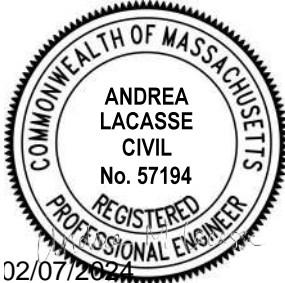


# Bridge Of Flowers Rehabilitation

Project No. S2161-003

Shelburne Falls Fire District  
Village of Shelburne Falls, MA

February 2024



**Bridge of Flowers Rehabilitation  
Shelburne Falls Fire District  
Shelburne Falls, Massachusetts**

**Table of Contents**

<b><u>Section</u></b>	<b><u>Title</u></b>	<b><u>Number of Pages</u></b>
<b>Division 0 – Bidding and Contract Requirements</b>		
00100	Advertisement for Bids	2
00200	Instructions to Bidders	10
00410	Form for General Bid	6
	Attachments to Form for General Bid	
00430	Bid Bond	2
00520	Agreement	7
006100	Performance Bond	3
00615	Payment Bond	3
00700	General Conditions	65
00800	Supplementary Conditions	12
	Attachments to Supplementary Conditions	65
	A. Massachusetts State Wage Rates	
	B. Town of Buckland Order of Conditions	
	C. Town of Shelburne Order of Conditions	14
<b>Division 1 – General Requirements</b>		
01110	Summary of Work	3
01140	Work Restrictions	4
01290	Application and Certificate for Payment	7
01295	Schedule of Values	1
01310	Coordination	3
01320	Construction Photographs	1
01321	Color Audio-Video Documentation Survey	2
01325	Scheduling of Construction	3
01330	Submittal Procedures	10
01350	Health & Safety Plan	7
01450	Quality Control	3
01451	Independent Testing Services	4
01520	Construction Facilities	1
01560	Temporary Barriers	2
01570	Temporary Controls	3
01600	Product Requirements	3
01630	Product Substitution During Construction	2
01720	Field Engineering	2
01725	Preservation and Restoration of Project Features	3
01770	Closeout Procedures	2

**Bridge of Flowers Rehabilitation  
Shelburne Falls Fire District  
Shelburne Falls, Massachusetts**

**Table of Contents**

<b><u>Section</u></b>	<b><u>Title</u></b>	<b><u>Number of Pages</u></b>
<b>Division 2 – Site Construction</b>		
02225	Selective Demolition	8
02315	Excavation, Backfill, Compaction and Dewatering	8
02320	Borrow Materials	4
02501	Disinfection of Water Distribution Systems	4
02502	Testing of Water Distribution Systems	4
02514	Ductile Iron Pipe and Fittings	11
02518	Valves and Hydrants	8
02810	Irrigation System	14
02920	Lawns and Grasses	5
02921	Vegetative Support Material	3
<b>Division 3 – Concrete</b>		
03100	Concrete Forms and Accessories	5
03200	Concrete Reinforcement	4
03300	Cast-In-Place Concrete	14
03930	Concrete Repair	6
<b>Division 5 – Metals</b>		
05500	Miscellaneous Metals	10
<b>Division 7 Thermal and Moisture Protection</b>		
07130	Sheet Membrane Waterproofing	4
<b>Division 9 - Finishes</b>		
09900	Painting	8
<b>Division 13 – Special Construction</b>		
13281	Asbestos Abatement	12
	Appendix A – Paint Chip Laboratory Data	
	Appendix B – Abatement Schedule	
	Appendix C – Photographic Log	

**Bridge of Flowers Rehabilitation  
Shelburne Falls Fire District  
Shelburne Falls, Massachusetts**

**Table of Contents**

<b><u>Section</u></b>	<b><u>Title</u></b>	<b><u>Number of Pages</u></b>
<b>Division 16 – Electrical</b>		
16050	Basic Electrical Requirements	5
16060	Grounding and Bonding	5
16070	Electrical Hangers and Supports	3
16075	Electrical Identification	3
16080	Electrical Testing	5
16091	Minor Electrical Demolition	2
16120	Conductors and Cables	5
16131	Conduit	8
16136	Boxes	5
16140	Wiring Devices	4
16520	Exterior Luminaires	4

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\\_TOC.docx

**DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS**

**SECTION 00100**

**ADVERTISEMENT FOR BIDS**

## SHELBURNE FALLS FIRE DISTRICT

## SHELBURNE &amp; BUCKLAND, MASSACHUSETTS

## ADVERTISEMENT FOR BIDS

Sealed Bids for the construction of the Shelburne Falls Fire District, “Bridge of Flowers Rehabilitation” will be received by the Shelburne Falls Fire District in the Meeting Room at the Shelburne Falls Fire Department, 121 State Street, Shelburne Falls, MA 01370 until 2:00 p.m. local time on March 7, 2024, at which time the Bids received will be publicly opened and read. Sealed Bids must have outer envelope marked as Shelburne Falls Fire District, “Bridge of Flowers Rehabilitation.”

The work consists of removal, storing, and resetting site features, selective demolition and repair of north spandrel wall, replacement of irrigation system, replacement of lighting system, replacement of watermain, replacement of wall-mounted ornamental pedestrian railing system, and site restoration. Bids shall be on a lump sum basis.

All Bids for this project are subject to the provisions of Massachusetts General Laws Chapter 30, Section 39M as amended.

Bidding Documents may be obtained electronically from the Tighe & Bond website at: [http://www.tighebond.com/Projects\\_Out\\_to\\_Bid.php](http://www.tighebond.com/Projects_Out_to_Bid.php)

Prospective bidders must complete a one-time registration process on the web site in order to receive log-in credentials. Bidders must log in to the web site to download bidding documents for the project. Bidders will be added to the “planholders” or prospective bidders list upon downloading the bidding documents for the project.

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

The time period for holding Bids, where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays excluded, after opening of Bids and where Federal approval is required, the time period for holding Bids is 30 days, Saturdays, Sundays and holidays excluded after Federal approval.

This Contract contains price adjustments for diesel fuel, gasoline, Portland cement contained in concrete, and steel. See Section 01290 for payment procedures and base prices for this Project.

Minimum Wage Rates as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27D, as amended, apply to this project. 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. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.

This project is partially funded by a grant from the MassWorks Infrastructure Program. Section 00800 contains the funding program construction contract requirements, all of which shall be applicable to this Contract.

A mandatory pre-Bid conference will be held at the site on Tuesday, February 20, 2024, at 10:00AM.

SHELBURNE FALLS & BUCKLAND, MASSACHUSETTS

Consulting Engineer:

Tighe & Bond, Inc.  
53 Southampton Road  
Westfield, MA 01085  
413-562-1600

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
00\00100.docx



**SECTION 00200**

**INSTRUCTIONS TO BIDDERS**

SECTION 00200

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

1. Defined Terms
2. Copies of Bidding Documents
3. Qualifications of Bidders
4. Site and Other Areas; Existing Site Conditions; Examination of Site; Owner's Safety Program; Other Work at the Site
5. Bidder's Representations
6. Pre-Bid Conference
7. Interpretations and Addenda
8. Bid Deposit
9. Contract Times
10. Liquidated Damages
11. Substitute and "Or Equal" Items
12. Subcontractors, Suppliers, and Others
13. Preparation of Bid
14. Basis of Bid
15. Submittal of Bid
16. Modification or Withdrawal of Bid
17. Opening of Bids
18. Disqualification of Bidders
19. Bids to Remain Subject to Acceptance
20. Evaluation of Bids and Award of Contract
21. Contract Securities
22. Contract Insurance
23. Signing of Agreement
24. Sales Taxes
25. Massachusetts Prevailing Wage Rates

**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 5 years of experience and shall have successfully completed 3 water main replacement and concrete bridge rehabilitation projects of similar scope within the past 3 years. Submit with the bid a summary of experience and representative projects 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.
  - A. Bidders may be required to provide a letter stating that the Bidder is in good financial standing. The letter must:
    1. Be provided by a financial institution or certified public accountant having a relationship with the Bidder;
    2. Be on the bank or accountant's letterhead;
    3. Include name and contact information for the bank or accountant including address, email and telephone number;

4. Identify the account holder(s), whose names must match the name of the Bidder, the type and length of business relationship, and the historical status of the accounts (i.e. good standing, timely payments, no overdrafts, etc.); and
5. NOT include account numbers, account amounts, or lines of credit.

**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. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
  - b. 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.

#### 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 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 encouraged 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.

#### ARTICLE 7 INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the meaning or intent of the Bidding Documents shall be submitted in writing to the Engineer via the Tighe & Bond website for bidding document distribution at:  
[http://www.tighebond.com/Projects\\_Out\\_to\\_Bid.php](http://www.tighebond.com/Projects_Out_to_Bid.php)
- 7.2 Prospective bidders must be registered users of the web site to submit questions regarding the project. In order to receive consideration, questions must be received by Engineer at least five days prior to the date fixed for the opening of Bids. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda to all parties recorded by Engineer as having received the Bidding Documents 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.
- 7.3 All questions about the meaning or intent of the Bidding Documents shall be submitted in writing to the Engineer via email at [amlacasse@tighebond.com](mailto:amlacasse@tighebond.com). Prospective bidders are responsible for ensuring their questions are received by the Engineer. In order to receive consideration, questions must be received by Engineer at least five days prior to the date fixed for the opening of Bids. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda to all parties recorded by Engineer as having received the Bidding Documents 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.
- 7.4 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 7.2.

- 7.5 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 certified check, bank money order, cash, or 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 SUBCONTRACTORS, SUPPLIERS, AND OTHERS (NOT USED)

#### ARTICLE 13 PREPARATION OF BID

- 13.1 A Bid must be made on the Bid form included with the Project Manual. The Bid form shall not be altered in any way.
- 13.2 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.

- 13.3 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.
- 13.4 The Bid shall contain an acknowledgment of the receipt of all Addenda in the space provided on the Bid form.
- 13.5 Postal and email addresses and telephone number to which communications regarding the Bid are to be directed shall be shown.
- 13.6 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.
- 13.7 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.
- 13.8 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 14 BASIS OF BID

##### 14.1 Lump Sum

- A. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid form.

#### ARTICLE 15 SUBMITTAL OF BID

- 15.1 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.

- 15.2 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 16 MODIFICATION OR WITHDRAWAL OF BID

##### 16.1 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.

##### 16.2 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 16.1.A and submit a new Bid prior to the date and time for the opening of Bids.

#### ARTICLE 17 OPENING OF BIDS

- 17.1 Bids will be opened as indicated in the Advertisement for Bids and publicly read aloud.
- 17.2 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.
- 17.3 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.
- 17.4 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 18 DISQUALIFICATION OF BIDDERS

- 18.1 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 19 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 19.1 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 20 EVALUATION OF BIDS AND AWARD OF CONTRACT

- 20.1 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.
- 20.2 Owner reserves the right to reject any Bid not accompanied by specified documentation and Bid deposit.

- 20.3 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.
- 20.4 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.
- 20.5 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.
- 20.6 In evaluating whether a Bidder is responsible, Owner will consider the qualifications the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 20.7 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.
- 20.8 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 20) submitting the lowest responsive Bid.
- 20.9 Contents of the Bid of the Successful Bidder will become part of any contract awarded.

#### ARTICLE 21 CONTRACT SECURITIES

- 21.1 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 Commonwealth of Massachusetts. 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.
- 21.2 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.
- 21.3 The required contract securities will become part of the Contract Documents.

#### ARTICLE 22 CONTRACT INSURANCE

- 22.1 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.
- 22.2 Within 15 days from the date of the Notice of Award, the Successful Bidder shall deliver evidence of required insurance to Owner and Engineer.
- 22.3 The required insurance certificates will become part of the Contract Documents.

#### ARTICLE 23 SIGNING OF AGREEMENT

- 23.1 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 24 SALES TAXES**

- 24.1 Owner is exempt from Massachusetts 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 tax exemption number or exemption certificate will be provided to the Successful Bidder.

**ARTICLE 25 FEDERAL (DAVIS-BACON) WAGE RATES**

- 25.1 Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act apply to this project. The Federal Minimum Wages at the time of printing of this document are included in Part II of the Supplementary Conditions.
- 25.2 It is the responsibility of the Bidder before the Bid opening to request any additional information on Federal Wage Rates for those tradespeople who may be employed for the proposed Work under this Contract.

**ARTICLE 26 MASSACHUSETTS PREVAILING WAGE RATES**

- 26.1 Minimum Wage Rates as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, apply to this project. The Wage Rate Determination is included in Part II of the Supplementary Conditions.
- 26.2 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
00\00200.docx

**SECTION 00410**

**BID FORM**

SECTION 00410

FORM FOR GENERAL BID

PROJECT IDENTIFICATION:

Bridge of Flowers Rehabilitation

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:

Shelburne Falls Fire District

121 State Street, Shelburne Falls, MA 01370

- 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.

#### ARTICLE 4 - BIDDER'S CERTIFICATION

- 4.1 Bidder certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work, that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee, and that Bidder will comply fully with all laws and regulations applicable to awards made subject to MGL Chapter 30, Section 39M.

- 4.2 Pursuant to M.G.L.c.62C, s49A, bidder hereby certifies under the penalties of perjury, to the best of Bidder’s knowledge and belief, that Bidder has complied with all laws of the commonwealth related to taxes, reporting of employees and contractors, and withholding and remitting of child support.
- 4.3 Bidder certifies that, under the penalties of perjury, this Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.
- 4.4 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.
- 4.5 Bidder certifies that Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- 4.6 Bidder certifies that Bidder has not solicited or induced any individual or entity to refrain from bidding.
- 4.7 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 Bridge of Flowers Rehabilitation, Shelburne Falls, MA 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 Contract Price (base bid) is:  
\_\_\_\_\_ dollars  
(words)  
(\$ \_\_\_\_\_ )  
(figures)

5.4 The subdivision of the proposed Contract Price (base bid) is as follows:

**Item 1 – Bridge of Flowers Rehabilitation:** The work of the General Contractor, being all Work other than that covered by Item 1A, Item 1B, Item 1C, and Item 1D.

\_\_\_\_\_ dollars  
 (Bid in words)  
 (\$ \_\_\_\_\_ )  
 (figures)

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
1A	Monthly price adjustment for diesel fuel, the price of:  One Thousand Dollars (\$ 1,000 )	Allowance =	\$ 1,000
1B	Monthly price adjustment for gasoline, the price of:  One Thousand Dollars (\$ 1,000 )	Allowance =	\$ 1,000
1C	Monthly price adjustment for structural steel and reinforcing steel, the price of:  One Thousand Dollars (\$ 1,000 )	Allowance =	\$ 1,000

**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:



- A. Bid deposit in the amount of \_\_\_\_\_ dollars (\$ \_\_\_\_\_), consisting of a bid bond in the amount of five percent of the total amount of Bid
- B. Evidence of authority to sign
- C. List of Project References
- D. 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
- E. A list of adversarial proceedings in which the bidder is or was a party within the past 10 years that relate to the procurement or performance of any public or private construction contract together with a brief statement as to outcome if concluded or status if pending.
- F. A list of any projects on which the firm was terminated or failed to complete the work within the past 10 years, including a brief explanation for each instance listed.
- G. Evidence of Bidder's qualifications in accordance with Article 3 of Section 00200
- H. List of Subcontractors

ARTICLE 8 - 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 00\00410-LS.docx

**ATTACHMENTS TO THE BID FORM**

CERTIFICATE OF VOTE OF AUTHORIZATION

**I hereby certify** that a meeting of the Board of Directors of the:

\_\_\_\_\_ Name of Corporation

duly called and held at \_\_\_\_\_ on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
at which a quorum was present and acting, it voted that \_\_\_\_\_,  
be and hereby is authorized to execute and deliver for and in behalf of the Corporation a Contract  
with Shelburne Falls Fire District, for work included in the Project known as “Bridge of Flowers  
Rehabilitation” in the Village of Shelburne Falls, and as Principal to execute Bonds in connection  
therewith, which Contract and Bond were presented to and made a part of the records of said meeting.

I further certify that \_\_\_\_\_ is duly qualified and acting

\_\_\_\_\_ Name of Corporate Officer  
\_\_\_\_\_ Title of the Corporation and that said vote has not been

repealed, rescinded or amended

**A true copy of the record,**

**ATTEST:**

\_\_\_\_\_

**(CORPORATE SEAL)**

SUBSCRIBED AND SWORN TO THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ BEFORE ME.

\_\_\_\_\_  
**Notary Public**

**MY COMMISSION EXPIRES:** \_\_\_\_\_

**STATEMENT OF BIDDER'S QUALIFICATIONS**

All questions must be answered, and the data given must be clear and comprehensive. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder:
2. Permanent main office address:
3. When organized:
4. If a corporation, where incorporated:
5. How many years have you been engaged in the contracting business under your present firm or trade name?
6. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate dates of completion.)
7. General character of work performed by your company.
8. Have you ever failed to complete any work awarded to you? If so, where and why?
9. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed (on Similar Project Work Form – next page).
10. Experience in construction work similar in importance to this project.
11. List your major equipment available for this contract:
12. Background and experience of the principal members of your organization, including the officers:
13. Credit available: \_\_\_\_\_
14. Give bank references: \_\_\_\_\_
15. Proposed Surety
  - a. Name: \_\_\_\_\_
  - b. Home Office Address: \_\_\_\_\_
  - c. Agent's Name & Address: \_\_\_\_\_
16. Will you, upon request, fill out a detailed financial statement and furnish other information that may be required by the Owner or the Engineer?
17. The undersigned hereby authorizes and requests the person, firm or corporation to furnish any information requested by the Owner or the Engineer in verification of recitals comprising this Statement of Bidder's Qualifications.

**SIMILAR PROJECT WORK**

- 1. Project Name: \_\_\_\_\_
  - A. Address of Work: \_\_\_\_\_
  - B. Completion Date: \_\_\_\_\_
  - C. Owner/Engineer Contact: \_\_\_\_\_  
Phone Number: \_\_\_\_\_
  - D. Value of Work: \_\_\_\_\_
  - E. Description of Work: \_\_\_\_\_  
\_\_\_\_\_

- 2. Project Name: \_\_\_\_\_
  - A. Address of Work: \_\_\_\_\_
  - B. Completion Date: \_\_\_\_\_
  - C. Owner/Engineer Contact: \_\_\_\_\_  
Phone Number: \_\_\_\_\_
  - D. Value of Work: \_\_\_\_\_
  - E. Description of Work: \_\_\_\_\_  
\_\_\_\_\_

- 3. Project Name: \_\_\_\_\_
  - A. Address of Work: \_\_\_\_\_
  - B. Completion Date: \_\_\_\_\_
  - C. Owner/Engineer Contact: \_\_\_\_\_  
Phone Number: \_\_\_\_\_
  - D. Value of Work: \_\_\_\_\_
  - E. Description of Work: \_\_\_\_\_  
\_\_\_\_\_

**CERTIFICATION OF NON-COLLUSION**

The undersigned certifies under the penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the work "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

By: \_\_\_\_\_  
(Signature of person signing bid or proposal)

\_\_\_\_\_  
(Name of business)

\_\_\_\_\_  
Date

**TAX COMPLIANCE CERTIFICATION**

**Qualification and Taxes:** The Contractor represents that it is qualified to perform the services required under this contract and possesses or shall obtain all requisite licenses and permits. Pursuant to MGL C.62C, S.49A, the Contractor has complied with all laws of the Commonwealth pertaining to taxes.

**Employment Security Contributions and Compulsory Workers' Compensation Insurance:** Pursuant to MGL C.151A, S.19 and MGL C.152, the Contractor certifies with all laws of the Commonwealth relating to payments to the Employment Security System and all Commonwealth laws relating to required worker's compensation insurance policies.

**Contractor**

By: \_\_\_\_\_  
(Signature of Authorized Representative)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date



**PUBLIC CONTRACTS – DEBARMENT**  
**Chapter 550, Acts of 1991**

The undersigned certifies under penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section 29F of Chapter 29 of the General Laws, or any other applicable debarment provision of any other Chapter of the General Laws, or any Rule or Regulation promulgated thereunder.

**Contractor**

By: \_\_\_\_\_  
(Signature of Authorized Representative)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**BAD BOY BY-LAW AFFIDAVIT**

I, \_\_\_\_\_, on oath state that neither I nor any employees, officers, or directors of \_\_\_\_\_ have been convicted of any violations described as follows:

- a) Bribery or attempting to bribe a public officer or employee of the Village of Shelburne Falls, the State of Massachusetts, or any other public entity, including but not limited to the Government of the United States, any state, any local government authority in the United States in that officer's or employee's capacity, or
- b) An agreement or collusion among bidders or prospective bidders in restraint of freedom of competition by agreement to bid a fixed price or otherwise.

I further state that neither I nor any of the employees, officers or directors of \_\_\_\_\_ have made an admission of guilt of such conduct in paragraphs (a) or (b) above, which is a matter of record, but has been prosecuted for conduct, has made an admission of guilt or such conduct which term shall be construed to include a plea of nolo contendere.

\_\_\_\_\_  
Signature

This affidavit in the case of a business entity shall be executed by, in the case of partnership, the general partner(s), and the case of a corporation, the president.

Signed under the pains and penalties of perjury this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**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**

(Seal)

(Seal)

\_\_\_\_\_  
Bidder'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

*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 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 *(seal)*

\_\_\_\_\_  
Surety's Name and Corporate Seal *(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**

## SECTION 00520

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION  
CONTRACT

This Agreement is by and between the Shelburne Falls Fire District as requested by its Board of Commissioners 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: "Bridge of Flowers Rehabilitation".

## 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 Milestones, if any, 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 on or before November 22, 2024, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before December 20, 2024.

## 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 \$1,000 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. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining 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.
- 4.2 The total amount will be adjusted by measurement of actual installed quantities in strict conformity with the provisions contained herein.
- 4.3 The total amount will be adjusted on a monthly basis when the monthly cost change for each of the following exceeds plus or minus five percent: fuel (both diesel and gasoline), asphalt, Portland cement contained in concrete, and steel. Section 01290 contains monthly price adjustment provisions for each of the above materials.

#### ARTICLE 5 PAYMENT PROCEDURES

- 5.1 Applications for Payment shall be processed in accordance with Article 15 of the General Conditions and in accordance with Massachusetts General Law.
- 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 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.
- 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 00800-12, inclusive);
  6. Specifications (Divisions 1 through 16);
  7. Drawings consisting of a cover sheet and sheets numbered Sheet 01 through Sheet 19, inclusive, with each sheet bearing the following general title: Bridge of Flowers Rehabilitation;
  8. Addenda (numbers \_\_\_\_\_ to \_\_\_\_\_, inclusive);
  9. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid (pages 00410-1 to 00410-6, 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 any thing 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.



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:

CONTRACTOR:

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest \_\_\_\_\_

Attest \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

Address for giving notices:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution of other documents authorizing execution of Owner-Contractor Agreement.)

License No. \_\_\_\_\_  
(Where applicable)

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

Certified as to the availability of funds:

\_\_\_\_\_

Date

\_\_\_\_\_

Signed

\_\_\_\_\_

Title

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
00\00520.docx

## 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



Issued and Published Jointly by



Copyright © 2013:

National Society of Professional Engineers  
1420 King Street, Alexandria, VA 22314-2794  
(703) 684-2882  
[www.nspe.org](http://www.nspe.org)

American Council of Engineering Companies  
1015 15th Street N.W., Washington, DC 20005  
(202) 347-7474  
[www.acec.org](http://www.acec.org)

American Society of Civil Engineers  
1801 Alexander Bell Drive, Reston, VA 20191-4400  
(800) 548-2723  
[www.asce.org](http://www.asce.org)

The copyright for this document is owned jointly by the three sponsoring organizations listed above. The National Society of Professional Engineers is the Copyright Administrator for the EJCDC documents; please direct all inquiries regarding EJCDC copyrights to NSPE.

NOTE: EJCDC publications may be purchased at [www.ejcdc.org](http://www.ejcdc.org), or from any of the sponsoring organizations above.



# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

## TABLE OF CONTENTS

	<b>Page</b>
Article 1 – Definitions and Terminology .....	1
1.01 Defined Terms .....	1
1.02 Terminology .....	5
Article 2 – Preliminary Matters.....	6
2.01 Delivery of Bonds and Evidence of Insurance .....	6
2.02 Copies of Documents .....	6
2.03 Before Starting Construction .....	6
2.04 Preconstruction Conference; Designation of Authorized Representatives .....	7
2.05 Initial Acceptance of Schedules .....	7
2.06 Electronic Transmittals.....	7
Article 3 – Documents: Intent, Requirements, Reuse .....	8
3.01 Intent.....	8
3.02 Reference Standards .....	8
3.03 Reporting and Resolving Discrepancies .....	8
3.04 Requirements of the Contract Documents .....	9
3.05 Reuse of Documents .....	10
Article 4 – Commencement and Progress of the Work.....	10
4.01 Commencement of Contract Times; Notice to Proceed .....	10
4.02 Starting the Work.....	10
4.03 Reference Points .....	10
4.04 Progress Schedule .....	10
4.05 Delays in Contractor’s Progress .....	11
Article 5 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions .....	12
5.01 Availability of Lands .....	12
5.02 Use of Site and Other Areas .....	12
5.03 Subsurface and Physical Conditions.....	13
5.04 Differing Subsurface or Physical Conditions .....	14
5.05 Underground Facilities .....	15

5.06	Hazardous Environmental Conditions at Site.....	17
Article 6 – Bonds and Insurance .....		19
6.01	Performance, Payment, and Other Bonds .....	19
6.02	Insurance—General Provisions .....	19
6.03	Contractor’s Insurance .....	20
6.04	Owner’s Liability Insurance .....	23
6.05	Property Insurance.....	23
6.06	Waiver of Rights .....	25
6.07	Receipt and Application of Property Insurance Proceeds .....	25
Article 7 – Contractor’s Responsibilities .....		26
7.01	Supervision and Superintendence .....	26
7.02	Labor; Working Hours .....	26
7.03	Services, Materials, and Equipment.....	26
7.04	“Or Equals” .....	27
7.05	Substitutes .....	28
7.06	Concerning Subcontractors, Suppliers, and Others .....	29
7.07	Patent Fees and Royalties .....	31
7.08	Permits .....	31
7.09	Taxes .....	32
7.10	Laws and Regulations.....	32
7.11	Record Documents .....	32
7.12	Safety and Protection.....	32
7.13	Safety Representative .....	33
7.14	Hazard Communication Programs .....	33
7.15	Emergencies .....	34
7.16	Shop Drawings, Samples, and Other Submittals.....	34
7.17	Contractor’s General Warranty and Guarantee.....	36
7.18	Indemnification .....	37
7.19	Delegation of Professional Design Services .....	37
Article 8 – Other Work at the Site .....		38
8.01	Other Work .....	38
8.02	Coordination .....	39
8.03	Legal Relationships.....	39

Article 9 – Owner’s Responsibilities.....	40
9.01 Communications to Contractor.....	40
9.02 Replacement of Engineer .....	40
9.03 Furnish Data .....	40
9.04 Pay When Due.....	40
9.05 Lands and Easements; Reports, Tests, and Drawings .....	40
9.06 Insurance .....	40
9.07 Change Orders.....	40
9.08 Inspections, Tests, and Approvals.....	41
9.09 Limitations on Owner’s Responsibilities .....	41
9.10 Undisclosed Hazardous Environmental Condition.....	41
9.11 Evidence of Financial Arrangements.....	41
9.12 Safety Programs .....	41
Article 10 – Engineer’s Status During Construction.....	41
10.01 Owner’s Representative.....	41
10.02 Visits to Site.....	41
10.03 Project Representative.....	42
10.04 Rejecting Defective Work.....	42
10.05 Shop Drawings, Change Orders and Payments.....	42
10.06 Determinations for Unit Price Work .....	42
10.07 Decisions on Requirements of Contract Documents and Acceptability of Work .....	42
10.08 Limitations on Engineer’s Authority and Responsibilities.....	42
10.09 Compliance with Safety Program.....	43
Article 11 – Amending the Contract Documents; Changes in the Work .....	43
11.01 Amending and Supplementing Contract Documents .....	43
11.02 Owner-Authorized Changes in the Work .....	44
11.03 Unauthorized Changes in the Work .....	44
11.04 Change of Contract Price .....	44
11.05 Change of Contract Times .....	45
11.06 Change Proposals .....	45
11.07 Execution of Change Orders.....	46
11.08 Notification to Surety.....	47
Article 12 – Claims.....	47

12.01	Claims .....	47
Article 13 –	Cost of the Work; Allowances; Unit Price Work.....	48
13.01	Cost of the Work .....	48
13.02	Allowances .....	50
13.03	Unit Price Work .....	51
Article 14 –	Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....	52
14.01	Access to Work.....	52
14.02	Tests, Inspections, and Approvals .....	52
14.03	Defective Work.....	53
14.04	Acceptance of Defective Work.....	53
14.05	Uncovering Work .....	53
14.06	Owner May Stop the Work .....	54
14.07	Owner May Correct Defective Work.....	54
Article 15 –	Payments to Contractor; Set-Offs; Completion; Correction Period .....	55
15.01	Progress Payments .....	55
15.02	Contractor’s Warranty of Title .....	58
15.03	Substantial Completion .....	58
15.04	Partial Use or Occupancy .....	59
15.05	Final Inspection .....	59
15.06	Final Payment.....	59
15.07	Waiver of Claims .....	61
15.08	Correction Period .....	61
Article 16 –	Suspension of Work and Termination .....	62
16.01	Owner May Suspend Work .....	62
16.02	Owner May Terminate for Cause .....	62
16.03	Owner May Terminate For Convenience .....	63
16.04	Contractor May Stop Work or Terminate .....	63
Article 17 –	Final Resolution of Disputes .....	64
17.01	Methods and Procedures .....	64
Article 18 –	Miscellaneous .....	64
18.01	Giving Notice .....	64
18.02	Computation of Times.....	64
18.03	Cumulative Remedies .....	64

18.04 Limitation of Damages ..... 65  
18.05 No Waiver ..... 65  
18.06 Survival of Obligations ..... 65  
18.07 Controlling Law ..... 65  
18.08 Headings..... 65

## 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 considered 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 Add the following after paragraph 1.01A.4:

- 1.01A.4.a. Filed Sub-Bidder – The individual or entity who submits a Bid to the General Bidder for projects subject to MGL Chapter 149, Section 44F.
- 1.01A.4.b. General Bidder – The individual or entity who submits a Bid directly to the Owner for projects subject to MGL Chapter 149, Section 44E.
- 1.01A.4.c. General Contractor – The individual or entity with whom the Owner has entered into the Agreement for projects subject to MGL Chapter 149, Section 44E.

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.

SC-1.01 Add the following language at the end of the first sentence of paragraph 1.01A.40:

or has been completed except for work having a contract price of less than one percent of the then adjusted total Contract Price.

## 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:SC-5.04  
Add the following new paragraph immediately after paragraph 5.04D.4:

5.04D.5 Adjustment resulting from subsurface or latent physical conditions will be in accordance with Massachusetts General Law Chapter 30, Section 39N referenced in Part II of the Supplementary Conditions.

#### 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 6.03J:  
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:

State: Statutory  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Employer's Liability:

Bodily injury, each accident Statutory  
 Bodily injury by disease, each employee Statutory  
 Bodily injury/disease aggregate Statutory

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

General Aggregate \$ 2,000,000  
 Products - Completed Operations Aggregate \$ 2,000,000  
 Personal and Advertising Injury \$ 1,000,000  
 Each Occurrence  
 (Bodily Injury and Property Damage) \$ 1,000,000

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

Bodily Injury:  
 Each person \$  
 Each accident \$

Property Damage:  
 Each accident \$  
 [or]  
 Combined Single Limit of \$ 1,000,000

4. Excess or Umbrella Liability:

Per Occurrence \$ 5,000,000  
 General Aggregate \$ 5,000,000

5. Contractor's Pollution Liability:

Each Occurrence \$ 1,000,000  
 General Aggregate \$ 2,000,000

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: Shelburne Falls Area Women's Club, Bridge of Flowers Committee

7. Contractor's Professional Liability:

Each Claim	\$ 1,000,000
Annual Aggregate	\$ 1,000,000

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 as named insured. This insurance shall provide coverage for not less than the following amounts:

Bodily Injury	\$ <u>3,000,000</u>	Each Occurrence
	\$ <u>3,000,000</u>	Aggregate

Property Damage	\$ <u>3,000,000</u>	Each Occurrence
	\$ <u>3,000,000</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 Delete Section 6.05 in its entirety and insert the following in its place:

6.05 Not used.

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, Inc. (53 Southampton Rd, Westfield, MA 01085)

## 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-7.06 Insert the following after Paragraph 7.06.A:

7.06A.1 The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

SC-7.06 Add the following language at the end of paragraph 7.06O.2:

Contractor shall make payments to Subcontractors in accordance with Massachusetts General Law Chapter 30, Section 39F which is referenced in PART II of these Supplementary Conditions.

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-7.08 Add the following new paragraph immediately after paragraph SC-7.08A:

7.08B The Owner has obtained the following permits and approvals for the Project. The Contractor is required to comply with the permit provisions. Copies of the permits are appended to this section.

- A. Shelburne Conservation Commission Order of Conditions
- B. Buckland Conservation Commission Order of Conditions
- C. USACOE Section 404, Clean Water Act

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 Commonwealth of Massachusetts. The tax exemption number or exemption certificate will be provided to the Contractor.

SC-7.10 Add the following new paragraph immediately after paragraph 7.10C.

7.10D Contractor shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding Contractor's records.

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. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.

1. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

**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.

13.02C Not used.

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 Delete the first sentence of paragraph 15.01B.1 and replace with the following:

15.01B.1 Engineer will, once in each month, make an estimate in writing of the total value of the work completed as of the date of the Application. Engineer shall review the Application with Contractor, and Contractor shall sign the Application.

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 Shelburne Falls Fire District as additional insureds.

- SC-15.01 Delete paragraph 15.01C.1 in its entirety and insert the following in its place:
- 15.01C.1 Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, which is referenced in Part II of these Supplementary Conditions.
- SC-15.01 Delete paragraph 15.01D.1 in its entirety and insert the following in its place:
- 15.01D.1 Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, which is referenced in Part II of these Supplementary Conditions.
- 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-15.03 Add the following new paragraph immediately after paragraph 15.03F:
- 15.03G. The procedure for Substantial Completion shall be in accordance with Chapter 30, Section 39G of the Massachusetts General Laws.
- 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-16.01 Delete paragraph 16.01.A in its entirety and insert the following in its place:

- 16.01.A Owner may order, at any time and without cause, suspension of the Work in accordance with Massachusetts General Law Chapter 30, Section 39O, which is referenced in Part II of the Supplementary Conditions.

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 17 – FINAL RESOLUTION OF DISPUTES

SC-17.01 Delete paragraph 17.01.B.1, 17.01.B.2, and 17.01.B.3 in their entirety and insert the following in their place:

- 17.01.B.1 elect in writing to invoke mediation.

SC-17.02 Add the following paragraph after paragraph 17.01:

- 17.02 Venue  
A. Any suit by either party arising under this Contract shall be brought only in the Superior Court in the county where the Project is located. The

parties hereto waive any argument that this venue is improper or that the forum is inconvenient.

#### 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. Per MGL Chapter 149, Section 27, Contractor shall comply with annual updates to the prevailing wage schedule which shall be effective on the anniversary date of the execution of the Contract.
- D. 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.

##### 2.0 COMMONWEALTH OF MASSACHUSETTS PROVISIONS

- 2.1 The Owner and Contractor agree that the following Commonwealth of Massachusetts Provisions apply to the work to be performed under this Contract and that these provisions supersede any conflicting provisions of this Contract.
- 2.4 520 CMR 14.00 Excavation Trench Safety
- 2.5 State Wage Rates

2.6 Conservation Commission Order of Conditions (Shelburne and Buckland)

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
00\00800.docx

**ATTACHMENTS TO SUPPLEMENTARY CONDITIONS**

**ATTACHMENT A  
MASSACHUSETTS STATE WAGE RATES**



MAURA HEALEY  
Governor

KIM DRISCOLL  
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT  
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the  
Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES  
Secretary

MICHAEL FLANAGAN  
Director

**Awarding Authority:** Shelburne Fall Fire District

**Contract Number:**

**City/Town:** BUCKLAND

**Description of Work:** Removal, storing, and resetting features, partial reconstruction of spandrel wall, replacement of irrigation system, lighting system, coating system, watermain, and guardrail, and site restoration.

**Job Location:** Water St, Shelburne, MA 01370

---

**Information about Prevailing Wage Schedules for Awarding Authorities and Contractors**

- **The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor.** For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The annual update requirement is not applicable to 27F "rental of equipment" contracts. **The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.**
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Construction</b>						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$38.95	\$15.07	\$18.67	\$0.00	\$72.69
	06/01/2024	\$39.95	\$15.07	\$18.67	\$0.00	\$73.69
	12/01/2024	\$39.95	\$15.07	\$20.17	\$0.00	\$75.19
	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.02	\$15.07	\$18.67	\$0.00	\$72.76
	06/01/2024	\$40.02	\$15.07	\$18.67	\$0.00	\$73.76
	12/01/2024	\$40.02	\$15.07	\$20.17	\$0.00	\$75.26
	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.14	\$15.07	\$18.67	\$0.00	\$72.88
	06/01/2024	\$40.14	\$15.07	\$18.67	\$0.00	\$73.88
	12/01/2024	\$40.14	\$15.07	\$20.17	\$0.00	\$75.38
	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$31.16	\$9.65	\$14.53	\$0.00	\$55.34
	06/01/2024	\$31.98	\$9.65	\$14.53	\$0.00	\$56.16
	12/01/2024	\$32.79	\$9.65	\$14.53	\$0.00	\$56.97
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.87	\$9.65	\$15.60	\$0.00	\$58.12
	06/01/2024	\$34.06	\$9.65	\$15.60	\$0.00	\$59.31
	12/01/2024	\$35.24	\$9.65	\$15.60	\$0.00	\$60.49
	06/01/2025	\$36.48	\$9.65	\$15.60	\$0.00	\$61.73
	12/01/2025	\$37.71	\$9.65	\$15.60	\$0.00	\$62.96
	06/01/2026	\$39.75	\$9.65	\$15.60	\$0.00	\$65.00
	12/01/2026	\$41.04	\$9.65	\$15.60	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	12/01/2023	\$36.72	\$14.50	\$10.55	\$0.00	\$61.77
	06/01/2024	\$37.62	\$14.50	\$10.55	\$0.00	\$62.67
	12/01/2024	\$38.52	\$14.50	\$10.55	\$0.00	\$63.57
	06/01/2025	\$39.42	\$14.50	\$10.55	\$0.00	\$64.47
	12/01/2025	\$40.32	\$14.50	\$10.55	\$0.00	\$65.37
ASPHALT RAKER <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.37	\$9.65	\$15.60	\$0.00	\$57.62
	06/01/2024	\$33.56	\$9.65	\$15.60	\$0.00	\$58.81
	12/01/2024	\$34.74	\$9.65	\$15.60	\$0.00	\$59.99
	06/01/2025	\$35.98	\$9.65	\$15.60	\$0.00	\$61.23
	12/01/2025	\$37.21	\$9.65	\$15.60	\$0.00	\$62.46
	06/01/2026	\$39.25	\$9.65	\$15.60	\$0.00	\$64.50
12/01/2026	\$40.54	\$9.65	\$15.60	\$0.00	\$65.79	
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$31.16	\$9.65	\$14.53	\$0.00	\$55.34
	06/01/2024	\$31.98	\$9.65	\$14.53	\$0.00	\$56.16
	12/01/2024	\$32.79	\$9.65	\$14.53	\$0.00	\$56.97
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.87	\$9.65	\$15.60	\$0.00	\$58.12
	06/01/2024	\$34.06	\$9.65	\$15.60	\$0.00	\$59.31
	12/01/2024	\$35.24	\$9.65	\$15.60	\$0.00	\$60.49
	06/01/2025	\$36.48	\$9.65	\$15.60	\$0.00	\$61.73
	12/01/2025	\$37.71	\$9.65	\$15.60	\$0.00	\$62.96
	06/01/2026	\$39.75	\$9.65	\$15.60	\$0.00	\$65.00
12/01/2026	\$41.04	\$9.65	\$15.60	\$0.00	\$66.29	
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79



**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - BOILERMAKER - Local 29**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

**Notes:**

**Apprentice to Journeyworker Ratio:1:4**

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	08/01/2023	\$50.81	\$11.49	\$20.21	\$0.00	\$82.51
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	02/01/2024	\$50.81	\$11.49	\$21.46	\$0.00	\$83.76
	08/01/2024	\$52.06	\$11.49	\$21.46	\$0.00	\$85.01
	02/01/2025	\$53.36	\$11.49	\$21.46	\$0.00	\$86.31
	08/01/2025	\$55.51	\$11.49	\$21.46	\$0.00	\$88.46
	02/01/2026	\$56.86	\$11.49	\$21.46	\$0.00	\$89.81
	08/01/2026	\$59.06	\$11.49	\$21.46	\$0.00	\$92.01
	02/01/2027	\$60.46	\$11.49	\$21.46	\$0.00	\$93.41

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.41	\$11.49	\$21.46	\$0.00	\$58.36
2	60	\$30.49	\$11.49	\$21.46	\$0.00	\$63.44
3	70	\$35.57	\$11.49	\$21.46	\$0.00	\$68.52
4	80	\$40.65	\$11.49	\$21.46	\$0.00	\$73.60
5	90	\$45.73	\$11.49	\$21.46	\$0.00	\$78.68

**Effective Date - 02/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.41	\$11.49	\$21.46	\$0.00	\$58.36
2	60	\$30.49	\$11.49	\$21.46	\$0.00	\$63.44
3	70	\$35.57	\$11.49	\$21.46	\$0.00	\$68.52
4	80	\$40.65	\$11.49	\$21.46	\$0.00	\$73.60
5	90	\$45.73	\$11.49	\$21.46	\$0.00	\$78.68

**Notes:**

---

**Apprentice to Journeyworker Ratio:1:5**

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
---	------------	---------	---------	---------	--------	---------

ENGINEERS LOCAL 98

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE	12/01/2023	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
	06/01/2024	\$46.96	\$9.65	\$18.22	\$0.00	\$74.83
	12/01/2024	\$48.43	\$9.65	\$18.22	\$0.00	\$76.30
	06/01/2025	\$49.93	\$9.65	\$18.22	\$0.00	\$77.80
	12/01/2025	\$51.43	\$9.65	\$18.22	\$0.00	\$79.30
	06/01/2026	\$52.98	\$9.65	\$18.22	\$0.00	\$80.85
	12/01/2026	\$54.48	\$9.65	\$18.22	\$0.00	\$82.35

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN</i>	09/01/2023	\$40.51	\$7.91	\$18.15	\$0.00	\$66.57
	03/01/2024	\$41.41	\$7.91	\$18.15	\$0.00	\$67.47
	09/01/2024	\$42.36	\$7.91	\$18.15	\$0.00	\$68.42
	03/01/2025	\$43.26	\$7.91	\$18.15	\$0.00	\$69.32
	09/01/2025	\$44.21	\$7.91	\$18.15	\$0.00	\$70.27
	03/01/2026	\$45.11	\$7.91	\$18.15	\$0.00	\$71.17
	09/01/2026	\$46.06	\$7.91	\$18.15	\$0.00	\$72.12
	03/01/2027	\$46.96	\$7.91	\$18.15	\$0.00	\$73.02

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - CARPENTER - Local 336 Hampden Hampshire Franklin**

**Effective Date - 09/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.26	\$7.91	\$1.38	\$0.00	\$29.55
2	60	\$24.31	\$7.91	\$1.38	\$0.00	\$33.60
3	70	\$28.36	\$7.91	\$13.95	\$0.00	\$50.22
4	75	\$30.38	\$7.91	\$13.95	\$0.00	\$52.24
5	80	\$32.41	\$7.91	\$15.35	\$0.00	\$55.67
6	80	\$32.41	\$7.91	\$15.35	\$0.00	\$55.67
7	90	\$36.46	\$7.91	\$16.75	\$0.00	\$61.12
8	90	\$36.46	\$7.91	\$16.75	\$0.00	\$61.12

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.71	\$7.91	\$1.38	\$0.00	\$30.00
2	60	\$24.85	\$7.91	\$1.38	\$0.00	\$34.14
3	70	\$28.99	\$7.91	\$13.95	\$0.00	\$50.85
4	75	\$31.06	\$7.91	\$13.95	\$0.00	\$52.92
5	80	\$33.13	\$7.91	\$15.35	\$0.00	\$56.39
6	80	\$33.13	\$7.91	\$15.35	\$0.00	\$56.39
7	90	\$37.27	\$7.91	\$16.75	\$0.00	\$61.93
8	90	\$37.27	\$7.91	\$16.75	\$0.00	\$61.93

**Notes:**  
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
 Step 1&2 \$26.46/ 3&4 \$31.82/ 5&6 \$50.38/ 7&8 \$55.77

**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME CARPENTERS-ZONE 3 (Wood Frame)	04/01/2023	\$24.16	\$7.21	\$4.80	\$0.00	\$36.17
--	------------	---------	--------	--------	--------	---------

All Aspects of New Wood Frame Work

**Apprentice - CARPENTER (Wood Frame) - Zone 3**

**Effective Date - 04/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
2	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
3	65	\$15.70	\$7.21	\$0.00	\$0.00	\$22.91
4	70	\$16.91	\$7.21	\$0.00	\$0.00	\$24.12
5	75	\$18.12	\$7.21	\$3.80	\$0.00	\$29.13
6	80	\$19.33	\$7.21	\$3.80	\$0.00	\$30.34
7	85	\$20.54	\$7.21	\$3.80	\$0.00	\$31.55
8	90	\$21.74	\$7.21	\$3.80	\$0.00	\$32.75

**Notes:**  
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
 Step 1&2 \$17.86/ 3&4 \$20.22/ 5&6 \$27.57/ 7&8 \$29.94

**Apprentice to Journeyworker Ratio:1:5**

CEMENT MASONRY/PLASTERING <i>BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)</i>	01/01/2024	\$44.68	\$12.90	\$18.66	\$1.25	\$77.49
--	------------	---------	---------	---------	--------	---------

**Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.34	\$12.90	\$15.86	\$0.00	\$51.10
2	60	\$26.81	\$12.90	\$18.66	\$1.25	\$59.62
3	65	\$29.04	\$12.90	\$18.66	\$1.25	\$61.85
4	70	\$31.28	\$12.90	\$18.66	\$1.25	\$64.09
5	75	\$33.51	\$12.90	\$18.66	\$1.25	\$66.32
6	80	\$35.74	\$12.90	\$18.66	\$1.25	\$68.55
7	90	\$40.21	\$12.90	\$18.66	\$1.25	\$73.02

**Notes:**  
 Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

**Apprentice to Journeyworker Ratio:1:3**

CHAIN SAW OPERATOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47

For apprentice rates see "Apprentice- LABORER"

COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$43.06	\$13.78	\$15.15	\$0.00	\$71.99
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DELEADER (BRIDGE) PAINTERS LOCAL 35 - ZONE 3	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55	\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60	\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65	\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70	\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75	\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80	\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90	\$50.45	\$9.95	\$22.74	\$0.00	\$83.14

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.63	\$9.95	\$0.00	\$0.00	\$38.58
2	55	\$31.49	\$9.95	\$6.66	\$0.00	\$48.10
3	60	\$34.36	\$9.95	\$7.26	\$0.00	\$51.57
4	65	\$37.22	\$9.95	\$7.87	\$0.00	\$55.04
5	70	\$40.08	\$9.95	\$20.32	\$0.00	\$70.35
6	75	\$42.95	\$9.95	\$20.93	\$0.00	\$73.83
7	80	\$45.81	\$9.95	\$21.53	\$0.00	\$77.29
8	90	\$51.53	\$9.95	\$22.74	\$0.00	\$84.22

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

DEMO: ADZEMAN LABORERS - ZONE 4 (BUILDING & SITE) For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20
DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 4 (BUILDING & SITE) For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
DEMO: BURNERS LABORERS - ZONE 4 (BUILDING & SITE) For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$45.23	\$9.65	\$18.07	\$0.00	\$72.95
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 4 (BUILDING & SITE) For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$45.48	\$9.65	\$18.07	\$0.00	\$73.20
DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 4 (BUILDING & SITE) For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$45.23	\$9.65	\$18.07	\$0.00	\$72.95
DEMO: WRECKING LABORER LABORERS - ZONE 4 (BUILDING & SITE)	12/01/2023	\$44.48	\$9.65	\$18.07	\$0.00	\$72.20

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DIVER PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN (Including Core Drilling) ELECTRICIANS LOCAL 7	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

**Apprentice - ELECTRICIAN - Local 7**

**Effective Date - 12/31/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.60	\$7.65	\$0.59	\$0.00	\$27.84
2	45	\$22.05	\$7.65	\$0.66	\$0.00	\$30.36
3	50	\$24.51	\$12.75	\$7.34	\$0.00	\$44.60
4	55	\$26.96	\$12.75	\$7.41	\$0.00	\$47.12
5	65	\$31.86	\$12.75	\$9.52	\$0.00	\$54.13
6	70	\$34.31	\$12.75	\$10.90	\$0.00	\$57.96

**Effective Date - 06/30/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.00	\$7.80	\$0.60	\$0.00	\$28.40
2	45	\$22.50	\$7.80	\$0.68	\$0.00	\$30.98
3	50	\$25.01	\$13.00	\$7.40	\$0.00	\$45.41
4	55	\$27.51	\$13.00	\$7.48	\$0.00	\$47.99
5	65	\$32.51	\$13.00	\$9.64	\$0.00	\$55.15
6	70	\$35.01	\$13.00	\$11.06	\$0.00	\$59.07

**Notes:**

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

**Apprentice to Journeyworker Ratio:2:3\*\*\*\***

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2024	\$61.98	\$16.18	\$20.96	\$0.00	\$99.12
	01/01/2025	\$62.83	\$16.28	\$21.36	\$0.00	\$100.47
	01/01/2026	\$63.68	\$16.38	\$21.76	\$0.00	\$101.82
	01/01/2027	\$64.53	\$16.48	\$22.16	\$0.00	\$103.17

**Apprentice - ELEVATOR CONSTRUCTOR - Local 41**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.99	\$16.18	\$0.00	\$0.00	\$47.17
2	55	\$34.09	\$16.18	\$20.96	\$0.00	\$71.23
3	65	\$40.29	\$16.18	\$20.96	\$0.00	\$77.43
4	70	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
5	80	\$49.58	\$16.18	\$20.96	\$0.00	\$86.72

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.42	\$16.28	\$0.00	\$0.00	\$47.70
2	55	\$34.56	\$16.28	\$21.36	\$0.00	\$72.20
3	65	\$40.84	\$16.28	\$21.36	\$0.00	\$78.48
4	70	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
5	80	\$50.26	\$16.28	\$21.36	\$0.00	\$87.90

**Notes:**  
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

**Apprentice to Journeyworker Ratio:1:1**

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2024	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
	01/01/2025	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
	01/01/2026	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
	01/01/2027	\$45.17	\$16.48	\$22.16	\$0.00	\$83.81

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & BEAM RAIL ERECTOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.41	\$9.65	\$14.53	\$0.00	\$54.59
	06/01/2024	\$31.23	\$9.65	\$14.53	\$0.00	\$55.41
	12/01/2024	\$32.04	\$9.65	\$14.53	\$0.00	\$56.22

