (cutting and welding);
 - i. excavation entry;
8. training requirements;
9. recordkeeping requirements;
10. emergency response plan that includes:
 - a. names of three (3) Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the Contractor intends to use in the event of an emergency;
 - b. evacuation routes and procedures;
 - c. emergency alerting and response procedures.

1.7 CONTINGENCY MEASURES & NOTIFICATIONS

- A. The potential for encountering hazardous buried objects or materials that could pose a threat to human health or the environment exists. In the event that potentially hazardous materials are encountered during the work under this contract, the responsibilities of the Contractor and the Engineer are described herein.
- B. The procedures and protocols to be used by the SSO in defining materials that are potentially hazardous include screening with a photo-ionization detector, odor, visual appearance of a material, and obvious oil or chemical contaminated materials.
- C. Upon encountering suspected hazardous buried objects or materials as described above, cover the excavation immediately if no imminent danger, as defined by the SSO, is present. If there is an imminent danger, as defined by the SSO, Evacuate the area immediately. The SSO shall then notify the Engineer and the Owner of the situation.

- D. Establish, properly barricade, and mark the area as an exclusion zone under the direction of the SSO. The SSO shall establish the exclusion zone boundaries based upon air quality monitoring using a photo-ionization detector and other equipment as appropriate. The exclusion zone shall be established at a minimum 50-foot radius around the location where the potentially hazardous material is encountered. Work within the exclusion zone shall be discontinued until the hazardous condition has been remediated and testing indicates that a hazard does not exist. Other activities of the site, outside the limits of the exclusion zone shall continue. Ambient air quality monitoring shall be performed by the SSO to demonstrate that ambient air quality in other portions of the site is not adversely impacted by the exclusion zone condition.
- E. Notify the Engineer and the Owner regarding the presence of potentially hazardous materials. The Owner may direct the Contractor to notify regulators and to obtain necessary regulatory approvals for remediation.
- F. Mobilize the appropriate equipment and personnel to sample and test the hazardous material within the exclusion zone to determine the remedial action required, subject to the Engineer's direction. The Contractor may be directed to remove and legally dispose of the material. Compensation for the removal and disposal of hazardous material will be as a Change in Work and Change in Contract Price in accordance with the General Conditions, if not covered under a specific bid item.

PART 2 PRODUCTS

2.1 AIR MONITORING EQUIPMENT

- A. Provide and maintain portable photo-ionization detector or organic vapor analyzer capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 parts per million (PPM) level.
- B. Provide and maintain an oxygen analyzer to measure oxygen concentration in any trench or confined space prior to entry, as determined by the SSO.
- C. Provide and maintain an explosimeter whenever the potential for accumulation of explosive gases exists, as determined by the SSO.
- D. All air monitoring equipment shall remain the property of the Contractor.
- E. Contractor is responsible for monitoring fugitive dust emissions in accordance with applicable local, state, and federal regulations. Equipment shall be sensitive to particulate matter less than 10 micrometer in size (PM-10) at a level of 100 micrograms per cubic meter (mcg/m³). Contractor will outline the dust monitoring program in their Health & Safety Plan.
- F. All readings must be recorded and be available for State (DEEP and DPH) personnel to review, upon request.

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01560
TEMPORARY BARRIERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Temporary Fencing System

1.2 SUBMITTALS

- A. Informational Submittals
 - 1. Submit information regarding the proposed temporary fencing system, including material of construction, plan layout, spacing of components, and anchorage.

1.3 TEMPORARY FENCING SYSTEM

- A. Comply with the requirements of local and/or regional permits required to be obtained as part of this regulation, for temporary fencing.
- B. Provide temporary fencing system around work areas and unattended open excavations.
- C. The Contractor will retain ownership of the temporary fencing system after the completion of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Temporary fencing shall be a minimum 6-foot high chain link fence supported by steel posts a minimum of 8 feet on center. Fence shall conform to the following requirements:
 - 1. Posts, Rails, and Framework
 - a. All pipes shall be galvanized cold-formed steel conforming to ASTM Designation A120, Schedule 40 latest requirements, and galvanized in conformance with ASTM A123 latest requirements.
 - b. Member sizes for 6-foot fence are as follows:

	<u>Nominal Size</u>
Terminal, corner posts	2 in.
Line posts	1-5/8 in.

2. Fence Fabric: The fabric shall be woven aluminum-coated steel chain link conforming to ASTM Designation A491 in its entirety. The fabric shall be 9 gauge, 2-inch square mesh.

PART 3 EXECUTION

3.1 FENCE INSTALLATION

- A. Install fence according to manufacturer's instructions at locations specified in Paragraphs 1.3 above.

END OF SECTION

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SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Products and Materials
 - 2. Product Delivery Requirements
 - 3. Packaging, Handling and Storage Requirements

1.2 QUALITY ASSURANCE

- A. Review all contract Drawings and Specifications with respect to specific system characteristics, applicability of materials and equipment for the intended purposes, sizes, orientation, and interface with other systems, both existing and proposed, and certify that the materials and equipment proposed will perform as specified prior to submitting shop drawings.
- B. Provide sworn certificates as to quality and quantity of materials where specified or requested by the Engineer.
- C. Obtain concurrence of the Engineer prior to processing, fabricating, or delivering material or equipment.

1.3 PRODUCTS AND MATERIALS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by a single manufacturer unless specified otherwise.
- B. Use only new and first quality material in the Work. Material shall conform to the requirements of these Specifications and be approved by the Engineer. If, after trial, it is found that sources of supply that have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved materials from other approved sources.
- C. Immediately remove defective materials and equipment from the site, at no additional cost to the Owner. The Contractor may be required to furnish sworn certificates as to the quality and quantity of materials before materials are incorporated in the Work.
- D. Engineer has the right to approve the source of supply of all material prior to delivery.

1.4 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- D. Progressively deliver materials and equipment to the Site so there will be neither delay in progress of the Work nor an accumulation of material that is not to be used within a reasonable time.
- E. Deliver products to the Site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to the manufacturer, grade, quality, source, and other pertinent information.

1.5 PACKAGING, HANDLING AND STORAGE REQUIREMENTS

- A. Provide storage and handling of all materials and equipment required for the Work.
- B. Except as otherwise indicated in the Contract Documents, determine and comply with the manufacturer's recommendations on product storage, handling, and protection. Provide manufacturer's documentation on recommended storage procedures when requested by the Engineer.
- C. Properly store and protect all equipment immediately upon its arrival. All equipment shall be stored in a clean, dry, heated, secured, and insured indoor facility satisfactory to the Engineer.
- D. Familiarize workmen and subcontractors with hazards associated with materials, equipment, and chemicals specified herein and take all necessary safety precautions.
- E. Areas available on the construction site for storage of material and equipment shall be as shown on the Drawings or approved by the Owner.
- F. Materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier, and Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.
- G. Protect finished surfaces including floor surfaces, stairs, joints, and soffits of passageways from damage until accepted by the Engineer.
- H. Promptly remove materials from the site of the Work which have become damaged or are unfit for the use intended or specified. The Contractor will not be compensated for the damaged materials or their removal costs.
- I. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required.
- J. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.
- K. All materials and equipment to be incorporated in the Work shall be placed so as to not damage any part of the Work or existing facilities and so that free access can be

had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Keep materials and equipment neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to the Owner.

- L. No material or equipment will be permitted to be stored in any of the Owner's facilities, unless otherwise approved by the Engineer.
- M. Do not store material or equipment in any wetland or environmentally sensitive area. Stockpile sites shall be level, devoid of mature stands of natural vegetation, and removed from drainage facilities and features, wetlands, and stream corridors.
- N. Contractor shall be fully responsible for loss or damage to stored materials and equipment.
- O. No item judged rusty, corroded or otherwise damaged during storage will be accepted. Any electrical or instrumentation item determined by the Engineer to be damaged shall be removed from the Site and replaced by a completely new item in first class condition. Items not properly stored will not be considered for any partial payment.
- P. Provide protective and preventive maintenance during storage consisting of manually exercising equipment where required, inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer as necessary for its protection and other precautions as necessary to assure proper protection of equipment stored.
- Q. Treat ferrous surfaces not receiving finish coats of paint with rust preventive coating, and protect non-ferrous metal work and devices with suitable wrappings.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01640**OWNER FURNISHED PRODUCTS****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Products furnished by the Owner and installed by the Contractor.

B. Related Requirements

1. Section 13201 – Fuel Storage Equipment

1.2 OWNER FURNISHED PRODUCTS**A. Town Dock**

1. The two existing Dresser Wayne, Model No. /G6202D/27AGJK/W1 Fuel Dispensers located at the Town Dock shall be reused.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION**

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SECTION 01725**PRESERVATION AND RESTORATION OF PROJECT FEATURES****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Protection and replacement of lawns, trees, shrubs, signs, property markers, fences, and related project features.
2. Taking precautions, providing programs, and taking actions necessary to protect public and private property and facilities that are outside the demolition scope from damage.

1.2 DEFINITIONS**A. Underground Structures**

1. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, and manholes, chambers, electrical and signal conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.
2. Underground structures known to the Engineer are shown on the Drawings to the extent that locations are available. This information is shown for the assistance of the Contractor in accordance with the best information available, but is not guaranteed to be correct or complete. The Contractor shall be responsible for checking on the actual locations of water, sewer, gas electric and telephone service connection lines to avoid potential interferences.

B. Surface Structures

1. Surface structures are defined as existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, fences, walks and all other facilities that are visible above the ground surface.

PART 2 PRODUCTS – NOT USED**PART 3 EXECUTION****3.1 REPAIR/RESTORATION**

- A. Lawns, trees, shrubs, and similar items shall not be removed or damaged except where necessary to access the required Work, as approved by the Engineer. Items to be removed shall be clearly marked as directed by the Engineer. If objects not to be removed are damaged or removed, they shall be repaired or replaced to their original condition.

- B. Lawns, trees and shrubs on private property, which are removed or damaged by the Contractor shall be replaced in kind.
- C. Signs, fences, property markers, walls, guard rails and other public or private property that are outside the demolition scope shall be replaced in kind if damaged. Supports and protective devices required shall be provided.
- D. Underground and Surface Structures
 - 1. In the event of damage, injury or loss to existing utilities and structures that were not indicated to be removed or abandoned, whether shown on the Drawings or not, make all reasonable efforts to facilitate repairs and to mitigate the impact of such events upon the utility or structure owner's normal operations. Restore the existing utility or structure to the condition required by the owner of the utility or structure or at least to the condition found immediately prior to the Work. In the event that the utility owner elects to make the repairs, provide all reasonable access and assistance, and reimburse the utility owner for the cost of repairs. If utility service is interrupted due to damage to facilities, alternate facilities shall be provided.
 - 2. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers and curbs which are temporarily removed to facilitate the Work shall be replaced and restored to their original condition at the Contractor's expense unless otherwise indicated in other sections of these specifications.
 - 3. Wherever water, sewer, gas or petroleum mains, electric or telephone lines, cables or other utilities and structures are encountered and may be in any way interfered with, inform the Engineer and the appropriate utility company. Cooperate with the Engineer and utility company in the protection, removal, relocation, and replacement of structures and facilities.
 - 4. Prior to proceeding with any demolition or construction, notify in writing owners of utilities and structures within the vicinity of the proposed Work.
 - 5. Materials used for relocation or replacement of utilities and structures shall be of an equivalent material, type, class, grade and construction as the existing or as approved by the respective owners thereof, unless otherwise shown or specified.
 - 6. When any survey monument or property marker, whether of stone, concrete, wood or metal, is in the line of any trench or other demolition or construction work and may have to be removed, notify the Engineer in advance of removal. Under no circumstances shall any monument or marker be removed or disturbed by the Contractor or by any of his Subcontractors, employees or agents, without the permission of the Engineer. Monuments or markers removed or disturbed shall be reset by a land surveyor licensed in the State where the Work is located at the Contractor's expense. Should any monuments or markers be destroyed through accident, neglect or as a result of the Work under this Contract, the Contractor shall, at his own expense, employ a land surveyor licensed in the State where the Work is located to re-establish the monument or marker.

3.2 PROTECTION

- A. The construction of certain portions of the project may require excavation within the root systems of trees. Roots with a diameter of 2-inches or more within the excavation shall not be cut. If necessary, excavation shall be made with small powered equipment or by hand to comply with this requirement. It may be necessary to excavate from more than one direction to avoid damage to the roots.
- B. The trunks of trees that are to remain and are within the swing radius of the excavating machine bucket when fully extended shall be wrapped with burlap and 2-inch by 4-inch protective wood slats (8-inch spacing maximum) wired around the circumference of the trees to protect them from damage.
- C. Tree limbs shall not be cut except upon written approval of the Owner and the Engineer. Tree limbs cut shall be painted with approved forestry paint manufactured specifically for that purpose.
- D. Underground and Surface Structures
 - 1. Sustain in their places and protect from direct or indirect injury underground and surface structures designated to remain within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.
 - 2. Pay utility service company charges related to the temporary support of utility poles if required to complete the Work.
 - 3. Assume risks associated with the presence of underground and surface structures within or adjacent to the limits of the Work. The Contractor shall be responsible for damage and expense for direct or indirect injury caused by his Work to any structure. Immediately repair damage caused by the Work to the satisfaction of the owner of the damaged structure.

END OF SECTION

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SECTION 01770

CLOSEOUT PROCEDURES

1.1 SUMMARY

A. Section Includes

1. Documentation required for the transfer of the completed Work to the Owner
2. Final Cleaning

1.2 SUBMITTALS

A. Closeout Submittals

1. As-built drawings
2. Operation and maintenance manuals
3. Evidence of payment and release of liens
4. List of Subcontractors, service organizations, and principal vendors

1.3 SUBSTANTIAL COMPLETION

- A. Refer to Article 15.03 in 00700, General Conditions, for procedures relating to obtaining Substantial Completion. Refer to 00520, Agreement, for Contract times.

1.4 PROJECT CLOSEOUT DOCUMENTS

- A. As-built Drawings - Submit as-built drawings review, approval, or comment. The as-built drawings shall show the completed work, including all deviations from the Drawings. The as-built drawings shall depict the location of all tanks, conduit and devices exterior of the tanks, the location of valves, piping, relocated devices and all field changes.

1. Locate all utilities and appurtenances concealed in construction. Provide detail not shown on Contract Documents. Use colored pencils or felt tipped pens to record all revisions to the as-built drawings. Use the following color code unless otherwise approved by the Engineer:
 - a. Process and Mechanical: Red
 - b. Architectural: Blue
 - c. Structural: Purple
 - d. Plumbing: Brown
 - e. HVAC: Green
 - f. Electrical: Orange
 - g. Other: Black

- B. Operation and Maintenance manuals – Submit two copies of Operation and Maintenance Manuals for each site for items listed in other sections of these Specifications and for other items when directed by the Engineer.
1. Manuals shall be in three-ring binders.
 2. Manuals shall include, as a minimum:
 - a. The Operations and Maintenance Manual Certification Form (copy attached at the end of this Section) which shall be attached to every copy of each Operations and Maintenance Manual submitted.
 - b. A comprehensive index broken down into sections
 - c. A complete list of the equipment supplied, including serial numbers, ranges, and pertinent data
 - d. Full specifications on each item
 - e. Detailed service, maintenance and operation instructions for each item supplied
 - f. System schematic drawings “as Constructed,” illustrating all components, piping and electrical connections of the systems supplied under Division 16
 - g. Clearly defined special maintenance requirements particular to this system, along with special calibration and test procedures
 - h. Operating instructions with a functional description of the entire system, with references to the systems schematic drawings and instructions
 - i. Complete parts lists with stock numbers and name, address, and telephone number of the local supplier
 - j. A complete “As Constructed” set of approved shop drawings
 - k. The format of the O&M manual shall meet the following general requirements:
 - 1) Complete, comprehensive index
 - 2) Section with operating instructions including complete overview of the system
 - 3) Section with a complete parts list as described above
 - 4) Section that includes all schematic diagrams, wiring diagrams etc. of the “As Constructed System”
 - 5) Product information
 - l. Section and sub-section dividers
 - m. Separate divider for each product

- n. Data sheets indicating the tag names (as used on the Drawings), manufacturer, complete model number, complete specifications, and parameter setup sheet with the parameter setup sheets following the manufacturers O&M manual in its entirety
- o. Final documentation written specifically for this project including standard and modified standard documentation, with modifications to existing hardware or software manuals made on the respective pages or inserted adjacent to the modified pages. All standard documentation furnished shall have all portions that apply clearly indicated, and all portions that do not apply shall be lined out.
- p. All illustrations, detailed drawings, wiring diagrams, and instructions necessary for installing, operating, and maintaining the equipment, with illustrated parts numbered for identification and all information applying specifically to the equipment furnished and only including instructions that are applicable. All such illustrations shall be incorporated within the printing of the page to form a durable and permanent reference book.

C. Final Documentation – Submit the following final documentation:

- 1. As-Built documentation shall include all previous submittals, as described in this Specification, updated to reflect the as-built system.
- 2. The maintenance documentation shall describe the detailed preventative and corrective procedures required to keep the system in good operating condition. All hardware maintenance manuals shall make reference to appropriate diagnostics, where applicable, and all necessary timing diagrams shall be included. A maintenance manual or a set of manuals shall be furnished for all delivered hardware, including peripherals. The hardware maintenance documentation shall include, as a minimum, the following information:
 - a. Operation information – This information shall include a detailed description of how the equipment operates and a block diagram illustrating each major assembly in the equipment.
 - b. Preventative-maintenance instructions – These instructions shall include all applicable visual examinations, hardware testing and diagnostics routines, and the adjustments necessary for periodic preventative maintenance of the system.
 - c. Corrective-maintenance instructions – These instructions shall include guides for locating malfunctions down to the card-replacement level. These guides shall include adequate details for quickly and efficiently locating the cause of an equipment malfunction and shall state the probable source(s) of trouble, the symptoms, probable cause, and instructions for remedying the malfunction.
 - d. Parts information – This information shall include the identification of each replaceable or field-repairable module. All parts shall be identified on a list in a drawing; the identification shall be of a level of

detail sufficient for procuring any repairable or replaceable part. Cross-references between the Contractor's part number and manufacturer's part numbers shall be provided. All PC boards shall be identified by; manufacturer and model number, slot number, part name and configuration (if applicable).

- D. Provide warranties and bonds for items so listed in pertinent other sections of the Project Manual. Provide all warranties and bonds in a three-ring binder.
- E. Provide keys and keying schedule, where applicable.
- F. Provide evidence of compliance with requirements of governmental agencies having jurisdiction including:
 - 1. Certificates of Inspection.
 - 2. Certificates of Occupancy.
- G. As specified in Article 15.06.A of Section 00700, provide evidence that all Work, materials and equipment will pass to Owner free and clear of any Liens or other title defects upon final payment. Such evidence may take the form of receipts or releases from all Subcontractors and Suppliers and an affidavit from Contractor as to the completeness of the receipts and releases as described in Section 00700 Article 15.06.A.3.
- H. List of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- I. Equipment start-up reports shall be submitted in duplicate to the Engineer for each piece of equipment installed. The report shall include detailed descriptions of the points inspected, tests, and adjustments made, quantitative results obtained and maintenance suggestions. The report shall certify that the equipment (1) has been satisfactorily installed and conforms to the Contract requirements; (2) is in accurate alignment and free from undue stress; (3) has been operated under full load and operates satisfactorily; and (4) nothing in the installation will render the manufacturer's warranty null and void. Equipment start-up reports shall be included in the appropriate equipment O&M manuals.
- J. Provide records of all Owner training/instruction sessions conducted in accordance with paragraph 1.5 of this Section and as required in the project Specifications. The record for each training session shall include reference to the relevant specification section, a summary of the topics covered in the training session, and a sign-in sheet listing all attendees in attendance for the training.
- K. Provide color charts, legends, instructions, special tools and other requirements specifically requested in sections of the Specification.

1.5 INSTRUCTION OF OWNER'S PERSONNEL

- A. Provide instruction by qualified manufacturers' representatives in the proper operation, maintenance, adjustment and the safety aspects of the equipment and materials furnished. Specific instruction requirements may be included within the sections of the Specification.

1.6 FINAL CLEANING & REPAIRS

- A. Complete cleaning prior to final inspection. Cleaning shall include all interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces. Thoroughly wipe clean all ductwork, piping, equipment, devices, and exposed surfaces. Clean debris from lawns, roofs, downspouts and gutters. Sweep paved surfaces and rake lawns and landscaped areas.
- B. Use only cleaning materials that will not create hazards to health or property.
- C. Remove and entirely dispose of material or debris that has washed, flowed or has been placed in existing watercourses, ditches, gutters, drains, pipe, or structures, for work done under the Contract work limits. Leave ditches, channels, drains, pipes, structures, and watercourses in a clean and neat condition upon completion of the Work.
- D. On or before the completion of the Work, tear down and remove all temporary buildings and structures, remove all temporary works, tools, and machinery or other construction equipment, remove all rubbish from any grounds which has been occupied and leave the roads and all parts of the premises and adjacent property in a neat and satisfactory condition.
- E. Restore or replace any public or private property damaged or removed during the course of the Work. Property shall be returned to a condition at least equal to that existing immediately prior to the beginning of operations. Complete all highway or driveway, walk, and landscaping work using suitable materials, equipment and methods. Perform restoration of existing property, signs or structures promptly as work progresses; do not leave restoration work until the end of the Contract Time.

1.7 COMPLETION

- A. The Contract shall be considered complete and final payment made, only when:
 - 1. All provisions of the Contract Documents have been strictly adhered to.
 - 2. All damage to adjoining areas caused by the Work has been repaired.
 - 3. The project and premises have been left in good order, including removal of all temporary construction, Contractor-owned and extraneous materials as required.
 - 4. All warranties, Operation and Maintenance Manuals, maintenance instructions, releases, and permits called for in the Contract have been submitted to the Owner and Engineer as applicable.
 - 5. All as-built drawings as required by the Contract Documents have been submitted to the Owner.
 - 6. All monies owed the Owner for services performed for the Contractor by Owner's forces in connection with the Contract have been paid.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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O&M MANUAL CERTIFICATION FORM

PROJECT: _____
ENGINEER: _____ ENGINEER'S PROJECT NO.: _____
CONTRACTOR: _____ CONTRACTOR'S PROJECT NO.: _____

TRANSMITTAL NO.: _____ SHOP DRAWING NO.: _____
SPECIFICATION NO.: _____ DRAWING NO.: _____
DESCRIPTION: _____
MANUFACTURER: _____

The above referenced O&M manual has been reviewed by the undersigned and I/we certify that the manual is customized as needed for this project, and contains the following items, where applicable for the materials or equipment provided:

- | | |
|--|---|
| <input type="checkbox"/> 3-ring binder with title on binder and binding edge | <input type="checkbox"/> Complete parts list of equipment supplied |
| <input type="checkbox"/> Electronic CD, when specified | <input type="checkbox"/> Complete specifications/data on each item |
| <input type="checkbox"/> Comprehensive index broken down into sections | <input type="checkbox"/> Detailed maintenance & operations instructions |
| <input type="checkbox"/> Dividers for sections and sub-sections | <input type="checkbox"/> "As constructed" layout & schematic drawings |
| <input type="checkbox"/> Warranties | <input type="checkbox"/> Wiring diagrams |
| <input type="checkbox"/> Troubleshooting information | <input type="checkbox"/> Lubrication & maintenance schedules |
| <input type="checkbox"/> Startup, operation & shutdown procedures | <input type="checkbox"/> Equipment performance curves |
| <input type="checkbox"/> Safety procedures | <input type="checkbox"/> List of spare parts supplied and current cost |
| <input type="checkbox"/> Manufacturer's contact information | <input type="checkbox"/> Parts & service contact information |

SUBMITTED BY: _____ DATE: _____

GENERAL CONTRACTOR'S STAMP

DIVISION 2 - SITE WORK

SECTION 02110

CONTAMINATED SOIL EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

- A. Contaminated soil has been identified and will likely be encountered during removal of the existing underground storage tank located at the Town Dock. Contaminated soil encountered during tank removal must be managed in accordance with this specification. Contaminated soil has not been encountered at the remaining sites.
- B. Section Includes
 - 1. Excavation, handling, stockpiling, and temporary storage of Contaminated Soil
 - 2. Movement and placement of Contaminated Soil into a temporary controlled stockpile area
 - 3. Decontamination of tools, equipment, and vehicles and the collection, management and disposal of resulting liquids and/or solids
 - 4. Other work involving the handling of contaminated materials which may be required including but not limited to miscellaneous facility component removal, removal of obstructions, excavation support systems, and any incidental work related thereto
- C. Related Sections
 - 1. Section 01350 - Health & Safety Plan
 - 2. Section 02120 - Transportation and Disposal of Contaminated Soil
 - 3. Section 02315 - Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

- A. Regulations of Connecticut State Agencies (R.C.S.A.) Sections 22a-133k-1 through 22a-133k-3
- B. 40 CFR Part 261, Identification and Listing of Hazardous Waste
- C. 40 CFR Part 268, Land Disposal Restrictions
- D. Documents referenced in the Related Sections listed above

1.3 DEFINITIONS

- A. Natural Soil: Soil in which all substances naturally occurring therein are present in concentrations not exceeding the concentrations of such substance occurring naturally in the environment and in which soil no other substance is analytically detectable.
- B. Polluted Soil: Means soil affected by a release of a substance at a concentration above the analytical detection limit for such substance but at concentrations below

Residential Direct Exposure Criteria or GA Pollutant Mobility Criteria, as these terms are defined in section 22a-133k-1 of the Regulations of Connecticut State Agencies.

- C. Contaminated Soil: Means soils or fills affected by a known or suspected release and determined, or reasonably expected to contain substances exceeding Residential Direct Exposure Criteria or GA Pollutant Mobility Criteria, as these terms are defined in section 22a-133k-1 of the Regulations of Connecticut State Agencies.
- D. Clean Fill: Means (1) natural soil and (2) rock, ceramics, uncontaminated brick and concrete.
- E. Special Handling: Methods used to excavate, collect, grade, load, move, transport, stockpile, dispose, or otherwise manage a contaminated material or Contaminated Soil are such that (1) the spillage, loss, co-mingling, or uncontrolled deposition of such material is minimized, (2) personal exposure to contaminants present in such a material are minimized, (3) the adverse impacts to the community and the surrounding environment from contaminants present in such material are minimized, (4) all applicable regulatory requirements applicable to such activity are satisfied.

1.4 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and other State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- B. All contaminated material excavated or otherwise collected, consolidated and managed during the course of the work will require Special Handling in accordance with these specifications, Contractor Health and Safety Plan, and all applicable permits, approvals, authorizations, and Regulations.
- C. Perform the handling of contaminated materials with equipment and techniques in accordance with the performance requirements defined in this specification.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. Provide all employees and subcontractor(s) with personal protective equipment and protective clothing consistent with the levels of protection for this work as indicated in Contractor's Health and Safety Plan.
- B. Perform all contaminated material handling operations in accordance with standard engineering practices applicable to such activity, according to CTDEEP regulations, and according to the provisions of Contractor Health and Safety Plan. Utilize methods which consider the health and safety of all Contractor and subcontractor personnel, support personnel, Engineer and his representatives, and the surrounding environment.
- C. All site health and safety controls shall be fully established and in operation prior to beginning any contaminated material handling activity. Site controls shall include

but not be limited to work zones properly barricaded, decontamination facilities, air monitoring, and all support equipment and supplies including personal protective equipment. Comply with the requirements of Section 01350, Health and Safety Plan.