For apprentice rates see "Apprentice- LABORER"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.37	\$9.65	\$15.60	\$0.00	\$57.62
	06/01/2024	\$33.56	\$9.65	\$15.60	\$0.00	\$58.81
	12/01/2024	\$34.74	\$9.65	\$15.60	\$0.00	\$59.99
	06/01/2025	\$35.98	\$9.65	\$15.60	\$0.00	\$61.23
	12/01/2025	\$37.21	\$9.65	\$15.60	\$0.00	\$62.46
	06/01/2026	\$39.25	\$9.65	\$15.60	\$0.00	\$64.50
	12/01/2026	\$40.54	\$9.65	\$15.60	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE <i>LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
/ COMMISSIONING <i>ELECTRICIANS</i>	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56

**Apprentice - OPERATING ENGINEERS - Local 98 Class 3**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.42	\$13.38	\$15.15	\$0.00	\$51.95
2	70	\$27.32	\$13.38	\$15.15	\$0.00	\$55.85
3	80	\$31.22	\$13.38	\$15.15	\$0.00	\$59.75
4	90	\$35.13	\$13.38	\$15.15	\$0.00	\$63.66

**Notes:**

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

**Apprentice to Journeyworker Ratio:1:6**

FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$25.48	\$9.65	\$15.60	\$0.00	\$50.73
	06/01/2024	\$26.51	\$9.65	\$15.60	\$0.00	\$51.76
	12/01/2024	\$26.51	\$9.65	\$15.60	\$0.00	\$51.76
	06/01/2025	\$27.59	\$9.65	\$15.60	\$0.00	\$52.84
	12/01/2025	\$27.59	\$9.65	\$15.60	\$0.00	\$52.84
	06/01/2026	\$28.71	\$9.65	\$15.60	\$0.00	\$53.96
	12/01/2026	\$28.71	\$9.65	\$15.60	\$0.00	\$53.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE III</i>	03/01/2023	\$40.07	\$7.31	\$18.15	\$0.00	\$65.53

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - FLOORCOVERER - Local 2168 Zone III**

**Effective Date - 03/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.04	\$7.31	\$1.38	\$0.00	\$28.73
2	55	\$22.04	\$7.31	\$1.38	\$0.00	\$30.73
3	60	\$24.04	\$7.31	\$2.76	\$0.00	\$34.11
4	65	\$26.05	\$7.31	\$2.76	\$0.00	\$36.12
5	70	\$28.05	\$7.31	\$15.39	\$0.00	\$50.75
6	75	\$30.05	\$7.31	\$15.39	\$0.00	\$52.75
7	80	\$32.06	\$7.31	\$16.77	\$0.00	\$56.14
8	85	\$34.06	\$7.31	\$16.77	\$0.00	\$58.14

**Notes:** Steps are 750 hrs.  
 % After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)  
 Step 1&2 \$26.72.24/ 3&4 \$32.11/ 5&6 \$50.75/ 7&8 \$56.14

**Apprentice to Journeyworker Ratio:1:1**

<b>FORK LIFT</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.25	\$13.78	\$15.15	\$0.00	\$68.18
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>GENERATORS/LIGHTING PLANTS</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)</b> <i>GLAZIERS LOCAL 1333</i>	06/01/2020	\$39.18	\$10.80	\$10.45	\$0.00	\$60.43
---	------------	---------	---------	---------	--------	---------

**Apprentice - GLAZIER - Local 1333**

**Effective Date - 06/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$32.19
2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$34.64
3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$37.74
4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$40.19
5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$43.34
6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$45.78
7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$55.53
8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57.98

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

<b>GRADER/TRENCHING MACHINE/DERRICK</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING - WATER) <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.87	\$9.65	\$15.60	\$0.00	\$58.12
	06/01/2024	\$34.06	\$9.65	\$15.60	\$0.00	\$59.31
	12/01/2024	\$35.24	\$9.65	\$15.60	\$0.00	\$60.49
	06/01/2025	\$36.48	\$9.65	\$15.60	\$0.00	\$61.73
	12/01/2025	\$37.71	\$9.65	\$15.60	\$0.00	\$62.96
	06/01/2026	\$39.75	\$9.65	\$15.60	\$0.00	\$65.00
	12/01/2026	\$41.04	\$9.65	\$15.60	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	09/01/2023	\$42.80	\$14.75	\$19.61	\$0.00	\$77.16
	09/01/2024	\$45.54	\$14.75	\$19.61	\$0.00	\$79.90
	09/01/2025	\$48.27	\$14.75	\$19.61	\$0.00	\$82.63
	09/01/2026	\$51.01	\$14.75	\$19.61	\$0.00	\$85.37

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield**

**Effective Date - 09/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.40	\$14.75	\$14.32	\$0.00	\$50.47
2	60	\$25.68	\$14.75	\$15.37	\$0.00	\$55.80
3	70	\$29.96	\$14.75	\$16.43	\$0.00	\$61.14
4	80	\$34.24	\$14.75	\$17.49	\$0.00	\$66.48

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.77	\$14.75	\$14.32	\$0.00	\$51.84
2	60	\$27.32	\$14.75	\$15.37	\$0.00	\$57.44
3	70	\$31.88	\$14.75	\$16.43	\$0.00	\$63.06
4	80	\$36.43	\$14.75	\$17.49	\$0.00	\$68.67

**Notes:**

Steps are 1 year

**Apprentice to Journeyworker Ratio:1:4**

IRONWORKER/WELDER	09/16/2023	\$39.81	\$8.25	\$22.70	\$0.00	\$70.76
IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)	03/16/2024	\$40.66	\$8.25	\$22.70	\$0.00	\$71.61

**Apprentice - IRONWORKER - Local 7 Springfield**

**Effective Date - 09/16/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.89	\$8.25	\$22.70	\$0.00	\$54.84
2	70	\$27.87	\$8.25	\$22.70	\$0.00	\$58.82
3	75	\$29.86	\$8.25	\$22.70	\$0.00	\$60.81
4	80	\$31.85	\$8.25	\$22.70	\$0.00	\$62.80
5	85	\$33.84	\$8.25	\$22.70	\$0.00	\$64.79
6	90	\$35.83	\$8.25	\$22.70	\$0.00	\$66.78

**Effective Date - 03/16/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.40	\$8.25	\$22.70	\$0.00	\$55.35
2	70	\$28.46	\$8.25	\$22.70	\$0.00	\$59.41
3	75	\$30.50	\$8.25	\$22.70	\$0.00	\$61.45
4	80	\$32.53	\$8.25	\$22.70	\$0.00	\$63.48
5	85	\$34.56	\$8.25	\$22.70	\$0.00	\$65.51
6	90	\$36.59	\$8.25	\$22.70	\$0.00	\$67.54

**Notes:**

**Apprentice to Journeyworker Ratio:1:4**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
JACKHAMMER & PAVING BREAKER OPERATOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47

For apprentice rates see "Apprentice- LABORER"

LABORER <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.41	\$9.65	\$14.53	\$0.00	\$54.59
	06/01/2024	\$31.23	\$9.65	\$14.53	\$0.00	\$55.41
	12/01/2024	\$32.04	\$9.65	\$14.53	\$0.00	\$56.22

**Apprentice - LABORER - Zone 4 Building and Site**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.25	\$9.65	\$14.53	\$0.00	\$42.43
2	70	\$21.29	\$9.65	\$14.53	\$0.00	\$45.47
3	80	\$24.33	\$9.65	\$14.53	\$0.00	\$48.51
4	90	\$27.37	\$9.65	\$14.53	\$0.00	\$51.55

**Effective Date - 06/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.74	\$9.65	\$14.53	\$0.00	\$42.92
2	70	\$21.86	\$9.65	\$14.53	\$0.00	\$46.04
3	80	\$24.98	\$9.65	\$14.53	\$0.00	\$49.16
4	90	\$28.11	\$9.65	\$14.53	\$0.00	\$52.29

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.12	\$9.65	\$15.60	\$0.00	\$57.37
	06/01/2024	\$33.31	\$9.65	\$15.60	\$0.00	\$58.56
	12/01/2024	\$34.49	\$9.65	\$15.60	\$0.00	\$59.74
	06/01/2025	\$35.73	\$9.65	\$15.60	\$0.00	\$60.98
	12/01/2025	\$36.96	\$9.65	\$15.60	\$0.00	\$62.21
	06/01/2026	\$39.00	\$9.65	\$15.60	\$0.00	\$64.25
	12/01/2026	\$40.29	\$9.65	\$15.60	\$0.00	\$65.54

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - LABORER (Heavy and Highway) - Zone 4**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.27	\$9.65	\$15.60	\$0.00	\$44.52
2	70	\$22.48	\$9.65	\$15.60	\$0.00	\$47.73
3	80	\$25.70	\$9.65	\$15.60	\$0.00	\$50.95
4	90	\$28.91	\$9.65	\$15.60	\$0.00	\$54.16

**Effective Date - 06/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.99	\$9.65	\$15.60	\$0.00	\$45.24
2	70	\$23.32	\$9.65	\$15.60	\$0.00	\$48.57
3	80	\$26.65	\$9.65	\$15.60	\$0.00	\$51.90
4	90	\$29.98	\$9.65	\$15.60	\$0.00	\$55.23

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER: CARPENTER TENDER  
LABORERS - ZONE 4 (BUILDING & SITE)      12/01/2023      \$30.41      \$9.65      \$14.53      \$0.00      \$54.59

06/01/2024      \$31.23      \$9.65      \$14.53      \$0.00      \$55.41

12/01/2024      \$32.04      \$9.65      \$14.53      \$0.00      \$56.22

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER  
LABORERS - ZONE 4 (BUILDING & SITE)      12/01/2023      \$30.41      \$9.65      \$14.53      \$0.00      \$54.59

06/01/2024      \$31.23      \$9.65      \$14.53      \$0.00      \$55.41

12/01/2024      \$32.04      \$9.65      \$14.53      \$0.00      \$56.22

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER  
LABORERS - ZONE 4 (BUILDING & SITE)      12/01/2023      \$30.89      \$9.65      \$14.41      \$0.00      \$54.95

For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER  
LABORERS - ZONE 4 (BUILDING & SITE)      12/01/2023      \$32.41      \$9.65      \$14.53      \$0.00      \$56.59

06/01/2024      \$33.23      \$9.65      \$14.53      \$0.00      \$57.41

12/01/2024      \$34.04      \$9.65      \$14.53      \$0.00      \$58.22

For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER (HEAVY & HIGHWAY)  
LABORERS - ZONE 4 (HEAVY & HIGHWAY)      12/01/2023      \$32.37      \$9.65      \$15.60      \$0.00      \$57.62

06/01/2024      \$33.56      \$9.65      \$15.60      \$0.00      \$58.81

12/01/2024      \$34.74      \$9.65      \$15.60      \$0.00      \$59.99

06/01/2025      \$35.98      \$9.65      \$15.60      \$0.00      \$61.23

12/01/2025      \$37.21      \$9.65      \$15.60      \$0.00      \$62.46

06/01/2026      \$39.25      \$9.65      \$15.60      \$0.00      \$64.50

12/01/2026      \$40.54      \$9.65      \$15.60      \$0.00      \$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

LABORER: MULTI-TRADE TENDER  
LABORERS - ZONE 4 (BUILDING & SITE)      12/01/2023      \$30.41      \$9.65      \$14.53      \$0.00      \$54.59

06/01/2024      \$31.23      \$9.65      \$14.53      \$0.00      \$55.41

12/01/2024      \$32.04      \$9.65      \$14.53      \$0.00      \$56.22

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: TREE REMOVER <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.41	\$9.65	\$14.53	\$0.00	\$54.59
	06/01/2024	\$31.23	\$9.65	\$14.53	\$0.00	\$55.41
	12/01/2024	\$32.04	\$9.65	\$14.53	\$0.00	\$56.22

This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47

For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.37	\$9.65	\$15.60	\$0.00	\$57.62
	06/01/2024	\$33.56	\$9.65	\$15.60	\$0.00	\$58.81
	12/01/2024	\$34.74	\$9.65	\$15.60	\$0.00	\$59.99
	06/01/2025	\$35.98	\$9.65	\$15.60	\$0.00	\$61.23
	12/01/2025	\$37.21	\$9.65	\$15.60	\$0.00	\$62.46
	06/01/2026	\$39.25	\$9.65	\$15.60	\$0.00	\$64.50
	12/01/2026	\$40.54	\$9.65	\$15.60	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2023	\$41.37	\$11.49	\$19.53	\$0.00	\$72.39
	02/01/2024	\$41.37	\$11.49	\$20.53	\$0.00	\$73.39
	08/01/2024	\$43.05	\$11.49	\$20.53	\$0.00	\$75.07
	02/01/2025	\$44.90	\$11.49	\$20.53	\$0.00	\$76.92
	08/01/2025	\$45.81	\$11.49	\$20.53	\$0.00	\$77.83
	02/01/2026	\$46.89	\$11.49	\$20.53	\$0.00	\$78.91
	08/01/2026	\$48.65	\$11.49	\$20.53	\$0.00	\$80.67
	02/01/2027	\$49.77	\$11.49	\$20.53	\$0.00	\$81.79

**Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.69	\$11.49	\$20.53	\$0.00	\$52.71
2	60	\$24.82	\$11.49	\$20.53	\$0.00	\$56.84
3	70	\$28.96	\$11.49	\$20.53	\$0.00	\$60.98
4	80	\$33.10	\$11.49	\$20.53	\$0.00	\$65.12
5	90	\$37.23	\$11.49	\$20.53	\$0.00	\$69.25

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick  
*BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE*

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					

MECHANIC/WELDER/BOOM TRUCK <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MILLWRIGHT (Zone 3) MILLWRIGHTS LOCAL 1121 - Zone 3	01/02/2023	\$40.16	\$8.58	\$21.57	\$0.00	\$70.31

**Apprentice - MILLWRIGHT - Local 1121 Zone 3**

**Effective Date - 01/02/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.09	\$8.58	\$5.72	\$0.00	\$36.39
2	65	\$26.10	\$8.58	\$17.93	\$0.00	\$52.61
3	75	\$30.12	\$8.58	\$18.98	\$0.00	\$57.68
4	85	\$34.14	\$8.58	\$20.01	\$0.00	\$62.73

**Notes:** Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)  
Steps are 2,000 hours

**Apprentice to Journeyworker Ratio:1:4**

MORTAR MIXER LABORERS - ZONE 4 (BUILDING & SITE)	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47

For apprentice rates see "Apprentice- LABORER"

OILER OPERATING ENGINEERS LOCAL 98	12/01/2023	\$35.02	\$13.78	\$15.15	\$0.00	\$63.95
---------------------------------------	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS VI OPERATING ENGINEERS LOCAL 98	12/01/2023	\$32.74	\$13.78	\$15.15	\$0.00	\$61.67
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 3	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36



**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55	\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60	\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65	\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70	\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75	\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80	\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90	\$50.45	\$9.95	\$22.74	\$0.00	\$83.14

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.63	\$9.95	\$0.00	\$0.00	\$38.58
2	55	\$31.49	\$9.95	\$6.66	\$0.00	\$48.10
3	60	\$34.36	\$9.95	\$7.26	\$0.00	\$51.57
4	65	\$37.22	\$9.95	\$7.87	\$0.00	\$55.04
5	70	\$40.08	\$9.95	\$20.32	\$0.00	\$70.35
6	75	\$42.95	\$9.95	\$20.93	\$0.00	\$73.83
7	80	\$45.81	\$9.95	\$21.53	\$0.00	\$77.29
8	90	\$51.53	\$9.95	\$22.74	\$0.00	\$84.22

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2024	\$38.83	\$9.65	\$19.90	\$0.00	\$68.38
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$40.03	\$9.65	\$19.90	\$0.00	\$69.58
	01/01/2025	\$41.23	\$9.65	\$19.90	\$0.00	\$70.78

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.42	\$9.95	\$0.00	\$0.00	\$29.37
2	55	\$21.36	\$9.95	\$4.43	\$0.00	\$35.74
3	60	\$23.30	\$9.95	\$4.83	\$0.00	\$38.08
4	65	\$25.24	\$9.95	\$5.23	\$0.00	\$40.42
5	70	\$27.18	\$9.95	\$17.49	\$0.00	\$54.62
6	75	\$29.12	\$9.95	\$17.89	\$0.00	\$56.96
7	80	\$31.06	\$9.95	\$18.29	\$0.00	\$59.30
8	90	\$34.95	\$9.95	\$19.10	\$0.00	\$64.00

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.02	\$9.95	\$0.00	\$0.00	\$29.97
2	55	\$22.02	\$9.95	\$4.43	\$0.00	\$36.40
3	60	\$24.02	\$9.95	\$4.83	\$0.00	\$38.80
4	65	\$26.02	\$9.95	\$5.23	\$0.00	\$41.20
5	70	\$28.02	\$9.95	\$17.49	\$0.00	\$55.46
6	75	\$30.02	\$9.95	\$17.89	\$0.00	\$57.86
7	80	\$32.02	\$9.95	\$18.29	\$0.00	\$60.26
8	90	\$36.03	\$9.95	\$19.10	\$0.00	\$65.08

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2024	\$36.15	\$9.95	\$19.90	\$0.00	\$66.00
PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$37.35	\$9.95	\$19.90	\$0.00	\$67.20
	01/01/2025	\$38.55	\$9.95	\$19.90	\$0.00	\$68.40

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.08	\$9.95	\$0.00	\$0.00	\$28.03
2	55	\$19.88	\$9.95	\$4.43	\$0.00	\$34.26
3	60	\$21.69	\$9.95	\$4.83	\$0.00	\$36.47
4	65	\$23.50	\$9.95	\$5.23	\$0.00	\$38.68
5	70	\$25.31	\$9.95	\$17.49	\$0.00	\$52.75
6	75	\$27.11	\$9.95	\$17.89	\$0.00	\$54.95
7	80	\$28.92	\$9.95	\$18.29	\$0.00	\$57.16
8	90	\$32.54	\$9.95	\$19.10	\$0.00	\$61.59

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.68	\$9.95	\$0.00	\$0.00	\$28.63
2	55	\$20.54	\$9.95	\$4.43	\$0.00	\$34.92
3	60	\$22.41	\$9.95	\$4.83	\$0.00	\$37.19
4	65	\$24.28	\$9.95	\$5.23	\$0.00	\$39.46
5	70	\$26.15	\$9.95	\$17.49	\$0.00	\$53.59
6	75	\$28.01	\$9.95	\$17.89	\$0.00	\$55.85
7	80	\$29.88	\$9.95	\$18.29	\$0.00	\$58.12
8	90	\$33.62	\$9.95	\$19.10	\$0.00	\$62.67

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, NEW) *	01/01/2024	\$37.43	\$9.95	\$19.90	\$0.00	\$67.28
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$38.63	\$9.95	\$19.90	\$0.00	\$68.48
	01/01/2025	\$39.83	\$9.95	\$19.90	\$0.00	\$69.68

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.72	\$9.95	\$0.00	\$0.00	\$28.67
2	55	\$20.59	\$9.95	\$4.43	\$0.00	\$34.97
3	60	\$22.46	\$9.95	\$4.83	\$0.00	\$37.24
4	65	\$24.33	\$9.95	\$5.23	\$0.00	\$39.51
5	70	\$26.20	\$9.95	\$17.49	\$0.00	\$53.64
6	75	\$28.07	\$9.95	\$17.89	\$0.00	\$55.91
7	80	\$29.94	\$9.95	\$18.29	\$0.00	\$58.18
8	90	\$33.69	\$9.95	\$19.10	\$0.00	\$62.74

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.32	\$9.95	\$0.00	\$0.00	\$29.27
2	55	\$21.25	\$9.95	\$4.43	\$0.00	\$35.63
3	60	\$23.18	\$9.95	\$4.83	\$0.00	\$37.96
4	65	\$25.11	\$9.95	\$5.23	\$0.00	\$40.29
5	70	\$27.04	\$9.95	\$17.49	\$0.00	\$54.48
6	75	\$28.97	\$9.95	\$17.89	\$0.00	\$56.81
7	80	\$30.90	\$9.95	\$18.29	\$0.00	\$59.14
8	90	\$34.77	\$9.95	\$19.10	\$0.00	\$63.82

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2024	\$34.75	\$9.95	\$19.90	\$0.00	\$64.60
PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$35.95	\$9.95	\$19.90	\$0.00	\$65.80
	01/01/2025	\$37.15	\$9.95	\$19.90	\$0.00	\$67.00

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.38	\$9.95	\$0.00	\$0.00	\$27.33
2	55	\$19.11	\$9.95	\$4.43	\$0.00	\$33.49
3	60	\$20.85	\$9.95	\$4.83	\$0.00	\$35.63
4	65	\$22.59	\$9.95	\$5.23	\$0.00	\$37.77
5	70	\$24.33	\$9.95	\$17.49	\$0.00	\$51.77
6	75	\$26.06	\$9.95	\$17.89	\$0.00	\$53.90
7	80	\$27.80	\$9.95	\$18.29	\$0.00	\$56.04
8	90	\$31.28	\$9.95	\$19.10	\$0.00	\$60.33

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.98	\$9.95	\$0.00	\$0.00	\$27.93
2	55	\$19.77	\$9.95	\$4.43	\$0.00	\$34.15
3	60	\$21.57	\$9.95	\$4.83	\$0.00	\$36.35
4	65	\$23.37	\$9.95	\$5.23	\$0.00	\$38.55
5	70	\$25.17	\$9.95	\$17.49	\$0.00	\$52.61
6	75	\$26.96	\$9.95	\$17.89	\$0.00	\$54.80
7	80	\$28.76	\$9.95	\$18.29	\$0.00	\$57.00
8	90	\$32.36	\$9.95	\$19.10	\$0.00	\$61.41

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	12/01/2023	\$32.12	\$9.65	\$15.60	\$0.00	\$57.37
LABORERS - ZONE 4 (HEAVY & HIGHWAY)	06/01/2024	\$33.31	\$9.65	\$15.60	\$0.00	\$58.56
	12/01/2024	\$34.49	\$9.65	\$15.60	\$0.00	\$59.74
	06/01/2025	\$35.73	\$9.65	\$15.60	\$0.00	\$60.98
	12/01/2025	\$36.96	\$9.65	\$15.60	\$0.00	\$62.21
	06/01/2026	\$39.00	\$9.65	\$15.60	\$0.00	\$64.25
	12/01/2026	\$40.29	\$9.65	\$15.60	\$0.00	\$65.54

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PANEL & PICKUP TRUCKS DRIVER	01/01/2024	\$38.78	\$15.07	\$18.67	\$0.00	\$72.52
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$39.78	\$15.07	\$18.67	\$0.00	\$73.52
	12/01/2024	\$39.78	\$15.07	\$20.17	\$0.00	\$75.02
	01/01/2025	\$39.78	\$15.57	\$20.17	\$0.00	\$75.52
	06/01/2025	\$40.78	\$15.57	\$20.17	\$0.00	\$76.52
	12/01/2025	\$40.78	\$15.57	\$21.78	\$0.00	\$78.13
	01/01/2026	\$40.78	\$16.17	\$21.78	\$0.00	\$78.73
	06/01/2026	\$41.78	\$16.17	\$21.78	\$0.00	\$79.73
	12/01/2026	\$41.78	\$16.17	\$23.52	\$0.00	\$81.47
	01/01/2027	\$41.78	\$16.77	\$23.52	\$0.00	\$82.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05

**Apprentice - PILE DRIVER - Local 56 Zone 3**

**Effective Date - 08/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

**Notes:** Apprentice wages shall be no less than the following Steps;  
(Same as set in Zone 1)  
1\$57.06/2\$61.96/3\$66.87/4\$69.32/5\$71.78/6\$71.78/7\$76.68/8\$76.68

**Apprentice to Journeyworker Ratio:1:5**

PIPELAYER <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.37	\$9.65	\$15.60	\$0.00	\$57.62
	06/01/2024	\$33.56	\$9.65	\$15.60	\$0.00	\$58.81
	12/01/2024	\$34.74	\$9.65	\$15.60	\$0.00	\$59.99
	06/01/2025	\$35.98	\$9.65	\$15.60	\$0.00	\$61.23
	12/01/2025	\$37.21	\$9.65	\$15.60	\$0.00	\$62.46
	06/01/2026	\$39.25	\$9.65	\$15.60	\$0.00	\$64.50
	12/01/2026	\$40.54	\$9.65	\$15.60	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PLUMBER/PIPEFITTER - Local 104**

**Effective Date - 09/17/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.58	\$9.55	\$10.10	\$0.00	\$41.23
2	50	\$23.98	\$9.55	\$10.10	\$0.00	\$43.63
3	55	\$26.38	\$9.55	\$10.10	\$0.00	\$46.03
4	60	\$28.78	\$9.55	\$10.10	\$0.00	\$48.43
5	65	\$31.17	\$9.55	\$10.10	\$0.00	\$50.82
6	70	\$33.57	\$9.55	\$10.10	\$0.00	\$53.22
7	75	\$35.97	\$9.55	\$10.10	\$0.00	\$55.62
8	80	\$38.37	\$9.55	\$10.10	\$0.00	\$58.02
9	80	\$38.37	\$9.55	\$17.10	\$0.00	\$65.02
10	80	\$38.37	\$9.55	\$17.10	\$0.00	\$65.02

**Effective Date - 03/17/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.14	\$9.55	\$10.10	\$0.00	\$41.79
2	50	\$24.61	\$9.55	\$10.10	\$0.00	\$44.26
3	55	\$27.07	\$9.55	\$10.10	\$0.00	\$46.72
4	60	\$29.53	\$9.55	\$10.10	\$0.00	\$49.18
5	65	\$31.99	\$9.55	\$10.10	\$0.00	\$51.64
6	70	\$34.45	\$9.55	\$10.10	\$0.00	\$54.10
7	75	\$36.91	\$9.55	\$10.10	\$0.00	\$56.56
8	80	\$39.37	\$9.55	\$10.10	\$0.00	\$59.02
9	80	\$39.37	\$9.55	\$17.10	\$0.00	\$66.02
10	80	\$39.37	\$9.55	\$17.10	\$0.00	\$66.02