- D. Minimize the spread of contaminated materials during handling. Transport vehicles used to move Contaminated Soil at the Project Site shall be free from leaks. Trucks or other conveyances deemed unacceptable for use by Engineer shall not be used for the movement of contaminated materials.
- E. Keep work areas, including but not limited to, areas adjacent to excavations, roadways leading to and from excavation areas, driveways, parking areas, and public roadways free of contaminated materials. If such materials are deposited, spilled, or spread, such material shall be removed promptly, and properly disposed of to the satisfaction of Engineer no later than the end of each working day or as requested by Engineer.
- F. Owner is the generator and will sign all manifests and bills of lading. Except for materials required to be transported under manifest, transport all Contaminated Soil material under bills of lading (prepared by Engineer) regardless of the chemical quality of the soils.

3.2 EXCAVATION OF CONTAMINATED MATERIALS

- A. Perform excavation in accordance with the requirements of Section 02315, Excavation, Backfill, Compaction and Dewatering, and this section.
- B. Excavate contaminated soil to the vertical and horizontal limits required to complete the work as specified or as identified by the Engineer.
- C. Engineer will continually evaluate field conditions to determine if additional excavation is required to achieve remedial objectives. This evaluation may require Engineer to work in close proximity to Contractor's excavation equipment, and may require frequent pauses in the work. Contractor shall work in a cooperative manner at all times during these operations to ensure the safety of Engineer, and to allow for thorough field evaluations to be conducted.
 - 1. When contaminated material excavation is undertaken, Engineer will make the final determination as to the limits of excavation required to achieve remediation objectives. Such limits shall be based upon actual conditions encountered at the time of excavation.
 - 2. If required, Engineer will define those areas beyond the limits originally indicated where additional contaminated material excavation shall be required based upon field observations.
- D. Minimize the spread and loss of contaminated materials during excavation activities.
 - 1. Following excavation, transport contaminated materials directly to the temporary controlled stockpile area for stockpiling or load into trucks for disposal, if all applicable conditions of Section 02120 Transportation and Disposal of Contaminated Materials have been met and approved by Engineer. Excavated contaminated materials shall not be placed directly on the ground.

- E. Employ methods necessary to isolate contaminated materials from non-contaminated soils to the degree practicable.
- F. Segregate construction debris from excavated contaminated materials at the point of excavation, prior to the movement of contaminated materials from excavation areas. Engineer may evaluate debris during excavation to determine if such material can be designated uncontaminated general demolition material.
- G. Open excavations represent a substantial hazard. Contractor shall implement measures as appropriate to secure open excavations while awaiting Engineer's confirmation test results from soils (refer to Item 3.5) or any other period when excavations remain open.
- H. Implement measures to divert surface water around excavation sites to prevent water from directly entering into open excavations.

3.3 BACKFILL

- A. Backfill excavations in accordance with Section 02315, Excavation, Backfill & Compaction and Dewatering.
- B. Backfill excavations as soon as possible after Engineer has indicated that test results confirm remediation objectives have been achieved and backfilling may proceed.
- C. Contaminated soils may not be used to backfill excavations.

3.4 UNFORESEEN CONTAMINATED MATERIALS

- A. In the event that unforeseen contaminated materials are encountered during the course of the work, permit the Engineer sufficient time to devise an appropriate course of action based upon the conditions present.
 - 1. Until such appropriate course of action is devised, Contractor shall secure the work area in question such that it does not pose a health and safety risk.
 - 2. Engineer will provide Contractor with a scope of work and performance requirements for the collection, consolidation, removal or excavation of unforeseen contaminated material. Contractor shall then undertake contaminated material remediation with equipment and techniques established by Contractor in accordance with said scope of work and performance requirements.
- B. Contaminated material remediation shall be performed in accordance with scope of work outlined in Item 3.4.A.2 and in accordance with this specification.

3.5 CONFIRMATION TESTING BY ENGINEER

- A. At such time the Engineer is satisfied that the limits of contaminated material have been reached, Engineer will perform appropriate confirmation sampling to confirm remediation objectives have been achieved and no additional contaminated material excavation or removal is required.
- B. Contractor is hereby notified that laboratory turnaround time for the analysis of confirmation samples may be up to 5 working days from date of collection. No claim for delay will be considered based upon Contractor failing to accommodate the laboratory turnaround time as defined herein.

- C. Engineer will inform Contractor if test results confirm remediation objectives have been achieved and backfilling may proceed.
- D. Should the results of Engineer's testing indicate additional contaminated material excavation or removal is required, Engineer will define those areas beyond the limits originally indicated where additional contaminated material excavation or removal shall be required.

3.6 STORAGE OF EXCAVATED MATERIALS

- A. Excavated contaminated material may be temporarily stockpiled on-site. Stockpile contaminated soils in an area designated by the Engineer in such a manner to protect existing site surface, materials and structures from contamination, runoff and erosion. Place the contaminated soil on a minimum of 6 mil polyethylene sheeting and at the end of each day the stockpiled soil shall be covered with 6 mil polyethylene sheeting and secure the covering to prevent the stockpile from becoming uncovered due to winds.
- B. If wet or saturated contaminated soils are to be stockpiled the stockpile area must be constructed so that contaminated water does not leach into the underlying soil and does not run off outside of the designated stockpile area.

3.7 DUST CONTROL

- A. Implement fugitive dust suppression to prevent unacceptable levels of dust resulting from handling operations associated with contaminated materials. Dust suppression methods shall be subject to approval from Engineer. Supervise fugitive dust control measures and monitor airborne particulate matter as required.

END OF SECTION

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SECTION 02115

UNDERGROUND STORAGE TANK AND PIPING REMOVAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Removal or closure-in-place of the underground storage tanks listed in TABLE 1 of this Section, to include cleaning, transportation and disposal of the tanks and associated equipment.

B. Related Sections

1. Section 01350 – Health and Safety Plan
2. Section 02110 – Contaminated Soil Excavation
3. Section 02120 – Transportation and Disposal of Contaminated Materials
4. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

- A. American Petroleum Institute Recommended Practice 1604, “Closure of Underground Petroleum Storage Tanks”
- B. Connecticut State Fire Code
- C. National Fire Protection Association (NFPA) Standard 30, Latest Edition – Flammable and Combustible Liquids Code
- D. NFPA 326 – Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning or Repair,” latest revision.
- E. CTDEEP Policy, Section 22a-449(d)-106, “Underground Storage Tank Regulations” and Section 22a-133k, “Remediation Standard Regulations”

1.3 DEFINITIONS

- A. Underground Storage Tank (UST): Any one, or combination of, tanks (including underground conveyance piping related thereto) that is, or was, used to contain an accumulation of petroleum or other regulated substances, and volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground.

1.4 SUBMITTALS

- A. No fewer than ten working days prior to performing the Work of this Section, submit:
 1. Tank Removal Work Plan as specified herein.
 2. Copies of all local, State, or Federal permits and licenses obtained as required herein.

3. Written confirmation that local authorities have been notified of planned tank removal activities in accordance with local requirements.

1.5 TANK SUMMARY

- A. Underground storage tanks at the Site are located generally as designated on the Drawings. The summary of underground storage tanks at the Site which are to be removed or closed-in-place under this Section is as follows:

TABLE 1
Fuel Tank Removal Schedule

Location	Capacity (gallons)	Contents	Scheduled Action	Construction
Town Dock	20,000	Diesel	Remove	Single-Wall Steel
DPW	6,000	Diesel	Remove	Single-Wall Fiberglass
DPW	4,000	Gasoline	Remove	Single-Wall Fiberglass
Pawcatuck Middle School	10,000	Heating-oil	Close-in-Place	Single-Wall Steel
BOE Administration Building	10,000	Heating-oil	Remove	Single-Wall Steel
West Broad Street School	10,000	Heating-oil	Remove	Single-Wall Steel

- B. In the event that additional, previously unidentified underground fuel storage tanks are encountered during the course of the Work, Owner will advise Contractor if such tanks are to be removed. Should Owner require removal of such tanks, Work shall be performed in accordance with this Section.

1.6 REGULATORY REQUIREMENTS

- A. Perform all tank removal, cleaning and disposal work in accordance with local, State, and Federal regulations and the requirements of any permits or authorizations.
- B. Notification of Scheduled Permanent Closure of UST must be submitted to Connecticut Department of Energy and Environmental Protection (CT DEEP) 30 days prior to removal.
 1. The Contractor shall provide a minimum of 45 days advanced notice to the Owner and Engineer.
 2. The Engineer shall be responsible for submitting the Notification to the CT DEEP.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. Perform operations in a manner which considers the health, safety and protection of all Contractor and Subcontractor personnel, support personnel, Owner and his representatives, and the surrounding environment.
- B. The Work of this Section shall be performed only by trained personnel who understand the associated hazards. Such personnel shall be sufficiently qualified, trained, or educated to safely carry out the necessary operations.
- C. Verify all existing conditions affecting the Work.
- D. Prior to initiating tank removal or closure-in-place activities, disconnect all electrical switches supplying electrical current to equipment that may be connected to the tank to be removed.
- E. Remove and dispose of residual petroleum product and other free liquids from the tank prior to removal of the tank from the ground or beginning closure-in-place activities.
 - 1. Contractor shall provide Bill of Lading for disposed residual fuel and sediment for payment in accordance with Section 01290.
 - 2. Each tank shall be rinsed with a clean water to remove residual materials, per requirement in this Section. Cleaning fluids shall be removed and disposed of following State and Federal requirements.
 - 3. Owner shall approve and sign all waste manifests prior to transporting any waste fuels offsite.
 - 4. Prior to transportation offsite, the gasoline tank shall be inerted using dry ice as detailed in paragraph 3.4.B of this Section.

3.2 TANK REMOVAL WORK PLAN

- A. Develop, implement, maintain, and supervise as part of the Work, a comprehensive Tank Removal Work Plan for tank removal, cleaning, and related operations. The plan shall include, but not be limited to, methods, means and sequence of operations for excavation, removal, cleaning, and ultimate disposal of the tank. The Tank Removal Work Plan shall be based on NFPA 326 and API 1604, Contractor experience, requirements of this Section, and applicable permits, approvals, authorizations, laws, and regulations.
- B. The Tank Removal Work Plan shall also provide guidance and information related to the closure-in-place of the UST located at Pawcatuck Middle School.
- C. At a minimum, the Tank Removal Work Plan shall include:
 - 1. Overall approach to tank removal.
 - 2. Pre-removal investigation activities.
 - 3. Methods to be employed for product, sludge, vapor, and pumpable liquid removal; purging and inerting; and storage/disposal methods.
 - 4. Proposed location(s) of any tank staging area(s) to be utilized for the temporary storage and cleaning of tank.

5. Tank opening and tank cleaning procedures applicable to in-place cleaning, if applicable, and cleaning at tank staging areas.
 6. Identification of waste and tank transporters and means of transportation.
 7. Treatment, disposal, and alternate facilities, and means of treatment, disposal or remediation.
 8. Safe entry procedures.
 9. Spill prevention procedures.
 10. Spill contingency procedures.
 11. Decontamination procedures and safety measures.
- D. The Work of this Section shall not be performed until the Tank Removal Work Plan is reviewed by Owner, Engineer and/or representatives, and authorization is given to proceed.

3.3 PREPARATION

- A. Determine nature and quantity of tank residuals to facilitate disposal of same. Sample residual product, pumpable liquids, and sludge. If the data is not adequate, perform additional sampling and analysis to the extent required by the approved off-site treatment/disposal facility. Satisfy all regulatory requirements related to management of tank residuals.
- B. Before excavating, drain product piping back to the tank, remove residual liquids trapped in the product lines, and remove all product and waste from the tank.
- C. Disposal
 1. Collect, contain and dispose of all un-salvageable tank products and sludge off the Site in accordance with Section 02120 – Transportation and Disposal of Contaminated Materials and the applicable regulatory requirements.
- D. All equipment used in draining and ventilating the tanks shall be properly grounded to prevent electrostatic discharge hazards.

3.4 PURGING AND INERTING

- A. After tank and piping contents have been removed, but prior to excavation beyond top of tank, disconnect all piping (except the piping which may be needed to purge or inert the tank). Flammable and toxic vapors shall be purged from the tank or the tank made inert in accordance with NFPA 326 and API 1604, with the exception that filling with water shall not be used. At a minimum, the tank atmosphere shall be continuously monitored for combustible vapors if the tank is purged, or continuously monitored for oxygen if the tank is inerted.
- B. If inerting the tank, the Contractor shall use 1.5 pounds of dry ice for every 100 gallons of tank capacity distributed evenly throughout the tank.

3.5 EXCAVATION

- A. Control excavation areas in accordance with Contractor's Health and Site Safety Plan (HASP).
- B. Excavate exploratory trenches as necessary to determine the tank location, orientation, limits and the location of ancillary equipment as well as ballast pads, deadmen, and concrete vault as required.
- C. Excavate around the perimeter of the tank so as to limit the amount of potentially contaminated soil that could be mixed with previously uncontaminated soil. If tank is to be closed-in-place, excavate and remove soil only as required to gain access to the tank and safely perform cleaning operations.
- D. Excavate as necessary to remove tank, ballast pad/vault where necessary, piping, and ancillary equipment. Install sheeting, bracing, or shoring if required.
- E. Implement measures as appropriate to secure open excavations during any period when tank excavations remain open. Backfill the excavations as soon as possible after tank and contaminated soil removals have been completed and confirmation samples have been taken.
- F. Implement measures as appropriate to divert surface water or runoff around excavations to prevent water from directly entering into open excavations.

3.6 REMOVAL OF PIPING, ANCILLARY EQUIPMENT, AND TANK

- A. Disconnect all piping and ancillary equipment from the tank. Remove all piping associated with tank to maximum extent possible. Cap all tank ancillary equipment and piping connections, except those connections necessary to inert the tank within the excavation zone. The piping exterior and ancillary equipment shall be cleaned to remove all soil and inspected for signs of corrosion and leakage.
 - 1. Contaminated soil and/or groundwater is expected at the Town Dock. Contaminated materials encountered during tank and piping excavation, (i.e., stained soil, free product), are to be removed in accordance with this Section and Section 02110 Contaminated Soil Excavation.
 - 2. Contaminated soil and/or groundwater is not expected at the remaining sites. However, if contaminated materials are encountered during tank and piping excavation, (i.e., odors, stained soil, free product), Owner will advise Contractor if such materials are to be removed. Should Owner require removal of contaminated soil or groundwater, Work shall be performed in accordance with this Section and Section 02110 Contaminated Soil Excavation.
- B. Remove tank from the excavation and clean the exterior to remove loose soil. Inspect for signs of corrosion, structural damage, or leakage. Take photos to document tank condition. All materials coming into contact with the tank, or in the vicinity of the excavation such as shovels, slings and tools shall be of the non-sparking type. After removal from the excavation, place tank in approved tank staging area on a level surface and secure with wood blocks or other devices to prevent movement. Tanks may also be loaded directly onto trucks/trailers for transportation to an approved disposal or recycling facility.

- C. Remove all associated pumps, piping, surface concrete pads, and associated equipment. Remove below-grade ballast pads as indicated in drawings. It is anticipated that non-contaminated tank-related materials such as concrete debris, tank tiedown pads, or deadmen will not require management as Contaminated Materials.
- D. After the tank and associated equipment has been removed from the ground, Engineer will examine and test adjacent and underlying soils for any evidence of contaminated soil. Should the Engineer's examination or testing identify soils as contaminated soil, Owner may require removal of contaminated soil or groundwater. Removal of contaminated soil shall be performed in accordance with this Section. Perform contaminated soil excavation in accordance with Section 02110 – Contaminated Soil Excavation.
- E. Take no fewer than 8 photographs of this Work for each underground storage tank system.

3.7 TANK CLEANING

- A. All tank cleaning/decontamination will be conducted at the Site in designated tank staging area(s), as approved by Owner. No tanks will be permitted to leave the Site until such Work has been completed.
- B. Tank cleaning may be conducted with tank in-place, or at a tank staging area, and shall be in accordance with approved Tank Removal Work Plan.
- C. Prior to cleaning the tank interior, monitor tank atmosphere for combustible vapors. If required, purge or inert in accordance with this Section.
- D. Clean tank interior in accordance with NFPA 326 using water rinse, steam cleaning, cleaning agents, or other approved method until all residual product, loose scale, and sludge is removed. The interior surfaces of piping shall also be cleaned, to the extent possible, using the same method used for cleaning the tank. Minimize contaminated water generated from interior cleaning operations (of both piping and tank) to the extent practicable. Collect, consolidate, and otherwise contain for disposal all rinse water or other residuals resulting from cleaning operations in accordance with Section 02120 – Transportation and Disposal of Contaminated Materials.
- E. Perform tank cleaning to eliminate, to the greatest extent possible, the need for personnel to enter the tank. Perform cleaning using specially designed tank cleaning equipment which allows the tank to be cleaned prior to cutting into sections without requiring personnel to enter the tank or, if less specialized equipment is used, to partially dissect the tank to minimize confined space entry hazards.
- F. Clean exterior of tank, piping, and associated equipment, as required, using non-sparking tools, to eliminate soil deposition on roadways during transportation to temporary storage area and to simplify tank cutting.
- G. If the tank is stored after tank exterior is cleaned and ancillary equipment is removed, and prior to being cut into sections, secure the tank for temporary storage in designated tank staging area.
- H. Plug or cap all accessible openings after the tank has been cleaned and freed of vapors. Leave a minimum 1/8-inch diameter vent hole in one fitting. Position tank fittings and the vent on top during storage and transportation to an approved disposal facility.

3.8 TRANSPORTATION AND DISPOSAL REQUIREMENTS

- A. Before the tank is transported off-site, label the tank as follows:

TANK HAS CONTAINED PETROLEUM FUEL PRODUCTS
NOT VAPOR FREE
NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR
HUMAN OR ANIMAL CONSUMPTION
DATE OF REMOVAL: MONTH/DAY/YEAR

- B. After the tank, piping, and ancillary equipment have been cleaned, transport the tank off-site for disposal. Recycle tank, piping sections and ancillary equipment to the extent practicable. Do not sell the tank intact.
- C. The tanks shall be removed from the site intact. Onsite demolition is prohibited unless approved by Owner in writing.
- D. Transport all tank-related materials and any ancillary equipment for off-site disposal in accordance with applicable regulations.

3.9 CONFIRMATION TESTING BY THE ENGINEER

- A. Following tank removal, if Engineer does not require contaminated soil excavation, or following the work of contaminated soil excavation if required by Engineer, Engineer will collect confirmation samples from the tank area in accordance with CT DEEP requirements.
1. Laboratory turnaround time for testing of such confirmation samples may be up to 5 working days from date of collection. Accommodate the laboratory turnaround time as defined herein.
 - a. The 5 working days for laboratory data will begin on the day following sample collection.
- B. Should the results of Engineer's testing indicate additional contaminated soil excavation is required, Engineer will define those areas beyond the original excavation limits where additional contaminated soil excavation is required. Contaminated soil excavation shall be performed in accordance with Section 02110 – Contaminated Soil Excavation.

END OF SECTION

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SECTION 02120

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Transportation and disposal of Contaminated Soil or materials collected, consolidated, excavated, and generated during performance of the Work.
 - 2. Coordination, loading, transportation and disposal of contaminated materials.
- B. Related Sections
 - 1. Section 01350, Health & Safety Plan
 - 2. Section 02110, Contaminated Soil Excavation

1.2 DEFINITIONS

- A. Disposal: The legal off-site disposition, including handling, transport and ultimate disposal, of a waste material at a facility licensed/permitted for the type of waste in question, including treatment facility or landfill in accordance with all applicable waste management rules, laws and regulations.
- B. Generator: Any person, by site, whose act or process produces hazardous waste, or whose act first causes a hazardous waste to become subject to regulation.
- C. Regulated Waste: Includes non-Resource Conservation and Recovery Act (RCRA) hazardous wastes such as oils, petroleum products or residuals, chemical liquids, chemical gases or vapors, non-Toxic Substances Control Act (TSCA) polychlorinated biphenyls (PCBs), waste chemical solids, including soils, and other contaminated material wastes not defined as RCRA Hazardous, TSCA-regulated, or Special Waste.
- D. Manifest: An approved form used as a shipping document to identify the quantity, composition, and the origin, routing, and destination of regulated or hazardous waste from the site of generation to the point of disposal, treatment, storage, or use.
- E. Shipping Paper: An invoice, bill of lading, or other shipping document serving a similar purpose; other than a hazardous waste manifest used to document the conveyance of materials between different locations, including regulated wastes when applicable.
- F. Treatment: Any method, technique or process, including neutralization, incineration, stabilization or solidification, designed to change the physical, chemical or biological character or composition of any hazardous waste so as to neutralize such waste or so as to render such waste less hazardous, non-hazardous, safer to transport, amenable to storage, or reduced in volume, except such method or technique as may be included as an integral part of a manufacturing process at the point of generation.

- G. Non-RCRA Out-of-State Lined Landfill: This type of landfill shall be state approved or permitted to accept material that is defined as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; material containing PCBs below 50 ppm; and all other material not permitted or unsuitable for in-state disposal or recycling.
- H. Out-of-State Recycling Facility: This type of facility shall be state approved or permitted to accept material that is defined as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; material containing PCBs below the facility's permitted level; and all other material not permitted or unsuitable for in-state disposal or recycling.
- I. In State Recycling Facility: This type of facility shall be approved by the State of Connecticut to accept material that is classified as petroleum contaminated material, that would be classified as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations if not managed under in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.
- J. Landfill Facility (Reuse as Cover Material): This type of facility shall be approved by the State in which the landfill is located to accept material that is classified as polluted material, that would be classified as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations if not managed under in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.

1.3 SUBMITTALS

- A. Submit all pertinent information relating to the transport and disposal of materials specified herein, a minimum of seven days prior to transport and disposal. The information submitted be in one package and shall include the following, as a minimum:
 - 1. Information for proposed treatment/disposal facility or facilities including the following:
 - a. General Information
 - 1) Facility Name
 - 2) Facility Address
 - 3) Name of Contact Person
 - 4) Title of Contact Person
 - 5) Telephone Number of Contact Person
 - 6) Permit Number
 - b. The facility shall specify the volume of material that can be accepted from the Project on a weekly and a total basis.

- c. The facility shall provide written confirmation that they are permitted to accept and will accept the classified contaminated materials the general quality and quantity described by these specifications.
 - d. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and treatment/disposal of the contaminated materials described by these specifications.
- 2. State of Connecticut Transporter Identification Number and expiration date.
- 3. Name and address of all hazardous material transporters to be used to transport materials including proof of permit, license, or authorization to transport hazardous material in all affected states.
- B. Upon receipt of final approval from treatment/disposal facility to accept contaminated materials, submit copy of said approval.
- C. Within ten (10) working days after the off-site transportation of contaminated materials, submit copies of all paperwork related to transportation of contaminated materials. Such paperwork may include, but not be limited to receipts, weight tickets, and disposal certificates.
 - 1. Provide certified tare and gross weight slips for each load received at the designated treatment/disposal facility which shall be attached to copy of related manifest or bill of lading.
- D. Prior to receiving progress payment, submit documentation certifying that all materials were transported to, accepted, and disposed of, at the selected treatment/disposal facility. The documentation shall include the following, as a minimum.
 - 1. Documentation for each load from the site to the disposal facility, including all manifests and any other applicable transfer documentation.
 - 2. All documentation for each load shall be tracked by the original manifest or bill of lading document number assigned at the project site at time of signature by authorized Engineer.

1.4 REGULATORY REQUIREMENTS

- A. Obtain all Federal, State and local permits, approvals, or authorizations required for the transport and disposal of contaminated materials. Adhere to all requirements of such permits, approvals, or authorizations.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. Sample, test, or analyze contaminated material for approval of final disposal. Engineer will sample and analyze contaminated soil.

- B. Contaminated materials to be disposed of include, but are not limited to contaminated soil, rock, miscellaneous contaminated debris, petroleum fuels, petroleum residuals, concrete, and other materials from remediation, demolition and decontamination operations.
- C. All contaminated materials excavated, consolidated, or otherwise managed during the course of the work will require special handling in accordance with these specifications, the Contractor's Health and Safety Plan, and all applicable permits, approvals, authorizations, and regulations.
- D. Dispose of contaminated materials at facilities approved by Owner or Engineer.
- E. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the Site Health and Safety Plan.
- F. Contractor shall select treatment/disposal facilities to receive contaminated materials from the Project which are established, fully operational, and in full compliance with all applicable Federal, State, and local regulations.
- G. Perform collection of characterization (except soils) samples and laboratory analyses to satisfy the acceptance criteria for selected receiving facility(s).
- H. Remove all contaminated materials from the project site and legally dispose of materials.

3.2 CHARACTERIZATION FOR DISPOSAL-CONTAMINATED SOIL

- A. Contaminated soil characterization sampling will be conducted by the Engineer. Contractor must provide a list of analytical requirements for the proposed disposal facility.
- B. The Engineer will collect soil samples. Such samples may be collected from within Excavation Areas, or following deposition of Contaminated Soil in the Temporary Controlled Stockpile Area.

3.3 DISPOSAL COORDINATION AND TRANSPORT

- A. Contractor is solely responsible for coordinating treatment/disposal facility approval, scheduling, loading, transport, and ultimate disposal of contaminated materials at treatment/disposal facility. No claim for delay will be considered based upon Contractor's facility failing to meet Contractor's production schedule. No payments will be made for rejected loads.

3.4 MANIFESTS AND SHIPPING PAPERS

- A. Owner is designated as the "Generator" and will sign all Manifests and Shipping Papers. Manifests and Shipping Papers shall be prepared by Contractor seventy-two (72) hours in advance of shipment of contaminated materials. Authorized Owner's representative will sign as "Generator" as each load of contaminated material leaves the Project Site. Contractor shall forward appropriate original copies of Manifests or Bills of Lading to Engineer on the same day the contaminated materials leave the Project Site.

3.5 TRANSPORT OF CONTAMINATED MATERIAL

- A. Transport contaminated materials off-site after all treatment/disposal facility documentation has been completed and the material accepted by said facility.
- B. Transport contaminated materials from the site to treatment/disposal facility in accordance with all United States Department of Transportation (DOT), USEPA, Connecticut regulations and other regulations of all affected states.
- C. The Hauler(s) shall be licensed in all states affected by transport.
- D. Provide to Engineer copies of all weight slips, both tare and gross, for every load weighed and disposed of at the accepted disposal facility. The slips shall be tracked by the original manifest document number that was assigned by Engineer at the site. Owner will only make progress payments upon receipt of these weight slips.
- E. Minimize the potential for development of free liquid during transport. Do not load wet soils for transport. If free liquid does develop during transport, Contractor shall be responsible for proper collection and disposal of same.
- F. Soil located in the Temporary Stockpile Area shall be removed from the Project Site in accordance with the requirements of this section.

END OF SECTION

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SECTION 02225**SELECTIVE DEMOLITION****PART 1 GENERAL****1.1 SUMMARY**

- A. Remove and dispose of asphalt, concrete and steel reinforcements generated during removal of the underground storage tanks and installation of new underground storage tanks.
 - 1. Underground storage tanks and equipment shall be disposed of as described in Section 02115.
- B. Coordinate all demolition work which may affect proposed subtrade work to verify the limits of the demolition work required.

1.2 RELATED SECTIONS

- A. Section 01350 – Health & Safety Plan
- B. Section 02115 - Underground Storage Tank and Piping Removal
- C. Section 02120 – Transportation and Disposal of Contaminated Materials

1.3 DEFINITIONS

- A. Demolish – To tear down, segregate waste streams and lawfully recycle or dispose of all debris generated in the process including structure contents.
- B. Limit of Work – Area delineated on Drawings that defines the extent of demolition work under the Contract.
- C. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- D. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- E. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 REGULATORY REQUIREMENTS

- A. Comply with all applicable federal, state, and local safety and health requirements regarding the demolition of structures including the proper handling of hazardous materials. Comply with all applicable federal and state requirements for the disposal of such materials.
- B. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or levied.
- C. Notify and obtain such permits or approvals from all agencies having jurisdiction over the Work, but not limited to Health, Building, and Fire Departments of the municipality and local, state and federal agencies.

- D. Comply with all applicable federal, state, and local environmental, safety and health requirements regarding the renovation or demolition of structures and other site features and recycling or disposal of demolition debris, as applicable.

1.5 PRE- DEMOLITION MEETINGS

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

1.6 JOB CONDITIONS

- A. The Owner will be continuously occupying the site adjacent to the areas of selective demolition. Conduct selective demolition work in a manner that will minimize need for disruption of owner's normal operations. Provide minimum of two (2) weeks advance notice to owner of demolition activities which will impact owner's normal operations.
- B. The Owner assumes no responsibility for actual condition of items or structures to be demolished. Conditions existing at the time of commencement of the contract will be maintained by the Owner insofar as practicable. However, variations within the structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from the site as they are removed. Storage or sale of removed items on site will not be permitted
- D. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
 - 1. Provide protective measures as required to provide free and safe passage of Owner's personnel by the sites.
 - 2. Protect from damage existing finish work that is to remain in place which will become exposed during demolition operations.
 - 3. Remove protections at completion of work.
- E. Promptly repair damages caused to adjacent facilities by demolition work at no additional cost to the Owner.
- F. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

- G. Do not close, block or otherwise obstruct roadways, walks or other occupied or used facilities without permission from Owner.
- H. Maintain existing utilities, keep in service, and protect against damage during demolition operations.
- I. Do not interrupt existing utilities serving the facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 INSPECTION

- A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing structure surfaces, equipment or surrounding properties which could be misconstrued as being damaged from selective demolition work. File with Owner prior to starting work.

3.2 DEMOLITION

- A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
- B. If unanticipated mechanical, electrical, or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Engineer in written, accurate detail. Pending receipt of directive from Engineer, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.3 DISPOSAL OF DEMOLISHED MATERIAL

- A. Remove debris, rubbish, and other materials resulting from demolition operations from site. Transport and legally dispose of materials off-site.

3.4 CLEAN-UP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment and demolished materials from site.
- B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

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SECTION 02315**EXCAVATION, BACKFILL, COMPACTION AND DEWATERING****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Excavation, backfill, compaction, and dewatering of underground storage tank excavations

B. Related Sections

1. Section 02110 – Contaminated Soil Excavation
2. Section 02120 – Transportation and Disposal of Contaminated Materials
3. Section 02320 - Borrow Materials
4. Section 02740 – Bituminous Concrete Pavement

1.2 REFERENCES

- A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
- B. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- C. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- E. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F

1.3 DEFINITIONS

- A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.
- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems,

sloping and benching systems, shield systems, and other systems that provide the necessary protection.

- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- G. Temporary Dewatering System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.
- H. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

1.4 SUBMITTALS

- A. Drawings and calculations for each Earth Retention System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Earth Retention Systems.
 - 1. Submit calculations and drawings for Earth Retention Systems prepared, signed and stamped by a Professional Engineer registered in the state where the work is performed.
- B. Performance data for the compaction equipment to be utilized.
- C. Construction methods that will be utilized for the removal of rock.
- D. Dewatering plan for the excavation locations.

1.5 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- B. The following test procedures will be performed by the Contractor's inspection agency. Results will be submitted to the Engineer for review.
 - 1. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:

- a. For suitable soil materials removed during excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.
 - b. For borrow materials; perform tests at frequency specified in Section 02320 - Borrow Materials.
- 2. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled. The Engineer will determine the locations and lifts to be tested.
 - a. The Engineer may specify additional compaction testing when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
 - b. If all compaction test results within the initial 25 % of the total anticipated number of tests indicate compacted field densities equal to or greater than 95 % of maximum dry density at optimum moisture content, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.
 - c. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where excavation sidewalls impact the attenuation of the gamma radiation or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.
- C. Employ the services of a dewatering specialist or firm when well points, deep wells, recharge systems, or equal systems are required. Specialist shall have completed at least 5 successful dewatering projects of equal size and complexity and with equal systems.

1.6 PROJECT CONDITIONS

- A. Notify "Call Before You Dig" prior to commencing excavation activities and obtain "Call Before You Dig" identification numbers.
- B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.
- B. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, SW, and SP

- C. Satisfactory fill materials shall not contain trash, refuse, vegetation, masses of roots, individual roots more than 18-inches long or more than 1/2-inch in diameter, or stones over 6 inches in diameter. Unless otherwise stated in the Contract Documents, organic matter shall not exceed minor quantities and shall be well distributed.
- D. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.
- E. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction. In no case shall salvaged materials be substituted for the required gravel base.
- F. A Certificate of Clean Fill must be provided to Engineer and Owner for approval prior to delivery of any and all fill material including but not limited to, mineral soil, borrow material, structural fill, processed fill material, loam, or top soil to be placed on site during the course of the Work. The Certificate must include laboratory analytical reports for all material to be used at the site on a basis of one sample per every 500 cubic yards or lesser portions thereof. Analytical reports must demonstrate that the proposed material does not contain detectable concentrations of contaminants including but not limited to; petroleum hydrocarbons, semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), pesticides, and/or herbicides and that metals listed in the Connecticut Remediation Standard Regulations do not exceed minimal concentrations deemed allowable by Engineer and Owner. No fill material shall be placed on site until Contractor has received approval from Engineer and/or Owner. Engineer and Owner reserves the right to collect and analyze samples from any proposed fill material prior to or after delivery to the site and to allow use of off-specification material at their sole discretion.

The Certificate must clearly state the following and be signed by an authorized signatory employed by the Contractor:

1. Volume of material to be used
2. Process by which the material was obtained
3. Location of origin and summary of current and past site uses of the location of origin
4. Statement from Contractor that the analytical reports included with the Certificate represent the specific material to be used at the site
5. Statement that the Contractor does not know or have reason to believe that the proposed fill material contains foreign materials or contaminants.

2.2 DEWATERING MATERIALS

- A. Provide silt filter bags (Dandy Dewatering Bag, Dirtbag, JMP Environ-Protection Filter Bag, or equal) of adequate size to match flow rate.
- B. Provide dewatering equipment and materials for engineered dewatering systems.

PART 3 EXECUTION**3.1 PREPARATION****A. Public Safety and Convenience**

1. Adhere to the requirements of Section 2.05 of the State of Connecticut of Transportation, Form 816, "Standard Specifications for Roads, Bridges and Incidental Construction", 2016.
2. Take precautions for preventing injuries to persons or damage to property in or about the Work.
3. Provide safe access for the Owner and Engineer at site during construction.
4. Do not obstruct site drainage, natural watercourses or other provisions made for drainage.

3.2 CONSTRUCTION**A. Earth Retention Systems**

1. Provide Earth Retention Systems necessary for safety of personnel and protection of the Work, adjacent work, utilities and structures.
2. Maintain Earth Retention Systems for the duration of the Work.
3. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.
4. Drive sheeting ahead of and below the advancing trench excavation to avoid loss of materials from below and from in front of the sheeting.
5. Sheet piling is to be driven to at least the depth specified by the designer of the earth retention system, but no less than 2 feet below the bottom of the Excavation.
6. Remove sheeting, unless designated to be left in place, in a manner that will not endanger the construction or other structures. Backfill and properly compact all voids left or caused by the withdrawal of sheeting.
7. Remove earth retention systems, which have been designated by the Engineer to be left in place, to a depth of 3 feet below the established grade.

B. Excavation

1. Perform excavation necessary to remove the underground storage tanks indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section.
2. Excavate with equipment selected to minimize damage to existing utilities or other facilities. Hand excavate as necessary to locate utilities or avoid damage.
3. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction.

4. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.
 - a. Excavated material not required or not suitable for backfill shall be removed from the site.
 - b. Perform grading to prevent surface water from flowing into the excavation.
 - c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.
 - d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.
5. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.
6. If satisfactory materials are not encountered at the design subgrade level, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the material. Backfill the resulting extra depth of excavation with satisfactory fill materials and compact in accordance with the provisions of this Section.

C. Backfill and Compaction

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.
2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.
3. Backfilling and compaction methods shall attain 95 % of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.
4. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.
5. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. In no case shall loose lift height for backfilling exceed 3 feet.
6. Where excavation is made through permanent pavements, curbs, paved driveways, or paved sidewalks, or where such structures are undercut by the

excavation, place the entire backfill to sub-grade with granular materials and compact in 6 inch layers. Use approved mechanical tampers for the full depth of the trench. If required, sprinkle the backfill material with water before tamping so as to improve compaction. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required to correct the problem, and shall then be refilled and properly compacted with the surface restored to required grade at no additional expense.

7. Backfill from the bottom of the trench to the centerline of the pipe with the specified material. This initial backfill is to be placed in layers of no more than 6 inches and thoroughly tamped under and around the pipe. This initial backfilling shall be deposited in the trench for its full width on both sides of the pipe, fittings and appurtenances simultaneously.
8. Electrical conduit not encased in concrete, shall be backfilled with sand borrow conforming to the requirements of Section 02320. The backfill shall be placed in the trench for its full width and shall extend to 12 inches over the pipe.

D. Dewatering

1. Obtain the following construction dewatering permits, as required:
 - a. CT DEEP permit titled "Stormwater and Dewatering Wastewaters from Construction Activities (DEP-PERD-GP-015)"
2. Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.
3. Conduct operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work.
4. Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.
5. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.
6. Exercise care to ensure that water does not collect in the bell or collar holes to sufficient depth to wet the bell or collar of pipes waiting to be jointed.
7. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches

for drainage. Upon completion of the work, all areas shall be restored to original condition.

8. Brace or otherwise protect pipelines and structures not stable against uplift during construction.
9. Do not excavate until the dewatering system is operational and the excavation may proceed without disturbance to the final subgrade.
10. Unless otherwise specified, continue dewatering uninterrupted until the structures, pipes, and appurtenances to be installed have been completed such that they will not float or be otherwise damaged by an increase in groundwater elevation.
11. Temporarily lower the groundwater level at least two feet below excavations to limit potential "boils," loss of fines, or softening of the ground. If any of these conditions are observed, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred.
12. When subgrades are soft, weak, or unstable due to improper dewatering techniques, remove and replace the materials in accordance with Section 02320 at no cost to the Owner.
13. Notify the Engineer immediately if any settlement or movement is detected of survey points adjacent to excavations being dewatered. If settlement is deemed by the Engineer to be related to the dewatering, submit a modified dewatering plan to the Engineer within 24 hours. Implement the approved modified plan and repair any damage incurred to the adjacent structure at no cost to the Owner.
14. Dewatering discharge:
 - a. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
 - b. Do not discharge water into any sanitary sewer system.
 - c. Provide separately controllable pumping lines.
 - d. The Engineer reserves the right to sample discharge water at any time.
15. Notify Engineer immediately if contaminated or potentially contaminated groundwater or saturated soil is encountered at areas that require dewatering.
16. In the event that unforeseen contaminated materials are encountered during the course of the work, permit the Engineer sufficient time to devise an appropriate course of action based upon the conditions present.
 - a. Until such appropriate course of action is devised, Contractor shall secure the work area in question such that it does not pose a health and safety risk.

- b. Engineer will provide Contractor with a scope of work and performance requirements for management of unforeseen contaminated material. Contractor shall then undertake contaminated material remediation with equipment and techniques established by Contractor in accordance with said scope of work and performance requirements.
- c. Contaminated material remediation shall be performed in accordance with scope of work outlined in Item 3.2.16.b and in accordance with this specification.

3.3 PROTECTION

A. Protection of Existing Structures

- 1. All existing foundations, conduits, wall, pipes, wires, poles, fences, property line markers and other items which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. Should such items be damaged, they shall be restored by the Contractor to at least as good condition as that in which they were found immediately before the Work began.

B. Accommodation of Traffic

- 1. Drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep drives open and safe for two-way traffic unless otherwise indicated.

C. Erosion and Sedimentation Control

- 1. Take all necessary steps to prevent soil erosion.
- 2. Plan the sequence of construction so that only the smallest practical area of land is exposed at any one time during construction.

END OF SECTION

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SECTION 02320

BORROW MATERIALS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Processed Gravel Borrow for Pavement Sub-base
 - 2. Granular Fill
 - 3. Washed Rounded Stone (Peastone)
- B. Related Sections
 - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

- A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- B. ASTM C117 - Standard Test Method for Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
- C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./ft³)
- E. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head)
- F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- H. AASHTO – Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended

1.3 SUBMITTALS

- A. Provide sieve analysis (ASTM C136) and permeability analysis (ASTM D2434) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 1,500 c.y. of borrow material placed.
- B. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.
- C. A Certificate of Clean Fill must be provided to Engineer and Owner for approval prior to delivery of any and all fill material including but not limited to, mineral soil, borrow material, structural fill, processed fill material, loam, or top soil to be placed on site

during the course of the Work. The Certificate must include laboratory analytical reports for all material to be used at the site on a basis of one sample per every 500 cubic yards or lesser portions thereof. Analytical reports must demonstrate that the proposed material does not contain detectable concentrations of contaminants including but not limited to; petroleum hydrocarbons, semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), pesticides, and/or herbicides and that metals listed in the Connecticut Remediation Standard Regulations do not exceed minimal concentrations deemed allowable by Engineer and Owner. No fill material shall be placed on site until Contractor has received approval from Engineer and/or Owner. Engineer and Owner reserves the right to collect and analyze samples from any proposed fill material prior to or after delivery to the site and to allow use of off-specification material at their sole discretion.

The Certificate must clearly state the following and be signed by an authorized signatory employed by the Contractor:

1. Volume of material to be used
2. Process by which the material was obtained
3. Location of origin and summary of current and past site uses of the location of origin
4. Statement from Contractor that the analytical reports included with the Certificate represent the specific material to be used at the site
5. Statement that the Contractor does not know or have reason to believe that the proposed fill material contains foreign materials or contaminants.

1.4 QUALITY ASSURANCE

- A. No borrow shall be placed prior to the approval of Samples by the Engineer.

1.5 PROJECT/SITE CONDITIONS

- A. Existing Conditions

1. Comply with any environmental requirements and restrictions.
2. Keep all public and private roadway surfaces clean during hauling operations and promptly and thoroughly remove any borrow or other debris that may be brought upon the surface before it becomes compacted by traffic. Frequently clean and keep clean the wheels of all vehicles used for hauling to avoid bringing any dirt upon the paved surfaces.

PART 2 PRODUCTS

2.1 PROCESSED GRAVEL BORROW FOR PAVEMENT SUBBASE

- A. The compacted Processed Gravel Borrow to be used for gravel access roads and pavement subbase, or other area where a firm, free-draining subgrade is needed shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

- B. Gradation requirements shall conform to the following:

Sieve	Percent Passing
3"	100
1 ½"	70 – 100
¾"	50 – 85
No. 4	30 – 60
No. 200	0 - 10

- C. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

2.2 GRANULAR FILL

- A. Granular Fill to be used as fill material to achieve gravel base grade beneath structures, pavement, or other area requiring structural fill shall consist of inert material that is hard, durable stone and sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

- B. Gradation requirements for Granular Fill shall conform to the following:

Sieve Size	Percent by Weight Passing Through	
	Minimum	Maximum
2/3rds loose lift thickness	100	--
No. 10	30	95
No. 40	10	70
No. 200	0	15

2.3 STONE BORROW

- A. Washed Rounded Stone (Peastone)

1. All stone shall be clean material substantially free from any foreign and deleterious material such that not more than 1% passes the #200 sieve. The maximum particle size shall be 5/8".
2. Washed rounded stone be washed, rounded and be acceptable to tank manufacturer. Washed rounded stone shall conform to the following gradation requirements:

Sieve Size	Percent Passing Through by Weight	
	Minimum	Maximum
5/8 "	100	-
½"	85	100
3/8"	15	45
No.4	0	15
No.8	0	5

PART 3 EXECUTION**3.1 INSTALLATION**

- A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents, and approved by the Engineer.
- B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.
- C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.
- D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.
- E. Utilize gravel borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.
- F. Processed gravel for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.
- G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.
- H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.
- I. Place all borrow to keep it free of other materials and to prevent segregation.

END OF SECTION

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SECTION 02740

HOT MIX ASPHALT (HMA) PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Permanent HMA Driveway/Parking Lot Repair
- B. For the purposes of this Section, Hot Mix Asphalt (HMA) and bituminous concrete have the same meaning.
- C. Provide HMA pavement repair at the BOE Administration Building, Pawcatuck Middle School, and West Broad Street School sites as indicated in Drawings.
- D. Owner shall provide all HMA pavement repair at Town Dock and Department of Public Works sites as indicated in Drawings.
- E. Related Requirements
 - 1. Section 02315 - Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

- A. State of Connecticut Department of Transportation "Standard Specifications for Roads, Bridges and Incidental Construction Form 814A," 1995 Edition as amended
- B. ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- C. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1990 Edition, as amended
- D. AASHTO M 320
- E. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual
- F. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual

1.3 SUBMITTALS

- A. Job mix formula for each mix specified under this Section.
- B. Certificate indicating the mixes specified meet or exceed the requirements specified herein.

1.4 QUALITY ASSURANCE

- A. Codes and standards: Comply with provisions of following, except otherwise indicated:
 - 1. Reference to "Form 816" means the State of Connecticut Department of Transportation "Standard Specification for Roads, Bridges and Incidental Construction, 2016", including any interim and supplemental specification.
- B. Obtain materials from same source throughout.

PART 2 PRODUCTS

2.1 MATERIALS

A. Bituminous Concrete Pavement:

1. Material for Bituminous Concrete Pavement and Bituminous Bases shall comply with Section M.04 of "Form 816".
2. The mixture design of bituminous and compacted thickness shall be as indicated on the Contract Drawings.

B. Bituminous Tack Coat:

1. Unless otherwise indicated on the Contract Drawings, the bituminous material for this work shall conform to the requirements of M.04.01 of "Form 816" for Grade SS-1 Emulsified Asphalt. Applications temperatures shall be between a minimum of 75 F and a maximum of 140 F.
2. The bituminous material shall be diluted with an equal amount of suitable emulsifier solution and thoroughly mixed into a homogeneous liquid.

PART 3 EXECUTION

3.1 PAVING – GENERAL

- A. Bituminous Concrete for Pavement shall comply with Article 4.06.03 of "Form 816".
- B. Maintain pavement under this Contract during the guarantee period of one year and promptly (within 3 days of notice given by the Engineer) refill and repave areas which have settled or are otherwise unsatisfactory for traffic.
- C. All pavement thicknesses referred to herein are compacted thicknesses. Place sufficient mix to ensure that the specified thickness of pavement results.
- D. Regardless of temperature, no permanent mix conforming to the requirements of these specifications shall be placed after October 31 or before May 1 of any year.
- E. When the air temperature falls below 50°F, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials and placing and compacting the mixtures.
- F. Existing drainage patterns shall not be altered by the new pavement construction unless otherwise shown on the Drawings.
- G. Furnish and spread calcium chloride on disturbed surfaces to control dust conditions when necessary, or upon direction of the Engineer.
- H. In no case will pavement be placed until the gravel base is dry and compacted to at least 95.0% maximum density at optimum moisture content.
- I. All pavement edges that have been damaged shall be sawcut again if necessary to re-establish a straight clean line between the existing pavement and trench patch.
- J. Tack Coats

1. The edges of the existing pavement where the joints are to be formed shall be thoroughly coated with tack coat to ensure adhesion between the two pavements.
 2. The contact surfaces of curbs, castings, and other structures shall be painted with a tack coat prior to placement of paving.
- K. Top course mixes shall provide for 4% air voids in the finished product. The initial in-place voids shall not exceed 7.5%. Final in-place voids shall not be below 2.5%. Additional asphalt content shall not be added for the sole purpose of reducing the in-place voids. If the in-place voids are too high or the paving is expected to occur during cold weather, more compactive effort will be required to adjust the void content rather than increasing the asphalt content.
- L. Breakdown rolling shall not occur before the HMA has cooled to a temperature of 320 degrees Fahrenheit, and shall be completed before the HMA mat has cooled to a temperature of 275 degrees Fahrenheit. Intermediate rolling shall be completed prior to the HMA mat attaining a temperature of 200 degrees Fahrenheit. Finish rolling shall be completed prior to the HMA mat attaining a temperature of 150 degrees Fahrenheit. Roller and paver speeds shall be agreed upon with the Engineer prior to placing HMA to ensure mix temperature requirements will be met.
- M. Thermal segregation of the HMA shall be limited to a maximum of 20 degrees Fahrenheit.
- N. Cascading HMA material on the top of the finished mat with rakes or shovels will not be permitted. Coarse Aggregate dislodged as a result of unavoidable hand work shall be removed from the surface prior to rolling.
- O. Place and compact HMA materials by steel-wheeled rollers of sufficient weight to compact the HMA to 92.5% of the calculated **Theoretical Maximum Density** (TMD) in accordance with ASTM D2041.
- P. Along curbs, structures and all other places not accessible with a roller, the paving mixture shall be thoroughly compacted with tampers. Such tampers shall not weigh less than 25 pounds and shall have a tamping face no more than 50 square inches in size. The surface of the mixture after compaction shall be smooth and true to the established line and grade.
- Q. No vehicular traffic shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled to below 140 degrees Fahrenheit or sufficiently to prevent distortion or loss of fines. HMA delivery trucks (loaded or empty) shall not be permitted on the newly completed pavement until the asphalt has cooled to below 90 degrees Fahrenheit. If the climatic or other conditions warrant, the period of time before opening to traffic may be extended at the discretion of the Engineer.
- R. Following all paving, the area along the edge of all pavement shall be backed up with gravel, or loam and seed as required, so that it is flush with the adjacent paving. Whenever possible, the final surface of the backup material shall slope away from the surface edge for drainage runoff.
- S. Following all paving, clean all catch basins and remove and dispose of all debris.

END OF SECTION

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SECTION 02920

LAWNS AND GRASSES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Restoration of all lawn and vegetated areas disturbed during construction including:

1.2 SUBMITTALS

- A. Lawn seed mixture including percent by weight of each seed type, and manufacturer/Supplier name.
- B. Suitable laboratory analysis of the topsoil to determine the quantity of fertilizer and lime to be applied.
- C. Lime and starter fertilizer application rates based on laboratory soil tests.
- D. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment.

1.3 QUALITY ASSURANCE

- A. Place seed only between the periods from April 15th to June 1st, and from August 15th to October 1st, unless otherwise approved by the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Starter Fertilizer

1. Starter fertilizer shall bear the manufacturer's name and guaranteed statement of analysis, and shall be applied in accordance with the manufacturer's directions.
2. Starter fertilizer shall be Scott's Starter Fertilizer, or equal, with timed nitrogen release to prevent burning.

B. Lime

1. Lime shall be an agricultural type ground limestone.
2. Lime shall be pelletized type for prolonged time release to soil.
3. Lime shall be applied at the rates recommended in the soil analysis.

C. Seed

1. Seed shall be of the previous year's crop.
2. Required properties:

- a. Purity > 90%
 - b. Germination > 80%
 - c. Crop < 0.5%
 - d. Weed < 0.3%
 - e. Noxious Weed – 0%
 - f. Inert < 8%
3. Grass seed shall conform to the following mixture in proportion by weight and weed content and shall pass the minimum percentages of purity and germination as indicated for same.

Recreation Mix	% Weight
Creeping Red Fescue	40%
Pennifine Perennial Ryegrass	35%
Birds Foot Trefoil (Empire Variety	15%
Ladino Clover	10%

4. All seed shall comply with State and Federal Seed Laws and Regulations.

PART 3 EXECUTION

3.1 PREPARATION

- A. The loam shall be prepared to receive seed by removing stones and grading to eliminate water pockets and irregularities prior to placing seed. Finish grading shall result in straight uniform grades and smooth, even surfaces without irregularities to low points.
- B. All stones over one-half (½) inch in diameter remaining on the surface after raking shall be removed.
- C. All areas disturbed by construction within the property lines and not covered by structures, pavement, or bark mulch shall be loamed and seeded.
- D. Fertilizer shall be spread on the top layer of loam at the minimum rate of 1 pound per 100 square feet.

END OF SECTION

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DIVISION 3 - CONCRETE

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Wood Form Material
 - 2. Formwork Accessories
- B. Related Sections
 - 1. Section 03200 – Concrete Reinforcement
 - 2. Section 03300 - Cast-in-Place Concrete

1.2 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. ACI 318 - Building Code Requirements for Reinforced Concrete
 - 2. ACI 347 - Guide to Formwork for Concrete
- B. American Society for Testing and Materials (ASTM)
 - 1. D4 - Standard Test Method for Bitumen Content
 - 2. D1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
- C. National Institute of Standards and Technology (NIST)
 - 1. Voluntary Product Standard PS 1-95 - Construction and Industrial Plywood

1.3 DESIGN REQUIREMENTS

- A. Design formwork and shoring at the Contractor's expense by a Professional Engineer registered in the State where the work will be performed to conform to all design and code requirements in ACI 301, ACI 318 and ACI 347 and other applicable regulations and codes. The design shall consider any special requirements that may result due to the use of super plasticized and/or retarded set concrete.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

- A. Lumber: Douglas Fir species, No. 1 grade S4S with grade stamp clearly visible

2.2 PREFABRICATED FORMS

- A. Manufacturers:
 - 1. Symons Corporation, DesPlains, Illinois

2. HICO Corporation, Bronx, NY
 3. Or equal
- B. Preformed Steel Forms: Minimum 16 gage (1.5 mm), tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearances of finished concrete surfaces; with clean, warp free, undented, ungouged, undamaged surfaces
- C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearances of finished concrete surfaces

2.3 FORMWORK ACCESSORIES

- A. Form Ties:
1. Setback cones shall be wood or plastic tapered cones 1 inch diameter and 1½ inches deep to allow filling and patching of the concrete surface after removal.
 2. Common wire ties shall not be used.
- B. Corners:
1. Chamfered No. 1 Poplar wood strips; ¾ inch by ¾ inch; maximum possible lengths

PART 3 EXECUTION

3.1 GENERAL

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.
- B. Review all work prepared by others to receive work of this Section and correct any defects affecting installation. Commencement of work by the Contractor will be construed as complete acceptance of preparatory work by others.
- C. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing frozen material. Remove improper and rejected materials immediately from point of use. Cover materials and accessories during construction period.

3.2 EARTH FORMS

- A. Earth forms are not permitted.

3.3 FORM PREPARATION

- A. Coat contact surfaces of forms with a form release agent prior to form installation.
- B. Thoroughly clean steel forms between uses using high pressure water or jet or sand blasting to remove all mill scale, concrete laitance or other ferrous deposits from the contact surfaces of the forms.

- C. Before re-use of wood forms, thoroughly clean form contact surfaces, repair damaged areas and remove projecting nails. A partial or complete steel lining on wood sheathing or plywood will not be allowed

3.4 ERECTION – FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements of ACI 301 and the following additional requirements:
 - 1. Variation from plumb in the lines and surfaces of columns, piers, and in walls
 - a. In any 10 feet of length $\frac{1}{4}$ inch
 - b. Maximum for entire length $\frac{1}{2}$ inch
 - 2. Variation in cross-sectional dimensions of columns and beams and in thickness of slabs and walls:
 - a. Minus $\frac{1}{8}$ inch
 - b. Plus $\frac{1}{4}$ inch

3.5 ACCESSORIES

- A. Install form liners into formwork prior to placement of reinforcing steel or concrete in compliance with the manufacturer's requirements.