**Notes: \*\*1:1,2:5,3:9,4:12**

**Apprentice to Journeyworker Ratio:\*\***

PNEUMATIC CONTROLS (TEMP.) PLUMBERS & PIPEFITTERS LOCAL 104	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS - ZONE 4 (HEAVY & HIGHWAY)	12/01/2023	\$32.37	\$9.65	\$15.60	\$0.00	\$57.62
	06/01/2024	\$33.56	\$9.65	\$15.60	\$0.00	\$58.81
	12/01/2024	\$34.74	\$9.65	\$15.60	\$0.00	\$59.99
	06/01/2025	\$35.98	\$9.65	\$15.60	\$0.00	\$61.23
	12/01/2025	\$37.21	\$9.65	\$15.60	\$0.00	\$62.46
	06/01/2026	\$39.25	\$9.65	\$15.60	\$0.00	\$64.50
	12/01/2026	\$40.54	\$9.65	\$15.60	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

POWDERMAN & BLASTER LABORERS - ZONE 4 (BUILDING & SITE)	12/01/2023	\$31.41	\$9.65	\$14.53	\$0.00	\$55.59
	06/01/2024	\$32.23	\$9.65	\$14.53	\$0.00	\$56.41
	12/01/2024	\$33.04	\$9.65	\$14.53	\$0.00	\$57.22

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.53	\$9.65	\$15.19	\$0.00	\$58.37
	06/01/2024	\$34.72	\$9.65	\$15.19	\$0.00	\$59.56
	12/01/2024	\$35.90	\$9.65	\$15.19	\$0.00	\$60.74
	06/01/2025	\$37.14	\$9.65	\$15.19	\$0.00	\$61.98
	12/01/2025	\$38.37	\$9.65	\$15.19	\$0.00	\$63.21
	06/01/2026	\$40.41	\$9.65	\$15.19	\$0.00	\$65.25
	12/01/2026	\$41.70	\$9.65	\$15.19	\$0.00	\$66.54
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2020	\$22.44	\$11.07	\$6.50	\$0.00	\$40.01
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 4 (BUILDING &amp; SITE)</i>	12/01/2023	\$30.66	\$9.65	\$14.53	\$0.00	\$54.84
	06/01/2024	\$31.48	\$9.65	\$14.53	\$0.00	\$55.66
	12/01/2024	\$32.29	\$9.65	\$14.53	\$0.00	\$56.47
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i>	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofing Waterproofing &Roofing Damproofing) <i>ROOFERS LOCAL 248</i>	07/16/2023	\$38.41	\$10.35	\$18.00	\$0.00	\$66.76

**Apprentice - ROOFER - Local 248**

**Effective Date - 07/16/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.05	\$10.35	\$0.00	\$0.00	\$33.40
2	65	\$24.97	\$10.35	\$18.00	\$0.00	\$53.32
3	70	\$26.89	\$10.35	\$18.00	\$0.00	\$55.24
4	75	\$28.81	\$10.35	\$18.00	\$0.00	\$57.16
5	80	\$30.73	\$10.35	\$18.00	\$0.00	\$59.08
6	85	\$32.65	\$10.35	\$18.00	\$0.00	\$61.00
7	90	\$34.57	\$10.35	\$18.00	\$0.00	\$62.92
8	95	\$36.49	\$10.35	\$18.00	\$0.00	\$64.84

**Notes:**

Steps are 750 hrs.Roofing(Tear Off)1:1; Same as above

**Apprentice to Journeyworker Ratio:1:3**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 248</i>	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
--	------------	---------	---------	---------	--------	---------



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- ROOFER"						
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53

**Apprentice - SHEET METAL WORKER - Local 63**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.71	\$4.79	\$4.76	\$0.92	\$30.18
2	50	\$21.90	\$5.32	\$5.29	\$1.03	\$33.54
3	55	\$24.09	\$5.85	\$5.82	\$1.13	\$36.89
4	60	\$26.28	\$6.38	\$6.35	\$1.23	\$40.24
5	65	\$28.47	\$6.92	\$6.88	\$1.33	\$43.60
6	70	\$30.66	\$7.45	\$7.41	\$1.44	\$46.96
7	75	\$32.85	\$7.98	\$7.94	\$1.54	\$50.31
8	80	\$35.04	\$8.51	\$15.42	\$1.64	\$60.61
9	85	\$37.23	\$9.04	\$15.95	\$1.74	\$63.96
10	90	\$39.42	\$9.58	\$16.48	\$1.85	\$67.33

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$20.27	\$4.79	\$4.76	\$0.92	\$30.74
2	50	\$22.53	\$5.32	\$5.29	\$1.03	\$34.17
3	55	\$24.78	\$5.85	\$5.82	\$1.13	\$37.58
4	60	\$27.03	\$6.38	\$6.35	\$1.23	\$40.99
5	65	\$29.28	\$6.92	\$6.88	\$1.33	\$44.41
6	70	\$31.54	\$7.45	\$7.41	\$1.44	\$47.84
7	75	\$33.79	\$7.98	\$7.94	\$1.54	\$51.25
8	80	\$36.04	\$8.51	\$15.42	\$1.64	\$61.61
9	85	\$38.29	\$9.04	\$15.95	\$1.74	\$65.02
10	90	\$40.55	\$9.58	\$16.48	\$1.85	\$68.46

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98
	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.53	\$15.07	\$18.67	\$0.00	\$73.27
	06/01/2024	\$40.53	\$15.07	\$18.67	\$0.00	\$74.27
	12/01/2024	\$40.53	\$15.07	\$20.17	\$0.00	\$75.77
	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	04/01/2023	\$47.43	\$11.45	\$16.61	\$0.00	\$75.49

**Apprentice - SPRINKLER FITTER - Local 669**

**Effective Date - 04/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.34	\$8.22	\$0.00	\$0.00	\$29.56
2	50	\$23.72	\$8.22	\$0.00	\$0.00	\$31.94
3	55	\$26.09	\$11.45	\$7.20	\$0.00	\$44.74
4	60	\$28.46	\$11.45	\$8.35	\$0.00	\$48.26
5	65	\$30.83	\$11.45	\$8.35	\$0.00	\$50.63
6	70	\$33.20	\$11.45	\$8.60	\$0.00	\$53.25
7	75	\$35.57	\$11.45	\$8.60	\$0.00	\$55.62
8	80	\$37.94	\$11.45	\$8.60	\$0.00	\$57.99
9	85	\$40.32	\$11.45	\$8.60	\$0.00	\$60.37
10	90	\$42.69	\$11.45	\$8.60	\$0.00	\$62.74

**Notes:**

**Apprentice to Journeyworker Ratio:1:1**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 7**

**Effective Date - 12/31/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.60	\$7.05	\$0.59	\$0.00	\$27.24
2	45	\$22.05	\$7.05	\$0.66	\$0.00	\$29.76
3	50	\$24.51	\$12.75	\$7.34	\$0.00	\$44.60
4	55	\$26.96	\$12.75	\$7.41	\$0.00	\$47.12
5	65	\$31.86	\$12.75	\$9.52	\$0.00	\$54.13
6	70	\$34.31	\$12.75	\$10.90	\$0.00	\$57.96

**Effective Date - 06/30/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.00	\$7.20	\$0.60	\$0.00	\$27.80
2	45	\$22.50	\$7.20	\$0.68	\$0.00	\$30.38
3	50	\$25.01	\$13.00	\$7.40	\$0.00	\$45.41
4	55	\$27.51	\$13.00	\$7.48	\$0.00	\$47.99
5	65	\$32.51	\$13.00	\$9.64	\$0.00	\$55.15
6	70	\$35.01	\$13.00	\$11.06	\$0.00	\$59.07

**Notes:**

Steps are 800 hours

**Apprentice to Journeyworker Ratio:1:1**

TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2023	\$61.34	\$11.49	\$22.34	\$0.00	\$95.17
	02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52
	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/10/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.67	\$11.49	\$23.59	\$0.00	\$65.75
2	60	\$36.80	\$11.49	\$23.59	\$0.00	\$71.88
3	70	\$42.94	\$11.49	\$23.59	\$0.00	\$78.02
4	80	\$49.07	\$11.49	\$23.59	\$0.00	\$84.15
5	90	\$55.21	\$11.49	\$23.59	\$0.00	\$90.29

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

TERRAZZO MECHANIC	08/01/2023	\$62.42	\$11.49	\$22.31	\$0.00	\$96.22
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	02/01/2024	\$62.42	\$11.49	\$23.56	\$0.00	\$97.47
	08/01/2024	\$64.52	\$11.49	\$23.56	\$0.00	\$99.57
	02/01/2025	\$65.82	\$11.49	\$23.56	\$0.00	\$100.87
	08/01/2025	\$67.97	\$11.49	\$23.56	\$0.00	\$103.02
	02/01/2026	\$69.32	\$11.49	\$23.56	\$0.00	\$104.37
	08/01/2026	\$71.52	\$11.49	\$23.56	\$0.00	\$106.57
	02/01/2027	\$72.92	\$11.49	\$23.56	\$0.00	\$107.97

**Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.21	\$11.49	\$23.56	\$0.00	\$66.26
2	60	\$37.45	\$11.49	\$23.56	\$0.00	\$72.50
3	70	\$43.69	\$11.49	\$23.56	\$0.00	\$78.74
4	80	\$49.94	\$11.49	\$23.56	\$0.00	\$84.99
5	90	\$56.18	\$11.49	\$23.56	\$0.00	\$91.23

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

TEST BORING DRILLER	12/01/2023	\$48.33	\$9.65	\$18.22	\$0.00	\$76.20
LABORERS - FOUNDATION AND MARINE	06/01/2024	\$49.81	\$9.65	\$18.22	\$0.00	\$77.68
	12/01/2024	\$51.28	\$9.65	\$18.22	\$0.00	\$79.15
	06/01/2025	\$52.78	\$9.65	\$18.22	\$0.00	\$80.65
	12/01/2025	\$54.28	\$9.65	\$18.22	\$0.00	\$82.15
	06/01/2026	\$55.83	\$9.65	\$18.22	\$0.00	\$83.70
	12/01/2026	\$57.33	\$9.65	\$18.22	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.45	\$9.65	\$18.22	\$0.00	\$72.32
	06/01/2024	\$45.93	\$9.65	\$18.22	\$0.00	\$73.80
	12/01/2024	\$47.40	\$9.65	\$18.22	\$0.00	\$75.27
	06/01/2025	\$48.90	\$9.65	\$18.22	\$0.00	\$76.77
	12/01/2025	\$50.40	\$9.65	\$18.22	\$0.00	\$78.27
	06/01/2026	\$51.95	\$9.65	\$18.22	\$0.00	\$79.82
	12/01/2026	\$53.45	\$9.65	\$18.22	\$0.00	\$81.32
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.82	\$15.07	\$18.67	\$0.00	\$73.56
	06/01/2024	\$40.82	\$15.07	\$18.67	\$0.00	\$74.56
	12/01/2024	\$40.82	\$15.07	\$20.17	\$0.00	\$76.06
	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11	
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$56.56	\$9.65	\$18.67	\$0.00	\$84.88
	06/01/2024	\$58.04	\$9.65	\$18.67	\$0.00	\$86.36
	12/01/2024	\$59.51	\$9.65	\$18.67	\$0.00	\$87.83
	06/01/2025	\$61.01	\$9.65	\$18.67	\$0.00	\$89.33
	12/01/2025	\$62.51	\$9.65	\$18.67	\$0.00	\$90.83
	06/01/2026	\$64.06	\$9.65	\$18.67	\$0.00	\$92.38
	12/01/2026	\$65.56	\$9.65	\$18.67	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$58.56	\$9.65	\$18.67	\$0.00	\$86.88
	06/01/2024	\$60.04	\$9.65	\$18.67	\$0.00	\$88.36
	12/01/2024	\$61.51	\$9.65	\$18.67	\$0.00	\$89.83
	06/01/2025	\$63.01	\$9.65	\$18.67	\$0.00	\$91.33
	12/01/2025	\$64.51	\$9.65	\$18.67	\$0.00	\$92.83
	06/01/2026	\$66.06	\$9.65	\$18.67	\$0.00	\$94.38
	12/01/2026	\$67.56	\$9.65	\$18.67	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$48.63	\$9.65	\$18.67	\$0.00	\$76.95
	06/01/2024	\$50.11	\$9.65	\$18.67	\$0.00	\$78.43
	12/01/2024	\$51.58	\$9.65	\$18.67	\$0.00	\$79.90
	06/01/2025	\$53.08	\$9.65	\$18.67	\$0.00	\$81.40
	12/01/2025	\$54.58	\$9.65	\$18.67	\$0.00	\$82.90
	06/01/2026	\$56.13	\$9.65	\$18.67	\$0.00	\$84.45
	12/01/2026	\$57.63	\$9.65	\$18.67	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$50.63	\$9.65	\$18.67	\$0.00	\$78.95
	06/01/2024	\$52.11	\$9.65	\$18.67	\$0.00	\$80.43
	12/01/2024	\$53.58	\$9.65	\$18.67	\$0.00	\$81.90
	06/01/2025	\$55.08	\$9.65	\$18.67	\$0.00	\$83.40
	12/01/2025	\$56.58	\$9.65	\$18.67	\$0.00	\$84.90
	06/01/2026	\$58.13	\$9.65	\$18.67	\$0.00	\$86.45
	12/01/2026	\$59.63	\$9.65	\$18.67	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98
	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53	
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 4 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$32.37	\$9.65	\$15.60	\$0.00	\$57.62
	06/01/2024	\$33.56	\$9.65	\$15.60	\$0.00	\$58.81
	12/01/2024	\$34.74	\$9.65	\$15.60	\$0.00	\$59.99
	06/01/2025	\$35.98	\$9.65	\$15.60	\$0.00	\$61.23
	12/01/2025	\$37.21	\$9.65	\$15.60	\$0.00	\$62.46
	06/01/2026	\$39.25	\$9.65	\$15.60	\$0.00	\$64.50
	12/01/2026	\$40.54	\$9.65	\$15.60	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WATER METER INSTALLER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Additional Apprentices Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

\*\* Multiple ratios are listed in the comment field.

\*\*\* APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

\*\*\*\* APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.



MAURA HEALEY  
Governor

KIM DRISCOLL  
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT  
DEPARTMENT OF LABOR STANDARDS

**Prevailing Wage Rates**

As determined by the Director under the provisions of the  
Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES  
Secretary

MICHAEL FLANAGAN  
Director

**Awarding Authority:** Shelburne Fall Fire District  
**Contract Number:** **City/Town:** SHELBURNE  
**Description of Work:** Removal, storing, and resetting features, partial reconstruction of spandrel wall, replacement of irrigation system, lighting system, coating system, watermain, and guardrail, and site restoration.  
**Job Location:** Water St, Shelburne, MA 01370

**Information about Prevailing Wage Schedules for Awarding Authorities and Contractors**

- **The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor.** For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The annual update requirement is not applicable to 27F "rental of equipment" contracts. **The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.**
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Construction</b>						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$38.95	\$15.07	\$18.67	\$0.00	\$72.69
	06/01/2024	\$39.95	\$15.07	\$18.67	\$0.00	\$73.69
	12/01/2024	\$39.95	\$15.07	\$20.17	\$0.00	\$75.19
	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.02	\$15.07	\$18.67	\$0.00	\$72.76
	06/01/2024	\$40.02	\$15.07	\$18.67	\$0.00	\$73.76
	12/01/2024	\$40.02	\$15.07	\$20.17	\$0.00	\$75.26
	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.14	\$15.07	\$18.67	\$0.00	\$72.88
	06/01/2024	\$40.14	\$15.07	\$18.67	\$0.00	\$73.88
	12/01/2024	\$40.14	\$15.07	\$20.17	\$0.00	\$75.38
	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$34.38	\$9.65	\$16.84	\$0.00	\$60.87
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$34.38	\$9.65	\$14.78	\$0.00	\$58.81
	06/01/2024	\$35.58	\$9.65	\$14.78	\$0.00	\$60.01
	12/01/2024	\$36.78	\$9.65	\$14.78	\$0.00	\$61.21
	06/01/2025	\$38.03	\$9.65	\$14.78	\$0.00	\$62.46
	12/01/2025	\$39.27	\$9.65	\$14.78	\$0.00	\$63.70
	06/01/2026	\$40.57	\$9.65	\$14.78	\$0.00	\$65.00
	12/01/2026	\$41.86	\$9.65	\$14.78	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	12/01/2023	\$36.72	\$14.50	\$10.55	\$0.00	\$61.77
	06/01/2024	\$37.62	\$14.50	\$10.55	\$0.00	\$62.67
	12/01/2024	\$38.52	\$14.50	\$10.55	\$0.00	\$63.57
	06/01/2025	\$39.42	\$14.50	\$10.55	\$0.00	\$64.47
	12/01/2025	\$40.32	\$14.50	\$10.55	\$0.00	\$65.37
ASPHALT RAKER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$34.38	\$9.65	\$16.84	\$0.00	\$60.87
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$34.38	\$9.65	\$14.78	\$0.00	\$58.81
	06/01/2024	\$35.58	\$9.65	\$14.78	\$0.00	\$60.01
	12/01/2024	\$36.78	\$9.65	\$14.78	\$0.00	\$61.21
	06/01/2025	\$38.03	\$9.65	\$14.78	\$0.00	\$62.46
	12/01/2025	\$39.27	\$9.65	\$14.78	\$0.00	\$63.70
	06/01/2026	\$40.57	\$9.65	\$14.78	\$0.00	\$65.00
	12/01/2026	\$41.86	\$9.65	\$14.78	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - BOILERMAKER - Local 29**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

**Notes:**

**Apprentice to Journeyworker Ratio:1:4**

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	08/01/2023	\$50.81	\$11.49	\$20.21	\$0.00	\$82.51
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	02/01/2024	\$50.81	\$11.49	\$21.46	\$0.00	\$83.76
	08/01/2024	\$52.06	\$11.49	\$21.46	\$0.00	\$85.01
	02/01/2025	\$53.36	\$11.49	\$21.46	\$0.00	\$86.31
	08/01/2025	\$55.51	\$11.49	\$21.46	\$0.00	\$88.46
	02/01/2026	\$56.86	\$11.49	\$21.46	\$0.00	\$89.81
	08/01/2026	\$59.06	\$11.49	\$21.46	\$0.00	\$92.01
	02/01/2027	\$60.46	\$11.49	\$21.46	\$0.00	\$93.41

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield

Effective Date - 08/01/2023

Table with 7 columns: Step, percent, Apprentice Base Wage, Health, Pension, Supplemental Unemployment, Total Rate. Rows 1-5 showing wage progression from \$25.41 to \$45.73.

Effective Date - 02/01/2024

Table with 7 columns: Step, percent, Apprentice Base Wage, Health, Pension, Supplemental Unemployment, Total Rate. Rows 1-5 showing wage progression from \$25.41 to \$45.73.

Notes: [Empty dashed box]

Apprentice to Journeyworker Ratio:1:5

Table row: BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING, 12/01/2023, \$39.56, \$13.78, \$15.15, \$0.00, \$68.49

ENGINEERS LOCAL 98

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Table rows for CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE with dates from 12/01/2023 to 12/01/2026 and rates from \$73.35 to \$82.35.

For apprentice rates see "Apprentice- LABORER"

Table rows for CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE with dates from 12/01/2023 to 12/01/2026 and rates from \$72.20 to \$81.20.

For apprentice rates see "Apprentice- LABORER"

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN</i>	09/01/2023	\$40.51	\$7.91	\$18.15	\$0.00	\$66.57
	03/01/2024	\$41.41	\$7.91	\$18.15	\$0.00	\$67.47
	09/01/2024	\$42.36	\$7.91	\$18.15	\$0.00	\$68.42
	03/01/2025	\$43.26	\$7.91	\$18.15	\$0.00	\$69.32
	09/01/2025	\$44.21	\$7.91	\$18.15	\$0.00	\$70.27
	03/01/2026	\$45.11	\$7.91	\$18.15	\$0.00	\$71.17
	09/01/2026	\$46.06	\$7.91	\$18.15	\$0.00	\$72.12
	03/01/2027	\$46.96	\$7.91	\$18.15	\$0.00	\$73.02

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - CARPENTER - Local 336 Hampden Hampshire Franklin**

**Effective Date - 09/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.26	\$7.91	\$1.38	\$0.00	\$29.55
2	60	\$24.31	\$7.91	\$1.38	\$0.00	\$33.60
3	70	\$28.36	\$7.91	\$13.95	\$0.00	\$50.22
4	75	\$30.38	\$7.91	\$13.95	\$0.00	\$52.24
5	80	\$32.41	\$7.91	\$15.35	\$0.00	\$55.67
6	80	\$32.41	\$7.91	\$15.35	\$0.00	\$55.67
7	90	\$36.46	\$7.91	\$16.75	\$0.00	\$61.12
8	90	\$36.46	\$7.91	\$16.75	\$0.00	\$61.12

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.71	\$7.91	\$1.38	\$0.00	\$30.00
2	60	\$24.85	\$7.91	\$1.38	\$0.00	\$34.14
3	70	\$28.99	\$7.91	\$13.95	\$0.00	\$50.85
4	75	\$31.06	\$7.91	\$13.95	\$0.00	\$52.92
5	80	\$33.13	\$7.91	\$15.35	\$0.00	\$56.39
6	80	\$33.13	\$7.91	\$15.35	\$0.00	\$56.39
7	90	\$37.27	\$7.91	\$16.75	\$0.00	\$61.93
8	90	\$37.27	\$7.91	\$16.75	\$0.00	\$61.93

**Notes:**  
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
 Step 1&2 \$26.46/ 3&4 \$31.82/ 5&6 \$50.38/ 7&8 \$55.77

**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME	04/01/2023	\$24.16	\$7.21	\$4.80	\$0.00	\$36.17
<i>CARPENTERS-ZONE 3 (Wood Frame)</i>						

All Aspects of New Wood Frame Work

**Apprentice - CARPENTER (Wood Frame) - Zone 3**

**Effective Date - 04/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
2	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
3	65	\$15.70	\$7.21	\$0.00	\$0.00	\$22.91
4	70	\$16.91	\$7.21	\$0.00	\$0.00	\$24.12
5	75	\$18.12	\$7.21	\$3.80	\$0.00	\$29.13
6	80	\$19.33	\$7.21	\$3.80	\$0.00	\$30.34
7	85	\$20.54	\$7.21	\$3.80	\$0.00	\$31.55
8	90	\$21.74	\$7.21	\$3.80	\$0.00	\$32.75

**Notes:**  
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
 Step 1&2 \$17.86/ 3&4 \$20.22/ 5&6 \$27.57/ 7&8 \$29.94

**Apprentice to Journeyworker Ratio:1:5**

CEMENT MASONRY/PLASTERING <i>BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)</i>	01/01/2024	\$44.68	\$12.90	\$18.66	\$1.25	\$77.49
--	------------	---------	---------	---------	--------	---------

**Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.34	\$12.90	\$15.86	\$0.00	\$51.10
2	60	\$26.81	\$12.90	\$18.66	\$1.25	\$59.62
3	65	\$29.04	\$12.90	\$18.66	\$1.25	\$61.85
4	70	\$31.28	\$12.90	\$18.66	\$1.25	\$64.09
5	75	\$33.51	\$12.90	\$18.66	\$1.25	\$66.32
6	80	\$35.74	\$12.90	\$18.66	\$1.25	\$68.55
7	90	\$40.21	\$12.90	\$18.66	\$1.25	\$73.02

**Notes:**  
 Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

**Apprentice to Journeyworker Ratio:1:3**

CHAIN SAW OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
--	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$43.06	\$13.78	\$15.15	\$0.00	\$71.99
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 3</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36





Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN (Including Core Drilling) <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

**Apprentice - *ELECTRICIAN - Local 7***

**Effective Date - 12/31/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.60	\$7.65	\$0.59	\$0.00	\$27.84
2	45	\$22.05	\$7.65	\$0.66	\$0.00	\$30.36
3	50	\$24.51	\$12.75	\$7.34	\$0.00	\$44.60
4	55	\$26.96	\$12.75	\$7.41	\$0.00	\$47.12
5	65	\$31.86	\$12.75	\$9.52	\$0.00	\$54.13
6	70	\$34.31	\$12.75	\$10.90	\$0.00	\$57.96

**Effective Date - 06/30/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.00	\$7.80	\$0.60	\$0.00	\$28.40
2	45	\$22.50	\$7.80	\$0.68	\$0.00	\$30.98
3	50	\$25.01	\$13.00	\$7.40	\$0.00	\$45.41
4	55	\$27.51	\$13.00	\$7.48	\$0.00	\$47.99
5	65	\$32.51	\$13.00	\$9.64	\$0.00	\$55.15
6	70	\$35.01	\$13.00	\$11.06	\$0.00	\$59.07

**Notes:**

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

**Apprentice to Journeyworker Ratio:2:3\*\*\*\***

ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2024	\$61.98	\$16.18	\$20.96	\$0.00	\$99.12
	01/01/2025	\$62.83	\$16.28	\$21.36	\$0.00	\$100.47
	01/01/2026	\$63.68	\$16.38	\$21.76	\$0.00	\$101.82
	01/01/2027	\$64.53	\$16.48	\$22.16	\$0.00	\$103.17

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - ELEVATOR CONSTRUCTOR - Local 41**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.99	\$16.18	\$0.00	\$0.00	\$47.17
2	55	\$34.09	\$16.18	\$20.96	\$0.00	\$71.23
3	65	\$40.29	\$16.18	\$20.96	\$0.00	\$77.43
4	70	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
5	80	\$49.58	\$16.18	\$20.96	\$0.00	\$86.72

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.42	\$16.28	\$0.00	\$0.00	\$47.70
2	55	\$34.56	\$16.28	\$21.36	\$0.00	\$72.20
3	65	\$40.84	\$16.28	\$21.36	\$0.00	\$78.48
4	70	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
5	80	\$50.26	\$16.28	\$21.36	\$0.00	\$87.90