3.6 FORM REMOVAL

- A. The Contractor shall be responsible for damage resulting from form removal. Forms and shoring for structural slabs or beams shall remain in place in accordance with requirements in ACI 301. Form removal shall also conform to the requirements specified in Section 03300.

3.7 INSPECTION

- A. The Engineer shall be notified when the forms are complete and ready for inspection at least thirty-six hours prior to the proposed concrete placement.
- B. Failure of the forms to comply with the requirements specified herein, or to produce concrete complying with requirements of these Specifications, shall be grounds for rejection of that portion of the concrete work. Rejected work shall be repaired or replaced at no additional cost to the Owner. Such repair or replacement shall be subject to the requirements of these Specifications and approval of the Engineer.

END OF SECTION

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SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Reinforcing Steel Bars
 - 2. Reinforcing Accessories
- B. Related Sections
 - 1. Section 03100 - Concrete Forms and Accessories
 - 2. Section 03300 - Cast-in-Place Concrete

1.2 REFERENCES

- A. The Connecticut State Building Code, latest edition.
- B. American Concrete Institute (ACI)
 - 1. ACI 117 - Standard Tolerance for Concrete Construction and Materials
 - 2. ACI 315 - Details and Detailing of Concrete Reinforcement
 - 3. ACI 318 - Building Code Requirements for Reinforced Concrete, American Concrete Institute
 - 4. ACI 350R - Environmental Engineering Concrete Structures
 - 5. ACI SP-66 - Detailing Manual
- C. American Society for Testing and Materials (ASTM)
 - 1. A185 - Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
 - 2. A615 - Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
 - 3. A675 - Specifications for Steel Bars, Carbon, Hot Wrought, Special Quality, Mechanical Properties
- D. American Welding Society (AWS)
 - 1. D1.4 Structural Welding Code - Reinforcing Steel
- E. Concrete Reinforcing Steel Institute (CRSI)
 - 1. CRSI 63 - Recommended Practice for Placing Reinforcing Bars
 - 2. CRSI 65 - Recommended Practice for Placing Bar Supports, specifications and nomenclature

1.3 DELIVERY, HANDLING AND STORAGE

- A. Reinforcing steel shall be substantially free from mill scale, rust, dirt, grease, or other foreign matter.
- B. Reinforcing steel shall be covered and stored off the ground, protected from moisture, and kept free from dirt, oil, or other foreign matter.

PART 2 PRODUCTS

2.1 REINFORCING STEEL BARS

- A. Reinforcing steel bars shall be newly rolled billet steel conforming to ASTM A615, Grade 60.
- B. Minimum yield strength shall be 60,000 psi.

2.2 REINFORCEMENT ACCESSORIES

- A. Reinforcement accessories shall conform to Product Standard PS7-766, National Bureau of Standards, Department of commerce, Class C, as produced by Dayton Superior Corporation; R.K.L. Building Specialties Co., Inc. or equal approved by the Engineer.
- B. Reinforcement accessories shall include spacers, chair ties, slab bolsters, clips, chair bars, and other devices for properly assembling, placing, spacing, supporting, and fastening reinforcement.
- C. Tie wire shall be of sufficient strength for all intended purpose, but not less than No. 18 gauge. Metal supports shall be of such type as not to penetrate surface of formwork and show through surface of concrete.
- D. Accessories touching interior formed surfaces exposed to view shall have not less than 1/8 inch of plastic between metal and concrete surface. Plastic tips shall extend not less than 1/2 inch up on metal legs.
- E. Individual and continuous slab bolsters and chairs shall be of type to suit various conditions encountered and must be capable of supporting 300 pound load without damage or permanent distortion.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Review all work prepared by others to receive work of this Section. Commencement of work will be construed as complete acceptance of preparatory work by others.

3.2 PREPARATION

- A. Notify the Engineer prior to the start of any phase of the reinforcing work so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of reinforcement placements and at least 36 hours in advance of other inspections (forms, etc.).

3.3 REINFORCING BAR FABRICATION

- A. Fabrication of reinforcement shall be in accordance with the recommendations of CRSI.

3.4 INSTALLATION

- A. Reinforcement shall be placed in accordance with requirements of CRSI -63 - "Recommended Practice for Placing Reinforcing Bars" and CRSI 65, "Recommended Practice for Placing Bar Supports" and with further requirements below.
- B. Reinforcement shall be accurately placed in accordance with Contract Documents and shall be firmly secured in position by wire ties, chairs, spacers, and hangers, each of type approved by the Engineer.
- C. Bending, welding or cutting reinforcement in field in any manner other than as shown on Drawings, is prohibited, unless specific approval for each case is given by the Engineer.
- D. Proceed with installation of embedded items, and reinforcement, but do not place concrete into or around such items until the Engineer has approved work.

3.5 FIELD QUALITY CONTROL

- A. The Engineer shall have the right to postpone or stop concrete operations when in his judgment, reinforcement and embedded item installation has not been properly completed or the quality of construction will impair strength and durability or desired finished product. Costs arising from delays due to noncompliance will not be considered.
- B. Any material or workmanship that is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.
- C. Before concrete is placed, reinforcement shall be free of excessive rust, dirt, oil, scale or other foreign matter that will destroy or reduce bond requirements. Reinforcement expected to be exposed to weather for a considerable length of time shall be painted with a heavy coat of cement grout. Protect stored materials so as not to bend or distort bars in any way. Bars that become damaged will be rejected.
- D. Before concrete is placed, check all installed reinforcement to ensure that it conforms to Contract Documents and approved Shop Drawings. Such checking shall be done only by qualified experienced personnel. In addition, the Engineer shall be notified at least 36 hours prior to concrete placement and given opportunity to inspect completed reinforcement. Prior approval of Shop Drawings shall in no way limit the Engineer's right to require modifications or additions to reinforcement or accessories.

3.6 ADJUSTING

- A. Carry out corrections without delay as directed by the Engineer when construction operations indicate that requirements of Contract Documents or prudent construction practices are being or are about to be violated.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Concrete Materials
 - 2. Admixtures
 - 3. Concrete Mix
 - 4. Miscellaneous Concrete Materials
- B. Related Sections
 - 1. Section 03100 - Concrete Forms and Accessories
 - 2. Section 03200 - Concrete Reinforcement

1.2 REFERENCES

- A. The Connecticut State Building Code, latest edition.
- B. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. T 104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- C. American Concrete Institute (ACI)
 - 1. ACI 305 - Hot Weather Concreting
 - 2. ACI 306.1-90 - Standard Specifications for Cold Weather Concreting
 - 3. ACI 318-02 - Building Code Requirements for Reinforced Concrete
- D. American Society for Testing and Materials (ASTM)
 - 1. C33 - Standard Specification for Concrete Aggregates
 - 2. C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete specimens
 - 3. C40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
 - 4. C87 - Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar
 - 5. C94 - Standard Specification for Ready-Mixed Concrete
 - 6. C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens)

7. C150 - Standard Specification for Portland Cement
8. C260 - Standard Specification for Air-Entraining Admixtures for Concrete
9. C330 - Standard Specification for Lightweight Aggregates for Structural Concrete
10. C494 - Standard Specification for Chemical Admixtures for Concrete
11. C535 - Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
12. C567 - Standard Test Method for Determining Density of Structural Lightweight Concrete
13. C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
14. C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
15. C881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
16. C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
17. D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics
18. D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
19. D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

1.3 SUBMITTALS

- A. Submit a truck load ticket for every concrete delivery. Ticket information shall include batch time and date, weights of all constituents, quantity of admixtures, water added at the batch plant and moisture content of coarse and fine aggregates.
- B. Maintain an accurate daily record of the locations and quantity of concrete placed. Submit a certified copy of this record with each pay estimate.

1.4 QUALITY ASSURANCE

- A. Provide notification prior to the start of any phase of concrete placement work so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of concrete placements and at least 36 hours in advance of other inspections (forms, rebars, etc.).
- B. Any material or workmanship that is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.
- C. If arrangements for corrections and/or replacements are not made within seven days after notice of rejection, the Owner has the right to have corrections and/or

replacement made and charge cost thereof and any costs associated with delay of project against balance of monies withheld.

- D. Acceptance of work and admixtures at the batch plant shall not prevent final rejection at job site upon arrival or after it has been installed, if work is found to be defective.
- E. Portions of a structure which do not meet the requirements of the Contract Documents based on appearance or for any other aesthetic reason, shall be corrected or removed and replaced at no additional cost to the Owner.
- F. Work on new concrete structures shall conform to the requirements of ACI 306.1, Standard Specifications for Cold Weather Concreting, except as modified herein.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement shall be American-made Portland Cement, free from water soluble salts or alkalis which will cause efflorescence on exposed surfaces. Portland Cement shall be Type II, ASTM C150 except in foundation mat where either Type II or Type IV, ASTM C150 may be used, as required, to meet heat gain requirements specified herein. Air entraining cements are prohibited.
- B. Use only one brand of cement for the project. Contractor shall be responsible for whatever steps are necessary to ensure that no visual variations in color will result in exposed concrete and shall place on order and secure in advance a sufficient quantity of this (these) cement(s) to complete concrete work specified herein.
- C. Pozzolans and Blast Furnace Slag
 - 1. Fly Ash: Class F conforming to the requirements of ASTM C618
 - 2. Ground Granulated Blast Furnace Slag: Conform to ASTM C989
- D. Normal Weight Fine Aggregate
 - 1. Washed, inert, natural sand conforming to ASTM C33 and the following additional requirements:
 - a. Fineness Modulus 2.75 (plus/minus 0.25)
 - b. Clay lumps and friable particles – 3.0 percent maximum
 - c. Coal and lignite – 0.5 percent maximum
 - d. Organic Impurities (ASTM C40) – Organic Plate No. 2
 - e. Strength of Mortar (ASTM C87) – not less than 95 percent at 7 days
 - f. Soundness (AASHTO T-104) - 10 percent maximum loss (magnesium sulfate solution, five cycles)
- E. Normal Weight Coarse Aggregate:
 - 1. Well graded crushed stone or washed gravel conforming to ASTM C33 and the following additional requirements.
 - a. Material finer than No. 200 sieve – 1.0 percent maximum

- b. Clay lumps and friable particles – 2.0 percent maximum
 - c. Chert (less than 2.40 specific gravity, saturated surface dry) – 3.0 percent maximum by weight.
 - d. Sum of clay lumps, friable particles, and chert (less than 2.40 specific gravity, saturated surface dry) – 3.0 percent maximum by weight. This limitation only applies to aggregates in which chert appears as an impurity.
 - e. Coal and lignite – 0.5 percent maximum
 - f. Soundness - 18 percent maximum loss (magnesium sulfate solution, five cycles)
 - g. Soundness - 10 percent maximum loss (sodium sulfate solution, five cycles)
- 2. Coarse aggregates shall not exceed 35 percent by weight "percentage of wear" as determined by the Los Angeles Abrasion and Impact Tests in ASTM C131 and C535.
 - 3. Provide designated sizes noted in Table A for normal weight coarse aggregate to minimize shrinkage and cracking. The sizes shall also be chosen in accordance with ACI requirements for actual reinforcement clearances.
- F. Lightweight Fine and Coarse Aggregates: rotary kiln expanded shale conforming to ASTM C330 and as specified herein. Aggregate sizes shall include fine aggregate designated as "sand size", and coarse aggregate designated as graded 3/4 inch size or 3/8 inch size.
- G. Water shall be from approved source, potable, clean and free from oils, acids, alkali, organic matter and other deleterious material.

2.2 ADMIXTURES

- A. Mid-range water-reducing agent:
- 1. Mid-range water-reducing agent shall be by same manufacturer as air-entraining agent.
 - 2. Daracem - 55 W.R. Grace & Co.
 - 3. Pozzolith 220N – BASF Admixtures, Inc.
 - 4. Eucon MR - Euclid Chemical Co.
 - 5. Or equal conforming to ASTM C494 Type A
- B. High-range water reducing agent:
- 1. Daracem - 100 W.R. Grace & Co.
 - 2. Reobuild 1000 - BASF Admixtures, Inc.
 - 3. Eucon-37 - Euclid Chemical Co.
 - 4. Or equal conforming to ASTM C494 Type F

- C. Air-entraining agent:
 - 1. DAREX AEA - W.R. Grace & Co.
 - 2. MB-VR or MB-AE90 - BASF Admixtures, Inc.
 - 3. Air-Mix - Euclid Chemical Co.
 - 4. Or equal conforming to ASTM C260
- D. Admixtures which retard setting of cement in concrete shall not be used without written approval of the Engineer. Admixtures causing accelerated setting of cement in concrete shall not be used.

2.3 CONCRETE MIX

- A. Development of concrete mix design and testing shall be by an independent ACI certified concrete testing agency engaged by and at the expense of the Contractor and shall conform to the following requirements:
 - 1. Select proportions of ingredients to meet the design strength and materials limits specified in Table B and to produce concrete having proper placability, durability, strength, appearance and other required properties. Proportioning shall also conform to the requirements in ACI 301 and ACI 318.
 - 2. The design mix shall be selected based on standard deviation data where a production facility has sufficient test records for a mix with essentially the same proportions.
 - 3. If sufficient test records are not available, (at least 30 consecutive strength tests or two groups of tests totaling at least 30 within the past 12 months), the design mix shall be developed using laboratory trial mixtures.
 - 4. Water content and cement content of concrete to be used in the work shall be based on a curve showing the relationship between water content, cement content, and 7 and 28 day compressive strengths of concrete made using proposed materials. Maximum water/cement (W/C) materials ratio or minimum cementitious materials content to be used in the proposed work shall be shown by the curve to produce the average strength required in Table C. Curves shall be determined by four or more points, each representing an average of at least three test specimens at each age, and shall have a range of values sufficient to yield desired data, including all compressive strengths required by the Contract Documents, without extrapolation. Design mix of concrete to be used in the work, as determined from the curve, shall correspond to the following test strengths (Table C) obtained in laboratory trial mixtures, but in no case shall resulting mix conflict with limiting values as specified in Table B.
 - 5. Sufficient materials for concrete mix design shall be furnished not less than five weeks before use. Duplicate small samples plainly and neatly labeled with source, where proposed to be used, date, and name of collector shall be provided and presented to the testing agency for permanent reference.
 - 6. All concrete is normal weight unless specifically designated otherwise with air-dry weight not to exceed 150 lbs. per cubic foot.

- B. Concrete in foundation mat shall conform to the requirements specified for massive concrete in ACI 301 and ACI 318 except as extended or modified by this Section.
- C. Limiting values shown in Table B apply for specific strengths of concrete with 3/4 inch coarse aggregates unless noted otherwise.
- D. In slabs exposed to weather, concrete shall contain the approved air-entraining admixture as per manufacturers written instructions to provide entrained air by volume in the cured concrete between 4.5 and 7.5 percent.
- E. The approved water-reducing admixture shall be used in all concrete, in accordance with manufacturer's written instructions. Concrete mix with a 0.45 or lower water/cement ratio shall require a high range water reducer.
- F. Structural lightweight concrete shall have an air dry unit weight of 109 to 115 pounds per cubic foot as determined in accordance with ASTM C567, and a corresponding wet density not to exceed 120 pounds per cubic foot as determined in accordance with ASTM C138. Splitting tensile strength as determined by laboratory tests in accordance with ASTM C330 and ASTM C496 shall equal or exceed 330 pounds per square inch.
- G. Deviation from the approved mix design will not be allowed without written approval of the Engineer. Additional testing by testing agency associated therewith shall be at no additional cost to the Owner.

2.4 MISCELLANEOUS CONCRETE MATERIALS

- A. Grout shall be a ready-to-use, non-metallic, non-shrink aggregate product requiring only the addition of water at the job site. Grout shall be as manufactured by Five Star Products, Inc.; Euclid Chemical Company; Master Builders; or equal equal. Grout shall be easily workable and shall have no drying shrinkage at any age. Compressive strength of grout (2 inch by 2 inch cubes) shall not be less than 5000 psi at 7 days, and 7500 psi at 28 days.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify all work prepared by other trades to receive work of this Section and correct any defective installations.
- B. Verify cover requirements over all reinforcement.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.
- D. Verify site conditions to insure that full access is available for placement of concrete.

3.2 HANDLING, STORAGE, AND PROTECTION OF MATERIALS

- A. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing frozen material. Remove improper and rejected materials immediately from point of use. Cover materials including steel reinforcement and accessories during

construction period. Stockpile concrete constituents properly to assure uniformity throughout project.

3.3 MIXING, CONSISTENCY, AND DELIVERY OF CONCRETE

- A. Concrete shall be ready-mixed, produced by a central batch plant. Hand or site mixing shall not be allowed. Constituents, including admixtures, except certain corrosion inhibitors and superplasticizers, shall be batched at the central batch plant. Admixtures shall be premixed in solution form and dispensed as recommended by the manufacturer.
- B. Central plant and rolling stock equipment and methods shall conform to Truck Mixer and Agitator Standard of Truck Mixer Manufacturer's National Ready-Mixed Concrete Association, ASTM C94, ASTM C685, and Contract Documents. Consistency of concrete at time of placement shall be as specified in Table D.
- C. Ready mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities. Discharge at site shall be within one and one-half hours after cement is first introduced into the aggregates. Concrete with a temperature greater than 90°F. shall be rejected and removed from the site.
- D. During hot weather conditions as defined in ACI 306R (i.e., any of the following conditions: high ambient temperature, high concrete temperature, low relative humidity, increased wind velocity, high solar radiation), when the temperature of the concrete is 85°F or above, the time between the introduction of cement to the aggregates and discharge shall not exceed one hour. In addition, when the rate of evaporation on the surface of the concrete is expected to approach 0.2 lb/ft²/hr. (see chart in ACI 305R) special precautions shall be taken against the formation of plastic shrinkage cracking on the surface of the concrete after placement.
- E. During cold weather conditions, that is, any period when for more than three successive days the average daily outdoor temperature drops below 40°F, the concrete temperature at the time of placement shall be as specified in Table E.
- F. Central mixed concrete shall be plant mixed a minimum of five minutes. Agitation shall begin immediately after premixed concrete is placed in truck and shall continue without interruption until discharged. Transit mixed concrete shall be mixed at mixing speed for at least ten minutes immediately after charging truck followed by agitation without interruption until discharged. All transit mixed truck load ticket information shall include batch time, load weights of constituents, gallonage of water added and amounts of additives.
- G. Retempering of concrete, which has partially hardened by mixing with or without additional cement, aggregates, or water shall not be permitted.

3.4 PLACING CONCRETE

- A. Pumping of concrete will be permitted. If selected for any portion of the work, submit the list of equipment to be provided and mix design suitable for pumping for approval.
- B. Remove excess water and foreign matter from forms and excavations. Do not place concrete on frozen soil. Provide adequate protection against frost action during freezing weather.

- C. Do not place concrete having slump outside of allowable range.
- D. Transport concrete from mixer to place of final deposit as rapidly as practical by methods which prevent separation of ingredients and displacement of reinforcements, and which avoid rehandling. Do not deposit partially hardened concrete. When concrete is conveyed by chutes, equipment shall be of such size and shape to ensure continuous flow in chute. Flat (coal) chutes shall not be used. Chutes shall be of metal or metal lined and uniformly sloped. Slope shall not be less than 25 degrees nor more than 45 degrees from horizontal. Discharge end of chute shall be provided with baffle plate or spout to prevent segregation. If discharge end of chute is more than five feet above surface of concrete in forms, a spout shall be used. Concrete shall be lowered and maintained as near to the surface of deposit as practicable. When operation is intermittent, the chute shall discharge into hopper. The chute shall be thoroughly cleaned before and after each use and debris and any water shall be discharged outside of the forms. Concrete shall not be allowed to flow horizontally over distances exceeding 10 feet or dropped vertically over 6 feet.
- E. Place concrete in such a manner as to prevent segregation and accumulations of hardened concrete on forms or reinforcement above the grade of concrete being placed. Suitable hoppers and spouts with restricted outlets and tremies shall be used as required.
- F. Thoroughly consolidate each layer of concrete by rodding and vibrating using internal type mechanical vibrator. Vibration shall be done by experienced operators under close supervision and shall be carried on only enough to produce homogeneity and optimum consolidation without permitting segregation of constituents or "pumping" of air. Vibrators used for normal weight concrete shall operate at speeds of not less than 7,000 vpm and be of suitable capacity. Do not use vibrators to move concrete. Vibration shall be supplemented by spading to remove bubbles and honeycombs adjacent to visible surfaces. At least one vibrator shall be on hand for every 10 cubic yards of concrete placed per hour, plus one spare. Vibrators shall be operable and on site prior to starting concrete placement.
- G. Deposit concrete continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the section. If a section cannot be placed continuously between planned construction joints, as specified, field joints and additional reinforcement shall be introduced at the Contractor's expense to preserve structural continuity.
- H. Chutes, hoppers, spouts, adjacent work, etc., shall be thoroughly cleaned before and after each use, and water and debris shall be discharged outside form.
- I. Sloped floors shall be placed with the use of pipe screeds for grade control. Pipe screeds shall be in place prior to placing the concrete for the floors.

3.5 CURING AND PROTECTION

- A. When concrete is placed at or below an ambient air temperature of 40°F. or whenever this temperature or lower values are likely to occur within 48 hours after placement of concrete, cold weather concreting procedures, according to ACI 306.1 and as specified herein, shall be followed. The entire area affected shall be protected by adequate housing or covering, and heating. No salt, chemicals or other foreign

materials shall be used in the mix to lower the freezing point of concrete. No oil or kerosene fixed heaters shall be utilized. Vent flue gases from combustion heating units to the outside of the enclosure.

- B. No frozen materials shall be used in batching concrete and any ice shall be removed from coming into contact with the concrete.
- C. Protect concrete work against injury from heat, cold, and defacement of any nature during construction operations.
- D. Concrete shall be treated and protected immediately after concreting or cement finishing is completed, to provide continuous moist curing above 50°F. for at least 7 days, regardless of ambient air temperatures.
- E. All concrete shall be cured immediately after finishing in accordance with the following requirements:
 - 1. Curing shall be accomplished by a continuous soaking process such as the use of soaker hose, sprinklers or accomplished through the use of a laminated reinforced asphalt impregnated paper which is non-staining or by use of plastic roll materials either of which shall be thoroughly wetted at least once a day or more often as required in very hot weather. Such paper or plastic shall be placed as soon as possible after finishing of concrete so that scarring of the surface will not occur. Paper or plastic shall be held in place on the surface of the concrete in such a manner and means as will not allow it to be blown off or otherwise dislodged from the concrete surface. Curing procedures shall be maintained continuously for a period of at least 7 days unless otherwise directed and approved by the Engineer.
 - 2. All methods of curing shall be subject to approval of the Engineer, and each method employed shall be practical and adequate for the curing required.
 - 3. Curing compounds in lieu of wet curing will not be allowed.
- F. Keep a permanent temperature record showing date and outside temperature during concreting operations. Thermometer readings shall be taken at start of work in morning, at noon, and again late in afternoon. Locations of concrete placed during such periods shall likewise be recorded in such manner as to show any effect temperatures may have had on construction. Copies of temperature records shall be distributed daily to the Engineer.

3.6 REMOVAL OF FORMWORK, SHORING AND RESHORING

- A. Forms and shoring shall not be removed until concrete has attained sufficient strength to support its own weight, construction loads to be placed thereon and lateral loads, without damage to structure or excessive deflection.
- B. Forms and supports shall remain in place for not less than the minimum time periods noted below.
 - 1. Unless specifically authorized by the Engineer, forms for horizontal surfaces shall not be removed before the concrete has attained a strength of not less than 60 percent of the minimum allowable prescribed compressive strength nor not less than the minimum time period specified in Table F.

2. Definition of degree-days - Total number of days times mean daily air temperature at the surface of the concrete. For example, 5 days at temperature of 60°F. equals 300 degree-days. Days or fractions of days in which temperature is below 50°F. shall not be included in calculation of degree-days except where modified by Table E.

3.7 FINISHING OF CAST-IN-PLACE CONCRETE

A. Slab Surfaces

1. Exterior bearing slab surfaces shall have a wood float non-slip finish. The finish shall be accomplished by a procedure as follows, but shall be the Contractor's responsibility to produce a good and proper finish on all parts of the work:
 - a. "Wood Float Finish" - The surface shall be screeded, given a minimum of one steel troweling and shall then be finished with a wood, cork or other float as required to produce the desired finish. In cases where a rough wood float finish is sufficient, the above procedure may be executed, omitting the steel troweling. A rough wood float finish shall be used only when allowed in writing by the Engineer.
2. For the finishing procedures described, the time element is important and something that must be determined during the progress of the work as conditions warrant. Normally, free water on the surface of concrete should not occur. Allow the concrete surface to dry before starting finishing operations. Do not, under any circumstance, add dry cement to wet areas in order to accelerate drying. Finishing and rubbing required for all parts of the work shall be done only by competent "Cement Finishers" trained for the work.

B. Formed Surfaces

1. Immediately after the end of the wet cure period, remove form ties and patch all tie-holes, rat holes, and other surface voids with a non-metallic, non-shrink grout, which most nearly matches the color and texture of the concrete surface. All protrusions shall be ground smooth with an approved mechanical grinder.

3.8 REPAIRING OF HARDENED CONCRETE SURFACES

- A. Defective concrete and honeycombed areas shall not be patched unless examined and approval is given by the Engineer. After approval, areas involved shall be cut back to a minimum depth of 1 inch from the finished surface, or as otherwise directed, whichever is greater. Edges of areas to be repaired shall be cut square to a minimum depth of 3/4 inch. Feathered edges will not be allowed. Any voids or honeycomb around reinforcing steel shall be chipped away to provide at least 3/4 inch clearance all around to permit proper placement of repair concrete around the steel to the parent, sound concrete.
- B. Exposed surfaces shall be thoroughly cleaned of all mud, paint, grime, scum, laitance, organic matter, detritus, calcareous growth and other foreign matter by sand and water blasting or other acceptable means. Immediately after cleaning, the surface shall be checked by the Engineer for proper surface preparation, including fractured concrete or loose aggregate. Any such material shall be removed using pneumatic or hand

tools. The final surfaces shall be thoroughly rinsed with clean water to remove remaining dirt and dust.

- C. Premoisten the prepared surface for at least 2 hours or reduce absorption of water by the parent concrete and to provide a reservoir for moist curing at the interface of the repair. The substrate should be saturated surface dry with no standing water. While the concrete surface is still damp, apply a thin 1/16 inch coat of neat cement slurry (mixed to the consistency of a heavy paste) with a bristle brush to provide a bond coat throughout the entire cavity of the repair. Before the slurry has dried or changed color, promptly install the repair concrete or dry-pack, as may be required or selected.
- D. For relatively small areas, ram repair concrete into this portion of the formed void. This concrete shall comprise a crumbly-dry 1-1-1.5 mixture of cement, concrete sand and pea gravel (or $\frac{3}{4}$ " gravel) mixed slightly damp to the touch (just short of "balling"). The "dry-pack" consistency of the concrete shall be zero slump, but moist enough so that when it is rodded and tamped until dense, an excess of paste will appear on the surface in the form of a spider web. In cases of unformed voids of thinner section, do not build-up repair in excess of a depth which will sag with the weight of the fresh mortar or concrete. Trowel smooth with heavy pressure.
- E. Large areas may be repaired with the normal concrete mix approved for use on the project.
- F. The concrete shall be of the driest possible consistency and mix composition so that it can be worked into the corners and angles of forms and around the reinforcement, without permitting the materials to segregate or free water to collect on the surface, due consideration being given to the methods of placing and compacting. Source and mixture of concrete shall be submitted for approval.
- G. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited which has hardened sufficiently to cause the formation of seams and planes of weakness within the section. Concrete shall be thoroughly consolidated and trowelled dense, smooth and plane. Avoid premature and excessive trowelling that could cause sagging.
- H. Repair areas and adjacent parent concrete surfaces shall be treated immediately after finishing providing continuous moist curing without change in color for at least 7 days. Surfaces shall be covered with damp burlap and sealed with taped polyethylene. Membrane curing compounds shall not be used.
- I. Leave finished work and adjacent concrete surfaces in a neat, clean condition with no evidence of spillovers or staining.