**Notes:**  
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

**Apprentice to Journeyworker Ratio:1:1**

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2024	\$43.39	\$16.18	\$20.96	\$0.00	\$80.53
	01/01/2025	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
	01/01/2026	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
	01/01/2027	\$45.17	\$16.48	\$22.16	\$0.00	\$83.81

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE <i>LOCAL 7</i> / COMMISSIONING <i>ELECTRICIANS</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56

**Apprentice - OPERATING ENGINEERS - Local 98 Class 3**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.42	\$13.38	\$15.15	\$0.00	\$51.95
2	70	\$27.32	\$13.38	\$15.15	\$0.00	\$55.85
3	80	\$31.22	\$13.38	\$15.15	\$0.00	\$59.75
4	90	\$35.13	\$13.38	\$15.15	\$0.00	\$63.66

**Notes:**

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

**Apprentice to Journeyworker Ratio:1:6**

FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$25.48	\$9.65	\$14.66	\$0.00	\$49.79
	06/01/2024	\$26.51	\$9.65	\$14.66	\$0.00	\$50.82
	12/01/2024	\$26.51	\$9.65	\$14.66	\$0.00	\$50.82
	06/01/2025	\$27.59	\$9.65	\$14.66	\$0.00	\$51.90
	12/01/2025	\$27.59	\$9.65	\$14.66	\$0.00	\$51.90
	06/01/2026	\$28.71	\$9.65	\$14.66	\$0.00	\$53.02
	12/01/2026	\$28.71	\$9.65	\$14.66	\$0.00	\$53.02
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE III</i>	03/01/2023	\$40.07	\$7.31	\$18.15	\$0.00	\$65.53

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - FLOORCOVERER - Local 2168 Zone III**

**Effective Date - 03/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.04	\$7.31	\$1.38	\$0.00	\$28.73
2	55	\$22.04	\$7.31	\$1.38	\$0.00	\$30.73
3	60	\$24.04	\$7.31	\$2.76	\$0.00	\$34.11
4	65	\$26.05	\$7.31	\$2.76	\$0.00	\$36.12
5	70	\$28.05	\$7.31	\$15.39	\$0.00	\$50.75
6	75	\$30.05	\$7.31	\$15.39	\$0.00	\$52.75
7	80	\$32.06	\$7.31	\$16.77	\$0.00	\$56.14
8	85	\$34.06	\$7.31	\$16.77	\$0.00	\$58.14

**Notes:** Steps are 750 hrs.  
 % After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)  
 Step 1&2 \$26.72.24/ 3&4 \$32.11/ 5&6 \$50.75/ 7&8 \$56.14

**Apprentice to Journeyworker Ratio:1:1**

<b>FORK LIFT</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.25	\$13.78	\$15.15	\$0.00	\$68.18
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>GENERATORS/LIGHTING PLANTS</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)</b> <i>GLAZIERS LOCAL 1333</i>	06/01/2020	\$39.18	\$10.80	\$10.45	\$0.00	\$60.43
---	------------	---------	---------	---------	--------	---------

**Apprentice - GLAZIER - Local 1333**

**Effective Date - 06/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$32.19
2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$34.64
3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$37.74
4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$40.19
5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$43.34
6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$45.78
7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$55.53
8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57.98

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

<b>GRADER/TRENCHING MACHINE/DERRICK</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING - WATER) <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$34.38	\$9.65	\$14.78	\$0.00	\$58.81
	06/01/2024	\$35.58	\$9.65	\$14.78	\$0.00	\$60.01
	12/01/2024	\$36.78	\$9.65	\$14.78	\$0.00	\$61.21
	06/01/2025	\$38.03	\$9.65	\$14.78	\$0.00	\$62.46
	12/01/2025	\$39.27	\$9.65	\$14.78	\$0.00	\$63.70
	06/01/2026	\$40.57	\$9.65	\$14.78	\$0.00	\$65.00
	12/01/2026	\$41.86	\$9.65	\$14.78	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	09/01/2023	\$42.80	\$14.75	\$19.61	\$0.00	\$77.16
	09/01/2024	\$45.54	\$14.75	\$19.61	\$0.00	\$79.90
	09/01/2025	\$48.27	\$14.75	\$19.61	\$0.00	\$82.63
	09/01/2026	\$51.01	\$14.75	\$19.61	\$0.00	\$85.37

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield**

**Effective Date - 09/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.40	\$14.75	\$14.32	\$0.00	\$50.47
2	60	\$25.68	\$14.75	\$15.37	\$0.00	\$55.80
3	70	\$29.96	\$14.75	\$16.43	\$0.00	\$61.14
4	80	\$34.24	\$14.75	\$17.49	\$0.00	\$66.48

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.77	\$14.75	\$14.32	\$0.00	\$51.84
2	60	\$27.32	\$14.75	\$15.37	\$0.00	\$57.44
3	70	\$31.88	\$14.75	\$16.43	\$0.00	\$63.06
4	80	\$36.43	\$14.75	\$17.49	\$0.00	\$68.67

**Notes:**

Steps are 1 year

**Apprentice to Journeyworker Ratio:1:4**

IRONWORKER/WELDER	09/16/2023	\$39.81	\$8.25	\$22.70	\$0.00	\$70.76
IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)	03/16/2024	\$40.66	\$8.25	\$22.70	\$0.00	\$71.61

**Apprentice - IRONWORKER - Local 7 Springfield**

**Effective Date - 09/16/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.89	\$8.25	\$22.70	\$0.00	\$54.84
2	70	\$27.87	\$8.25	\$22.70	\$0.00	\$58.82
3	75	\$29.86	\$8.25	\$22.70	\$0.00	\$60.81
4	80	\$31.85	\$8.25	\$22.70	\$0.00	\$62.80
5	85	\$33.84	\$8.25	\$22.70	\$0.00	\$64.79
6	90	\$35.83	\$8.25	\$22.70	\$0.00	\$66.78

**Effective Date - 03/16/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.40	\$8.25	\$22.70	\$0.00	\$55.35
2	70	\$28.46	\$8.25	\$22.70	\$0.00	\$59.41
3	75	\$30.50	\$8.25	\$22.70	\$0.00	\$61.45
4	80	\$32.53	\$8.25	\$22.70	\$0.00	\$63.48
5	85	\$34.56	\$8.25	\$22.70	\$0.00	\$65.51
6	90	\$36.59	\$8.25	\$22.70	\$0.00	\$67.54

**Notes:**

**Apprentice to Journeyworker Ratio:1:4**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
JACKHAMMER & PAVING BREAKER OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
LABORER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.50	\$9.65	\$16.84	\$0.00	\$59.99

**Apprentice - LABORER - Zone 3 Building & Site**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.10	\$9.65	\$16.84	\$0.00	\$46.59
2	70	\$23.45	\$9.65	\$16.84	\$0.00	\$49.94
3	80	\$26.80	\$9.65	\$16.84	\$0.00	\$53.29
4	90	\$30.15	\$9.65	\$16.84	\$0.00	\$56.64

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.63	\$9.65	\$14.78	\$0.00	\$58.06
	06/01/2024	\$34.83	\$9.65	\$14.78	\$0.00	\$59.26
	12/01/2024	\$36.03	\$9.65	\$14.78	\$0.00	\$60.46
	06/01/2025	\$37.28	\$9.65	\$14.78	\$0.00	\$61.71
	12/01/2025	\$38.52	\$9.65	\$14.78	\$0.00	\$62.95
	06/01/2026	\$39.82	\$9.65	\$14.78	\$0.00	\$64.25
	12/01/2026	\$41.11	\$9.65	\$14.78	\$0.00	\$65.54

**Apprentice - LABORER (Heavy & Highway) - Zone 3**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.18	\$9.65	\$14.78	\$0.00	\$44.61
2	70	\$23.54	\$9.65	\$14.78	\$0.00	\$47.97
3	80	\$26.90	\$9.65	\$14.78	\$0.00	\$51.33
4	90	\$30.27	\$9.65	\$14.78	\$0.00	\$54.70

**Effective Date - 06/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.90	\$9.65	\$14.78	\$0.00	\$45.33
2	70	\$24.38	\$9.65	\$14.78	\$0.00	\$48.81
3	80	\$27.86	\$9.65	\$14.78	\$0.00	\$52.29
4	90	\$31.35	\$9.65	\$14.78	\$0.00	\$55.78

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.50	\$9.65	\$16.84	\$0.00	\$59.99
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$34.13	\$9.40	\$16.59	\$0.00	\$60.12
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.60	\$9.65	\$16.97	\$0.00	\$60.22
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$34.63	\$9.65	\$16.84	\$0.00	\$61.12
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.50	\$9.65	\$16.84	\$0.00	\$59.99
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.50	\$9.65	\$16.84	\$0.00	\$59.99
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2023	\$41.37	\$11.49	\$19.53	\$0.00	\$72.39
	02/01/2024	\$41.37	\$11.49	\$20.53	\$0.00	\$73.39
	08/01/2024	\$43.05	\$11.49	\$20.53	\$0.00	\$75.07
	02/01/2025	\$44.90	\$11.49	\$20.53	\$0.00	\$76.92
	08/01/2025	\$45.81	\$11.49	\$20.53	\$0.00	\$77.83
	02/01/2026	\$46.89	\$11.49	\$20.53	\$0.00	\$78.91
	08/01/2026	\$48.65	\$11.49	\$20.53	\$0.00	\$80.67
	02/01/2027	\$49.77	\$11.49	\$20.53	\$0.00	\$81.79



**Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.69	\$11.49	\$20.53	\$0.00	\$52.71
2	60	\$24.82	\$11.49	\$20.53	\$0.00	\$56.84
3	70	\$28.96	\$11.49	\$20.53	\$0.00	\$60.98
4	80	\$33.10	\$11.49	\$20.53	\$0.00	\$65.12
5	90	\$37.23	\$11.49	\$20.53	\$0.00	\$69.25

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick

BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 3) MILLWRIGHTS LOCAL 1121 - Zone 3	01/02/2023	\$40.16	\$8.58	\$21.57	\$0.00	\$70.31
--	------------	---------	--------	---------	--------	---------

**Apprentice - MILLWRIGHT - Local 1121 Zone 3**

**Effective Date - 01/02/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.09	\$8.58	\$5.72	\$0.00	\$36.39
2	65	\$26.10	\$8.58	\$17.93	\$0.00	\$52.61
3	75	\$30.12	\$8.58	\$18.98	\$0.00	\$57.68
4	85	\$34.14	\$8.58	\$20.01	\$0.00	\$62.73

**Notes:** Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)  
Steps are 2,000 hours

**Apprentice to Journeyworker Ratio:1:4**

MORTAR MIXER LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
---	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

OILER OPERATING ENGINEERS LOCAL 98	12/01/2023	\$35.02	\$13.78	\$15.15	\$0.00	\$63.95
---------------------------------------	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS VI OPERATING ENGINEERS LOCAL 98	12/01/2023	\$32.74	\$13.78	\$15.15	\$0.00	\$61.67
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 3</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55	\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60	\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65	\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70	\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75	\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80	\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90	\$50.45	\$9.95	\$22.74	\$0.00	\$83.14

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.63	\$9.95	\$0.00	\$0.00	\$38.58
2	55	\$31.49	\$9.95	\$6.66	\$0.00	\$48.10
3	60	\$34.36	\$9.95	\$7.26	\$0.00	\$51.57
4	65	\$37.22	\$9.95	\$7.87	\$0.00	\$55.04
5	70	\$40.08	\$9.95	\$20.32	\$0.00	\$70.35
6	75	\$42.95	\$9.95	\$20.93	\$0.00	\$73.83
7	80	\$45.81	\$9.95	\$21.53	\$0.00	\$77.29
8	90	\$51.53	\$9.95	\$22.74	\$0.00	\$84.22

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2024	\$38.83	\$9.65	\$19.90	\$0.00	\$68.38
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. <i>PAINTERS LOCAL 35 - ZONE 3</i>	07/01/2024	\$40.03	\$9.65	\$19.90	\$0.00	\$69.58
	01/01/2025	\$41.23	\$9.65	\$19.90	\$0.00	\$70.78

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.42	\$9.95	\$0.00	\$0.00	\$29.37
2	55	\$21.36	\$9.95	\$4.43	\$0.00	\$35.74
3	60	\$23.30	\$9.95	\$4.83	\$0.00	\$38.08
4	65	\$25.24	\$9.95	\$5.23	\$0.00	\$40.42
5	70	\$27.18	\$9.95	\$17.49	\$0.00	\$54.62
6	75	\$29.12	\$9.95	\$17.89	\$0.00	\$56.96
7	80	\$31.06	\$9.95	\$18.29	\$0.00	\$59.30
8	90	\$34.95	\$9.95	\$19.10	\$0.00	\$64.00

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.02	\$9.95	\$0.00	\$0.00	\$29.97
2	55	\$22.02	\$9.95	\$4.43	\$0.00	\$36.40
3	60	\$24.02	\$9.95	\$4.83	\$0.00	\$38.80
4	65	\$26.02	\$9.95	\$5.23	\$0.00	\$41.20
5	70	\$28.02	\$9.95	\$17.49	\$0.00	\$55.46
6	75	\$30.02	\$9.95	\$17.89	\$0.00	\$57.86
7	80	\$32.02	\$9.95	\$18.29	\$0.00	\$60.26
8	90	\$36.03	\$9.95	\$19.10	\$0.00	\$65.08

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2024	\$36.15	\$9.95	\$19.90	\$0.00	\$66.00
PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$37.35	\$9.95	\$19.90	\$0.00	\$67.20
	01/01/2025	\$38.55	\$9.95	\$19.90	\$0.00	\$68.40

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.08	\$9.95	\$0.00	\$0.00	\$28.03
2	55	\$19.88	\$9.95	\$4.43	\$0.00	\$34.26
3	60	\$21.69	\$9.95	\$4.83	\$0.00	\$36.47
4	65	\$23.50	\$9.95	\$5.23	\$0.00	\$38.68
5	70	\$25.31	\$9.95	\$17.49	\$0.00	\$52.75
6	75	\$27.11	\$9.95	\$17.89	\$0.00	\$54.95
7	80	\$28.92	\$9.95	\$18.29	\$0.00	\$57.16
8	90	\$32.54	\$9.95	\$19.10	\$0.00	\$61.59

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.68	\$9.95	\$0.00	\$0.00	\$28.63
2	55	\$20.54	\$9.95	\$4.43	\$0.00	\$34.92
3	60	\$22.41	\$9.95	\$4.83	\$0.00	\$37.19
4	65	\$24.28	\$9.95	\$5.23	\$0.00	\$39.46
5	70	\$26.15	\$9.95	\$17.49	\$0.00	\$53.59
6	75	\$28.01	\$9.95	\$17.89	\$0.00	\$55.85
7	80	\$29.88	\$9.95	\$18.29	\$0.00	\$58.12
8	90	\$33.62	\$9.95	\$19.10	\$0.00	\$62.67

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, NEW) *	01/01/2024	\$37.43	\$9.95	\$19.90	\$0.00	\$67.28
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$38.63	\$9.95	\$19.90	\$0.00	\$68.48
	01/01/2025	\$39.83	\$9.95	\$19.90	\$0.00	\$69.68

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.72	\$9.95	\$0.00	\$0.00	\$28.67
2	55	\$20.59	\$9.95	\$4.43	\$0.00	\$34.97
3	60	\$22.46	\$9.95	\$4.83	\$0.00	\$37.24
4	65	\$24.33	\$9.95	\$5.23	\$0.00	\$39.51
5	70	\$26.20	\$9.95	\$17.49	\$0.00	\$53.64
6	75	\$28.07	\$9.95	\$17.89	\$0.00	\$55.91
7	80	\$29.94	\$9.95	\$18.29	\$0.00	\$58.18
8	90	\$33.69	\$9.95	\$19.10	\$0.00	\$62.74

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.32	\$9.95	\$0.00	\$0.00	\$29.27
2	55	\$21.25	\$9.95	\$4.43	\$0.00	\$35.63
3	60	\$23.18	\$9.95	\$4.83	\$0.00	\$37.96
4	65	\$25.11	\$9.95	\$5.23	\$0.00	\$40.29
5	70	\$27.04	\$9.95	\$17.49	\$0.00	\$54.48
6	75	\$28.97	\$9.95	\$17.89	\$0.00	\$56.81
7	80	\$30.90	\$9.95	\$18.29	\$0.00	\$59.14
8	90	\$34.77	\$9.95	\$19.10	\$0.00	\$63.82

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2024	\$34.75	\$9.95	\$19.90	\$0.00	\$64.60
PAINTERS LOCAL 35 - ZONE 3	07/01/2024	\$35.95	\$9.95	\$19.90	\$0.00	\$65.80
	01/01/2025	\$37.15	\$9.95	\$19.90	\$0.00	\$67.00

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.38	\$9.95	\$0.00	\$0.00	\$27.33
2	55	\$19.11	\$9.95	\$4.43	\$0.00	\$33.49
3	60	\$20.85	\$9.95	\$4.83	\$0.00	\$35.63
4	65	\$22.59	\$9.95	\$5.23	\$0.00	\$37.77
5	70	\$24.33	\$9.95	\$17.49	\$0.00	\$51.77
6	75	\$26.06	\$9.95	\$17.89	\$0.00	\$53.90
7	80	\$27.80	\$9.95	\$18.29	\$0.00	\$56.04
8	90	\$31.28	\$9.95	\$19.10	\$0.00	\$60.33

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.98	\$9.95	\$0.00	\$0.00	\$27.93
2	55	\$19.77	\$9.95	\$4.43	\$0.00	\$34.15
3	60	\$21.57	\$9.95	\$4.83	\$0.00	\$36.35
4	65	\$23.37	\$9.95	\$5.23	\$0.00	\$38.55
5	70	\$25.17	\$9.95	\$17.49	\$0.00	\$52.61
6	75	\$26.96	\$9.95	\$17.89	\$0.00	\$54.80
7	80	\$28.76	\$9.95	\$18.29	\$0.00	\$57.00
8	90	\$32.36	\$9.95	\$19.10	\$0.00	\$61.41

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	12/01/2023	\$33.63	\$9.65	\$14.78	\$0.00	\$58.06
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$34.83	\$9.65	\$14.78	\$0.00	\$59.26
	12/01/2024	\$36.03	\$9.65	\$14.78	\$0.00	\$60.46
	06/01/2025	\$37.28	\$9.65	\$14.78	\$0.00	\$61.71
	12/01/2025	\$38.52	\$9.65	\$14.78	\$0.00	\$62.95
	06/01/2026	\$39.82	\$9.65	\$14.78	\$0.00	\$64.25
	12/01/2026	\$41.11	\$9.65	\$14.78	\$0.00	\$65.54

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PANEL & PICKUP TRUCKS DRIVER	01/01/2024	\$38.78	\$15.07	\$18.67	\$0.00	\$72.52
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$39.78	\$15.07	\$18.67	\$0.00	\$73.52
	12/01/2024	\$39.78	\$15.07	\$20.17	\$0.00	\$75.02
	01/01/2025	\$39.78	\$15.57	\$20.17	\$0.00	\$75.52
	06/01/2025	\$40.78	\$15.57	\$20.17	\$0.00	\$76.52
	12/01/2025	\$40.78	\$15.57	\$21.78	\$0.00	\$78.13
	01/01/2026	\$40.78	\$16.17	\$21.78	\$0.00	\$78.73
	06/01/2026	\$41.78	\$16.17	\$21.78	\$0.00	\$79.73
	12/01/2026	\$41.78	\$16.17	\$23.52	\$0.00	\$81.47
	01/01/2027	\$41.78	\$16.77	\$23.52	\$0.00	\$82.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05

**Apprentice - PILE DRIVER - Local 56 Zone 3**

**Effective Date - 08/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

**Notes:** Apprentice wages shall be no less than the following Steps;  
(Same as set in Zone 1)  
1\$57.06/2\$61.96/3\$66.87/4\$69.32/5\$71.78/6\$71.78/7\$76.68/8\$76.68

**Apprentice to Journeyworker Ratio:1:5**

PIPELAYER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i> For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
PIPELAYER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PLUMBER & PIPEFITTER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PLUMBER/PIPEFITTER - Local 104**

**Effective Date - 09/17/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.58	\$9.55	\$10.10	\$0.00	\$41.23
2	50	\$23.98	\$9.55	\$10.10	\$0.00	\$43.63
3	55	\$26.38	\$9.55	\$10.10	\$0.00	\$46.03
4	60	\$28.78	\$9.55	\$10.10	\$0.00	\$48.43
5	65	\$31.17	\$9.55	\$10.10	\$0.00	\$50.82
6	70	\$33.57	\$9.55	\$10.10	\$0.00	\$53.22
7	75	\$35.97	\$9.55	\$10.10	\$0.00	\$55.62
8	80	\$38.37	\$9.55	\$10.10	\$0.00	\$58.02
9	80	\$38.37	\$9.55	\$17.10	\$0.00	\$65.02
10	80	\$38.37	\$9.55	\$17.10	\$0.00	\$65.02

**Effective Date - 03/17/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.14	\$9.55	\$10.10	\$0.00	\$41.79
2	50	\$24.61	\$9.55	\$10.10	\$0.00	\$44.26
3	55	\$27.07	\$9.55	\$10.10	\$0.00	\$46.72
4	60	\$29.53	\$9.55	\$10.10	\$0.00	\$49.18
5	65	\$31.99	\$9.55	\$10.10	\$0.00	\$51.64
6	70	\$34.45	\$9.55	\$10.10	\$0.00	\$54.10
7	75	\$36.91	\$9.55	\$10.10	\$0.00	\$56.56
8	80	\$39.37	\$9.55	\$10.10	\$0.00	\$59.02
9	80	\$39.37	\$9.55	\$17.10	\$0.00	\$66.02
10	80	\$39.37	\$9.55	\$17.10	\$0.00	\$66.02

**Notes: \*\*1:1,2:5,3:9,4:12**

**Apprentice to Journeyworker Ratio:\*\***

PNEUMATIC CONTROLS (TEMP.) PLUMBERS & PIPEFITTERS LOCAL 104	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY)	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
	12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
	06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
	12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
	06/01/2026	\$40.07	\$9.65	\$14.78	\$0.00	\$64.50
	12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

POWDERMAN & BLASTER LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2023	\$35.13	\$9.40	\$16.59	\$0.00	\$61.12
--	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$34.63	\$9.65	\$14.78	\$0.00	\$59.06
	06/01/2024	\$35.83	\$9.65	\$14.78	\$0.00	\$60.26
	12/01/2024	\$37.03	\$9.65	\$14.78	\$0.00	\$61.46
	06/01/2025	\$38.28	\$9.65	\$14.78	\$0.00	\$62.71
	12/01/2025	\$39.52	\$9.65	\$14.78	\$0.00	\$63.95
	06/01/2026	\$40.82	\$9.65	\$14.78	\$0.00	\$65.25
	12/01/2026	\$42.11	\$9.65	\$14.78	\$0.00	\$66.54
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2020	\$22.44	\$11.07	\$6.50	\$0.00	\$40.01
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$33.88	\$9.65	\$16.84	\$0.00	\$60.37
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i>	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofing Waterproofing &Roofing Damproofg) <i>ROOFERS LOCAL 248</i>	07/16/2023	\$38.41	\$10.35	\$18.00	\$0.00	\$66.76

**Apprentice - ROOFER - Local 248**

**Effective Date - 07/16/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.05	\$10.35	\$0.00	\$0.00	\$33.40
2	65	\$24.97	\$10.35	\$18.00	\$0.00	\$53.32
3	70	\$26.89	\$10.35	\$18.00	\$0.00	\$55.24
4	75	\$28.81	\$10.35	\$18.00	\$0.00	\$57.16
5	80	\$30.73	\$10.35	\$18.00	\$0.00	\$59.08
6	85	\$32.65	\$10.35	\$18.00	\$0.00	\$61.00
7	90	\$34.57	\$10.35	\$18.00	\$0.00	\$62.92
8	95	\$36.49	\$10.35	\$18.00	\$0.00	\$64.84

**Notes:**

Steps are 750 hrs.Roofing(Tear Off)1:1; Same as above

**Apprentice to Journeyworker Ratio:1:3**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 248</i>	07/16/2023	\$38.91	\$10.35	\$18.00	\$0.00	\$67.26
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.38	\$15.15	\$0.00	\$67.56
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2024	\$43.80	\$10.64	\$17.54	\$2.05	\$74.03
	07/01/2024	\$45.05	\$10.64	\$17.54	\$2.05	\$75.28
	01/01/2025	\$46.30	\$10.64	\$17.54	\$2.05	\$76.53

**Apprentice - SHEET METAL WORKER - Local 63**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.71	\$4.79	\$4.76	\$0.92	\$30.18
2	50	\$21.90	\$5.32	\$5.29	\$1.03	\$33.54
3	55	\$24.09	\$5.85	\$5.82	\$1.13	\$36.89
4	60	\$26.28	\$6.38	\$6.35	\$1.23	\$40.24
5	65	\$28.47	\$6.92	\$6.88	\$1.33	\$43.60
6	70	\$30.66	\$7.45	\$7.41	\$1.44	\$46.96
7	75	\$32.85	\$7.98	\$7.94	\$1.54	\$50.31
8	80	\$35.04	\$8.51	\$15.42	\$1.64	\$60.61
9	85	\$37.23	\$9.04	\$15.95	\$1.74	\$63.96
10	90	\$39.42	\$9.58	\$16.48	\$1.85	\$67.33

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$20.27	\$4.79	\$4.76	\$0.92	\$30.74
2	50	\$22.53	\$5.32	\$5.29	\$1.03	\$34.17
3	55	\$24.78	\$5.85	\$5.82	\$1.13	\$37.58
4	60	\$27.03	\$6.38	\$6.35	\$1.23	\$40.99
5	65	\$29.28	\$6.92	\$6.88	\$1.33	\$44.41
6	70	\$31.54	\$7.45	\$7.41	\$1.44	\$47.84
7	75	\$33.79	\$7.98	\$7.94	\$1.54	\$51.25
8	80	\$36.04	\$8.51	\$15.42	\$1.64	\$61.61
9	85	\$38.29	\$9.04	\$15.95	\$1.74	\$65.02
10	90	\$40.55	\$9.58	\$16.48	\$1.85	\$68.46