3.9 CLEANING

- A. Concrete surfaces shall be cleaned of objectionable stains as determined by the Engineer. Materials containing acid in any form or methods which will damage the "skin" of concrete surfaces shall not be employed, except where otherwise specified.

Cast-In-Place Concrete Data Sheet
TABLE A

Coarse Aggregate Size

Concrete Section	Coarse Aggregate Size (inches)	ASTM C33 Size Number
Mat Foundations	1-1/2	467
All other concrete	3/4	67

TABLE B

Maximum Allowable Water/Cement Ratios

Compressive Strength (PSI)	Maximum Allowable Water/Cement Ratio ¹	Total Cementitious Material (lbs.) ^{2, 3}	
		Minimum	Maximum
4500 ⁴	0.45	635	658
4000	0.45	611	635
3500	0.45	565	590
3000	0.50	517	540
2500	0.55	451	

¹Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregates. Maximum W/C ratio for all water retaining structures and below grade structures (pump chambers, tunnels, etc.) shall be 0.42.

²Total cementitious material is for ¾" coarse aggregate mix - use lower quantity for larger coarse aggregate size mix. Fly ash may be substituted for up to 20 percent by weight of the total cementitious material in all classes of concrete. Ground granulated blast furnace slag may be substituted for up to 40 percent by weight of the total cementitious material in all classes of concrete. For all water retaining structures and below grade structures, fly ash shall be substituted for a minimum of 15 percent and a maximum of 25 percent of the total cementitious material, or ground granulated blast furnace slag shall be substituted for a minimum of 25 percent and a maximum of 40 percent of the total cementitious material.

³For concrete flatwork with a steel trowel finish, fly ash may be substituted for up to 10 percent by weight and ground granulated iron blast-furnace slag may be substituted for up to 25 percent by weight of the total cementitious material.

⁴For all water retaining structures exposed to freeze/thaw conditions, concrete exposed to freezing and thawing in a moist condition, and/or concrete exposed to deicing chemicals, use 4500 psi minimum design mix.

Cast-In-Place Concrete Data Sheet (Cont.)
TABLE C

Minimum Strength of Lab Mixes (PSI)

Design Strength	Trial Mix Strength 28 Days
4500	5700
4000	5200
3500	4700
3000	4200

TABLE D

 Concrete Slump⁵

Portion of Structure	Recommended (inches)	Maximum Range (inches)
Mats	2	2-3
Slabs	3	2-4

⁵After addition of high range water reducer

TABLE E

Concrete Temperature During Cold Weather Conditions

Least Dimension of Section (Inches)	Minimum Temperature Of Concrete As Placed And Maintained During The Protection Period, °F	Maximum Gradual Decrease In Surface Temperature During Any 24 Hours After End Of Protection, °F
Less than 12	55	50
12 to less than 36	50	40
36 to less than 72	45	30
Greater than 72	40	20

END OF SECTION

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DIVISION 9 - FINISHES

SECTION 09900**PAINTING****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Surface preparation and application of coatings.

1.2 REFERENCES**A. The Society for Protective Coatings (SSPC):**

1. Surface Preparation Specifications
 - a. SP-1 - Solvent Cleaning
 - b. SP-2 - Hand Tool Cleaning
 - c. SP-3 - Power Tool Cleaning
2. SSPC-PA 1 – Shop, Field and Maintenance Painting
3. SSPC-PA 2 - Measurement of Dry Coating Thickness with Magnetic Gages
4. SSPC Visual Standards SSPC VIS 1-89

B. Occupational Safety and Health Administration (OSHA) Standards**1.3 SCOPE OF WORK****A. Items of work include but are not limited to the surface preparation and coating of the following:**

1. Interior and exterior piping
2. Piping support systems
3. Bollards

1.4 SUBMITTALS

- A. List of coating products and systems proposed, giving brand, type and manufacturer.
- B. Product for product listing of the manufacturer's coating system showing a comparison with the specified coating systems in Schedules 09900-A and 09900-B.
- C. When requested by the Engineer, provide product container labels and labeled mixing instructions for products utilized in the Work.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications – Minimum 5 years' experience in application of specified products.

- B. Regulatory Requirements – Meet federal, state and local requirements limiting the emission of volatile organic compounds.

1.6 DELIVERY, HANDLING, STORAGE AND PROTECTION

- A. Deliver materials to painter's area in original, unbroken, containers with name and analysis of product, manufacturer's name, and shelf life date. Do not use or retain contaminated, outdated, prematurely opened, or diluted materials.
- B. Storage of materials shall be in accordance with the paint manufacturer's recommendations.
- C. Store paints and painter's materials only in areas designated solely for this purpose. Avoid damaging or dirtying coatings by contact with soil, pavement or other harmful materials that might necessitate special cleaning. Use suitable blocking during storage.
- D. Confine mixing, thinning, clean-up and associated operations, and storage of painting debris before authorized disposal, to these areas.
- E. Do not expose primed surfaces to weather for more than six months before top coating. Allow less time if recommended by coating manufacturer.
- F. Do not use plumbing fixtures, piping or mechanical equipment for mixing or disposal of paint materials.
- G. Store waste temporarily in closed, nonflammable containers until final disposal. Keep no rubbish in painter's area longer than 24 hours. Finally, dispose of waste in an approved disposal system.
- H. During surface preparation, cleaning and painting operations, protect all surfaces not to be painted.
- I. Protect coated items, whether prime or finish, from damage due to shipping and handling. Use padding, blocking, fabric slings and extra care as required.
- J. Upon completion of field painting, ensure coatings are undamaged and in good condition. Repair damaged or deteriorated coating, resulting from failure to observe foregoing requirements.

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied.
 - 2. Do not apply coatings when dust is being generated.
- B. Cover or otherwise protect work by other trades and surfaces not being painted during all painting operations.
- C. All shop primed ferrous metals shall be primed using the same coatings specified in the paint schedule.

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Substitutions of other manufacturers will be considered only if a "Product for Product" listing is submitted. The Engineer reserves the right to request and receive detailed technical literature of each proposed coating system before approval.
- B. No coating systems will be considered that decrease the film thickness, decrease the number of coats, decrease the effectiveness of the surface preparation or change the type of coating specified in the schedule of this section.

2.2 MATERIALS, GENERAL

- A. Paint Coatings - Suitable for intended use, recommended by their manufacturer for intended service. All coatings, unless otherwise specified, shall be suitable for severe service.
- B. Products Used - Minimum of five years satisfactory use under similar service conditions.
- C. Use products of one manufacturer in any one paint coating system; all coating materials compatible. Coatings for touch-up - same as original.
- D. Equipment prime or finish painted by the equipment manufacturer shall be painted in strict accordance with this Section and the equipment's individual specification section.
- E. Bear entire responsibility in providing complete compatibility of all shop and field painting systems.
- F. It is recognized that the specific application of the coating products varies for each specific manufacturer (number of coats, mil thickness per coat, etc.). Therefore, these Specifications represent the minimum to be provided under this contract and shall be increased in accordance with each manufacturer's recommendations.

2.3 COLORS AND FINISHES

- A. Unless otherwise indicated, use gloss or semi-gloss for finish paint.

2.4 COATING TYPES

- A. Coatings are described in Table 09900-A Coating Schedule. Description of coating types includes minimum acceptable percent (by volume) of component solids.

PART 3 EXECUTION**3.1 GENERAL**

- A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into an acceptable condition through preparatory work.
- B. Do not proceed with surface preparation or coating application until conditions are suitable.

- C. The following shop and field instruments shall be used to inspect surface preparation and dry film thickness.
 - 1. SSPC visual standards SSPC-VIS 1-89
 - 2. Surface temperature thermometer
 - 3. SSPC-PA2 methods

3.2 PREPARATION

A. Basic Steps

- 1. Arrange to do all preparation and paint work in heated enclosure unless ambient weather conditions ensure still, dry air and a minimum of 50 degree F temperature.
- 2. Coordinate cleaning and painting operations to eliminate contamination of one by the other.
- 3. Maintain all coating materials at manufacturer's recommended mixing and application temperatures for not less than 24 hours before use. Have clean, proper containers, spray equipment, applicators and accessory items ready for use before decanting or mixing paint materials.
- 4. Ensure proper coordination of materials to be applied hereunder with previous coatings on affected surfaces. Have all manufacturer's written directions on hand, and follow them strictly, except where otherwise specified.
- 5. Carefully coordinate preparation and material compatibility requirements of paint systems used by manufacturers to shop prime equipment.

B. Before any paint application, carefully clean all surfaces to be coated of dust, dirt, grease, rust, mill scale, paint unsuitable for top coatings, efflorescence, oil, moisture, foreign matter or conditions detrimental to coating bond and durability.

- 1. Following cleaning, apply preparatory treatment in strict accordance with manufacturer's written instructions.
- 2. Fill imperfections and holes in surfaces to be painted.

C. Metals

- 1. Prepare all field and shop primed ferrous metals, including galvanized ferrous metals, in accordance with Schedule 09900-A Coating System Schedule included under this Section.
- 2. A needle gun may be used for field welds and shop welds which occur in narrow, unprimed areas in an otherwise shop primed surface.
- 3. Prepare non-ferrous and galvanized metal surfaces for finishing in accordance with SSPC-SP16 Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steels, Stainless Steels and Non-Ferrous Metals. Provide minimum uniform anchor profile of 1 mil. Apply coatings as outlined on the Coating Schedule.

- D. Provide higher degree of cleaning for acceptable equivalent paint products when paint manufacturer recommends in their printed surface preparation recommendations.
- E. Before applying field coat, touch-up abraded areas of shop coats with paint of the same type. Apply an entire coat if necessary. Touch-up coats are in addition to, and not a substitute for first field coat. Clean deteriorated surfaces to bare metal before applying touch-up coat.
- F. After installation and before applying field coats, touch-up all scratches and blemishes on equipment, motors, pumps, instrumentation panels, electrical switchgear, and similar items with shop coats, paint filler, enamel or other treatment customary with manufacturer.
- G. After installation, touch up all scratches and blemishes on all steel.

3.3 APPLICATION

A. Conditions

1. Do not apply paints or other finish to wet or damp surfaces, except in accordance with instructions of manufacturer. Do not apply exterior paint during cold, rainy, or frosty weather, or when temperature is likely to drop to freezing within the paint coatings curing time as specified by the paint manufacturer. Avoid painting of surfaces while they are exposed to direct sunlight.
2. Paint surfaces which have been cleaned, pretreated, or otherwise prepared for painting with first finish coat as soon as practicable after such preparation has been completed, but in any event prior to deterioration of prepared surface.
3. Coat blast cleaned metal surfaces immediately after cleaning, before any rusting or other deterioration or contamination of the surface occurs. Do not coat blast cleaned surfaces later than 8 hours after cleaning under ideal conditions or sooner if conditions are not ideal.
4. Work shall conform to SSPC-PA 1.

B. Methods

1. Prepare surfaces, mix and apply paint materials in strict accordance with manufacturer's printed instructions and recommendations, except where specifically directed otherwise. Control temperature of materials upon mixing and application, surface temperature and condition, thinning and modifying.
2. Protect surfaces to be coated, before, during and after application unless ambient weather conditions are favorable.

C. Workmanship

1. Apply coating materials to meet manufacturer's spreading rate and dry film thickness recommendations.
2. Apply paints and coatings using skilled painters, brushed or rolled or sprayed out carefully to a smooth, even coating without runs or sags. Allow each coat

of paint to dry thoroughly, on the surface and throughout the film thickness, before the next coat is applied.

3. Finish surfaces - Uniform in finish and color, and free from flash spots and brush marks.
4. Accessory items, finish hardware, trim and similar finish items not to be painted: Remove or carefully mask before painting adjacent surfaces; carefully replace and reposition upon completion of adjacent painting and cleaning work.

3.4 PROTECTION, CLEAN-UP

- A. Protect all materials and surfaces painted or coated under this Section, from the time of surface preparation until the final coat has fully dried. Also protect all adjacent work and materials from touch-up painting by the use of sufficient drop cloths during the progress of this work. Upon completion of the work, clean up all paint spots, oil, and stains from floors, glass, hardware, and similar finished items.

3.5 PAINT SCHEDULE

- A. Coordinate, schedule and confirm the various cleaning, touch-up and finishing operations. Ensure the transmission of materials data, color selections and coating system methods between the coating applicators. Take responsibility for not exceeding exposure and recoat time limits.
- B. Color code all piping in accordance with Schedule 09900-B, Coating Schedule.

3.6 FACTORY ASSEMBLED EQUIPMENT

- A. Painting fabricated ferrous assemblies, frames, supports, skids, vessels, tanks, and OSHA guards shall strictly conform to the requirements of this Section including SSPC-SP6 surface preparation, epoxy primer, and intermediate coats, and a polyurethane topcoat.
- B. Painting of piping shall be in accordance with this section.
- C. Painting of electrical components, motors and enclosures shall be manufacturer's standard coating system with a minimum of an industrial grade painting system.
- D. Submit detailed schedule of painting system(s) to be used for all equipment to the Engineer. All schedules shall be provided prior to commencement of all painting operations.
- E. Stainless steel and aluminum are not required to be painted unless it is the manufacturer's standard practice.

3.7 FIELD QUALITY CONTROL

- A. Unsatisfactory Application
 1. If surface has an improper finish color or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.

2. Evidence of runs, bridges, shiners, laps or other imperfections is cause for rejection.
3. Repair defects in accordance with written recommendations of coating manufacturer.

B. Damaged coatings

1. Feather edges and repair in accordance with recommendations of paint manufacturer.
2. Hand or power sand visible areas of chipped, peeled or abraded paint, and feather the edges. Follow with primer and finish coat. Depending on the extent of repair and appearance, a finish sanding and topcoat may be required.
3. Apply finish coats, including touchup and damage repair coats in a manner that will present a uniform texture and color-matched appearance.

3.8 FINAL TOUCH-UP

- A. Prior to final completion and acceptance, examine painted and finished surfaces and retouch or refinish as necessary to leave surfaces in perfect condition.
- B. After hangers and supports are installed, refinish surfaces.

TABLE 09900-A

Paint System Schedule

Surface	Surface Preparation	Finishes		
		Primer DFT =	2nd Dry Film Thickness, Mils	Final
Ferrous Metals, Exterior Non-Submerged	SSPC-SP-6	Series 1 (2.5-3.5 DFT)	Series 66HS (4.0-6.0 DFT)	Series 73 (2.5-5.0 DFT)
		<i>Corothane I</i> <i>Galvapac 2K</i>	<i>Macropoxy 646</i> <i>FC Epoxy</i>	<i>Acrolon 218</i> <i>HS</i> <i>Polyurethane</i>
Non-Ferrous Metal (Other Than Galvanized), Interior and Exterior Non-Submerged	SSPC-SP-16 Surface Preparation of Galvanized Steel (Minimum 1 mil anchor profile)	Series 66HS (2.0-3.0 DFT)		Series 73 (2.5-3.0 DFT)
		<i>Macropoxy 646 FC</i> <i>Epoxy</i>		<i>Acrolon 218</i> <i>HS</i> <i>Polyurethane</i>
Galvanized Steel, Interior and Exterior	SSPC-SP-16 Surface Preparation of Galvanized Steel 1.0-1.5 mil profile	Series 1 for field touch-up (2.5-3.5 DFT)	Series 66HS (2.0-3.0 DFT)	Series 73 (2.5-3.0 DFT)
		<i>Corothane I</i> <i>Galvapac 1K for</i> <i>field touch up</i>	<i>Macropoxy 646</i> <i>FC Epoxy</i>	<i>Acrolon 218</i> <i>HS</i> <i>Polyurethane</i>

TABLE 09900-B
Color Schedule

Item	Color
Fuel Piping	Metallic Grey
Bollards	Safety Yellow

END OF SECTION

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DIVISION 10 - SPECIALTIES

SECTION 10522**FIRE EXTINGUISHERS AND ACCESSORIES****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Fire extinguishers
 - 2. Mounting brackets
- B. Related Sections
 - 1. Section 13201 – Fuel Storage Tanks

1.2 REFERENCES

- A. Factory Mutual Research Corporation
- B. NFPA 10 Portable Fire Extinguishers - National Fire Protection Association
- C. ADA Accessibility Guidelines for Buildings and Facilities

1.3 DEFINITIONS

- A. "Fire Extinguishers" as used in this Section refer to units that can be hand-carried as opposed to those which are equipped with wheels or to fixed fire extinguishing systems.

1.4 SUBMITTALS

- A. Product Data: Submit product data for each type of product included in this Section.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility - Obtain products in this Section from one manufacturer.
- B. UL-Listed Products - Provide new portable fire extinguishers, which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.
- C. Provide fire extinguishers which meet NFPA 10.

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturer - Subject to compliance with requirements, provide fire extinguishers from one of the following:
 - 1. Amerex
 - 2. Badger Fire Protection
 - 3. Sentry

4. or equal

2.2 MATERIALS

A. Fire Extinguishers

1. General - Provide fire extinguishers for each location indicated, in colors and finishes selected by the OWNER's Project Representative from manufacturer's standard which comply with requirements of governing authorities.
2. Provide multi-purpose mono-ammonium phosphate dry chemical extinguishers used for Class A, B, and C fires.
3. Extinguisher shall be heavy-duty steel cylinders with polyester/epoxy finish.

B. Mounting Brackets

1. Provide manufacturer's standard bracket designed to prevent accidental dislodgement of extinguisher, of sizes required for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install items included in this Section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities, including, but not limited to, the State Building Code and the more stringent of the State and Federal Handicap Accessibility Guidelines listed in Section 1.2.
- B. Securely fasten mounting brackets to structure, square and plumb, to comply with manufacturer's instructions.
- C. Where exact location of fire extinguisher is not indicated, locate as directed by OWNER's Project Representative.

3.2 SCHEDULE

TABLE 10522-A
Fire Extinguisher Schedule

Location	Size	Class	Quantity	Mounting Bracket	Cabinet
Town Dock	10 lb.	A,B,C	1	Yes	No
DPW	10 lb.	A,B,C	1	Yes	No
BOE Administration Building	10 lb.	A,B,C	1	Yes	No

END OF SECTION

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DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13201

FUEL STORAGE EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. General requirements
2. Underground storage tank (UST) equipment
 - a. Double-walled fiberglass tanks
 - b. Tank sumps
 - c. Dispenser sumps
 - d. Double-walled piping
 - e. Submersible pumps
 - f. Overfill prevention valves
 - g. Below grade spill containers
 - h. Interstitial manways
 - i. Adaptors
 - j. Emergency shear valves
 - k. Transition sleeves
 - l. Fuel island forms
 - m. Venting
 - n. Signage
 - o. Deadmen
3. Aboveground storage tank (AST) equipment
 - a. Double-walled steel tanks
 - b. Single-walled steel tanks
 - c. Temporary storage tanks
 - d. Piping
 - e. Overfill prevention valve
 - f. Remote fill spill containers
 - g. Adaptors

- h. Mechanical level gauging
- i. Venting
- j. Signage

B. Related Sections

- 1. Section 02320 – Borrow Material
- 2. Section 03100 – Concrete Forms and Accessories
- 3. Section 03200 – Concrete Reinforcement
- 4. Section 03300 – Cast-in-Place Concrete
- 5. Section 09900 - Painting
- 6. Section 13426 – Fuel Tank Monitoring and Management Systems
- 7. Section 15050 – Piping – General
- 8. Section 15060 – Hangers and Supports
- 9. Section 15102 – Carbon Steel Pipe and Fittings
- 10. Section 15110 – Valves
- 11. Section 16060 – Grounding and Bonding
- 12. Section 16410 – Switches and Circuit Breakers

1.2 REFERENCES

- A. 40 CFR 280 – Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- B. Connecticut State Fire Code
- C. National Fire Protection Association (NFPA) Standard 30 – Flammable and Combustible Liquids Code
- D. NFPA 30A – Motor Fuel Dispensing Facilities and Repair Garages
- E. NFPA 31 – Standard for the Installation of Oil Burning Equipment
- F. NFPA Standard 704 – Standard System for the Identification of the Hazards of Materials for Emergency Response
- G. Petroleum Equipment Institute (PEI) Recommended Practice (RP) 100 – Installation of Underground Liquid Storage Systems
- H. PEI RP 200 – Installation of Aboveground Storage Systems
- I. PEI RP 300 – Installation and Testing of Vapor-Recovery Systems at Vehicle Fueling Sites
- J. Regulations of Connecticut State Agencies (RCSA) Section 22a-174-30a – Stage I Vapor Recovery

- K. RSCA Section 22a-449(d)-1 – 22a-449(d)-113 – Underground Storage Tank System Management
- L. Steel Tank Institute (STI) R912-00 – Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids
- M. Underwriters Laboratories, Inc. (UL) 79 – Standard for Power-Operated Pumps for Petroleum Dispensing Products
- N. UL Standard 142 – Steel Aboveground Tanks for Flammable and Combustible Liquids
- O. UL Standard 971 – Standard for Nonmetallic Underground Piping for Flammable Liquids
- P. UL Standard 1316 – Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures
- Q. UL Standard 1238 – Standard for Control Equipment for Use with Flammable Liquid Dispensing Devices
- R. UL Standard 2085 – Protected Aboveground Tanks for Flammable and Combustible Liquids

1.3 SUBMITTALS

- A. Shop drawings and manufacturer's product information for equipment not provided by the Owner.
- B. Product certificates provided by the manufacturer certifying material compliance with the specification.
- C. Proposed field test procedures.
- D. Factory and field test reports.
- E. Warranty information.

1.4 QUALITY ASSURANCE

- A. Equipment manufacturers shall have a minimum of ten years of experience in the design and manufacture of equipment of similar size, type, and capacity.
- B. Contractor shall have a minimum of ten years of experience in the installation of equipment of similar size, type, and capacity and complete five projects of similar scope within the past two years.
- C. Contractor shall verify tank integrity at the time of delivery from the manufacturer and the integrity of the tank and piping system upon completion of the installation.
- D. All equipment provided for the project must be new and installed in a workman like manner in accordance with the manufacturer's requirements.
- E. 100% of the primary and secondary containment for the tank and piping shall be tested for tightness following an approved testing method.

- F. Following the installation of the system provide the following items to the Owner and Engineer:
1. As-built drawings showing the location of equipment, piping, and conduit routing.
 2. Manufactures installation, operation and maintenance manuals.
 3. Tank installers checklist, vapor recovery test records and tightness testing records as described herein.
- G. Warrantees
1. The Contractor shall warrantee equipment and materials for one-year from the date of installation. For the purpose of this warrantee the date of installation shall be defined as the Final Completion Date.
 2. The storage tank and sump manufacturers shall provide a written 30-year limited warrantee for each tank and sump.
 - a. Contractor shall provide the manufacturer's completed written warrantee paperwork to the Owner with a copy of the manufacturer's installation checklist and any other information required by the manufacturer to register the warrantee.
 - b. Contractor shall be responsible for registering the warrantee with the equipment manufacturer.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Contractor shall provide pipe, fittings, bushings, anchors, hangers, electrical wiring, conduit and ancillary equipment required to provide the Owner with a fully functional fuel system.
- B. Backfill for underground storage tanks shall be as specified in Section 02320.
- C. Aboveground tanks, including day tanks, shall be grounded as specified in Section 16060.
1. Piping and equipment shall be bonded to the tank.
 2. Electrical systems shall be grounded separately from the tank and installed as specified in Division 16.
- D. Fuel tank interstitial monitoring and overfill alarms shall be as specified in Section 13426.
- E. Fuel management systems shall be provided as specified in Section 13426.
- F. All steel fuel piping and connectors shall be as specified in Sections 15050, 15060 and 15102.
1. All steel piping and connectors shall be painted in accordance with the requirements of Section 09900.

- 2. Below grade fuel piping shall be as specified in this Section.
- G. Valves shall comply and be installed as specified in Section 15110.
- H. Emergency electrical disconnect switches shall be as specified in Section 16410.

2.2 UNDERGROUND STORAGE TANK EQUIPMENT

A. Double-walled fiberglass tanks

- 1. Underground storage tanks at the Town Dock, Department of Public Works (DPW) Garage and Pawcatuck Middle School shall be installed in accordance with the requirements of this Section.
 - a. Tank dimensions, burial depths, pipe dimensions and routing shall be as detailed on the project Drawings.
- 2. The USTs shall meet the capacity and approximate dimensional requirements detailed below.
 - a. Town Dock
 - 1) One 20,000-gallon tank for diesel storage
 - 2) Approximate dimensions: diameter – 10'-6", length – 37'-5½"
 - b. DPW Garage:
 - 1) One 10,000-gallon compartmentalized tank with one 4,000-gallon compartment for gasoline (E85) storage and one 6,000-gallon compartment for diesel storage.
 - 2) Approximate dimensions: diameter – 8', length – 30'-6"
 - c. Pawcatuck Middle School:
 - 1) One 10,000-gallon tank for heating oil storage
 - 2) Approximate dimensions: diameter – 8', length – 30'-6"
- 3. Provide double-walled, brine filled, fiberglass, cylindrical, horizontal, underground storage tanks with factory installed sump collars as detailed on the project Drawings.
 - a. The tank shall be manufactured in a manner that produced a non-air inhibited and high gloss laminate to provide a fully cured inner and outer surface.
- 4. The double-walled tanks shall have a monitoring space between the walls to allow for the free flow and containment of leaked product from the primary tank. The monitoring space shall provide equal communication in all directions.
- 5. The tank shall have an integrally mounted annual space reservoir installed on the tank for factory-installed brine and continuous monitoring.
 - a. The reservoir shall be constructed of fiberglass reinforced plastic material and be included in the tank warranty.

- b. The monitoring port fitting shall be a 4-inch NPT fitting.
 - c. The monitoring system, when installed, shall be capable of detecting a breach in the inner and outer tank under the following conditions:
 - 1) When the primary tank is empty.
 - 2) When the primary tank is partially or completely full and the ground water table is below the tank bottom.
 - 3) When the primary tank is partially or completely full and the tank is partially or completely submerged in groundwater.
 - d. The hydrostatic monitoring solution shall be a calcium chloride solution, compatible with the tank and be of a contrasting color to the tank.
6. The underground storage tank shall meet the following load conditions:
- a. External hydrostatic pressure: buried in ground with a maximum of 7-feet of burden over the top of the tank, the excavation fully flooded and a safety factor of 5:1 against general buckling.
 - b. Surface loads: tank shall be installed to withstand surface H-20 axle loads.
 - c. Internal loads: primary and secondary tanks shall withstand 5 psig air pressure test with 5:1 safety factor.
7. The tanks shall be provided with factory-installed, fiberglass reinforced plastic, secondary containment collars with a minimum diameter of 42-inches.
- a. Secondary containment collar shall bear a UL label.
 - b. The collar shall include an internal adhesive channel for affixing the containment sump.
 - c. The collar shall be included in the tank warranty.
 - d. Tank collars shall be listed by Underwriters Laboratories for petroleum fuels and all blends of alcohol (same as tank). Collar and sump shall be tested and listed as a complete sump system.
8. Tanks shall be provided with 22" flanged manways in each sump.
- a. Each manway shall be provided with a minimum of four x 4" female NPT fittings.
 - 1) The manway for the Town Dock UST shall be provided with a minimum of on 6" fitting.
 - b. Fittings shall be supplied with temporary thread protectors or threaded plugs.
9. Concrete deadmen shall meet the following criteria:
- a. Design shall be in accordance with ACI 318 to the minimum number and dimensions shown on the Drawings.