Notes:

**Apprentice to Journeyworker Ratio:1:3**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98
	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.53	\$15.07	\$18.67	\$0.00	\$73.27
	06/01/2024	\$40.53	\$15.07	\$18.67	\$0.00	\$74.27
	12/01/2024	\$40.53	\$15.07	\$20.17	\$0.00	\$75.77
	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	04/01/2023	\$47.43	\$11.45	\$16.61	\$0.00	\$75.49

**Apprentice - *SPRINKLER FITTER - Local 669***

**Effective Date - 04/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.34	\$8.22	\$0.00	\$0.00	\$29.56
2	50	\$23.72	\$8.22	\$0.00	\$0.00	\$31.94
3	55	\$26.09	\$11.45	\$7.20	\$0.00	\$44.74
4	60	\$28.46	\$11.45	\$8.35	\$0.00	\$48.26
5	65	\$30.83	\$11.45	\$8.35	\$0.00	\$50.63
6	70	\$33.20	\$11.45	\$8.60	\$0.00	\$53.25
7	75	\$35.57	\$11.45	\$8.60	\$0.00	\$55.62
8	80	\$37.94	\$11.45	\$8.60	\$0.00	\$57.99
9	85	\$40.32	\$11.45	\$8.60	\$0.00	\$60.37
10	90	\$42.69	\$11.45	\$8.60	\$0.00	\$62.74

**Notes:**

**Apprentice to Journeyworker Ratio:1:1**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 7</i>	12/31/2023	\$49.01	\$12.75	\$14.61	\$0.00	\$76.37
	06/30/2024	\$50.01	\$13.00	\$14.86	\$0.00	\$77.87
	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 7**

**Effective Date - 12/31/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.60	\$7.05	\$0.59	\$0.00	\$27.24
2	45	\$22.05	\$7.05	\$0.66	\$0.00	\$29.76
3	50	\$24.51	\$12.75	\$7.34	\$0.00	\$44.60
4	55	\$26.96	\$12.75	\$7.41	\$0.00	\$47.12
5	65	\$31.86	\$12.75	\$9.52	\$0.00	\$54.13
6	70	\$34.31	\$12.75	\$10.90	\$0.00	\$57.96

**Effective Date - 06/30/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.00	\$7.20	\$0.60	\$0.00	\$27.80
2	45	\$22.50	\$7.20	\$0.68	\$0.00	\$30.38
3	50	\$25.01	\$13.00	\$7.40	\$0.00	\$45.41
4	55	\$27.51	\$13.00	\$7.48	\$0.00	\$47.99
5	65	\$32.51	\$13.00	\$9.64	\$0.00	\$55.15
6	70	\$35.01	\$13.00	\$11.06	\$0.00	\$59.07

**Notes:**

Steps are 800 hours

**Apprentice to Journeyworker Ratio:1:1**

TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2023	\$61.34	\$11.49	\$22.34	\$0.00	\$95.17
	02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52
	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/10/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.67	\$11.49	\$23.59	\$0.00	\$65.75
2	60	\$36.80	\$11.49	\$23.59	\$0.00	\$71.88
3	70	\$42.94	\$11.49	\$23.59	\$0.00	\$78.02
4	80	\$49.07	\$11.49	\$23.59	\$0.00	\$84.15
5	90	\$55.21	\$11.49	\$23.59	\$0.00	\$90.29

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

TERRAZZO MECHANIC	08/01/2023	\$62.42	\$11.49	\$22.31	\$0.00	\$96.22
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	02/01/2024	\$62.42	\$11.49	\$23.56	\$0.00	\$97.47
	08/01/2024	\$64.52	\$11.49	\$23.56	\$0.00	\$99.57
	02/01/2025	\$65.82	\$11.49	\$23.56	\$0.00	\$100.87
	08/01/2025	\$67.97	\$11.49	\$23.56	\$0.00	\$103.02
	02/01/2026	\$69.32	\$11.49	\$23.56	\$0.00	\$104.37
	08/01/2026	\$71.52	\$11.49	\$23.56	\$0.00	\$106.57
	02/01/2027	\$72.92	\$11.49	\$23.56	\$0.00	\$107.97

**Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 08/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.21	\$11.49	\$23.56	\$0.00	\$66.26
2	60	\$37.45	\$11.49	\$23.56	\$0.00	\$72.50
3	70	\$43.69	\$11.49	\$23.56	\$0.00	\$78.74
4	80	\$49.94	\$11.49	\$23.56	\$0.00	\$84.99
5	90	\$56.18	\$11.49	\$23.56	\$0.00	\$91.23

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

TEST BORING DRILLER	12/01/2023	\$48.33	\$9.65	\$18.22	\$0.00	\$76.20
LABORERS - FOUNDATION AND MARINE	06/01/2024	\$49.81	\$9.65	\$18.22	\$0.00	\$77.68
	12/01/2024	\$51.28	\$9.65	\$18.22	\$0.00	\$79.15
	06/01/2025	\$52.78	\$9.65	\$18.22	\$0.00	\$80.65
	12/01/2025	\$54.28	\$9.65	\$18.22	\$0.00	\$82.15
	06/01/2026	\$55.83	\$9.65	\$18.22	\$0.00	\$83.70
	12/01/2026	\$57.33	\$9.65	\$18.22	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.45	\$9.65	\$18.22	\$0.00	\$72.32
	06/01/2024	\$45.93	\$9.65	\$18.22	\$0.00	\$73.80
	12/01/2024	\$47.40	\$9.65	\$18.22	\$0.00	\$75.27
	06/01/2025	\$48.90	\$9.65	\$18.22	\$0.00	\$76.77
	12/01/2025	\$50.40	\$9.65	\$18.22	\$0.00	\$78.27
	06/01/2026	\$51.95	\$9.65	\$18.22	\$0.00	\$79.82
	12/01/2026	\$53.45	\$9.65	\$18.22	\$0.00	\$81.32
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.82	\$15.07	\$18.67	\$0.00	\$73.56
	06/01/2024	\$40.82	\$15.07	\$18.67	\$0.00	\$74.56
	12/01/2024	\$40.82	\$15.07	\$20.17	\$0.00	\$76.06
	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11	
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$56.56	\$9.65	\$18.67	\$0.00	\$84.88
	06/01/2024	\$58.04	\$9.65	\$18.67	\$0.00	\$86.36
	12/01/2024	\$59.51	\$9.65	\$18.67	\$0.00	\$87.83
	06/01/2025	\$61.01	\$9.65	\$18.67	\$0.00	\$89.33
	12/01/2025	\$62.51	\$9.65	\$18.67	\$0.00	\$90.83
	06/01/2026	\$64.06	\$9.65	\$18.67	\$0.00	\$92.38
	12/01/2026	\$65.56	\$9.65	\$18.67	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$58.56	\$9.65	\$18.67	\$0.00	\$86.88
	06/01/2024	\$60.04	\$9.65	\$18.67	\$0.00	\$88.36
	12/01/2024	\$61.51	\$9.65	\$18.67	\$0.00	\$89.83
	06/01/2025	\$63.01	\$9.65	\$18.67	\$0.00	\$91.33
	12/01/2025	\$64.51	\$9.65	\$18.67	\$0.00	\$92.83
	06/01/2026	\$66.06	\$9.65	\$18.67	\$0.00	\$94.38
	12/01/2026	\$67.56	\$9.65	\$18.67	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$48.63	\$9.65	\$18.67	\$0.00	\$76.95	
	06/01/2024	\$50.11	\$9.65	\$18.67	\$0.00	\$78.43	
	12/01/2024	\$51.58	\$9.65	\$18.67	\$0.00	\$79.90	
	06/01/2025	\$53.08	\$9.65	\$18.67	\$0.00	\$81.40	
	12/01/2025	\$54.58	\$9.65	\$18.67	\$0.00	\$82.90	
	06/01/2026	\$56.13	\$9.65	\$18.67	\$0.00	\$84.45	
	12/01/2026	\$57.63	\$9.65	\$18.67	\$0.00	\$85.95	
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$50.63	\$9.65	\$18.67	\$0.00	\$78.95	
	06/01/2024	\$52.11	\$9.65	\$18.67	\$0.00	\$80.43	
	12/01/2024	\$53.58	\$9.65	\$18.67	\$0.00	\$81.90	
	06/01/2025	\$55.08	\$9.65	\$18.67	\$0.00	\$83.40	
	12/01/2025	\$56.58	\$9.65	\$18.67	\$0.00	\$84.90	
	06/01/2026	\$58.13	\$9.65	\$18.67	\$0.00	\$86.45	
	12/01/2026	\$59.63	\$9.65	\$18.67	\$0.00	\$87.95	
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98	
	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98	
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48	
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98	
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98	
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59	
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19	
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19	
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93	
01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53		
For apprentice rates see "Apprentice- LABORER"							
WAGON DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/01/2023	\$34.38	\$9.40	\$16.59	\$0.00	\$60.37	
	For apprentice rates see "Apprentice- LABORER"						
	WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$33.88	\$9.65	\$14.78	\$0.00	\$58.31
		06/01/2024	\$35.08	\$9.65	\$14.78	\$0.00	\$59.51
		12/01/2024	\$36.28	\$9.65	\$14.78	\$0.00	\$60.71
		06/01/2025	\$37.53	\$9.65	\$14.78	\$0.00	\$61.96
		12/01/2025	\$38.77	\$9.65	\$14.78	\$0.00	\$63.20
06/01/2026		\$40.07	\$9.65	\$14.78	\$0.00	\$64.50	
12/01/2026	\$41.36	\$9.65	\$14.78	\$0.00	\$65.79		
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
WATER METER INSTALLER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61	
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86	
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"							

## Additional Apprentices Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

\*\* Multiple ratios are listed in the comment field.

\*\*\* APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

\*\*\*\* APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.



**ATTACHEMENT B  
TOWN OF BUCKLAND ORDER OF CONDITIONS**

**ATTACHEMENT C  
TOWN OF SHELBURNE ORDER OF CONDITIONS**





**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 282-0095  
 MassDEP File # \_\_\_\_\_  
 eDEP Transaction # \_\_\_\_\_  
 Shelburne  
 City/Town

**A. General Information (cont.)**

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):  
 Franklin  
 a. County \_\_\_\_\_ b. Certificate Number (if registered land) \_\_\_\_\_
- c. Book \_\_\_\_\_ d. Page \_\_\_\_\_
7. Dates: 10/24/2023 11/27/2023 12/8/2023  
 a. Date Notice of Intent Filed b. Date Public Hearing Closed c. Date of Issuance
8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):  
 Bridge of Flowers Over Deerfield River Rehabilitation Project  
 a. Plan Title \_\_\_\_\_  
 Tighe & Bond, Inc.  
 b. Prepared By \_\_\_\_\_ c. Signed and Stamped by \_\_\_\_\_  
 10/23/2023 \_\_\_\_\_  
 d. Final Revision Date \_\_\_\_\_ e. Scale \_\_\_\_\_
- f. Additional Plan or Document Title \_\_\_\_\_ g. Date \_\_\_\_\_

**B. Findings**

1. Findings pursuant to the Massachusetts Wetlands Protection Act:
- Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:
- a.  Public Water Supply    b.  Land Containing Shellfish    c.  Prevention of Pollution  
 d.  Private Water Supply    e.  Fisheries    f.  Protection of Wildlife Habitat  
 g.  Groundwater Supply    h.  Storm Damage Prevention    i.  Flood Control
2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

**Approved subject to:**

- a.  the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



**WPA Form 5 – Order of Conditions**

**B. Findings (cont.)**

**Denied** because:

- b.  the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c.  the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**
- 3.  Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) a. linear feet

**Inland Resource Area Impacts:** Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input type="checkbox"/> Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input type="checkbox"/> Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet



Massachusetts Department of Environmental Protection  
 Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 282-0095  
 MassDEP File # \_\_\_\_\_  
 eDEP Transaction # \_\_\_\_\_  
 Shelburne  
 City/Town

**B. Findings (cont.)**

**Coastal Resource Area Impacts:** Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	_____	_____	_____	_____
	a. square feet	b. square feet	c. nourishment	d. nourishment
14. <input type="checkbox"/> Coastal Dunes	_____	_____	_____	_____
	a. square feet	b. square feet	c. nourishment	d. nourishment
15. <input type="checkbox"/> Coastal Banks	_____	_____		
	a. linear feet	b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	_____	_____		
	a. square feet	b. square feet		
17. <input type="checkbox"/> Salt Marshes	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	_____	_____		
	a. c/y dredged	b. c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	_____		
	a. square feet	b. square feet		



**WPA Form 5 – Order of Conditions**

**B. Findings (cont.)**

\* #22. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22.  Restoration/Enhancement \*:

a. square feet of BVW

b. square feet of salt marsh

23.  Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

**C. General Conditions Under Massachusetts Wetlands Protection Act**

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
  - a. the work is a maintenance dredging project as provided for in the Act; or
  - b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on \_\_\_\_\_ unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

**WPA Form 5 – Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

282-0095

MassDEP File #

eDEP Transaction #

Shelburne

City/Town

**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
10. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,  

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]  
"File Number            282-0095            "
11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.





Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

**WPA Form 5 – Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

282-0095

MassDEP File #

eDEP Transaction #

Shelburne

City/Town

**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

**NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS**

19. **The work associated with this Order (the “Project”) (1)  is (2)  is not subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

- i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
- ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
- iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
- iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
- v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

## WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

282-0095

MassDEP File #

eDEP Transaction #

Shelburne

City/Town

### C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



## WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

282-0095

MassDEP File #

eDEP Transaction #

Shelburne

City/Town

### C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
  2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
  3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
- k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
- l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

**See attached document - BOF OOC - Bridge of Flowers - Shelburne**

---

---

---

---



**WPA Form 5 – Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**D. Findings Under Municipal Wetlands Bylaw or Ordinance**

- 1. Is a municipal wetlands bylaw or ordinance applicable?  Yes  No
- 2. The Shelburne hereby finds (check one that applies):  
Conservation Commission

- a.  that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw \_\_\_\_\_ 2. Citation \_\_\_\_\_

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- b.  that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

1. Municipal Ordinance or Bylaw \_\_\_\_\_ 2. Citation \_\_\_\_\_

- 3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

---



---



---



---



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

**WPA Form 5 – Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

282-0095

MassDEP File #

eDEP Transaction #

Shelburne

City/Town

**E. Signatures**

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Please indicate the number of members who will sign this form.

This Order must be signed by a majority of the Conservation Commission.

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

12/8/23  
1. Date of Issuance  
5  
2. Number of Signers

Signatures:

*Alanna Davenport Chair*  
*Chris Richards Clerk*  
*Stephen J. Mohrman*

*John R. Hill*  
*Susan Brown*

by hand delivery on

12/13/2023

Date

by certified mail, return receipt requested, on

Date

**F. Appeals**

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

Order of Conditions, NOI File Number –

- 1) Before any work commences, and at a time when the ground conditions are visible, applicant will notify the Conservation Commission. The notification will include:
  - a. Confirmation of the OOC being filed at the Registry of Deeds by including Section G of the OOC form 5, unless this has been sent to the ConCom prior.
  - b. Confirmation that the DEP file number has been posted at the site in the required manner and sign size.
  - c. A written and signed statement to the effect that the OOC has been completely read and is understood by the applicant, and the applicant is responsible for ensuring all work on site is done, regardless of who performs the work, in accordance with this OOC. An email from the applicant is acceptable in place of a signature.
  
- 2) Once a contractor for this job has been selected and prior to starting construction the Conservation Commission will meet with the contractor for review of the following:
  - a. Written Stormwater Pollution Prevention Plan
  - b. Anti-Siltation measures, installation and maintenance
  - c. Details of temporary excavation material storage and equipment parking locations
  - d. Any other areas of construction related concern to Conservation Commission members.
  
- 3) Erosion control and anti-siltation measures will remain in place until re-establishment of vegetation after all work is complete.
  
- 4) Stormwater management during the duration of this OOC shall include weekly inspection of silt sacks and barriers, conducted by the contractors or another person designated by the applicant. A similar inspection shall occur within 24 hours of a rain event in excess of ½" in 24 hours.
  
- 5) Any member of the Conservation Commission can enter the property at any time during the duration of the Order of Conditions, to inspect the work and the erosion and anti-siltation measures.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 282-0095  
 MassDEP File # \_\_\_\_\_  
 eDEP Transaction # \_\_\_\_\_  
 Shelburne  
 City/Town

**G. Recording Information**

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Shelburne  
 Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location

MassDEP File Number

Has been recorded at the Registry of Deeds of:

County

Book

Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

- 6) The contractor shall provide adequate signage, above and below the bridge, notifying boaters of the presence of the construction site.



**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:

Bridge of Flowers Rehabilitation  
Shelburne Falls Fire District  
February 2024

Tighe & Bond, Inc.  
Consulting Engineers  
Westfield, Massachusetts

2. The Work includes the following major items:
  - a. Concrete repairs including reconstruction of a section of the north spandrel wall, isolated crack, isolated spall repairs, and recoating of the exterior of the bridge as specified.
  - b. Replacement of water main including appurtenances on the Shelburne and the Buckland approaches, as well as the temporary bypass.
  - c. Improvements to bridge drainage and waterproofing through replacement of fill material as specified and replacement of membrane waterproofing as identified on the plans.
  - d. Protecting in place or removing, storing, and resetting existing site features in accordance with contract documents.
  - e. Replacement of existing electrical and irrigation systems.
  - f. Safety improvements including replacement of the guardrail system.
  - g. Site restoration including new walkway, garden beds, restoration to walking surfaces within the approaches as well as any areas within the limit of work disturbed in the construction process restored to the original condition.

B. Related Requirements

1. 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. The existing concrete arch bridge is a 5-span concrete spandrel arch bridge that spans approximately 400 feet and carries a water main.

#### 1.4 PROJECT/SITE CONDITIONS

##### A. Permits

1. Obtain the permits and approvals listed below:
  - a. Permits and licenses of a temporary nature necessary to perform the Work.
  - b. Permits for disposal of construction wastes including disposal of cleared and grubbed materials.
  - c. Other permits or licenses required for the Contractor's operations or required elsewhere in the Contract Documents and not included herein.
2. Comply with the permits and approvals listed below:
  - a. Town of Shelburne Conservation Commission Order of Conditions. A copy of the Order of Conditions is included in Section 00800.
  - b. Town of Buckland Conservation Commission Order of Conditions. A copy of the Order of Conditions is included in Section 00800.
  - c. Army Corps of Engineers Section 404 Individual Permit. A copy of the Individual Permit is included in Section 00800.
3. 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.
4. Permits require that a representative of the permitting authority or the Owner be present on site during construction or given the opportunity to observe conditions prior to backfilling or otherwise proceeding with construction. Notify the Owner, Engineer, and the permitting authority prior to performing Work that is governed by the permit.
5. 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.
6. 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 and temporary construction access agreements obtained by the Owner within the limits of Work shown on the Drawings.
  - b. 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.

- c. 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.
- d. Provide for the disposal of waste materials off-site in accordance with all applicable laws.
- e. 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.
- f. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.
- g. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.

## 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01110.docx

## SECTION 01140

## WORK RESTRICTIONS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Work Schedule
  - 2. Construction Constraints
  - 3. Vehicle Access
  - 4. Available Work Area
  - 5. Site Usage Plan
- B. Related Requirements
  - 1. Section 01110 – Summary of Work
  - 2. Section 01310 - Coordination
  - 3. Section 01325 - Scheduling of Construction

## 1.2 SUBMITTALS

- A. Incorporate the requirements of this Section in the project schedule submitted under Section 01325.
- B. Action Submittals
  - 1. Submit site usage plan within 30 days of the Notice to Proceed.

## 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 5:00 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 8:00 a.m. and all equipment must be shut off by 4:00 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. Water service must remain in operation throughout construction of the new facility unless otherwise specified herein or in Section 01310.

### 3.2 VEHICLE ACCESS

- A. Contractor to refer to contract documents for restrictions and limitations on use of the bridge for construction vehicle access as well as personnel access, including required supporting documentation.

### 3.3 AVAILABLE WORK AREA

- A. Refer to Specification 01110 Section 1.4.B.1. for use of premises and off-site work.
- B. Limits of construction are defined on the Drawings. No work will be permitted to be performed outside these boundaries.

### 3.4 SITE USAGE PLAN

- A. Limits of work are shown on the Drawings.
- B. Contractor to limit idling of equipment within the approaches.
- C. Submit a site usage plan showing all proposed staging areas, locations of all office and storage trailers, and material laydown areas. The site usage plan should be a drawing showing the proposed locations and shall include on-site traffic modifications and temporary utilities as may be applicable. Submit plan to Owner for review. Modify plan per Owner comments.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01140.docx

**Contractor's Application for Payment No.**

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

**Application For Payment  
Change Order Summary**

Approved Change Orders				
Number	Additions	Deductions		
TOTALS				
NET CHANGE BY CHANGE ORDERS				

1. ORIGINAL CONTRACT PRICE.....	\$	
2. Net change by Change Orders.....	\$	
3. Current Contract Price (Line 1 ± 2).....	\$	
4. TOTAL COMPLETED AND STORED TO DATE (Column F on Progress Estimate).....	\$	
5. RETAINAGE:		
a. X _____ Work Completed.....	\$	
b. X _____ Stored Material.....	\$	
c. Total Retainage (Line 5a + Line 5b).....	\$	
6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c).....	\$	
7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application).....	\$	
8. AMOUNT DUE THIS APPLICATION.....	\$	
9. BALANCE TO FINISH, PLUS RETAINAGE (Column G on Progress Estimate + Line 5 above).....	\$	

**Contractor's Certification**

The undersigned Contractor certifies that to the best of its knowledge: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

---

By: \_\_\_\_\_ Date: \_\_\_\_\_

Payment of: \$ \_\_\_\_\_  
(Line 8 or other - attach explanation of the other amount)

is recommended by: \_\_\_\_\_ (Date) \_\_\_\_\_  
(Engineer)

Payment of: \$ \_\_\_\_\_  
(Line 8 or other - attach explanation of the other amount)

is approved by: \_\_\_\_\_ (Date) \_\_\_\_\_  
(Owner)

Approved by: \_\_\_\_\_ (Date) \_\_\_\_\_  
Funding Agency (if applicable)





## 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 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 lump sum 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.

## 1.3 LUMP SUM ITEMS

- A. Each lump sum 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. Item 1 – Bridge of Flowers Rehabilitation
  - 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 each 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 Bridge of Flowers Rehabilitation, in its entirety as detailed in the Contract Documents.

### 1.4 ALLOWANCES

A. The following allowances are stated in the Bid form.

B. Item 1A – Monthly price adjustment for diesel fuel

#### 1. Measurement

- a. This Contract contains a price adjustment for diesel fuel. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of diesel fuel, or credits due to the Owner for decreases in the price of diesel fuel, will be determined in accordance with the following procedure.

- 1) The Base Price for diesel fuel for this Project will be \$3.148 per gallon.
- 2) The price adjustment shall be based on the variance in price for diesel fuel from the Base Price to the Period Price and shall occur on a monthly basis.
- 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
- 4) The price adjustment will be determined by multiplying the number of cubic yards of excavation and borrow (as defined in the next paragraph) paid during each one-month period by 0.29 gallons per cubic yard, and adding that to the tons of hot mix asphalt (as defined in the next paragraph) paid during each one-month period by 2.90 gallons per ton. The total number of gallons calculated shall then be multiplied by the variance in price between Base Price and Period Price of diesel fuel.
- 5) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

C. Item 1B – Monthly price adjustment for gasoline

#### 1. Measurement

- a. This Contract contains a price adjustment for gasoline. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the

Contractor for increases in the price of gasoline, or credits due to the Owner for decreases in the price of gasoline, will be determined in accordance with the following procedure.

- 1) The Base Price for gasoline for this Project will be \$2.467 per gallon.
- 2) The price adjustment shall be based on the variance in price for gasoline from the Base Price to the Period Price and shall occur on a monthly basis.
- 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
- 4) The price adjustment will be determined by multiplying the number of cubic yards of excavation and borrow (as defined in the next paragraph) paid during each one-month period by 0.15 gallons per cubic yard, multiplied by the variance in price between Base Price and Period Price of gasoline.
- 5) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

D. Item 1C – Monthly price adjustment for structural steel and reinforcing steel

1. Measurement

- a. This Contract contains a price adjustment for structural steel and reinforcing steel. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of structural steel and reinforcing steel, or credits due to the Owner for decreases in the price of structural steel and reinforcing steel, will be determined in accordance with the following procedure.
- b. The Base Price for structural steel and reinforcing steel for this Project shall be \$1.03 per pound. Price adjustments will be handled as described below and shall only apply to unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings, and unfabricated reinforcing steel bars.
- c. The Base Price Date is the month and year in which bids are opened for the project. This date is used to select the Base Price Index.
- d. Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices calculated based on the purchase date of the steel (Period Price Date) using an index of steel prices to adjust the Base Price.

- e. The Period Price Date is the date the steel was delivered to the fabricator as evidenced by an official bill of lading submitted to the Department containing a description of the shipped materials, weights of the shipped materials and the date of shipment. This date is used to select the Period Price Index.
- f. The index used for the calculation of Period Prices is the U.S. Bureau of Labor Statistics (BLS) Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a "(P)".
- g. Period Prices are determined as follows:  
$$\text{Period Price} = \text{Base Price} \times \text{Index Factor}$$
$$\text{Index Factor} = \text{Period Price Index} / \text{Base Price Index}$$
  - 1) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.
  - 2) Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars subject to a price adjustment by the index factor calculated as shown above.
  - 3) Price adjustments will not include the costs of shop drawing preparation, handling, fabrication, coatings, transportation, storage, installation, profit, overhead, fuel costs, fuel surcharges, or other such charges not related to the cost of the unfabricated structural steel and unfabricated reinforcing steel.
  - 4) The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

- 2. No price adjustments will be made for Work completed beyond the date of Final Completion.

## 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, with erasable pencil, 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 last regular job meeting 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\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01290.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: \_\_\_\_\_

## 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 3 copies 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 Work items showing values allocated to the various elements of the Work.
- 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.
- E. At the Contractor's option, items for mobilization and demobilization may be included in the Schedule of Values. The combined value shall not exceed 5 percent of the Contract Price, and the values for mobilization and demobilization shall be equal. Payment for mobilization will be included in the first payment request after the Contractor has initiated full-time construction activity. Payment for demobilization will be included in the first payment request after Substantial Completion has been reached and all equipment has been removed from the Site.

## PART 2 PRODUCTS – NOT USED

## PART 3 EXECUTION – NOT USED

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01295.docx



## SECTION 01310

## COORDINATION

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Project Management
  - 2. Coordination
  - 3. Project Meetings
  - 4. Bridge of Flowers Committee
- 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.
  - 2. Existing gardens to remain within the approaches will be maintained by the Bridge of Flowers Committee staff unless otherwise specified. Access to their garden storage sheds on the Shelburne approach is to be provided in a safe and reasonable manner.

## 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 water system 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 within one week after the pre-construction conference. Include Contractor, Owner, Engineer,

Representative from the Bridge of Flowers Committee, and Village of Shelburne Falls personnel including police, fire, and ambulance.

4. Submit to the Owner and Engineer, in writing, all requests for valve operations at least 2 weeks prior to commencing operation.

### 1.3 COORDINATION

- A. Do not interfere with the operation of the existing facilities.
- B. Perform all coordination necessary to complete connections to the existing water main.
- C. Coordinate with appropriate utility companies, as well as with the Owner, where the Work crosses or is adjacent to existing utilities.
- D. Coordinate any disturbance of existing garden beds and site features that are to remain with the Engineer and Bridge of Flowers Committee prior to commencing any work that may impact these areas.

### 1.4 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 every 2 weeks and at other times 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 DIGSAFE at 1-888-344-7233 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.
- 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. Refilling, disinfection, flushing and re-activation of the existing pipeline and new water mains.
  - 3. Timing and duration of linestopping activities.

**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.

**3.4 SHUTDOWNS**

- A. Water service shutdowns as a result of pipeline construction activities are not permitted, unless otherwise noted in this Section. Notify water system customers regarding interruptions in service at least one week in advance. Coordinate with the Owner regarding scheduling such notifications. An existing main shall not be shut off for more than 6 hours.
- B. Rescheduling or reactivation of any temporary shutdowns may be required if an emergency occurs in the distribution system, such as a major pipeline break or fire.
- C. Furnish all labor, materials, tools and equipment necessary to provide supports and braces necessary to perform the tie-in work in a safe and secure manner. Observe all safety regulations.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01310.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 PROGRESS PHOTOGRAPHY

- A. Take construction photographs of active work areas at least every 2 weeks 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 at each scheduled interval at each location where Work is in progress.
- B. Take a minimum of 2 photographs at each location at 100-foot intervals along the entire length of the bridge. The photographs will serve as a record of the conditions where construction activities have and will occur.
- C. Take photographs of all utility abandonments.
- D. Take photographs of all relocated utility connections.

## 3.2 POST-CONSTRUCTION PHOTOGRAPHY

- A. Provide post construction photography after all Work has been completed at each location. The locations to be photographed and the number of photographs required shall be as specified in Paragraph 3.1 for the preconstruction photography.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01320.docx

## SECTION 01321

## COLOR AUDIO-VIDEO DOCUMENTATION SURVEY

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Pre-construction color video recording of existing surface features.

## 1.2 DEFINITIONS

- A. Zone of Influence is defined as any area within the immediate construction site which may be affected by equipment traffic, material stockpiles, temporary staging areas including a minimum 200 feet along each side of adjoining streets to the construction site.

## 1.3 SUBMITTALS

## A. Informational Submittals

1. Submit audio-video recording of preconstruction areas in the manner described in this section. Do not commence with construction activities until the recordings are submitted and approved.
2. Video documentation must occur within 6 months prior to the start of work on the subject street. If video documentation is more than 6 months prior to the start of work, these areas or streets must be videoed again prior to commencement of work in that area or street and submitted to the Engineer.

## 1.4 QUALITY ASSURANCE

- A. Documentation shall be performed during times of good visibility when there is no precipitation or snow cover. The Owner is not responsible for the removal of snow, leaves, debris, or parked vehicles.

## PART 2 PRODUCTS

## 2.1 FORMAT

- A. Audio-video recording shall be in digital versatile/video disc (DVD) format. Video output from camera(s) used must be capable of producing NTSC-500 lines. Resolution in the Y channel, minimum 500 TV lines at center. Geometric Distortion shall not exceed 2% of picture height at any point in picture area.

## 2.2 RECORDING INFORMATION

- A. The audio-video recording shall have the potential to convey 1 video track and 1 audio track. The video and audio tracks shall be recorded simultaneously as original live recordings and shall not be copies of other audio or video recordings. These recordings shall consist of a fixed elevation video record of the Zone of Influence of construction and the commentary of the videographer making the video record.
- B. Video recordings shall, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording, the engineering stationing corresponding to the stationing on the Drawings or as directed by the Engineer, the name of the street, easement or building being documented, the

project name, direction of travel and the viewing side. The date and time shall appear in the upper lefthand corner of the picture -- example:

Time 8:35:15

Date 9/20/79

## PART 3 EXECUTION

### 3.1 CONSTRUCTION AUDIO-VIDEO PROCEDURES

- A. Perform audio-video documentation as follows:
  - 1. Prior to the start of on-site construction activities to depict pre-construction conditions
- B. Audio-video documentation shall commence 100 feet before the beginning of work along the construction baseline and finish 100 feet beyond the end of the proposed limit of work. Includes the exterior of the bridge from safely accessible vantage points that will allow viewings of the structure.
- C. The average rate of speed in the general direction of the conveyance used during recording shall not exceed 50 feet per minute. Panning and zooming rates shall be controlled sufficiently that playback will produce optimum clarity of the objects being viewed.
- D. Coverage shall include, but not be limited to, the entire roadway pipeline route, existing driveways, sidewalks, curbs, ditches, streets (including condition of paving for full width), intersections, landscaping, trees, culverts, catch basins, head walls, fences, mailboxes, retaining walls, visible utilities and all buildings and structures located within the Zone of Influence. Include existing faults, fractures, defects or other imperfections exhibited by the above-mentioned surface features.
- E. Houses and buildings shall be identified visually by house or building number, when possible, in such manner that the progress of the taping and proposed construction areas may be located by reference to the houses and buildings.
- F. Recordings produced under this Contract shall be turned over to the Engineer on an every other day basis so the Owner may review and monitor quality and progress. Any portion of the recording coverage deemed unacceptable by the Owner or Engineer shall be re-recorded at no additional cost to the Owner.
- G. DVDs and cases shall be properly identified by recording number, location, project name, and become the property of the Owner. A record of the contents of each DVD shall be supplied by a run sheet identifying each segment in the tape by location, i.e., roll number, street or easement viewing, disc time, viewing side, starting point, traveling direction and ending point.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01321.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 REFERENCES

- A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, an Associated General Contractors (AGC) of America publication.

## 1.3 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. Installation of equipment and critical materials
  - 5. Fabrication of special equipment and material, and its installation and testing
  - 6. Final inspecting and testing
  - 7. Punchlist
  - 8. Final cleanup
  - 9. Other activities that may be critical to the Progress Schedule
  - 10. 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.
- G. Show information in such detail that duration times of activities will range from one to 15 days. The selection and number of activities shall be subject to the approval of the Owner and Engineer.
- H. The Progress Schedule should show preceding and following event numbers for each activity, description of each activity, and activity duration in calendar days.
- I. Submit the Progress Schedule on maximum sheet size 30-inches high by the width required.

#### 1.4 SUBMITTALS

- A. Informational Submittals
  - 1. Submit four prints 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. Periodic reports - On the first progress meeting of each month, submit four prints of the updated Progress Schedule, as well as a report of construction activities in the prior month.
  - 4. 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.

#### 1.5 PERIODIC REPORTS

- A. At the first scheduled progress meeting of each month, present four copies of a construction report which details the Work performed during the preceding period. The report shall include the following at a minimum:
  - 1. Actual progress of Work. Update the Progress Schedule accordingly.
  - 2. The Progress Schedule, or revised Progress Schedule, should show the portions of the Progress Schedule impacted by the Work progress.
  - 3. Activities or portions of activities completed during the reporting period, and their total value as basis for Contractor's periodic request for payment. Payment made will be based on the total value of such activities completed or partially completed after verification by the Engineer.
  - 4. State the percentage of the Work actually completed and scheduled as of the report date, and the progress along the critical path in terms of days ahead of or behind the dates defined in the Progress Schedule.
  - 5. If the Work is behind the dates set forth in the Progress Schedule, also report progress along other paths with negative slack.
  - 6. Include a narrative which includes:



- a. A description of problem areas, anticipated and current
- b. Delaying factors and their impact
- c. An explanation of corrective actions taken or proposed

7. Show the date of latest revision.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01325.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 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 (water main, equipment, piping, electrical conduits, and controls, 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. Samples and color selection charts: Provide sample, when requested by individual Specification to establish conformance with the Specifications, and as necessary to define color, texture and pattern selections available.
- D. Product Substitutions: In accordance with Section 01630.
- E. Operation and Maintenance Manuals: In accordance with Section 01770.
- F. Schedule of Values: In accordance with Section 01295.
- G. Site Usage Plan: In accordance with Section 01140.

#### 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 30 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. General:
    - a. Submit sworn certificates from the manufacturer or material supplier that the materials and fabrications provided under the Specification section conform with the Contract Documents.
    - b. Certificates shall be signed by an officer of the manufacturer's corporation and witnessed by a Notary Public.
  2. Welding: Submit in accordance with individual Specification sections.
  3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
  4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
  5. 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.
  6. Manufacturer's Certificate of Compliance: In accordance with individual Specification sections.
- F. Application for Payment
1. Submit applications for payment in accordance with Section 01270, Measurement and Payment or Section 01290, Application and Certificate for Payment.
  2. Submit schedule of stored materials when requesting payment for materials not yet installed.

- G. Construction Photography and Videography: Provide preconstruction, progress, and post-construction photography and videography in accordance with Sections 01320 and 01321.
- 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. 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.
- R. 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.
- S. 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.
- T. 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.
- U. Erosion Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of erosion control plans.
- V. Traffic Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of traffic 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 30 days for review of submittals from the time received by the Engineer. For submittals of major equipment, that require more than 30 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 revision number commencing with "1" (*e.g.* Submittal number 11330-01-1).
- 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 PE 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01330.docx

**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
----------------------------

**PE CERTIFICATION FORM**

The undersigned hereby certifies that he/she is a Professional Engineer registered in the Commonwealth of Massachusetts and that he/she has been employed by

\_\_\_\_\_ to design  
(Name of Contractor)

\_\_\_\_\_  
(Insert PE 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 PE 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.

\_\_\_\_\_  
PE Name

\_\_\_\_\_  
Contractor's Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

## SECTION 01350

## HEALTH &amp; SAFETY PLAN

## PART 1 GENERAL

## 1.1 SUMMARY

## A. The Contractor shall:

1. develop a site-specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered at the work site. The HASP shall include the information described in this specification (as applicable) and meet all applicable OSHA requirements.
2. furnish all labor, equipment, materials, and employee training for effective implementation of the HASP and worker health and safety protection of all Contractor personnel.
3. furnish all labor, equipment, materials, and employee training to effectively complete any required air monitoring and/or decontamination.
4. review the requirements and data provided for the project and supplement the HASP with any additional measures deemed necessary to fully comply with applicable regulatory requirements and to adequately protect personnel on the site.
5. maintain a copy of the HASP at the worksite, accessible to employees working at the site.
6. post the emergency response plan section of the HASP, inclusive of emergency alerting and response procedures and directions to the nearest hospital, in a visible location for all workers to see.

## B. Related Sections

1. 02225 – Selective Demolition
2. 13281 – Asbestos Abatement

## 1.2 SITE-SPECIFIC PROJECT CONDITIONS

- A. The Contractor shall review and understand all existing information as it relates to potential exposure to subsurface site contaminants, environmental data and reports.
- B. The Contractor shall review and understand all existing information as it relates to potential exposure to hazardous structure/building materials (i.e., asbestos, polychlorinated biphenyls (PCBs), lead paint, and oil/hazardous materials containers). Site-specific information with respect to potential exposures to hazardous structure/building materials are included in applicable technical specifications contained herein. See applicable Sections 02225, 13281 for applicable environmental data.
- C. The nature of the materials present at the site may require use of special protective clothing and the possible use of respiratory protective equipment, which is intended to help minimize worker exposure to known or suspected site hazards.

1. Levels of personal protection are established in reference standards and generally described for Levels C and D herein. It is anticipated that a majority of the Work to be performed on this project may be performed at Personnel Protection Level D.
2. The Contractor shall be responsible for determining if a higher level of personnel protection is required based on the criteria outlined in the Contractor's HASP. In the event that the Contractor determines that a level of protection higher than Level D is required, the Contractor's personnel shall take the necessary steps outlined in the Contractor's HASP.
3. The Contractor shall notify the Engineer and Owner in writing prior to implementing any upgrades in personal protection. The Engineer will review the Contractor's notification and determine the need to notify other applicable agencies.

### 1.3 REFERENCES

- A. OSHA 29 CFR Part 1910 (General Industry standards)
- B. OSHA 29 CFR Part 1926 (Construction Standards)
- C. OSHA Regulation 29 CFR §1926.62 (Lead)

### 1.4 DEFINITIONS

- A. CHMM: Certified Hazardous Materials Manager, as certified by the Institute of Hazardous Materials Management.
- B. CIH: Certified Industrial Hygienist, as certified by the American Board of Industrial Hygiene®.
- C. CSP: Certified Safety Professional, as certified by the Board of Certified Safety Professionals.
- D. Site Safety and Health Official (SSHO): The individual located at a job site who is responsible to the Contractor and has the authority and knowledge necessary to implement the HASP and verify compliance with applicable safety and health requirements.

### 1.5 SUBMITTALS

- A. On-site Work shall not begin until the HASP has been submitted by the Contractor and accepted by the Owner/Engineer.
- B. Informational Submittals
  1. Submit the following within thirty (30) days after the Effective Date of the Agreement.
    - a. A site-specific HASP, including the information described in this Specification as applicable.
      - 1) The HASP must be reviewed, approved, and signed by Contractor representative, with specific responsibility for safety for the Contracting company.

- 2) The Engineer's review is only to determine if the HASP is consistent with the minimum requirements of this specification. Engineer has no control over contractor's health & safety and the means and methods of health & safety implementation. Engineer also does not perform health & safety monitoring of Contractor's Work.
- 3) The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.
  - b. Documentation of qualifications and experience of the SSHO.
  - c. Applicable health and safety training records.

#### 1.6 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor, vendors/manufacturers, site visitors and anyone directly or indirectly employed by any of them.
- B. Provide a designated SSHO for the project.
- C. Pre-arrange emergency medical care services at a nearby hospital or medical clinic, including establishment of an emergency notification process and emergency routes of travel.
- D. Conduct pre-entry and weekly safety meetings with all site personnel, documenting attendance and topics covered.
- E. Develop and implement the site-specific HASP, inclusive of the elements in contained in this specification.
- F. For projects where contaminated media are known, likely, or suspected to be encountered:
  1. monitor air quality in and around the work area using appropriate air monitoring equipment.
  2. develop and implement a respiratory protection program per 29 CFR §1910.134 and 29 CFR §1926.103 for all workers authorized to wear respirators.
  3. record all air quality readings and maintain records on site.
  4. stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded.
  5. ensure that the degree and type of respiratory protection provided is protective for the monitored concentrations and individual chemical parameters.
  6. lawfully dispose of all personal protective equipment that cannot be decontaminated.

#### 1.7 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The following items shall be included/addressed in the HASP:

1. a safety and health risk or hazard analysis for each site task and operation in the workplan;
  - a. a physical hazard evaluation and hazard control plan shall be included covering, but not limited to the following, as applicable:
    - 1) equipment operation;
    - 2) confined space entry;
    - 3) slips, trips, and falls;
    - 4) building collapse;
    - 5) falling debris;
    - 6) encountering unmarked utilities;
    - 7) cold and heat stress;
    - 8) hot work (cutting and welding);
    - 9) drum and container handling;
    - 10) trench and/or excavation entry.
2. the employee safety and health training program covering each site task and operation in the workplan.
3. personal protective equipment to be used for each site task and operation in the workplan.
4. site control measures to address visitors, delivery personnel, and to protect the worksite from unauthorized access.
5. an emergency response plan for the safe and effective response to foreseeable emergencies;
  - a. including, but not limited to the following:
    - 1) a map indicating the route to a nearby hospital or medical clinic for emergency medical care;
    - 2) procedures for emergency medical treatment and first aid;
    - 3) site evacuation routes and procedures;
    - 4) emergency alerting and response procedures.

## PART 2 PRODUCTS

### 2.1 AIR MONITORING EQUIPMENT

- A. If organic vapors or total hydrocarbons are known, likely, or suspected to be encountered during the work:
  1. provide and maintain a portable photo-ionization detector (PID) or flame-ionization detector (FID) capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 parts per million (PPM) level.

- B. If hazardous atmospheres (oxygen, hydrogen sulfide, carbon monoxide, methane, etc.) are known, likely, or suspected to be encountered during the work:
  - 1. provide and maintain an applicable multi-gas analyzer to measure concentrations in applicable work environments (i.e. confined spaces, trenches, tunnels, buildings, etc.).
- C. If there is a potential for the accumulation of explosive gas:
  - 1. provide and maintain an explosimeter (LEL meter).
- D. If there is a potential for visible dust emissions or the site, dust monitoring must be considered.
  - 1. The Contractor is responsible for monitoring fugitive dust emissions in accordance with applicable local, state, and federal regulations.
  - 2. Equipment shall be sensitive to particulate matter less than 10 micrometer in size (PM<sub>10</sub>) at a level of 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).
  - 3. Contractor shall outline the dust monitoring program in their HASP, including applicable action levels.
- E. All air monitoring equipment shall remain the property of the Contractor.
- F. All air monitoring equipment readings must be recorded and be available for federal, state, and/or local regulatory personnel to review.

## 2.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. All PPE must conform to the OSHA requirements, as indicated in the previous Reference Standards Section. Various PPE to be furnished by the Contractor under different levels of protection for their own personnel and subcontractor's personnel include, but are not limited to, the following:
  - 1. Level D Protection:
    - a. Coveralls or Tyvek
    - b. Gloves
    - c. Safety boots/shoes
    - d. Safety glasses
    - e. Hearing protection (for high noise operations)
    - f. Hard hat with optional face shield
  - 2. Level C Protection:
    - a. Air-purifying respirator
    - b. Chemical protective overalls or Coveralls (e.g., Saran coated Tyvek)
    - c. Gloves, inner (disposable, surgical type)
    - d. Gloves, outer (Neoprene, Nitrile, Viton or Butyl)
    - e. Boots, chemical protective, steel toe and shank (Neoprene or Nitrile)



- f. Booties, chemical protective (disposable PVC)
  - g. Hard hat
  - h. Face shield (if necessary)
3. Levels B and A represent increased levels of personal protection and are described in the Reference Standards.
4. Contractor is fully responsible for all PPE selection (including the various stages of protection), proper use, maintenance, and continuous monitoring.

### PART 3 EXECUTION

#### 3.1 HEALTH AND SAFETY PLANNING AND IMPLEMENTATION

- A. Implement the HASP throughout the execution of all applicable work.
- B. The Contractor shall perform all monitoring as detailed in the HASP.
- C. Contractor(s) shall implement routine health and safety meetings and any follow-up supplemental briefings.
- D. Provide applicable health and safety training for all personnel who may come in contact with or be exposed to various dangerous, hazardous, or changing site conditions.
- E. Personnel who have not received applicable training and who are not equipped with the required PPE, shall not be permitted access to the site by the Contractor during the course of the work that may result in potential exposures to unsafe or hazardous site conditions.
- F. Contractor shall periodically monitor dust conditions. The dust monitoring results shall be compared to a permissible concentration for PM<sub>10</sub> of 150 µg/m<sup>3</sup>. If a time-weighted average exceeds this dust action level, the Contractor shall implement dust control measures. Dust monitoring records must be provided to Engineer.

#### 3.2 PERSONNEL AND EQUIPMENT DECONTAMINATION

- A. All equipment shall be provided to the work site free of contamination. Engineer may prohibit from the site any equipment which in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of Contractor's equipment prior to arrival at the site shall be at the expense of Contractor. Contractor is prohibited from decontaminating equipment on the project site which is not thoroughly decontaminated prior to arrival.
- B. Contractor shall furnish labor, materials, tools, and equipment for decontamination of all personnel, equipment and supplies which are used to handle contaminated materials.
- C. Properly store and dispose of contaminated PPE and all other generated decontamination waste.

#### 3.3 INCIDENT REPORTING

- A. The Contractor shall comply with all accident and/or incident reporting requirements, including the following:
  - 1. Should any unforeseen safety-related factor, hazard, or condition become evident during the course of the work, the Contractor must immediately take action to

establish, maintain, and secure the site and working conditions. This shall be followed by immediate notice to the Owner and Engineer.

2. If injury to any person on-site occurs, the Contractor shall immediately report the incident to the Owner and Engineer. Corrective actions shall be implemented.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01350 Health and Safety Plan.docx

## SECTION 01450

## QUALITY CONTROL

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Quality assurance and control of the Work
  - 2. Testing and inspection services
  - 3. Cooperation with Owner's independent testing agency
  - 4. Product test reports
  - 5. Manufacturer's field service
- B. Related Requirements
  - 1. Section 01451 - Independent Testing Services
  - 2. Testing requirements are described in various Sections of the Project Manual.

## 1.2 SUBMITTALS

- A. Informational Submittals
  - 1. Product test reports

## 1.3 QUALITY ASSURANCE

- A. Monitor quality control over Suppliers, products, services, site conditions, and workmanship to produce Work of specified quality.
- B. Comply fully with manufacturer's instructions. Should these instructions conflict with the Specifications, request clarification from the Owner before proceeding.
- C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or requirements indicate higher standards or more precise workmanship.

## 1.4 TESTING SERVICES FURNISHED BY CONTRACTOR

- A. Furnish all testing services required for materials and equipment proposed to be used in the Work, and quality control tests made in the field including:
  - 1. Concrete materials and mix designs
  - 2. Concrete in place
  - 3. Modified proctor analyses for all borrow materials used on the Project
  - 4. Modified proctor analysis of all subgrade material to be compacted during surface preparation and fine grading and compaction work
  - 5. Sieve analyses for all borrow materials used on the Project
  - 6. Soil structure and nutrient analyses for all loam and topsoil used on the Project

7. Compaction tests performed during trench backfilling and compaction, rough grading and site preparation, fine grading and compaction of roadway and sidewalk subgrades, and placement of roadway and sidewalk subbase materials
  8. Design of asphalt mixtures
  9. Asphalt in place
  10. Field welded joints
  11. All other tests and engineering data as required in the Contract Documents.
- B. Testing agencies must meet the requirements of Section 01451.
  - C. An independent commercial testing laboratory, with current Massachusetts certification, shall perform all tests that require the services of a laboratory to determine compliance with the Contract Documents. Independent testing laboratory requirements are defined under Section 01451.
  - D. Secure and deliver the required number of samples to the laboratory as required by the Contract Documents.
  - E. Notify Owner and Engineer of time, location and material being sampled.
  - F. Schedule necessary testing laboratory services.
  - G. Furnish written reports of each test within 48 hours of completion of testing.
  - H. Notify the Engineer 48 hours prior to operations requiring inspections and laboratory testing services so the Engineer may witness testing. All failed test areas shall be re-worked and re-tested until passing results are obtained.
  - I. The Owner may hire its own independent testing laboratory for quality control tests made in the field or laboratory on materials and equipment during and after their incorporation in the Work. Cooperate with the Owner and independent testing laboratory and furnish samples of materials, design, mix, equipment, tools, storage, and assistance as requested.
  - J. Re-work all failed test areas until passing results are obtained. All re-tests required as a result of the Contractor's failure to perform the work in accordance with the Contract Documents shall be at the Contractor's expense.
- 1.5 CODE COMPLIANCE TESTING
- A. Provide inspections and tests required by codes or ordinances, or by a legally constituted authority having jurisdiction over the Work.
- 1.6 PRODUCT TEST REPORTS
- A. Submit 2 copies of product test reports where required by the Contract Documents.
- 1.7 SUPPLIERS' FIELD SERVICE
- A. Provide qualified field service and installation personnel from material and equipment Suppliers to observe site conditions, installation techniques, quality of workmanship, equipment start-up, adjustment, and performance test where required by the Contract Documents. Observations are to be reported and incorporated in the Work procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01450.docx

## SECTION 01451

## INDEPENDENT TESTING SERVICES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Independent testing services including geotechnical, concrete, grout and mortar, and welding inspection and testing
  - 2. Testing laboratory services
- B. Related Requirements
  - 1. Section 01450 - Quality Control

## 1.2 REFERENCES

- A. General
  - 1. ASTM E329 – Standard Specifications for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction
- B. Soil Testing
  - 1. American Association of State Highway and Transportation Officials (AASHTO)
- C. Concrete Testing
  - 1. Cement and Concrete Reference Laboratory (CCRL)
- D. Welding Inspection
  - 1. American Welding Society (AWS) B1.11 - Guide for the Nondestructive Examination of Welds
  - 2. AWS B5.1 - Specifications for the Qualifications of Welding Inspectors
  - 3. AWS B5.15 - Specifications for the Qualifications of Radiographic Interpreters
  - 4. AWS ARE - 6 Test Methods for Evaluating Welded Joints
  - 5. AWS ARE - 10 Monitoring and Control of Welding and Joining Processes
- E. Coating Inspection
  - 1. National Association of Corrosion Engineers (NACE)
  - 2. SSPC – The Society for Protective Coatings

## 1.3 SUBMITTALS

- A. Informational Submittals
  - 1. Qualifications, experience, and certifications of each proposed testing service
  - 2. Certificate of calibration for testing equipment

3. Inspection and test reports

1.4 QUALITY ASSURANCE

A. General

1. Comply with the requirements of Section 01450, Quality Control, for testing and inspection requirements.
2. Testing services shall have the following general qualifications:
  - a. Minimum five years as a firm with the type of testing specified.
  - b. Ability to provide timely field testing services to minimize the impact of the testing requirements on construction progress.
  - c. Certification to perform the specified services in the state in which the Work is to be performed.
3. Testing services proposed by the Contractor shall be subject to review by the Owner and Engineer. Any testing firm not acceptable to the Owner or Engineer will be rejected.