- b. Manufactured using 4,000 psig concrete.
 - c. Provide adjustable anchor points for hold down straps.
 - 10. Fiberglass hold down straps of the size and quantity specified by the storage tank manufacturer.
 - a. Hold down straps shall be anchored to the deadmen using galvanized drop-forged turnbuckles sized in accordance with the manufacturer's requirements.
 - b. Looped wire rope may be substituted for one turnbuckle on each hold down strap. Looped wire rope shall meet the tank manufacture's installation requirements.
 - 11. All threaded fittings shall be located on a manway cover or within 12" of the tank top center line. Fittings to be supplied with temporary thread protectors or threaded plugs.
 - 12. Tank shall be capable of storing liquids with a specific gravity of 1.1.
- B. Tank Sumps
- 1. Tank sumps shall be listed by Underwriters Laboratories for petroleum fuels and all blends of alcohol (same as tank). Collar and sump shall be tested and listed as a complete sump system.
 - 2. Tank sump components shall be constructed of fiberglass reinforced plastic. The tank sump shall be 42-inches in diameter and must mount to the secondary containment collar. The sump height shall meet the requirements shown on the Drawings.
 - 3. A 34-inch watertight lid shall be installed to provide a watertight seal to the sump enclosure with 12-inches of water above the lid and remain leak free.
 - 4. Steel manhole rings and covers as shown on the Drawing.
 - a. The steel manhole ring and tank top leak detection sump and cover and concrete pad shall be of design and construction to meet an H-20 load rating. The steel ring frame shall have a galvanized steel skirt of at least 10-inches in depth and of at least 14-gauge steel construction. The manhole ring, cover and concrete pad shall be of size and design to be compatible with the manhole/sump riser system.
 - b. Manhole ring and covers shall be set ½-inch above finished grade of the concrete pad. The concrete pad shall be sloped around the manhole perimeter to direct water away from the manholes.
 - c. Manhole covers shall be constructed of composite materials with roto-lock mechanisms to hold the cover to the manhole ring.
 - 5. All sumps shall be hydrostatically tested after installation in accordance with the manufacturer's instructions and the requirements of 40 CFR 280 before introducing fuel into the piping.

- a. Provide a copy of the hydrostatic testing results to include the date, time, liquid measurements, duration of test and the name of the person performing the test to the Engineer and Owner.

C. Dispenser Sumps

1. Provide and install three fiberglass dispenser sumps, one beneath each dispenser.
 - a. Sumps shall be compatible with gasoline and diesel.
 - b. Backfill and compaction shall be in accordance with the manufacturer's specification and Section 02320.
2. Each sump shall be equipped with a UL listed stabilizer bar mounted into the concrete fuel dispenser island.
 - a. The emergency shear valve details in this Section shall be secured to the stabilizer bar in accordance with the manufacturer's specifications.
3. All sumps shall be hydrostatically tested after installation in accordance with the manufacturer's instructions and the requirements of 40 CFR 280 before introducing fuel into the piping.
 - a. Provide a copy of the hydrostatic testing results to include the date, time, liquid measurements, duration of test and the name of the person performing the test to the Engineer and Owner.
4. All pipe and conduit penetrations shall be made using flexible entry boots that are chemically bonded to the sump body and mechanically fastened to the pipe or conduit.
5. Sumps shall be equipped with a 1" rain lip to prevent water intrusion into the sump.
 - a. Contractor shall install the sumps so that the rain lip is at the correct elevation.

D. Double-Walled Piping

1. Pipe specifications:
 - a. UL Certification: UL 971
 - b. Maximum working pressure: 145 psig
 - c. Minimum bend radius: 36-inches
2. Piping shall be sized as shown on the project Drawings.
3. Piping shall be constructed at the factory consisting of a primary pipe and secondary pipe capable of containing release from the primary pipe for the purpose of leak detection.
4. Piping shall be pitched a minimum of ¼-inch per foot so that the low end of the pipe is located at a sump for leak detection monitoring.

5. Flexible double-walled pipe shall be installed as a single pipe without tears, cuts or splices.
6. Male and female piping connections shall be made using stainless steel swivel type fittings.
 - a. All fitting connectors installed below grade shall be contained within sumps.
 - b. Fittings shall have an internal expanding stainless-steel coupling and Viton ring gasket.
 - c. The installation of the stainless-steel fittings shall not cover the secondary containment pipe, or otherwise interfere with the secondary pipe.
7. Fuel supply and return piping shall be routed through a single corrugated flexible conduit. The corrugated pipe shall be capable of withstanding an H-20 loading when properly installed.
8. Piping compatibility shall be consistent with that of the associated underground storage tank as detailed below.
9. Flexible sump entry boots shall be provided at each pipe and conduit penetration through the sump wall.
 - a. Entry boots shall be bonded to the sump wall in accordance with the manufacturer's installation instructions.
 - b. All sump penetrations shall be watertight.
 - c. Pipe and conduit penetrations shall exit through the sump wall at an angle perpendicular to the sump wall.
 - d. The angle of pipe and conduit penetrations shall not exceed 10 degrees off the centerline of the entry boot flange.
10. All piping located below grade shall be of double-walled construction in accordance with the requirements of UL971 and bearing the UL label.

E. Single-Walled Piping

1. Aboveground piping shall be constructed of Schedule 40 single-walled steel.
 - a. Aboveground steel pipe shall be painted in accordance with the requirements of Section 09900.
2. Transitions between the double-walled underground pipe to the single-walled aboveground pipe shall be completed inside of wall sleeves, dispenser sumps, tank sumps or transition sumps as indicated below.

F. Submersible Pumps

1. General
 - a. Pumps shall be designed for installation in a Class 1, Group D location.
 - b. Pumps shall be compatible with the fuel to be transferred:

- 1) Diesel
 - 2) E85 Gasoline
 - c. Provide one new Control Box for each submersible pump.
 - d. The Control Boxes shall be capable of acting as a secure lock-out-tag-out device.
 2. DPW Garage
 - a. Provide two new UL 79 listed submersible fuel pump, Red Jacket submersible turbine pump, or equal.
 - 1) One shall be 3/4-horsepower for gasoline service, 60 hz, single-phase.
 - 2) One shall be 1.5-horsepower for diesel service, 60 hz, single-phase.
 - b. Pump shall be sized for installation through a 4" fitting.
 3. Provide and install one mechanical line leak detector on each submersible pump.
 - a. The line leak detector shall be manufactured by the pump manufacturer and intended for use on the equipment provided.
 - b. Line leak detector shall be capable of detecting a leak of 3 gph at 10 psi.
 4. The submersible pumps shall be provided with, at a minimum, built in check valves, air eliminators, siphon check valve, pressure test screw and expansion relief valve.
- G. Overfill Prevention Valves
1. One mechanical automatic shutoff valve and drop tube, OPW 61SO, Franklin Fueling Defender Series, or equal.
 2. Automatic shut off valve shall be set to limit the tank volume to 95% capacity.
 3. Automatic shut off valves shall have a minimum operating pressure of 5 psi and a maximum operating pressure of 100 psi.
 4. Internal valve working mechanisms shall be constructed of stainless steel.
 5. Valves shall be compatible with the material stored.
 6. Drop tube shall extend to within 4" of the tank bottom.
 7. Provide quick connect style adaptors with vapor tight caps for the tank fill connections.
 - a. The gasoline tank shall be equipped with a compliant Stage I vapor tight swivel adaptor.
 - 1) The Stage I adaptor and vapor tight caps shall be CARB-approved.

- b. Vapor Recovery shall be accomplished using a two-point system.

H. Below Grade Spill Containers

- 1. Provide five-gallon below grade spill buckets for each tank fill connection and vapor recovery connection, Franklin Fueling Defender Series, or equal.
- 2. Spill Buckets shall be the thread-on type.
 - a. Below grade spill buckets will be required in the designated quantity at the following locations:
 - 1) DPW Garage: gasoline fill, vapor recovery and diesel fill
 - 2) Pawcatuck Middle School: heating oil fill
 - b. The Town Dock shall be equipped with a remote fill spill container as specified in paragraph 2.2.J of this Section
- 3. Spill buckets shall be CARB approved.
- 4. Surface loads: spill bucket cover shall be installed to withstand surface H-20 axle loads.
- 5. Grade level spill bucket cover shall be constructed of fiberglass and be painted to indicate the fuel stored in each tank:
 - a. Diesel: Yellow
 - b. Gasoline: Red
 - c. Heating Oil: Green
 - d. Vapor recovery: Orange

I. Interstitial Manways

- 1. Interstitial monitoring hand hole as shown on the Drawings
 - a. Surface loads: spill bucket cover shall be installed to withstand surface H-20 axle loads.
 - b. Grade level cover shall be marked “DO NOT FILL”

J. Adaptors

- 1. Provide 3” aluminum or brass Cam and Groove type, rotatable fill and vapor recovery adaptors.
- 2. All adaptors shall be provided with tight fitting caps to prevent water intrusion and to control vapors.
- 3. Dry disconnect valves shall be provided at the Town Dock.

K. Emergency Shear Valves

- 1. Emergency Shear Valves

- a. Provide rigidly anchored emergency shear valves for the gasoline and diesel dispensers at the DPW (2) and Town Dock (2).
- b. Valves shall be double-poppet valves designed for pressure applications with a fusible link designed to close the valve at 165 degrees Fahrenheit.
- c. Valve shall be equipped with an internal thermal relief valve designed to relieve pressures over 25 psi.
- d. Valves shall have male or female treaded ends of the same diameter as the fuel pipe.
- e. Emergency shear valves shall be anchored at the base to stabilizer bars located inside of the containment pan and anchored into the concrete fueling island pad.
- f. Emergency shear valves shall be equipped with test plugs.
- g. A single offset adaptor will be allowed for each dispenser.

L. Transition Sleeves

- 1. At the Pawcatuck Middle School provide one transition sleeve to provide containment of the transition from double-walled pipe to single-walled pipe, Franklin Fueling Systems Grade Level Sleeve, or equal.
- 2. The transition sleeve shall have flexible entry boots on each end to provide a liquid tight seal.
- 3. Transition fitting from the double-walled pipe to single walled pipe shall be performed within the transition sleeve.
- 4. The transition sleeve shall be installed so that the length of the sleeve is in the wall with one entry boot on the outside (soil side) of the wall and one entry boot in on the basement side of the wall.

M. Fuel Island Forms

- 1. Island forms shall be 9 ¼" tall stainless-steel forms manufactured by Burtco, or equal.

N. Venting

- 1. Below grade vent piping shall be constructed of single-walled fiberglass piping.
 - a. Piping shall be installed in accordance with the manufacturer's installation instructions.
- 2. Above grade vent piping shall be constructed of single-walled, schedule 40, galvanized steel piping.
- 3. Vents shall terminate a minimum of 12' above ground level and be located where shown on the Drawings.
- 4. Vertical vent piping lengths shall be supported in accordance with Section 15060.

5. Vent piping shall not terminate within 5' of windows or doors or less than 5' below building eaves.
 - a. When possible, vent piping shall terminate above adjacent roof lines.
6. Vents shall discharge upward and be protected from intrusion of rain with a weather proof hood with a noncorrosive screen not coarser than 30-mesh.
7. Vapor recovery venting
 - a. A CARB-approved pressure/vacuum vent cap shall be mounted at the end of the DPW Garage gasoline tank vent
8. The vent installations shall comply with the applicable sections of fire and mechanical codes, including, but not limited to, NFPA 30, NFPA 30A and the UFC.

O. Signage

1. Dispensers shall be labeled on each side facing the drive mat indicating the appropriate fuel.
2. Dispensers shall have a "NO SMOKING" sign on each side facing the drive mat.
 - a. Lettering shall be a minimum of 3" high and in red type on white background.

2.3 ABOVEGROUND STORAGE TANK EQUIPMENT

- A. Single-Walled Steel Tank at the BOE Administration Building shall be installed in accordance with the requirements of this Section.
1. The AST shall meet the capacity and approximate dimensional requirements detailed below:
 - a. Two 330-gallon UL 80, vertical, aboveground storage tank at the BOE Building manufactured by Highland Tank, Granby Industries, or equal.
 - b. Approximate dimensions: length – 72", width – 27.25", height – 44.25"
 2. The tanks shall be manufactured from single wall, 12 gauge steel and be labeled in accordance with UL 80 standard. The tanks shall be labeled in accordance with NFPA 31 for indoor use.
 3. Tank shall be delivered as a complete UL listed assembly.
 4. Provide tank supports as shown on the Drawings.
 5. The tanks shall be provided with an external powder coating.
 6. The tank shall be suitable for the storage of heating oil.
 7. A fitting schedule is provided on the Drawings showing the fitting sizes, location and total number of required fittings.
 8. All fitting shall be located above the maximum liquid level, along the centerline of the tank.

9. A tank chart showing the conversion from inches-to-gallons in 1/8-inch increments shall be provided.
10. Tanks shall be designed for the aboveground storage of flammable and combustible liquids at atmospheric pressure.
11. Pipe fittings, bushings, anchors, electrical wiring and ancillary required to provide the Owner with a fully functional fuel system.

B. Temporary Storage Tanks

1. At the DPW Garage provide one double-walled 3,000-gallon temporary aboveground storage tanks and fleet fueling system to provide diesel fuel to authorized Town personnel.
 - a. Owner will coordinate with their supplier to fuel to the temporary storage tanks.
2. The diesel temporary fuel tank shall be constructed to the UL 142 standard and equipped with the following:
 - a. Fuel dispenser pump, hose and nozzle
 - 1) The fuel dispenser equipment shall be provided with a hangar for the fuel nozzle.
 - b. Level gauge
 - c. Minimum 2" quick connect fill connection and remote spill container.
 - d. Overfill prevention valve set to 95% of the tanks capacity
 - e. Atmospheric and emergency vents as required by UL 142
 - f. Ground connections and properly installed ground rod.
3. Provide temporary electrical connections to the fuel pumps from the DPW Garage.
 - a. Wiring to the fuel pumps shall be routed through PVC or ridged galvanized steel conduit.

C. Transition Sumps

1. Provide two single-walled fiberglass transition sumps for transitioning single-walled aboveground steel pipe to double-walled flexible underground pipe at the Town Dock, Bravo 600 large Walkover Sump, equivalent by OPW, or equal.
 - a. Sump shall be compatible with diesel fuel.
 - b. Sump shall have a 2" raised compression fitting welded to the frame to accommodate the 2" fuel oil supply pipe suitable for providing a weather-proof seal.
 - c. Sump body shall be constructed of fiberglass with a galvanized and epoxy coated mid-frame.

- d. The sump cover shall be constructed of galvanized diamond-plate with an approximate thickness of 1/8-inch.
 - 1) The sump cover shall have a drainage channel with drainage pipes on at least two (2) corners. Drainage pipes shall extend a minimum of 6-inches below the concrete.
- 2. The sump shall be hydrostatically tested after installation in accordance with the manufacturer's instructions and the requirements of 40 CFR 280 before introducing fuel into the piping.
 - a. Provide a copy of the hydrostatic testing results to include the date, time, liquid measurements, duration of test and the name of the person performing the test to the Engineer and Owner.
- 3. All pipe and conduit penetrations shall be made using flexible entry boots that are chemically bonded to the sump body and mechanically fastened to the pipe or conduit.

D. Piping

- 1. Above grade piping shall be constructed of single-walled schedule 40 black steel and meet the requirements of Sections 15050 and 15102.
 - a. Piping located outside shall be painted in accordance with the requirements of Section 09900.
- 2. Pipe supports shall meet the requirements of the Connecticut Building Code.
- 3. Pipe sizing shall be as detailed on the project Drawings.

E. Adaptors

- 1. Provide two 2-inch adaptors and caps for the BOE Building fill connections, Scully Unifill Tight Fill adaptor, or equal.
- 2. All adaptors shall be provided with tight fitting caps to prevent water intrusion and to control vapors.

F. Mechanical Level Gauging

- 1. BOE Building
 - a. Provide two level gauges to allow for direct reading of the tank contents as a percentage full (one for each tank).
 - b. Gauge shall have a clear plastic or glass showing, at a minimum, the tank level as a percentage full.
 - c. The level gauge shall have a galvanized swing arm and HDPE float, compatible with heating oil.

G. Venting

- 1. Provide one atmospheric vent for each AST as shown on the project Drawings.

2. Vents shall discharge upward and be protected from intrusion of rain with a weather proof hood with a noncorrosive screen not coarser than 30-mesh.
3. Vent piping shall not terminate within 5' of windows or doors or less than 5' below building eaves.
 - a. When possible, vent piping shall terminate above adjacent roof lines.
4. The vent installations shall comply with the applicable sections of fire and mechanical codes, including, but not limited to, NFPA 30, NFPA 30A, NFPA 31 and UL 142.
 - a. Vent sizes shall be determined by the tank manufacturer.
5. Vertical vent piping lengths shall be supported in accordance with Section 15060.

H. Signage

1. Provide the following signage on the door of the tank room in the BOE Building:
 - a. Tank capacity
 - b. Tank contents
 - c. A 10-inch by 10-inch NFPA diamond indicating the hazards associated with the tank contents.
 - d. "NO SMOKING"
 - e. "COMBUSTIBLE"

PART 3 EXECUTION

3.1 GENERAL

- A. Obtain all local permits prior to beginning demolition of the existing aboveground storage tanks and installation of new fuel storage tanks.
- B. Install new and owner furnished equipment in accordance with the manufacturer's instructions. Provide a copy of the manufacturer's checklist with the closeout documentation.
- C. On behalf of the Owner, register the new equipment and serial numbers in accordance with the manufacturer's warranty requirements.
- D. Furnish all labor, materials, equipment and supervisory, operating and monitoring personnel to conduct the Work as shown on the project Drawings and specified herein in a safe and professional manner.
- E. Perform system tests in accordance with the manufacturer's recommendations, State and local codes.
- F. Contractor shall furnish and install all other items including hangers, supports, conduit, wiring and all other devices required to complete the system.

- G. Installation of equipment and materials shall be in accordance with the manufacturer's recommended practice, State code and the Project Manual. Where conflict occurs between regulatory requirements, the manufacturer's recommendation, code requirements and the Project Manual or plans, the more stringent requirements will take precedence.
- H. Trenches shall be free from material that may damage conduit. Care shall be taken so that foreign matter is not introduced into the excavation or backfill during Work.
- I. Conduit fittings installed underground and inside building and shall be constructed with dielectric isolation when necessary.

3.2 INSTALLATION AND TESTING

- A. Install new fuel storage tanks and equipment in accordance with the manufacturer's instructions. Provide a copy of the Manufacturer's checklist with the closeout documentation.
- B. Contractor shall be responsible for offloading and hoisting into place all tanks.
- C. On behalf of the Owner, register the tank and serial number in accordance with the manufacturer's warrantee requirements.
- D. Sump and spill bucket testing:
 - 1. After the installation is complete, but before introducing fuel into the systems, the Contractor shall conduct a hydrostatic test of all piping, dispenser and transition sumps and spill buckets by filling the sumps to the top with water, or to the level that activates the leak detection sensor.
 - 2. The test will be considered a failure if there is a loss of 1/8-inch or greater of water over a period of one-hour.
 - 3. Should any of the tested equipment fail the hydrostatic test, the contractor shall be responsible for repairing or replacing the equipment and retesting the failed equipment at no cost to the Owner.
 - 4. Provide records of the hydrostatic test to the Owner and Engineer. The records shall include the results of the test, date and time of the test and the name and company of the individual performing the test.
- E. Vapor recovery testing
 - 1. Contractor shall retain a third-party testing contractor to perform the following required testing in accordance with the requirements of RCSA 22a-174-30a:
 - a. Pressure decay
 - b. Vapor space tie-in
 - c. Pressure/vacuum valve test (leak rate)
 - 2. Tests shall be completed within 60 days of initial operation.
 - 3. The Contractor shall, at no cost to the Owner, repair or replace any component that is cause for a test failure and retest the system.

- a. Retesting shall be completed within 60 days of completing the repairs or installing replacement parts.
- 4. Provide a minimum of 7-days' notice to the CT DEEP, Owner and Engineer before testing.
- 5. Submit testing reports to the CT DEEP. Copies shall be provided to the Owner and Engineer.
- F. Contractor, prior to installation, shall obtain the required state and local permits.
- G. Tank and appurtenance secondary enclosures shall be shop-fabricated as one unit at the factory and require no assembly, construction or completion at installation site.
- H. The tank and piping excavations shall be free from material that may damage the tank coating. Care shall be taken so that foreign matter is not introduced into the excavation or backfill during Work.
- I. Equipment to perform Work shall be of to ensure that no damage to the tank or appurtenances occurs.

END OF SECTION

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SECTION 13426

FUEL TANK MONITORING AND MANAGEMENT SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. General requirements
 - 2. Fuel tank leak detection, leak sensing, and alarm equipment
 - 3. Fleet fuel management system
- B. Related Sections
 - 1. Section 01640 – Owner Furnished Products
 - 2. Section 13201 – Fuel Storage Equipment
 - 3. Section 16050 – Basic Electrical Requirements
 - 4. Section 16060 – Grounding and Bonding
 - 5. Section 16120 – Conductor and Cables
 - 6. Section 16131 – Conduit
 - 7. Section 16136 – Boxes
 - 8. Section 16131 – Conduit
 - 9. Section 16410 – Switches and Circuit Breakers

1.2 REFERENCES

- A. 40 CFR 280 – Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- B. Connecticut State Fire Code
- C. National Fire Protection Association (NFPA) Standard 30 – Flammable and Combustible Liquids Code
- D. NFPA 30A – Motor Fuel Dispensing Facilities and Repair Garages
- E. NFPA 31 – Standard for the Installation of Oil Burning Equipment
- F. Petroleum Equipment Institute (PEI) Recommended Practice (RP) 100 – Installation of Underground Liquid Storage Systems
- G. PEI RP 200 – Installation of Aboveground Storage Systems
- H. PEI RP 300 – Installation and Testing of Vapor-Recovery Systems at Vehicle Fueling Sites

- I. RSCA Section 22a-449(d)-1 – 22a-449(d)-113 – Underground Storage Tank System Management
- J. Steel Tank Institute (STI) R912-00 – Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids

1.3 SUBMITTALS

- A. Shop drawings, wiring diagrams and manufacturer's product information for the tank monitoring system console, tank level probes, interstitial and dispenser monitoring sensors, alarms boxes and cables.
- B. Product certificates provided by the manufacturer certifying material compliance with the specification.
- C. Factory and field test reports.
- D. Warranty information.

1.4 QUALITY ASSURANCE

- A. Equipment manufacturers shall have a minimum of ten years of experience in the design and manufacture of equipment of similar size, type, and capacity.
- B. Contractor shall have a minimum of ten years of experience in the installation of equipment of similar size, type, and capacity and complete five projects of similar scope within the past two years.
- C. All equipment provided for the project must be new and installed in a workman like manner in accordance with the manufacturer's requirements.
- D. Following the installation of the fuel monitoring system provide the following items to the Owner:
 - 1. As-built drawings showing the location of equipment and conduit routing.
 - 2. Manufactures installation, operation and maintenance manuals.
 - 3. Manufacturer's installer checklist.
- E. Warrantees
 - 1. The Contractor shall warrantee equipment and materials for one-year from the date of installation. For the purpose of this warrantee the date of installation shall be the Substantial Completion Date.
 - 2. Contractor shall provide the manufacturers completed written warrantee paperwork to the Owner with a copy of the manufacturer's installation checklist and any other information required by the manufacturer to register the warrantee.
- F. Tank level sensors for the leak detection and overfill alarm probe shall be able to detect a leak or discharge of 0.10 gallons per hour with a probability of detection of at least 95% and a maximum probability of false alarm of 5% as determined by the National Work Group on Leak Detection Evaluators (NGWLDE).

1. The system shall be able to perform this testing on tanks with a minimum volume of 25% and a maximum volume of 90% of the tank's design capacity.

PART 2 PRODUCTS

2.1 FUEL MONITORING SYSTEMS

- A. Provide two new complete electronic interstitial and sump leak detection and overfill alarm systems with integrated printers, Veeder-Root TLS 350, or equal.
 1. One system shall be installed at the Town Dock (Alternate No. 1).
 2. One system shall be installed at the Department of Public Works.
 3. The Veeder-Root system shall be capable of reconciling fuel inventory with the Fuel Master fuel management system that is to be installed under this Section.
- B. Provide one new complete electronic interstitial and sump leak detection and overfill alarm systems with integral printer, Veeder-Root TLS 300C, or equal.
 1. To be installed at the Pawcatuck Middle School.
- C. The aboveground storage tank at the BOE Building will not be monitored using an electronic fuel tank monitoring system.
- D. Electronic fuel monitoring systems shall include the following:
 1. Veeder-Root magnetostrictive tank level probes for monitoring both fuel and water levels in the fuel storage tanks.
 - a. Metallic probe components shall be of stainless steel construction.
 - b. Floats shall be 4-inches in diameter and compatible with the material stored.
 - c. Tank level probes shall be calibrated to provide an overfill alarm at 90% capacity.
 - d. Level probes shall be located at the centerline of the tank.
 2. Interstitial leak detection between the inner and outer walls of the brine filled, double-walled storage tanks as follows:
 - a. The monitoring system, when installed, shall be capable of detecting a breach in the inner and outer tank under the following conditions:
 - 1) When the primary tank is empty.
 - 2) When the primary tank is partially or completely full and the ground water table is below the tank bottom.
 - 3) When the primary tank is partially or completely full and the tank is partially or completely submerged in groundwater.
 - b. Double float reservoir sensor compatible with the brine solution and capable of providing two alarm points positioned 10-inches apart.

- c. The leak detection performance of the monitoring system shall be listed as a continuous interstitial monitoring method by the NWGLDE.
- 3. Provide non-discriminating sump leak detection sensors for each dispenser and transition sump.
 - a. Sensors shall be located at the lowest point in the sumps.
 - b. Sensors shall be non-discriminating type, capable of detecting ½-inch of liquid in the sumps.
- E. Provide one audible and visible, weather-proof alarm horn for each electronic monitoring system; Town Dock, DPW Garage and Pawcatuck Middle School.
 - 1. Program alarm to activate when the tank reaches 90% of design capacity.
 - 2. Alarm shall be equipped with a test button and alarm acknowledgment switch.
 - 3. Acknowledgement switch shall be located on the exterior of the building, immediately adjacent to the overfill alarm.
 - 4. Confirm placement of alarm with Engineer and Owner prior to installation.
 - 5. Audible alarm shall be programmable to activate for 10 to 60 seconds.
 - 6. Contractor shall provide conduit and wiring for the alarm panels.
- F. Signage
 - 1. At each location provide a sign with the text specified below adjacent to the audible / visual overfill alarm:
 - a. “CAUTION – WHEN ALARM BELL SOUNDS TANK IS FILLED TO CAPACITY – DO NOT OVERFILL”

2.2 FUEL MANAGEMENT SYSTEMS

- A. The Town of Stonington currently uses a Fuel Master fuel management system at the Police Department, and intends to provide mutual system access to all departments using the same chip keys, user codes and departmental system access. The Town is requiring that all departments transition to the Fuel Master system as upgrades to the fueling systems are made.
- B. Provide and install two new, complete Fuel Master fuel management system, conduit and electrical wiring, no approved equal.
 - 1. One system shall be provided at the Town Dock (Alternate No. 2);
 - 2. One system shall be provided at the DPW Garage
- C. The fuel management system shall, as a minimum, consist of the items described below.
 - 1. Read/write keys will be used to activate the system by insertion into a key reader and will be unique to each vehicle or individual.

2. Keys should be capable of being written to 100,000 times, and vehicle keys should contain the previous transaction mileage and range for reasonability check. Quantity and product restrictions are also to be encoded on keys.
 3. Keys must have gold plated contacts and pins.
 4. A master island key reader.
 5. Master island reader shall be located on the fuel island and used to turn fuel dispensers on and off, monitor fuel dispensed, recognize authorized keys, and interface with the fuel monitoring system.
 6. The island fuel management unit should have a 32bit processor and preferably a Rockwell socket modem to permit upgrade of modem.
 7. Modem should be at least 33.6kbps. The receptacle for reading keys must be covered to prevent sand, water and snow from causing system problems.
 8. Unit shall be compatible with a PC.
 9. On-site transaction printer.
- D. The equipment and software shall be capable of operating in five different system access configurations. The system configurations shall use a vehicle key and terminate the transaction if a vehicle's odometer reading is out of the range encoded on its key. Owner shall have the option of selecting the initial configuration and the option of changing the configuration at a later date should operational requirements so dictate.
1. Vehicle key and verifiable driver number
 2. Vehicle key and unverified driver number
 3. Vehicle and driver key
 4. Either vehicle or driver key
 5. Driver key and verifiable vehicle number
- E. Data on Vehicle Keys is as follows:
1. Key identification number
 2. Vehicle budget or agency number
 3. Vehicle license number
 4. Fuel type to allow for pumping of designated fuel type only
 5. Maximum number of gallons/units allowed per transaction for each product type
 6. Odometer or hour reading
 7. Preventive maintenance reminder (oil change mileage, etc.)
 8. Site signature to identify the applicable owner's system
- F. Driver keys, if used in lieu of having the driver enter an ID number on the island key reader keypad. Driver keys will be encoded with the following information:

1. Key identification number
 2. Driver identification number
 3. Types of products authorized
 4. Product limitations
 5. Budget or agency number
 6. Site signature
 7. Supervisor keys shall allow the on-site supervisor special access to the site's key reader. This access allows the supervisor to:
 8. Change the key reader's configuration, to include time/date, product codes, hose numbers, tank numbers, pulser divide rate, no pulse time out, key timer setting, pump finish timer, message duration setting, zero-quantity shutdown, and pump handle switch control
 9. Issue fuel
 10. Update a vehicle key's PM flags
 11. Activate semi-manual mode of fuel issue
 12. Initiate on-site reports generation
 13. Enter fuel drops and corrections to fuel drops
 14. Perform diagnostic testing of system components
- G. Each island key reader shall have the ability to simultaneously control up to four hoses and control up to four satellite units, which in turn can simultaneously control up to eight four.
- H. Each master and each satellite key reader shall store a minimum of 4,000 transactions.
- I. The system shall be capable of performing as a gate opener using switch closure and shall provide the option of providing a less expensive gate opener, which is not a complete key reader unit. The fuel management system shall also be capable of controlling bulk or canned oil, antifreeze, CNG and other alternative fuels or liquid products. The system must have the capability to mount a key reader on a tanker truck to act as a mobile refueling site.
1. Each hose shall be individually set for any number of pulses between 1 and 1000 for each unit of measurement. Thus, the system can use various rate pulsers to measure different products to various levels of accuracy.
 2. Operator Input at Fueling Station. The system shall include a key reader with a liquid crystal display (LCD) using light emitting diodes (LED) with back light, that is a minimum of 2 lines by 40 characters. It must also include a numeric keypad (0 through 9, A through D, Enter/Yes, and Clear/No) located near the pumps.
 3. The operator shall be prompted by the LCD to input information, that shall be recorded as part of the transaction record, for each transaction in accordance

with the system configuration of paragraph 2.2 C, above. The driver will insert his/her key into the island key reader, and upon queue from the system prompts will enter his/her ID number and odometer reading, and select a pump.

J. Data Management and Reporting.

1. Each island key reader may be downloaded by the central controller operator at his/her convenience, or at a time of day programmable by the central controller operator. When automatically downloading, the system shall dial each site in sequence and generate a report of all transactions for individual sites once each 24-hour period.
2. The software shall operate on a compatible PC using Windows 2000, ME, NT or 2007. The software shall permit networking.
3. 3.5.2 The system shall provide the following information at the central controller as a transaction record:
4. User identification number.
5. Vehicle odometer or hour reading.
6. Vehicle Number.
7. Number of units (gallons, quarts, cubic feet, etc.) dispensed to tenths, hundredths, etc.
8. Fuel site.
9. Data & time.
10. Hose number.
11. Product number.
12. Key type
13. The system shall be capable of totaling monthly fuel costs by organization number, vehicle ID number, agency number, and user number.
14. The system shall keep a declining balance inventory of fuel remaining in storage. The inventory report shall give a summary of the remaining fuel in each storage tank monitored. It must also note when fuel should be purchased for a specific tank.
15. The system shall allow the operator to compile summary reports for all transactions by site, organization, date, vehicle, etc.
16. All vehicles due for preventive maintenance shall be printed as an exception report on the central controller's printer, provided the PM option is used.
17. All vehicles that have an out of range odometer reading shall be printed as an exception report on the central controller's printer.
18. The central controller shall be capable of displaying reports on the central controller monitor before the reports are printed. When reports are displayed

on the monitor, the user shall be capable of scrolling up and down to view any page of the report.

19. In the event of a power failure to the island key reader equipment located at the pump, the system shall have the capability to store all data collected up to the time of the power failure for a minimum period of three months. The equipment at each fueling site must have the ability to operate if the central processor is down, limited only by the key reader's internal storage capacity. There shall be a method to access dispenser transaction information should there be data transmission problems. The main board, with memory, shall be removable and must be capable of being installed in an operating unit and downloaded; or, if the central controller is inoperable, another central controller shall be capable of downloading data. Support for recovering data from the system shall also be provided by the factory when required.

K. These required features must be available

1. The fuel management system must be capable of a future upgrade to a fully automated system, requiring no human intervention for the system to operate. RF/TAG technology is the preferred method for an autonomous, passive system.
2. An on-site transaction printer will be provided for each site. An on-line journal printer, driven by the key reader, and located at the self-service fueling station, will print (record) each transaction as it occurs. This allows the remote site operators to maintain a hard copy record of transactions, as well as the capability to print the site configuration and total fuel dispensed by hose number and product code.
3. The system shall permit manual override of the fuel management system should any problem occur. The override must be a complete, total by-pass of the fuel management system. Thus any requirement that parts of the fuel management system be operational for the manual override to function, for example, emit fiber optic signals, etc. is unacceptable.
4. The system shall have the capability to record fuel dispensed in emergency situations when there is a need for vehicles without keys to be refueled or to streamline refueling operations, and yet accountability is still desired. With this option, individual key readers may be put into the semi-manual mode with a supervisor's key. When in this mode, fuel can be dispensed by any pump as if the key reader was not functioning, but the key reader will record all transactions as semi-manual transactions.
5. The island key reader shall permit diagnostic testing of boards, LCD, and keypad using the supervisor's key.
6. The system shall have the capability to have drivers record whether or not they checked their oil and the amount of oil added, using the keypad on the island key reader. This information will be downloaded into the system software and permit the tracking of oil usage.
7. The vendor shall provide toll free support during the warranty or extended maintenance period for the hardware and software that is being bid.

Additionally, a means of dialing the vendor's product support technicians directly from the island key reader is desired.

8. The vendor shall offer extended maintenance agreements on an annual basis for the life of the system (minimum 10 years).
 9. The vendor shall provide a minimum of two-hours for the training of system operators.
 10. The system shall have surge (lightning) protection on the AC power line and on the telephone line. Surge protection shall be designed specifically for the voltage and current requirements of fuel management systems.
 11. The system shall have the capability to customize the initial entry prompt, user ID and vehicle ID prompts.
 12. The system shall have the appropriate interfaces available to permit the operator to connect a lap top computer to the island key reader to download transactions and upload vehicle and personnel lists, as well as providing local diagnostic capabilities.
- L. The equipment should be designed in a modular manner to permit replacement of components by non-technical personnel. It shall be designed for operation by non-technical personnel with limited computer experience.
1. The equipment shall be simple to operate and supplied with operating instructions. The computer and data collection/download interface shall require a minimum of operating instructions and require little or no prior computer operating experience.
 2. Suitable clearance and access shall be provided to all maintainable points. The system shall be of modular construction and have circuit boards/components that are replaceable by the user. If available, the bidder should provide documentation from an outside source indicating the time required for replacing components. It is expected that replacement of circuit boards/wiring harnesses should take less than ten minutes. If the island key reader is accessed by a modem, the unit shall have the capability of the user plugging in a telephone and talking directly to factory technicians who can assist in diagnostics and repair while working on the key reader.
 3. The vehicle operator interface with the equipment will be outdoors and exposed to the elements. Thus, the fuel island unit must have an operating range of -60 degrees F to +140 degrees F and withstand rain, snow, and blowing sand. The system shall have been tested by an independent environmental testing organization to provide outside affirmation of environmental limits.
 4. This equipment shall be designed to operate from 120 volt AC, 60 Hz single phase power.
 5. Safety. The equipment shall be provided with all necessary safety devices and guards to protect the operator. All primary operator control buttons, switches, etc. shall be grouped and mounted in a location affording the operator convenient access to the controls. Essential safety operating instructions shall identify safety and health hazards associated with the equipment and the

procedures and practices necessary for safe operations. Placards shall be provided to warn operator or maintenance personnel of hazardous areas which could cause injury. Installation manuals and maintenance manuals shall include all necessary safety and hazardous conditions warnings.

- M. The supplier shall provide on-site training of personnel in the functions of operation, maintenance, and repair as they apply to each specific item of equipment. Supervisors and operators at each refueling site will be provided training in the operation of the island fuel management units. Training on software may be conducted on-site or via a remotely located computer on line with the central controller (PC) operator.
- N. Maintenance and spare parts
 - 1. The manufacturer shall agree to sell spare parts for the operating life of the equipment, estimated to be 10 years. The vendor shall provide any documentation that supports the assertion that spare parts will be available for 10 years.
 - 2. The manufacturer shall agree to provide system maintenance on a yearly renewable contract for the life of the system. The manufacturer, under a maintenance agreement, would be responsible for providing all repair parts and telephonic assistance. The procuring agency may or may not accept the terms of the maintenance agreement and may or may not renew the maintenance contract on an annual basis.
- O. Manufacturer shall warrant parts for the equipment supplied for a period of one (1) year. Read/write keys shall be warranted for five (5) years. All replacement parts shall be provided by the Manufacturer for this one (1) year period, except those required by acts of nature (i.e., flood, lightning, etc.). All telephonic support labor for diagnostics and assistance shall also be provided.

PART 3 EXECUTION

3.1 GENERAL

- A. Contractor shall be responsible for obtaining the appropriate permit(s) from the local permitting authority.
- B. Install new and owner furnished equipment in accordance with the manufacturer's instructions. Provide a copy of the manufacturer's checklist with the closeout documentation.
- C. On behalf of the Owner, register the new equipment and serial numbers in accordance with the manufacturer's warrantee requirements.
- D. Furnish all labor, materials, equipment and supervisory, operating and monitoring personnel to conduct the Work as shown on the project Drawings and specified herein in a safe and professional manner. All work shall be conducted in accordance with NFPA 30 and 30A, 527 CMR 1.00, and PEI RP 200.
- E. Contractor shall provide all other items including hangers, supports, conduit, wiring and all other devices required to complete the system.
- F. Installation of equipment and materials shall be in accordance with the manufacturer's recommended practice, State code and the Project Manual. Where conflict occurs

between regulatory requirements, the manufacturer's recommendation, code requirements and the Project Manual or plans, the more stringent requirements will take precedence.

- G. Trenches shall be free from material that may damage conduit. Care shall be taken so that foreign matter is not introduced into the excavation or backfill during Work.
- H. Provide warranty information for Contractor installed equipment.

3.2 INSTALLATION

- A. Work shall be installed in accordance with the manufacturer's printed instructions.
- B. Obtain all local permits prior to beginning work.
- C. Install the equipment in strict accordance with the manufacturer's recommendations and applicable fire and environmental codes.
- D. Provide 1-year warranty for workmanship and product defect for the fuel monitoring system and equipment.
- E. Provide conduit fittings, bushings, anchors, electrical wiring and ancillary equipment required to provide the Owner with a fully functional system.

3.3 TESTING

- A. Perform system tests in accordance with the manufacturer's recommendations, NFPA 30, and NFPA 30A.

3.4 TRAINING

- A. Demonstrate operation of the fuel oil storage, monitoring and gauging systems in the field following installation.
- B. Provide two (2) hours of onsite training for the Owner and Owner's employees on the operation of the new fuel monitoring/and/management system(s) to include a review of system functions and the liquid level probe and leak sensor locations.

END OF SECTION

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DIVISION 15 - MECHANICAL

SECTION 15050

PIPING - GENERAL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Permit requirements and documentation
 - 2. Anchor bolts
 - 3. Pipe and equipment coatings
 - 4. Piping installation
 - 5. Testing
- B. Related Sections
 - 1. Section 09900 – Painting
 - 2. Section 13201 – Fuel Storage Equipment
 - 3. Section 15060 - Hangers and Supports

1.2 REFERENCES

- A. ASTM A778 – Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products
- B. ASTM A36 – Specification for Carbon Structural Steel
- C. UL 971 – Standard for Nonmetallic Underground Piping for Flammable Liquids, latest edition

1.3 SUBMITTALS

- A. Material specifications and shop drawings for all materials and equipment furnished under this Section
- B. Certificates of Compliance on all pipe materials
- C. Pipe testing procedures

1.4 QUALITY ASSURANCE

- A. The location of all equipment, fixtures, and piping is considered to be approximate only and the Engineer has the right to change at any time before the work is installed, the position of equipment and piping to meet structural conditions, avoid interferences, provide proper clearances or for other sufficient causes. Such changes shall be made without additional expense to the Owner.
- B. Secure all permits and pay all fees required to carry out the piping work. Comply with all laws, ordinances, codes, rules, and regulations of the local and state authorities having jurisdiction over any of the work specified herein. Where

provisions of the Contract are in conflict with the codes, the more stringent of either the codes or the Contract Documents shall govern.

- C. The drawings and diagrammatics show the pipe sizes and general routing. Offsets and fittings required to avoid field interferences and provide improved layout shall be provided at no additional cost to the Owner.
- D. All pipe, tube, hose, and fittings in a given specification section shall be the product of a single manufacturer who is experienced in the manufacture of the materials to be furnished. The manufacturer must have provided materials which have been successfully installed and operated for at least 5 years in a similar application.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Care shall be taken in loading, transporting, and unloading to prevent damage to the pipe or coatings. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before installing, and no piece shall be installed which is found to be defective. Any damage to the pipe linings or coatings shall be repaired as directed by the Engineer at no additional cost to the Owner.
- B. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before installing, shall be kept clean until they are used in the work, and when installed shall conform to the lines, grades and dimensions required.
- C. Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture. Protect stored pipes and tubes. Elevate above grade and enclose with durable, waterproof wrapping. When stored inside, do not exceed structural capacity of the floor. Protect flanges, fittings, and specialties from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sleeves and Seals - Furnish all sleeves required under this Division. Coordinate the sleeve locations and elevations for placement.
 - 1. Sleeves will be required at the locations shown on the Drawings or as specified herein. The type of wall penetration shown on the Drawings shall govern over the summary presented herein.
 - 2. Sleeves shall be Schedule 5S stainless steel in accordance with ASTM A-778 with seep rings. Wall sleeves shall be the same length as the wall thickness.
 - 2. Sleeves for carrier pipes 1 inch diameter and less shall be Type WSK as manufactured by O.Z. Electrical Manufacturing Company, Brooklyn, NY, Wall-Seal by Dresser Manufacturing, GPT/Thunderline, or equal.
 - 3. Pipes penetrating a concrete floor poured on soil above grade shall be poured in place. Pipes shall be fully isolated with full depth, ¼ inch thick, self-

expanding cork or other bond-breaking material held securely in place during concrete placement. The annular space at finish floor shall be caulked.

- B. Anchor Bolts - Anchor bolts, nuts, washers, and bolt sleeves shall be Type 316 stainless steel. Expansion bolts shall be "Thunderstuds," as manufactured by Unifast Industries, Inc., Hauppauge, NY, Redhead "Wedge Anchors" as manufactured by ITT Phillips; Michigan City, Indiana or Molly parabolt as manufactured by USM Corporation, Shelton, CT. All expansion bolts and associated hardware shall be stainless steel.

2.2 FINISHES

- A. Pipe and Equipment Coatings - The prime and field applied coatings shall conform to the requirements of Section 09900. Prime coats must be compatible with the paint system approved for this project.
 - 1. Exposed piping shall be painted in accordance with the individual pipe specification section and Section 09900.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean and prepare pipe joints to be free of scale, dirt, and debris prior to connections.
- B. Comply with the surface preparation requirements outlined in Section 09900 for all piping, supports and hangers requiring painting.

3.2 INSTALLATION

- A. Work shall be installed in accordance with the manufacturer's printed instructions and shall be plumb and true to line. Install piping as close to walls, and ceilings as possible yet facilitating maintenance and access to valves and devices. In general, piping systems shall parallel walls, partitions, and structural members. Offsets and fittings to accomplish a neat and workmanlike installation shall be provided at no additional cost to the Owner. Piping shall be installed true to the grades required as shown on the Drawings.
- B. Take care that stresses are not imposed on the pipe during installation.
- C. Concrete inserts for hangers and supports shall be furnished and installed in the concrete as it is placed. The inserts shall be set in accordance with the requirements of the piping layout and joint method and their locations shall be verified from approved piping layout drawings and the structural drawings. Layouts for hanger and supports shall be submitted to the Engineer for approval. Pipe hangers and supports shall conform to the requirements of Section 15060.
- D. All valves, fittings, and appurtenances needed on the pipelines shall be set and jointed as indicated on the Drawings or as required.
- E. Equipment Connections - Provide unions and control valves on services to equipment provided under other Sections. All valves are to be installed in the upright position. Valves shall be installed and located so they can be operated easily and shall be located adjacent to the equipment.

- F. Unions - All piping 2 inches and smaller shall have a sufficient number of unions to allow convenient removal of piping and shall be as approved by the Engineer.
- G. Cutting and Patching - Sleeves not initially set in the work shall be cut in place with permission of the Engineer. This work shall be performed by workmen competent to do the work and equipped with proper hand tools. Power tools with the exception of core boring machines shall not be used.
- H. Welding - Welding shall only be performed by certified welders tested in the position applicable to the work. Welding shall be performed in accordance with AWS standards. Copies of welding certifications shall be provided to the Engineer.

3.3 REPAIR/RESTORATION

- A. During the course of the Work, protect all materials, fixtures, and equipment from damage. Any damage to piping, linings or coatings shall be repaired to the satisfaction of the Engineer or replaced.

3.4 CLEANING

- A. At the completion of the Work, thoroughly clean all piping and equipment installed. Remove all concrete, stickers, rust stains, foreign matter and discoloration. Piping and equipment shall be in a thoroughly clean condition and ready for finish painting.

3.5 PRESSURE TESTING

- A. Testing - Test all piping systems in accordance with the code applicable to the location where the work is performed. Pipes shall hold pressure without the addition of water or additional pumping. Additional tests or methods may be required by local ordinances or inspection authorities. Tests shall be repeated as necessary to make the systems tight and accepted. Provide all water, air, fuel, or gas, apparatus, gauges, and materials necessary for performing tests.
- B. Provide all equipment, materials, and apparatus to conduct pressure tests as required by code or the individual piping sections. All tests shall be witnessed by the Engineer. Any leaks shall be repaired and the pipe retested to the Engineer's satisfaction.

END OF SECTION

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SECTION 15060

HANGERS AND SUPPORTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Manufactured piping hangers and supports
- B. Related Sections
 - 1. Section 15050 - Piping - General

1.2 REFERENCES

- A. Manufacturers' Standardization Society SP-58, Pipe Hangers and Supports - Materials Design and Manufacture, Selection and Application, Fabrication and Installation Practices
- Manufacturers' Standardization Society SP-90, Guidelines on Terminology for Pipe Hangers and Supports
- B. ASTM A 36 - Specification for Structural Steel
- C. ASTM A 123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- D. ASTM A 780 - Practice for Repair of Damaged Hot Dipped Galvanized Coatings
- E. ASTM B 633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel
- F. ASME B 31.9 - Building Services Piping
- G. American Welding Society (AWS) Structural Welding Code
- H. Connecticut State Building Code, latest edition

1.3 DESIGN REQUIREMENTS

- A. Mechanical components and systems and their attachments shall be designed in accordance with ASCE 7-05, Section 13.6 Mechanical and Electrical Components, the International Building Code (IBC 2009), and Section 1621 of IBC 2003, Connecticut State Building Code and Supplements.
- B. The design of each pipe support and pipe support framework shall be the responsibility of the Contractor.

1.4 QUALITY ASSURANCE

- A. Provide anchors and supports in conformance with the Manufacturers Standardization Society of the Valve and Fitting Industry, Inc. (MSS). All materials, design, manufacture, selection, application and fabrication shall be in conformance with the appropriate MSS numbers.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Manufactured Piping Hangers and Supports - Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with MSS SP-58.
 - 1. As a minimum, all components shall have hot-dipped galvanized coatings where installed for all other piping and equipment at the DPW, Pawcatuck School, and BOE Site, where required.
 - 2. All components at the Town Dock site shall be outdoor-rated, weather-proof, marine-grade Stainless Steel.
 - 3. All hangers and supports shall have some form of adjustment available after installation.
 - 4. Hanger rods shall be subjected to tension only. Lateral and axial movements shall be accommodated by proper linkage in the rod assembly.
 - 5. Strut channel hangers shall be used to support parallel piping. Strut clamps, straps, and rollers shall be used to maintain proper alignment.
 - 6. Floor supported process piping shall be supported by pipe supports which are provided with a base stand secured to the concrete using stainless steel anchors, adjustable shank, saddle, U-bolt, and hex nuts to hold pipe securely to the saddle.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which supports and anchors are to be installed. Do not proceed with installing until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-58.
- B. Install supports with maximum spacings complying with MSS SP-58.
- C. Install supports with minimum rod diameter complying with MSS SP-58.
- D. Install building attachments within concrete or to structural steel. Space attachments within maximum piping span length indicated in MSS SP-58. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping.
- E. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- F. Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors.

- G. Install hangers and supports so that piping live and dead loading and stress from movement will not be transmitted to connected equipment.
- H. Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.
- I. Anchors
 - 1. Install anchors at proper locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.
 - 2. Fabricate and install anchors by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9 and with AWS Standards D1.1.
 - 3. Anchor Spacings - Where not otherwise indicated, install anchors at ends of principal pipe runs. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.
- J. Shelf Bracket Supports
 - 1. Anchor brackets into concrete wall using anchors specified in Section 15050.

3.3 CONSTRUCTION

- A. Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

3.4 ADJUSTING

- A. Hanger Adjustment - Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.5 CLEANING

- A. For galvanized surfaces clean welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

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SECTION 15102**CARBON STEEL PIPE AND FITTINGS****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Carbon Steel Pipe and Fittings
- B. Related Sections
 - 1. Section 09900 – Painting
 - 2. Section 13201 – Fuel Storage Equipment
 - 3. Section 15050 - Piping - General

1.2 REFERENCES

- A. ASTM A47 - Specification for Ferritic Malleable Iron Castings
- B. ASTM A53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
- C. ASTM A105 - Specification for Forgings, Carbon Steel, for Piping Components
- D. ASTM A197 - Specification for Cupola Malleable Iron
- E. ASTM A234 - Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
- F. ASTM A307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile
- G. ASME B31.3 - Code for Pressure Piping
- H. ASME Boiler and Pressure Vessel Code

1.3 SUBMITTALS

- A. Provide submittals in accordance with Sections 13201 and 15050.

1.4 QUALITY ASSURANCE

- A. Comply with provisions of Section 15050.
- B. Comply with the requirements of ASME Code for Pressure Piping B31.3, Normal Fluid Service.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with the provisions of Sections 13201 and 15050.

PART 2 PRODUCTS**2.1 CARBON STEEL PIPE AND FITTINGS**

- A. Steel Pipe - ASTM A-53

1. ½-inch to 3-inch - Sch. 40
- B. Steel Fittings
 1. ½-inch to 3-inch - Threaded Fittings

2.2 FINISHES

- A. Surface preparation, prime painting, and finish painting of the pipe exterior shall be in accordance with Section 09900.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Installation shall be in accordance with Sections 13201 and 15050 and ASME B31.3.
- B. The system shall be arranged with low points and drains to permit complete drainage of the system.

3.2 FIELD QUALITY CONTROL

- A. Testing shall be in accordance with Sections 13201 and 15050.
- B. Piping shall be tested to a maximum pressure of 145 psig. Test pressure for other applications will be determined by the Engineer. Test pressure shall be maintained with no loss in pressure for a period of four hours minimum.

END OF SECTION

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SECTION 15110**VALVES****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Ball Valves
 - 2. Check Valves
 - 3. Fire Safety Valves
- B. Related Sections
 - 1. Section 15050 – Piping - General
 - 2. Section 15102 – Carbon Steel Pipe and Fittings

1.2 REFERENCES

- A. ASTM B62 - Specification for Composition Bronze or Ounce Metal Castings
- B. UL 842 – Standard for Valves for Flammable Fluids
- C. UL 157 – Standard for Gaskets and Seals

1.3 SUBMITTALS

- A. Product data including body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions.
- B. Wiring diagrams, product and performance data for solenoid valves.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Ensure valves are dry and internally protected against rust and corrosion.
 - 2. Protect valve ends against damage to threads, flange faces, and weld-end preps.
 - 3. Set valves in best position for handling. Set ball valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
 - 1. Do not remove valve end protectors unless necessary for inspection; then reinstall for storage.
 - 2. Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor

storage is necessary, support valves off the ground or pavement in watertight enclosures.

PART 2 PRODUCTS

2.1 GENERAL

- A. Sizes - Same size as upstream pipe, unless otherwise indicated.
- B. Valves shall have the same end connections and an equivalent or higher pressure rating as the pipeline in which it is installed.

2.2 BALL VALVES

- A. Ball valves, 3-inch and smaller - rated for 150 psi saturated steam pressure, 600 psi WOG pressure; two-piece adaptor load construction; with bronze body conforming to UL 842, single reduced port, chrome-plated brass ball, glass reinforced "Teflon" or "TFE" seats and seals, blowout-proof stem, screwed ends, and vinyl-covered steel handle.
- B. Provide lever handles for quarter-turn valves 3-inches and smaller. Provide one lever handle for each valve supplied.

2.3 CHECK VALVES

- A. Swing Check Valves, 3 inch - Check valves shall be all iron body, bronze mounted, full opening swing type. Valve clapper shall swing completely clear when valve is full open, permitting a "full flow" thru the valve equal to the nominal pipe diameter.
- B. Check Valves shall be rated at 200 psi or greater cold non-shock pressure limit.
- C. Check valves shall have a maximum thermal expansion relief of 50 PSI.
- D. Check valves shall be furnished with threaded ends.
- E. Check valves shall be constructed to permit top entry for complete removal of internal components without removing the valve from the line.

2.4 SOLENOID VALVES

- A. Solenoid valves shall be packless piston type direct acting for sizes less than 1-inch and internal pilot operated for sizes 1-inch and larger, 2-way, valves and shall be ASCO Valve; Red Hat as manufactured by Automatic Switch Co., equal by Atkomatic Valve Co. or equal.
- B. Valves shall be energized to open.
- C. Valves shall have forged brass or cast aluminum bodies, NPT end connections of the connected, and viton valve seats. Valves shall have a minimum 150 psig safe working pressure and zero minimum operating pressure differential. Connections shall be threaded.
 - 1. Valve body and seals shall be compatible with (E85) diesel, fuel oil.
- D. Valves shall be NEMA 4 rated, 120v, 60 Hz single phase continuous duty Class F coil.

- E. Valve shall have a 100 mesh strainer at the inlet.

2.5 FIRE SAFETY VALVES

- A. Fire Safety Valves shall be all iron body, a brass or steel fulcrum shaft. Valve clapper shall swing completely clear when valve is full open, permitting a "full flow" thru the valve equal to the nominal pipe diameter. Valves shall be UL listed for the intended application.
- B. Fire Safety Valves shall have a fusible link that is UL listed for a maximum temperature of 165 degrees Fahrenheit.
- C. Fire Safety Valves shall be rated at 200 psi or greater cold non-shock pressure limit.
- D. Fire Safety Valves shall be furnished with threaded ends.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine valve interior through the end ports for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.
- B. Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.
- C. Examine threads on both the valve and the mating pipe for form (i.e., out-of-round or local identification) and cleanliness.
- D. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.
- E. Replace defective valves with new valves.

3.2 INSTALLATION

- A. General Applications - Refer to the drawings and piping system specification sections for specific valve applications and arrangements.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown. Unions are not required on flanged devices.
- D. Install valves in horizontal piping with stem at or above the center of the pipe.
- E. Install valves in a position to allow full stem movement.
- F. Valves shall be installed to be plumb in the vertical direction.

3.3 THREADED CONNECTIONS

- A. Note the internal length of threads in valve ends and proximity of valve internal seat or wall to determine how far pipe should be threaded into valve.

- B. Align threads at point of assembly.
- C. Apply appropriate tape or thread compound to the external pipe threads (except where dry seal threading is specified).
- D. Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded

3.4 FIELD QUALITY CONTROL

- A. After piping systems have been tested and put into service, but before final adjusting and balancing, inspect valves for leaks. Adjust or replace packing to stop leaks; replace valves if leak persists.

3.5 CLEANING

- A. Clean mill scale, grease, and protective coatings from exterior of valves and prepare valves to receive finish painting or insulation.

3.6 FINAL ACCEPTANCE AND WARRANTY

- A. Final acceptance of all equipment furnished under these Specifications will be withheld until after the installation and field testing by the Engineer. The manufacturer and the Contractor shall guarantee the equipment against defects of any kind for a period of one year after final testing and acceptance.

END OF SECTION

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DIVISION 16 - ELECTRICAL

SECTION 16050

BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Basic Electrical Requirements specifically applicable to Division 16 Sections
 - 2. As-Built Documentation
- B. Related Sections
 - 1. Section 01770 - Closeout Procedures

1.2 REFERENCES

- A. ASCE 7-10 – Minimum Design Loads for Buildings and Other Structures
- B. International Building Code – IBC 2012
- C. Connecticut State Building Code, latest Edition
- D. NFPA 70 - National Electrical Code
- E. NFPA 79 – Electrical Standard for Industrial Machinery
- F. ANSI/ISA-S5.4 – Instrument Loop Diagrams

1.3 SUBMITTALS

- A. Submit shop drawings, product data, and reports.
- B. Submit as-built documentation in accordance with Section 01770. I&C documentation shall conform to the latest versions of NFPA 79 and ANSI/ISA-S5.4.
- C. Submit a written warranty.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable Connecticut Building Code.
- B. Electrical - Conform to Connecticut Electrical Code. All references to the National Electrical Code or NEC in the project manual shall be construed as references to the Connecticut Electrical Code.
- C. Conform to applicable Local Building Codes.
- D. Obtain and pay for all applicable permits.
- E. Schedule and pay for all inspections necessary for the electrical installation including but not necessarily limited to the general electrical inspection and fire department inspections.

1.5 PROJECT CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission from the Engineer before proceeding.
- C. Location of electrical equipment, devices, and similar items, as indicated, are approximate only. Exact locations are to be determined by the Contractor during construction. If any location is different from those indicated (greater than 5 feet away from location shown on Drawings), the Engineer must give approval to the change.
- D. Verify in field, existing conditions and final locations of equipment installed under other Sections that require electrical work.
- E. Equipment wiring
 - 1. Equipment power and control wiring is based on specific manufacturers and models. Actual wiring required may be different.
 - 2. Before pulling any power or control wire or installing conduit, obtain equipment electrical and control installation instructions and wiring diagrams. Any discrepancies from what is shown on the electrical drawings shall be brought to the attention of the Engineer. The Engineer will provide instructions for any changes that may be necessary.
 - 3. Installation of conduit or wire prior to obtaining the above specified information shall be at the Contractor's risk. The Owner will not be responsible for any extra costs related to removal or replacement of conduit or wire resulting from the failure to coordinate equipment conduit and wire requirements. In the event that additional conductors or larger conductors than shown on the Drawings are required, the Owner will not be responsible for any labor costs related to the installation of these materials unless it can be demonstrated by the Contractor to the satisfaction of the Engineer that these conductors could not have been installed at the same time as the conductors shown on the Drawings.
- F. Drawings and Specifications
 - 1. Drawings and Specifications are typical of work done and of arrangement desired. Provide accessories and appurtenances necessary for complete installation (e.g., home runs, conduit and wire for instrumentation and control wiring) that are required to provide a complete electrical system.
- G. As-Built Drawings: Maintain a master set of as-built drawings showing the changes and deviations from the Drawings or the approved shop drawings. Make markups as the changes are made.
- H. Where underground electric facilities are installed, measure, record, and submit as built dimensions.

1.6 WARRANTY

- A. Submit a written warranty, executed by the Contractor and manufacturer agreeing to the replacement and installation of all material, parts and adjustments required due to failure in materials or workmanship within one year from final acceptance of the Work.
- B. This warranty shall be in addition to, and not a limitation of, other rights and remedies the Owner may have against any party under the Contract Documents. This warranty is in addition to all other warranties existing under either the Contract Documents or required by Law.

1.7 SEISMIC REQUIREMENTS

- A. Components, systems and their supports shall be designed by the contractor in accordance with ASCE 7-10, Section 13.6 Mechanical and Electrical Component Design, the 2016 Connecticut State Supplement to the 2012 edition of the International Building Code (IBC 2012).
- B. Submit details showing the seismic restraints.

PART 2 PRODUCTS

2.1 GENERAL

- A. Products shall be Underwriter's Laboratory (UL) listed if a UL listing for that product is available.

2.2 FINAL SYSTEM DOCUMENTATION

- A. Prior to final acceptance of the system, provide operating and maintenance manuals (O&M's) covering instruction and maintenance on each type of equipment in accordance with Section 01770.
- B. The requirements for final documentation shall be as specified in Section 01770.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Perform all work in accordance with OSHA (Occupational Safety and Health Administration) requirements.
- B. Perform all work in accordance with NFPA 70E, Handbook for Electrical Safety in the Workplace.
- C. Install all equipment in accordance with manufacturer's instructions and recommendations.
- D. Perform all electrical equipment installation, checkout, and test in a safe manner. Provide the following special safety precautions, as appropriate:
 - 1. Locking and tagging procedures
 - 2. Barricades
 - 3. De-energization and/or isolation of equipment prior to testing
 - 4. Review of procedures with the Engineer and the Owner

5. Erection of warning signs
 6. Stationing of guards and watchmen
 7. Maintenance of voice communications
 8. Personnel orientation
- E. Do not install electrical equipment in its permanent location until structures are weather-tight or equipment is properly protected from the weather.
- F. Before energizing any machine, visually inspect for serviceability. Verify that equipment and machines have been properly lubricated and aligned. Verify nameplate for electrical power requirements.

END OF SECTION

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SECTION 16060**GROUNDING AND BONDING****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes**

1. Electrical equipment and raceway grounding and bonding

1.2 REFERENCES

- A. NFPA 30 – Flammable and Combustible Liquids Code
- B. NFPA 70 – National Electrical Code

1.3 SYSTEM DESCRIPTION

- A. Bond together exposed non-current carrying metal parts of electrical equipment, handrails, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, metallic tanks and all metallic piping.
- B. Install grounding in accordance with NEC Article 250.

PART 2 PRODUCTS**2.1 MATERIALS**

- A. Grounding Conductors - insulated copper, minimum size #12 AWG and in accordance with NEC Tables 250.66 or 250.102, or larger if so indicated on the Drawings

PART 3 EXECUTION**3.1 INSTALLATION**

- A. Provide a separate, insulated equipment grounding conductor with each feeder and branch circuit. Terminate each end on a grounding lug, bus, or bushing.
- B. Ground aboveground storage tanks and piping in accordance with the requirements of NFPA 30.
- C. Use grounding bushings on all conduits stubbed up below panelboards, and load centers. Bond all conduits to ground bus. Use grounding bushings to ground electrical equipment and exposed non-current carrying metal parts.

3.2 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation and compliance with NEC Article 250.

END OF SECTION

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SECTION 16070

ELECTRICAL HANGERS AND SUPPORTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Support channel
 - 2. Fastening hardware
 - 3. Anchor bolts

1.2 REFERENCES

- A. ASTM A-780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dipped Galvanized Coatings

1.3 SUBMITTALS

- A. Submit product data.

1.4 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2 PRODUCTS

2.1 SUPPORT CHANNEL

- A. Support channel shall be galvanized steel.
- B. Support channel assembly hardware shall be stainless steel.
- C. Support channel shall be by Unistrut, Wayne, MI; B-Line, Highland, IL; Thomas & Betts, Memphis, TN; or equal.

2.2 FASTENING HARDWARE

- A. All fastening hardware shall be 304-stainless steel unless noted otherwise.

2.3 ANCHOR BOLTS

- A. Anchor bolts, nuts, washers, bolt sleeves, and assembly hardware shall be Type 316 stainless steel. Expansion bolts shall be “Kwik Bolt II” or “HVA Adhesive Anchor” by Hilti, Tulsa, OK; Redhead “Trubolt Wedge” or “Epcon Adhesive Anchor” by ITW Ramset / Red Head, Wood Dale, IL; or Parabolt as manufactured by the Molly Division Emhart Corp., or equal.
- B. All expansion/adhesive bolts and associated hardware are to be stainless steel.

2.4 PIPE CLAMPS AND STANDOFFS

- A. Pipe clamps and standoffs shall be one hole, malleable iron type. They shall be of the same manufacturer and shall be designed to be used together.

2.5 THREADED RODS

- A. Threaded hanging rods shall be 304 stainless steel and be one piece. The size shall be suitable for the loads being supported.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors, preset inserts or beam clamps. Do not use spring steel clips and clamps.
- B. Use expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
- C. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.
- D. Do not use powder-actuated anchors.
- E. Fabricate supports from hot-dipped galvanized structural steel or hot-dipped galvanized steel channel rigidly welded or bolted to present a neat appearance. Use stainless steel hexagon head bolts with spring lock washers under all nuts. Coat ends of galvanized steel channel that has been cut with zinc-rich paint in accordance with ASTM A-780.
- F. Install freestanding electrical equipment on 4 inch concrete housekeeping pads.
- G. Install surface-mounted cabinets and panelboards with minimum of four 316 stainless steel anchors. Provide galvanized steel channel supports to stand cabinet 1 inch off wall.
- H. Bridge studs top and bottom with galvanized steel channels to support flush-mounted cabinets and panelboards in stud walls.
- I. Use standoffs for all surface mounted conduit to maintain ¼ inch space between conduits and walls.

END OF SECTION

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SECTION 16075**ELECTRICAL IDENTIFICATION****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Nameplates
 - 2. Wire and cable markers

1.2 REFERENCES

- A. NEMA WC5 - Thermoplastics - Insulated Wire and Cable for Transmission and Distribution of Electrical Energy
- B. ANSI C57

1.3 SUBMITTALS

- A. Provide schedule for nameplates.

PART 2 PRODUCTS**2.1 NAMEPLATES**

- A. Engraved three-layer plastic, white letters on a black background

2.2 WIRE AND CABLE MARKERS

- A. Wires up to AWG10: Split sleeve or tubing type waterproof markers (Thomas & Betts, Panduit, Burndy, Sur-Code Sleeve Markers or equal).
- B. Wires AWG8 and larger: Plastic impregnated cloth markers, resistant to abrasion, moisture, dirt and oil (Ideal, Panduit, Brady or equal).

PART 3 EXECUTION**3.1 INSTALLATION**

- A. Degrease and clean surfaces to receive nameplates.
- B. Install nameplates parallel to equipment lines.
- C. Wording of the nameplates shall be in conformance with Drawings and acceptable to the Owner. Secure nameplates to equipment fronts using ASA Type U drive screws, and water resistant adhesive. Secure nameplate to face of panelboard doors one third of the way down from the top of the door.
- D. Embossed tape will not be permitted for any application.

3.2 WIRE IDENTIFICATION

- A. Provide wire markers on each end of each conductor in panelboard gutters, pull boxes, outlet and junction boxes, switchgear, switchboards, motor control centers,

control panels, at each load connection and at each terminal board connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring.

- B. Circuits passing through junction boxes shall be individually grouped and bound with Ty-raps.
- C. Include the following color coding of all conductors used for power or lighting circuits.
 - 1. 120/240 volt, single phase 3 wire
 - a. Black - Phase A
 - b. Red - Phase B
 - c. White - Neutral
 - d. Green - Equipment ground
 - 2. 120/208 volt, three phase 4 wire
 - a. Black - Phase A
 - b. Red - Phase B
 - c. Blue - Phase C
 - d. White - Neutral
 - e. Green - Equipment ground
- D. Color coding of multiconductor control cables shall be in accordance with NEMA Standard WC5.

3.3 NAMEPLATE ENGRAVING SCHEDULE

- A. Provide nameplates of minimum letter height as scheduled below.
- B. Load Centers - ¼ inch to identify equipment designation, 1/8 inch to identify voltage rating and source.
- C. Individual Enclosed Switches - 1/8 inch to identify load served.

END OF SECTION

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SECTION 16091**MINOR ELECTRICAL DEMOLITION****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Electrical demolition

PART 2 PRODUCTS**2.1 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work: as specified in individual Sections.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on field observation.
- D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- B. Existing Electrical Service: Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

- F. Repair adjacent construction and finishes damaged during demolition and extension work.
- G. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- H. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.4 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangements.

3.5 INSTALLATION

- A. Install relocated materials and equipment as indicated.

END OF SECTION

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SECTION 16120

CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Building wire and cable
 - 2. AST signal cable
 - 3. Wire connectors
- B. Related Sections
 - 1. Section 16075 - Electrical Identification

1.2 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code

1.3 SUBMITTALS

- A. Submit product data

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.5 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions. Determine required separation between cable and other work.
- C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required. Determine cable routing to avoid interference with other work.

PART 2 PRODUCTS

2.1 BUILDING WIRE AND CABLE

- A. Description: Stranded conductor insulated wire, multi-conductor control cable and tray cable.
- B. Conductor: copper
- C. Insulation Voltage Rating: 600 volts
- D. Insulation: ANSI/NFPA 70; Type THW, 75°C insulation, XHHW, THHW insulation for underground power wiring AWG 8 and larger; type THHN/THWN insulation for aboveground feeders and branch circuits, and underground power

wiring AWG 10 and smaller. Type THHN/THWN insulation for AWG 14 control wire.

E. Manufacturer

1. Okonite Co.
2. Rome Cable Corp.
3. American Insulated Wire Corp.
4. Southwire
5. or equal

2.2 UNDERGROUND STORAGE TANK (UST) SIGNAL CABLE

- A. Description: twisted pair shielded instrumentation wire, NEC type TC listed, wet location, approved for Class 1 circuits as permitted in NEC Article 725.
- B. Conductor: tinned copper 22 AWG
- C. Insulation Material: PVC jacket
- D. Insulation Temperature Rating: 75°C wet, 90°C dry
- E. Shield: 100% coverage, with drain wire
- F. Insulation voltage rating: 300 volts
- G. Manufacturer
 1. Belden No. 8441
 2. Equal by Alpha
 3. Equal by Clifford
 4. or equal

2.3 ABOVEGROUND STORAGE TANK (AST) SIGNAL CABLE

- A. Description: twisted pair, NEC type CMP listed, outdoor rated, overall shield.
- B. Conductors: tinned copper 18 AWG stranded
- C. Insulation: Fluorinated ethylene propylene (FEP)
- D. Outer Jacket: FEP
- E. Shield: 100% shield coverage, with drain wire
- F. Insulation Voltage Rating: 300 volts
- G. Operating Temperature Range: -70°C to +200°C
- H. Manufacturer
 1. Belden No. 88760
 2. Other compatible with existing monitoring equipment.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Verify that mechanical work likely to damage wire and cable has been completed.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

- A. Minimum size for power wiring shall be AWG #12.
- B. Minimum size for control wiring shall be AWG #14.
- C. Minimum size for signal wiring shall be AWG #18.
- D. All wiring shall be run in conduit, unless otherwise noted.
- E. Install products in accordance with manufacturers instructions.
- F. Use stranded conductors for all wire sizes.
- G. Use suitable cable fittings and connectors.
- H. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- I. Clean conductor surfaces before installing lugs and connectors.
- J. Instrumentation, control and signal wiring shall be continuous with no splices from source to destination, unless otherwise shown on drawings.
- K. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- L. Use split bolt connectors for copper conductor splices and taps, 8 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- M. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- N. Ground signal cable shields on receiving end only.
- O. Properly connect and insulate shields at all splice points.
- P. Provide separation of power wiring from control and signal wire in accordance with NEC Article 725.

3.4 INTERFACE WITH OTHER PRODUCTS

- A. Identify wire and cable under provisions of Section 16075.
- B. Identify each conductor with its circuit number or other designation indicated on Drawings.

3.5 FIELD QUALITY CONTROL

- A. Inspect wire and cable for physical damage and proper connection.

- B. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- C. Verify continuity of each branch circuit conductor.

END OF SECTION

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SECTION 16131

CONDUIT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Metal conduit
 - 2. Fittings and conduit bodies
 - 3. Explosion proof sealing fittings
- B. Related Sections
 - 1. Section 16060, Grounding and Bonding
 - 2. Section 16070, Electrical Hangers and Supports

1.2 REFERENCES

- A. ACI 318 – Building Code Requirements for Structural Concrete
- B. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
- C. ANSI/NFPA 70 - National Electric Code
- D. ANSI C80.1 - Galvanized Rigid Steel Conduit, Zinc Coated
- E. UL-6 – Standard for Rigid Metal Conduit

1.3 SUBMITTALS

- A. Submit product data

1.4 DESIGN REQUIREMENTS

- A. Conduit Size: ANSI/NFPA 70

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Accept conduit on site. Inspect for damage.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.6 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

- D. Provide complete conduit systems between electrical equipment and devices as required.

PART 2 PRODUCTS

2.1 GENERAL CONDUIT REQUIREMENTS

- A. Minimum Size: 3/4 inch unless otherwise specified
- B. All locations: Use galvanized rigid steel conduit
- C. Class 1 Division 1 and 2 Hazardous Locations
 - 1. Use galvanized rigid steel conduit
 - 2. Provide sealing fittings at each entrance to enclosure housing an arcing device. Locate seal fittings as close as possible, in no case more than 18 inches.
 - 3. Provide seal fittings for each conduit leaving hazardous (Class 1 Division 1 or 2) area.
 - 4. Use conduit seal fittings appropriate for conduit orientation.
 - 5. Use conduit sealing compound with fiber dam in compliance with manufacturer's recommendations.
 - 6. Provide junction boxes rated for hazardous locations.

2.2 RIGID STEEL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; all steel fittings

2.3 FITTINGS AND CONDUIT BODIES

- A. Fittings
 - 1. Description - Threaded, malleable Iron. Coating to correspond with type of conduit system being used
- B. Conduit Bodies
 - 1. Manufacturer
 - a. Appleton-Type Mogul - malleable iron
 - b. Equal by O-Z Gedney
 - c. Equal by Crouse-Hinds
 - d. or equal
- C. Conduit Hubs
 - 1. Manufacturer
 - a. Crouse Hinds – Myers hub Type HUB

- b. Equal by O-Z Gedney
- c. Equal by RACO
- d. Equal by Appleton
- e. or equal

2.4 EXPLOSION PROOF SEALING FITTINGS

- A. Description: Explosion proof and dust-ignition proof sealing fitting.
- B. Ratings:
 - 1. Class I, Division 1 and 2, Groups A, B, C, D
 - 2. Class II, Division 1, Groups E, F, G
 - 3. Class II, Division 2, Groups F, G
 - 4. Class III
- C. Bodies: Feraloy iron alloy and/or ductile iron
- D. Plugs: Feraloy iron alloy and/or steel
- E. Removable Nipples: steel
- F. Manufacturer:
 - 1. Crouse-Hinds type EYS
 - 2. Approved equivalent
- G. Sealant:
 - 1. Crouse-Hinds Chico X fiber and Chico A sealing compound or Chico Speed Seal
 - 2. Sealant system of sealing fitting manufacturer selected

PART 3 EXECUTION

3.1 INSTALLATION

- A. Junction boxes shall be provided as needed to comply with NFPA 70 requirements.
- B. Install conduit in accordance with NECA "Standards of Installation."
- C. Arrange supports to prevent misalignment during wiring installation.
- D. Support conduit using coated steel or malleable iron straps, pipe hangers, U-bolt clamps and beam clamps.
- E. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
- F. Fasten conduit supports to building structure and surfaces under provisions of Section 16070.

- G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
- H. Do not attach conduit to ceiling support wires.
- I. Arrange conduit to maintain headroom and present neat appearance.
- J. Route exposed conduit parallel and perpendicular to walls.
- K. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- L. Route conduit in and under slab from point-to-point unless drawings indicate otherwise.
- M. Cross conduits in slab only with the Engineer's approval.
- N. Maintain adequate clearance between conduit and piping.
- O. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104°F.
- P. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- Q. Before installation of wires and cables, clean and dry inside of each conduit run.
- R. Use conduit hubs to fasten conduit to boxes and control panels.
- S. Install no more than equivalent of three 90° bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inch size.
- T. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- U. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.
- V. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Ground and bond conduit in accordance with Section 16060.
- X. Do not penetrate waterproofing membranes in the structural floor slab or foundation walls without approval by, and in a manner acceptable to the Engineer.
- Y. Install rigid steel conduit using only threaded fittings.
- Z. Use two locknuts, one inside and one outside of each box and enclosure when enclosure ratings are NEMA 1 or 12.
- AA. Install a chromium plated, spun or split type escutcheon on all exposed conduits passing through walls or ceilings.
- BB. Extend pipe sleeves 3/4 inch above finished floors.
- CC. Install a water and fire resistant caulking around all conduits passing through floors.
- DD. Do not install motor feed and control wiring in the same conduit.

- EE. For penetrations in existing walls, patch with mortar and touch up paint. Match existing paint color.
- FF. For penetrations in fire rated walls, use materials that maintain the fire rating of the wall.
- GG. Provide explosion proof sealing fittings where indicated on the Drawings and where required by code.

END OF SECTION

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SECTION 16136

BOXES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Conduit Hubs
 - 2. Pull and junction boxes
 - 3. NEMA 7 explosion proof boxes
 - 4. Covers

1.2 REFERENCES

- A. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes and Conduit Bodies for Conduit and Cable Assemblies
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 volts maximum)

1.3 SUBMITTALS

- A. Shop product data

1.4 PROJECT CONDITIONS

- A. Verify that the field measurements are as shown on the Drawings.

PART 2 PRODUCTS

2.1 CONDUIT HUBS

- A. Conduit hubs shall be threaded and sealing type with neoprene gasket
 - 1. Acceptable Manufacturers
 - a. Crouse Hinds – type “HUB”
 - b. Thomas & Betts – type “BULLET”
 - c. Equal by Appleton
 - d. Or equal.

2.2 PULL AND JUNCTION BOXES

- A. Cast Metal Pull and Junction Boxes
 - 1. NEMA FB 1, Type 4 cast iron.
 - 2. Shall be suitable for use in wet locations when used with gasketed covers.
 - 3. Cover shall be by box manufacturer, and shall have stainless steel cover screws and a neoprene gasket.

4. Surface-mounted cast boxes shall have mounting lugs, do not drill through the box walls.
5. Provide threaded sealing conduit hubs on all conduit entries.
6. Provide green grounding screw.
7. Acceptable Manufacturers
 - a. Crouse-Hinds.
 - b. Appleton.
 - c. Hubbell.
 - d. or equal.

2.3 NEMA 7 EXPLOSION-PROOF BOXES

- A. Boxes shall be rated for the hazardous classification of the area, Class I, Division 1, Division 2, etc.

2.4 COVERS

- A. Provide covers for all boxes. Covers shall be screw fastened or hinged and comply with NEMA Standards OS 1, OS 2 or FB 1.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install electrical boxes as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- C. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- D. Pull and Junction Boxes
 1. Use sealing conduit hubs on all conduit entries.
 2. Use Cast Metal pull and junction boxes in all locations.

3.2 ADJUSTING

- A. Install knockout closure in unused box opening.

END OF SECTION

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SECTION 16410

SWITCHES AND CIRCUIT BREAKERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Explosion-proof disconnect switches
- B. Related Sections
 - 1. Section 16070 – Electrical Hangers and Supports

1.2 REFERENCES

- A. NEMA KS 1 – Enclosed Miscellaneous Distribution Equipment Switches (600 Volts Maximum)

1.3 SUBMITTALS

- A. Shop product data.

1.4 REGULATORY REQUIREMENTS

- A. Use circuit breakers and switch assemblies listed by Underwriter's Laboratories, Inc., and suitable for specific application.

PART 2 PRODUCTS

2.1 DISCONNECT SWITCH

- A. Description: NEMA 3R, NEMA 7, Class I, Division 1 & 2, non-fusible heavy duty, disconnect switch. Disconnect switch shall be outdoor-rated, weather-proof. Disconnect switch at Town Dock site shall also be marine-grade.
- B. Construction: Copper-free aluminum body, cover and operating handle; neoprene cover gasket; stainless steel cover bolts, washers and retractile springs; stainless steel operating shaft and bushing.
- C. Voltage Rating: 600 volts AC.
- D. Amperage Rating: 30 amperes
- E. Operating handle padlockable in either the ON or OFF position.
- F. Manufacturer:
 - 1. Cooper Crouse-Hinds EBMBB FD W30360
 - 2. Equivalent by Appleton
 - 3. Equivalent by other

2.2 ENCLOSURE:

- A. NEMA 4X stainless steel. Enclosure at the Town Dock site shall be marine-grade.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Verify that surfaces are ready to receive work.
- B. Verify field measurements are as shown on Drawings.
- C. Verify that required utilities are available, in proper location, and ready for use.

3.2 INSTALLATION

- A. Install explosion-proof disconnect switches where shown on Drawings, in accordance with manufacturer's instructions.
- B. Provide all necessary hardware and supports and make all wiring connections.
- C. Support equipment of this Section in accordance with Section 16070.

3.3 FIELD QUALITY CONTROL

- A. Inspect visually and perform several mechanical ON-OFF operations on each circuit breaker and switch assembly.

END OF SECTION

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