B. All testing agencies and laboratories must meet the requirements of ASTM E329.

C. Testing company shall have been in business for a minimum of the last 5 years providing applicable testing services.

D. Testing equipment shall be calibrated at maximum 12 month intervals by devices of accuracy traceable to National Bureau of Standards. Submit copy of certificate of calibration made by accredited calibration agency.

E. Testing shall be in accordance with applicable codes and regulations referenced in individual Specification Sections, and with selected standards of the American Society for Testing and Materials.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 TESTING SERVICES – GENERAL

A. Provide testing services meeting the following:

1. Provide qualified personnel promptly on notice.
2. Perform inspections required by the Contract Documents. Sample and test materials and observe methods of construction to determine compliance with applicable standards and with the requirements of the Contract Documents.
3. Take specimens and samples for testing, as required in individual Specification Sections. Provide all sampling equipment and deliver all specimens and Samples.
4. Promptly notify the Owner and the Engineer of irregularities or deficiencies in the Work which are observed during performance of services.
5. Promptly submit 2 copies of reports of inspections and tests to the Owner, and one copy to the Engineer including:

- a. Date issued
  - b. Project title and number
  - c. Testing laboratory or agency name and address
  - d. Name and signature of inspector
  - e. Date of inspection or sampling
  - f. Record of temperature and weather
  - g. Date of test
  - h. Identification of product and Specification Section
  - i. Location of Project
  - j. Type of inspection or test
  - k. Results of tests and observations regarding compliance with Contract Documents
- B. Perform additional tests and services as required to assure compliance with the Contract Documents.
  - C. Obtain Owner's approval of testing laboratory before performing testing services.
  - D. Coordinate with testing laboratory.
- 3.2 GEOTECHNICAL TESTING
- A. Provide field testing and laboratory services for geotechnical soil testing required in Sections 02315 and 02320.
- 3.3 CONCRETE TESTING
- A. Provide qualified independent field and laboratory testing service to perform the concrete testing required in Division 3 of the specifications.
  - B. The concrete testing laboratory shall have been inspected by the CCRL within the past five years.
  - C. The testing laboratory shall be licensed by the Commonwealth of Massachusetts.
  - D. Field testing technicians shall have a Grade 1 concrete field technician license as issued by the American Concrete Institute (ACI).
- 3.4 WELDING INSPECTION AND TESTING SERVICES
- A. Provide qualified independent welding inspection services as required in Section 13200 of the specifications.
  - B. The welding inspector(s) shall be qualified under the requirements of AWS B5.1. Radiographic interpretation shall be performed by persons qualified under AWS B5.15.
- 3.5 COATING INSPECTIONS
- A. The Owner will provide independent coating inspection services to inspect work described in Division 9 of the specifications.
- 3.6 COORDINATION WITH TESTING LABORATORY



- A. Provide testing laboratory personnel access to site and manufacturer's operations.
- B. Provide laboratory with representative samples of materials to be tested in required quantities.
- C. Furnish labor and facilities:
  - 1. To provide access to Work to be tested.
  - 2. To facilitate inspections and tests.
  - 3. For laboratory's exclusive use for storage and curing of test samples.
  - 4. to provide forms for preparing concrete test beams and cylinders.
- D. Notify laboratory sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.
- E. Arrange with laboratory and pay for additional inspections, samples, and tests required for Contractor's convenience.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01451.docx

SECTION 01520

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
  - 1. Temporary sanitary and first-aid facilities

1.2 QUALITY ASSURANCE

- A. Maintain temporary construction facilities in proper and safe condition throughout the progress of the Work.

1.3 TEMPORARY SANITARY AND FIRST AID FACILITIES

- A. Provide suitably enclosed chemical or self-contained toilets for the use of the labor force employed on the Work. Toilets shall be located near the Work sites and secluded from observation insofar as possible. Toilets shall be serviced weekly, kept clean and supplied throughout the course of the Work.
- B. Contractor shall enforce proper use of sanitary facilities.
- C. Use of the Owner's sanitary facilities by the Contractor is prohibited.
- D. Provide a first aid station at the site.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01520.docx

SECTION 01560  
TEMPORARY BARRIERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
  - 1. Temporary Fencing System
- B. Related Requirements
  - 1. Section 01720, Field Engineering

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 520 CMR 14.00, and the local and/or regional permit required to be obtained as part of this regulation, for temporary fencing.
- B. Provide temporary fencing system to protect the work area. Fencing system shall be installed such that the fence system cannot be moved by hand.
- C. The Contractor will retain ownership of the temporary fencing system after the completion of the Work.

1.4 SITE SECURITY

- A. Provide 6-foot high chain link temporary fencing system to prevent unauthorized access to construction areas. The location of the temporary fence is shown on the drawings.
- B. Do not move the fence system under any circumstances until the construction activities are complete.
- C. Remove the temporary fencing system after the completion of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Site security fencing shall be a 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>	<u>O.D.</u>	<u>Weight/ Lin. Ft.</u>
Terminal, corner posts	3 in.	2.875	5.79 lbs.
Line posts	2-1/2 in.	2.375	3.65 lbs.

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 and 1.4 above.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\DIV 01\01560.docx

## SECTION 01570

## TEMPORARY CONTROLS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Dust control
  - 2. Drainage and erosion control
  - 3. Erosion Control Barrier
  - 4. Mulch
  - 5. Sediment trapping devices
- B. Related Requirements
  - 1. Section 02920 – Lawns and Grasses

## 1.2 SUBMITTALS

- A. Informational Submittals
  - 1. Materials proposed for use in dust control
  - 2. Haybales, siltation fence, mulch, and sediment trapping devices

## PART 2 PRODUCTS

## 2.1 EROSION CONTROL BARRIER

- A. Straw wattles shall be dense 9” diameter tubes, made with certified noxious weed-free straw bound by netting of the type normally used for siltation or erosion control or construction projects.

## 2.2 SEDIMENT TRAPPING DEVICES

- A. Sediment trapping devices shall be Siltsack®, Dandy Bag II®, or equal.

## 2.3 MULCH

- A. Hay mulch shall consist of mowed cured grass, clover, alfalfa, timothy, oats, or wheat. No salt hay shall be used.

## PART 3 EXECUTION

## 3.1 DUST CONTROL

- A. Control dust during the Work.
- B. Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be policed and controlled to prevent spreading of the material.
- C. Control dust during the work on-site using calcium chloride and/or water.

- D. During the Work on-site, all paved road and driveway surfaces shall be scraped and broomed free of excavated materials on a daily basis. The surfaces shall be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface shall be exposed.
- E. Ensure that the existing equipment, facilities, and occupied space adjacent to or nearby areas of the work do not come in contact with dust or debris as a result of concrete demolition, excavation or surface preparation for coatings.
- F. Control dust by the construction of temporary wooden frame/polyethylene sheeting walls and covering enclosures separating adjacent or nearby areas and equipment from the Work site.
- G. Submit for approval materials proposed for use for dust control, prior to start of the Work.

### 3.2 DRAINAGE AND EROSION CONTROL

- A. Control erosion and siltation during the construction through mulching, diversion and control of storm water run-off, ponding areas and similar methods.
- B. Discharge surface runoff from any disturbances to the site into silt containment basins. Utilize siltation prevention measures including haybale and geotextile fences before discharge to drainage systems.
- C. Install sediment trapping devices in catch basins located in existing paved areas with sediment trapping devices to minimize the transport of sediment through the subsurface stormwater collection system.

### 3.3 RESTORATION

- A. Provide erosion control, seed and mulch and netting for surface restoration of areas disturbed during construction activities.
- B. Provide temporary stabilization of disturbed areas that remain inactive greater than 14 consecutive days to minimize erosion. Methods to minimize erosion may include but are not limited to:
  - 1. Spreading straw and/or providing temporary planting stabilization.
  - 2. Installing jute netting.
  - 3. Preparing surfaces to increase the runoff flow path, reduce the runoff flow velocity, or create small storage pockets to retain surface flows. Methods of accomplishing this include using mechanical devices such as track equipment or sheep's foot rollers.
- C. Restore the ground surface in brush and/or woodland areas by machine spreading of existing stripped surface soils (loam and humus), liming, fertilizing, seeding and mulching, as well as installing jute netting where required by steep slopes.
- D. Salvage existing loam and topsoil and stockpile this material for re-spreading where originally removed. On backfilling, grading shall be returned to preconstruction contours and the stockpile of loam shall be spread over areas disturbed during construction activities.
- E. Place mulch on seeded areas. Use jute netting on areas having a slope greater than 3 horizontal to 1 vertical, to anchor the mulch until a satisfactory growth is obtained. If

seeding is not possible because of the time of the year, apply mulch and netting to stabilize the area until such time as seed can be sown.

- F. Provide grading, refertilizing, reseeding, remulching and/or netting to maintain the restored areas until the Work is accepted by the Owner.
- G. Seed shall be as specified under Section 02920.

#### 3.4 CLEANING

- A. Remove any sediment that builds up around the straw wattles or catchbasins.
- B. Clean sediment trapping devices periodically during the Work. Devices shall be cleaned on a weekly basis, or more frequently if the devices become clogged.
- C. Clean catchbasins that collect sediment as a result of the Work.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01570.docx

## 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
  - 4. Inspection of Offsite Work

## 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. 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.
- H. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required. Provide suitable and adequate storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished, until the final completion and acceptance of the Work.
- I. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.
- J. 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.

- K. No material or equipment will be permitted to be stored in any of the Owner's facilities, unless otherwise approved by the Engineer.
- L. 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.
- M. Contractor shall be fully responsible for loss or damage to stored materials and equipment.
- N. 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.
- O. 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.
- P. Treat ferrous surfaces not receiving finish coats of paint with rust preventive coating, and protect non-ferrous metal work and devices with suitable wrappings.

#### 1.6 INSPECTION OF OFFSITE WORK

- A. The Owner and Engineer will inspect Work performed away from the construction site during fabrication, manufacture, or testing, or before shipment. Give 2 weeks written notice regarding the place and time where such fabrication, manufacture, testing, or shipping will be done.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01600.docx

## SECTION 01630

## PRODUCT SUBSTITUTION DURING CONSTRUCTION

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Product substitution procedures

## 1.2 CONTRACTOR'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by performance or reference standard, select product meeting that standard, by any Supplier. To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or Suppliers named, which fully complies with the Drawings and Specifications. Another "or-equal" product can also be considered by the Engineer if it complies with the provisions of Article 7.04, Section 00700. If a product proposed by the Contractor does not qualify as an "or-equal" item, then it can be considered as a proposed substitute item, and the Contractor must comply with the requirements of Article 7.05, Section 00700.
- C. For products specified by naming products or manufacturers and followed by words indicating that no "or-equal" item or substitution is permitted, there is no option and no substitution will be allowed.
- D. Where more than one choice is available as a Contractor's option, select product that is compatible with other products already selected or specified.

## 1.3 SUBSTITUTIONS

- A. If in the Engineer's sole discretion a product proposed by the Contractor does not qualify as an "or-equal" item under the provisions of Article 7.04 of Section 00700, it can be considered a proposed substitute item. Submit information required under Article 7.05, Section 00700 for proposed substitutes.
- B. The Engineer will consider written requests from the Contractor for substitutions within 30 days after the Notice to Proceed. After this period, requests will be considered only in case of unavailability of product or other conditions beyond control of the Contractor.
- C. Submit 5 copies of request for substitutions. Submit a separate request for each proposed substitution. In addition to the submittal requirements outlined in Article 7.05 of Section 00700, include the following in each substitution request:
  - 1. For products or Suppliers:
    - a. Product identification, including Supplier & manufacturer's name and address.
    - b. Manufacturer's literature with product description, performance and test data, and reference standards.
    - c. Samples, if appropriate.

- d. Name and address of similar projects on which product was used, and date of installation.
- 2. For construction methods (if specified):
  - a. Detailed description of proposed method.
  - b. Drawings illustrating method.
- 3. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, Supplier or method specified.
- D. The substitution request shall include written certification and statements that are outlined in Article 7.05 of Section 00700.
- E. A request constitutes a representation that Contractor:
  - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
  - 2. Will provide same or better guarantees, warranties or bonds for proposed substitution as for specified product.
  - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives all claims for additional costs or time extension which may subsequently become apparent.
  - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities having jurisdiction.
- F. A proposed substitution will not be accepted if:
  - 1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
  - 2. It will delay completion of the Work.
  - 3. It is intended or implied on a Shop Drawing and is not accompanied by a formal request for substitution from the Contractor.
- G. The Contractor is responsible for all costs relating to substitution requests.
- H. Approval of a substitution does not relieve the Contractor from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01630.docx

## SECTION 01720

## FIELD ENGINEERING

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Establishment of lines, benchmarks, and elevations required to layout and construct the Work
2. Property line survey and delineation

## 1.2 SUBMITTALS

## A. Informational Submittals

1. Submit the qualifications of the Registered Professional Engineer and/or Registered Land surveyor to be hired to perform various portions of the Work, as applicable.
2. Submit documentation verifying the accuracy of field engineering work.
3. Submit 4 copies of final record drawings of field engineering layouts and as-built survey.
4. Submit certificate signed by registered (licensed) engineer or surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain deviations.

## 1.3 RECORDS

- A. Maintain a complete, accurate log of control and survey work as it progresses.

## 1.4 QUALITY ASSURANCE

- A. Employ a qualified engineer, registered with the Commonwealth of Massachusetts as a Professional Engineer or a competent surveyor, registered with the Commonwealth of Massachusetts as a Land Surveyor, as required for the particular characteristics of the work being performed.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

## 3.1 PROCEDURES

- A. The Registered Professional Engineer or Land Surveyor provided shall establish and maintain lines, elevations and reference marks needed during the progress of the Work and shall re-establish stakes and marks placed by the Engineer that are lost or destroyed through the course of the Work. Verify such work by instrument or other appropriate means.
- B. The Engineer shall be permitted at all times to check the lines, elevations and reference marks, set by the Contractor, who shall correct any errors disclosed by such check. Such a check shall not be construed to be an approval of the Contractor's work and shall not

relieve or diminish the responsibility of the Contractor for the accurate and satisfactory construction and completion of the entire Work.

- C. Make, check, and be responsible for measurements and dimensions necessary for the proper construction of and the prevention of misfittings in the Work.
- D. Furnish all protective stakes and temporary structures for marking and maintaining points and lines for the building of the Work, and give the Engineer such facilities and materials for verifying said lines and points as he may require.
- E. Revisions to the layout and elevations of the Work as defined by the Contract Documents shall be approved by the Engineer.
- F. Maintain and prepare final record drawings of field engineering layouts and as-built survey conducted after completion of the Work.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
01\01720.docx

## SECTION 01725

## PRESERVATION AND RESTORATION OF PROJECT FEATURES

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Protection and replacement of trees, shrubs, signs, property markers, fences, benches, existing flagpole, monuments, 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, benches, 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. Trees, shrubs, and similar items shall not be removed except where indicated on the drawings or as 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. 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. Work affecting water distribution systems, which will take fire hydrants out of service, must be coordinated with the local fire department. The Contractor shall be prepared to restore fire flows in the event of an emergency or to provide for temporary fire flow service in accordance with the requirements of the local fire department.
  6. 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.
  7. 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 01\01725.docx

## SECTION 01770

## CLOSEOUT PROCEDURES

## PART 1 GENERAL

## 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 for review, approval, or comment. The as-built drawings shall show the completed work, including all deviations from the original Drawings. Take swing ties to all underground work from a minimum of two horizontal locations. Vertical dimensions to all below grade work shall also be obtained. All fittings, bends, valves and other appurtenances shall be shown. At a minimum, the following information shall be shown on the as-built drawings.

1. Ties to all buried fittings (including tees, crosses, bends, reducers, wyes, offsets, adapters, sleeves, caps, plugs), valves, services and structures from two horizontal measurements to permanent surface reference points, and depth below permanent grade. Permanent surface reference points are manholes, catch basins, power poles, and above-grade structures.
2. Ties to all surface structures (including manholes, catch basins, vaults, valve boxes, hydrants, curb stops, cleanouts, wet wells, outlets, etc.) from two horizontal measurements to permanent surface reference points. Re-station surface structures if stationed on Drawings.
3. Changes to pipe size and materials.

- B. Operation and Maintenance manuals - Provide four copies of operation and maintenance manuals for each type of equipment provided on the project. Manuals shall include as a minimum:

1. Detailed service, maintenance and operation instructions for each item supplied

2. Special maintenance requirements, along with special calibration and test procedures
  3. Operating instructions
  4. Preventative maintenance instructions
  5. Corrective-maintenance instructions
  6. Complete parts lists with stock numbers and name, address, and telephone number of the local supplier
- C. Provide warranties and bonds for items listed in pertinent sections of the Project Manual.
- D. Provide evidence of compliance with requirements of governmental agencies having jurisdiction.
- E. 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.
- F. Provide 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.

#### 1.5 FINAL PAYMENT

- A. Refer to Article 15.05 and 15.06 in 00700, General Conditions, for procedures relating to final inspection and payment.
- B. 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. The project and premises have been left in good order, including removal of all temporary construction, Contractor-owned and extraneous materials.

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION

##### 3.1 CLEANING

- A. 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.
- B. 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.

END OF SECTION

**DIVISION 2 - SITE WORK**

## SECTION 02225

## SELECTIVE DEMOLITION

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Scope of selective demolition, disturbance, and dismantling including, but not limited to, painted and unpainted metal equipment, such as handrails, lamp posts, etc. Also includes demolition and/or disturbance of unpainted and painted concrete spandrel walls. These components are part of proposed renovations to the Bridge of Flowers, located in Shelburne Falls, Massachusetts (the Site).
2. Paint chip sample laboratory results are attached herein as Appendix A. Painted metal equipment and masonry being disturbed were evaluated for the presence of lead. The gray/off white painted concrete spandrel walls and green painted metal handrails located at the Bridge of Flowers have detectable levels of lead.
3. Treat painted spandrel walls and metal handrails at the Bridge of Flowers that are to be repaired, drilled into, removed, demolished, or otherwise disturbed during this project, as containing lead and protect workers in accordance with OSHA requirements.
4. If creating dust, protect the environment by working from within a regulated and demarcated work area using engineering controls to reduce fugitive emissions and cover the ground surfaces, equipment to remain, other work areas at all times during painted component removal or paint disturbance activity.
5. A limited pre-renovation asbestos survey of the areas being planned for disturbance was performed on September 14, 2023, by Massachusetts licensed and certified asbestos inspectors representing Tighe & Bond. The results of the survey and laboratory data can be found in Section 13281 of the specifications.

## B. Related Sections

1. Section 01350 – Health & Safety Plan
2. Section 13281 – Asbestos Abatement

## 1.2 DEFINITIONS

- A. Demolish or Dismantle – To tear down, take apart, segregate waste streams, and lawfully recycle or dispose of 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 Salvage - Detach items from existing construction, in a manner to prevent damage, and store.
- E. Remove and Reinstall - Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- F. Existing to Remain - Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- G. Dismantle - To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

### 1.3 SUBMITTALS

- A. Quality Control Submittals prior to commencement of Equipment / Component Removal:
  - 1. Methods of demolition and equipment proposed for selective demolition. This submittal should be sufficient to demonstrate a thorough understanding of the Work to be completed and the means to safely complete the Work without damage to surrounding structures or resources. The Engineer will review the submittal for completeness but will not “Approve” the means and methods.
  - 2. Waste Management Plan, which shall indicate the types of waste to be generated and the proposed disposal or recycling locations.
  - 3. Copies of any authorizations and permits required to perform the work, including disposal/recycling facility permits and building permits.
- B. Lead Management Plan - Submit written procedures for the methods to be employed for lead impact work including methods to remove painted components scheduled for demolition/replacement. If work has the potential to create an airborne hazard, then provide information pertaining to dust control to a level of no emissions, surface preparation, containment construction (if necessary), ventilation, interface of trades, sequencing of lead related work, respirator usage, protective equipment, etc., as required in OSHA 29 CFR 1926.62, Lead in Construction. This plan may include the use of HEPA attachments for certain dust generating power tools.
- C. Keep and maintain the following records and disposal documentation throughout the project in chronological order in a 3-ring notebook with appropriate tabbed dividers as follows:
  - 1. Records of the amounts of waste generated, by waste type
  - 2. Evidence of lawful disposal or recycling of all wastes generated
  - 3. Copies of any analytical results generated as a result of waste stream characterization
  - 4. Copies of all recycling/disposal receipts

### 1.4 MATERIALS OWNERSHIP

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

- B. Although not observed, historic items, relics, antiques, and similar objects of interest or value to the Owner that may be uncovered during demolition remain the property of the Owner.

- 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

#### 1.5 REGULATORY REQUIREMENTS

- A. Contractor is solely responsible for obtaining permits or approvals (as applicable) which may be required to perform the work of this section, including all costs, fees and taxes required or levied.
- B. 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.
- C. 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.
- D. Conform to procedures identified in Section 01350 – Health and Safety Plan related to site hazards associated with the project with particular attention towards maintaining compliance with OSHA 1926.62, Lead in Construction regulations when impacting and creating lead dust during impact of any painted surface or component throughout the structure.

#### 1.6 PRE-INSTALLATION MEETINGS

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

#### 1.7 JOB CONDITIONS – SELECTIVE DEMOLITION

- A. Conduct selective demolition work in a manner that will minimize disruption of Owner's normal operations.
- B. The Owner assumes no responsibility for the actual condition of items or structures to be demolished. However, variations within the structures may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. 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 and general public to and from occupied portions of the facility.
  2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or work to remain.
  3. Protect from damage existing finish work that is to remain in place which will become exposed during demolition operations.
  4. Protect floors with suitable coverings, when necessary.
  5. Remove protections at completion of work.
- D. Promptly repair damage caused to adjacent facilities by demolition work at no additional cost to the Owner.
- E. 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.
- F. Do not close, block, or otherwise obstruct roadways, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Maintain existing utilities, keep in service, and protect against damage during demolition operations.
- H. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

## 1.8 FIELD CONDITIONS

- A. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner as far as practical.
- B. Lead Containing Paint is present in and around equipment and/or components being removed. Comply with this Section and the Health and Safety Plan before conducting any operation involving these materials.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner that shall not interfere with the operation of others at the facility, or employee's access and safety.
- B. Damaged or deteriorated materials shall not be used and shall be promptly removed from the premises.
- C. Waste Containers shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without risk of ripping, rupture, or exposure to persons, or emissions to the atmosphere.



**PART 3 EXECUTION****3.1 INSPECTION**

- A. Verify that utilities to items to be demolished have been disconnected and capped before starting selective demolition operations. Perform lock-out/tag-out procedures, as necessary.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
  - 1. Unknown Site Conditions - The information provided in the Drawings and in the Specifications is based on available information and is approximate. Field verify all information. Bear full responsibility for obtaining locations of underground structures, utilities, and their connections. Maintain services to buildings outside the limits of work, at no additional cost to the Owner.
- C. Verify that hazardous materials have been remediated before proceeding with selective demolition operations and/or that selective demolition will not disturb hazardous materials.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or videos.
  - 1. Inventory and record the condition of items to be removed and recycled. Provide photographs or videos of conditions that might be misconstrued as damage caused by such operations.

**3.2 SITE PREPARATION**

- A. Remove and/or stabilize all overhead hazards, prior to commencing work near any building. Where hazards cannot be stabilized, mark and control areas below hazards to prohibit access below the hazards. Similarly, all holes through the ground or weak sections of the ground shall either be covered or clearly marked to prohibit entry. If necessary, ground coverings shall be capable of supporting heavy equipment use.

**3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS**

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. Arrange to shut off utilities with utility companies, where applicable.
  - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components if indicated on Drawings to be removed.
  - a. Piping to Be Removed: Remove portions of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
  - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
  - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
  - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
  - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
  - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
  - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

### 3.4 PAINTED COMPONENTS AND DUST GENERATING OPERATIONS

- A. Contractors Responsibilities: Lead has been confirmed on painted spandrel walls and metal handrails at the Bridge of Flowers. Any Contractor whose activities may generate dust or impact on this painted surface shall conduct work in accordance with this Section and OSHA 1926.62 Lead in Construction.
- B. Compliance with OSHA 1926.62 Lead in Construction is required.

### 3.5 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people, damage to adjacent structures to remain, and contamination of the environment.
  1. Provide protection to ensure safe passage of people around selective demolition areas, and to and from occupied portions of the structure.
  2. Provide temporary weather protection on exterior surfaces during the interval between selective demolition of existing facilities and new construction, to prevent water leakage and damage to structures and interior areas.
  3. Protect existing finish work that is to remain or that is exposed during selective demolition operations.
  4. Cover and protect furnishings and equipment that are to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of structures and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of items being selectively demolished.

1. Strengthen or add new support when required during the progress of selective demolition.
2. Cease operations and notify the Owner and the Engineer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
3. Remove temporary barricades and protections where hazards no longer exist.

### 3.6 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering, and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Erect and maintain dust-proof partitions and closures as required to prevent the spread of dust, fumes, or debris to adjacent portions of the building.
  5. Keep outdoor surfaces sprinkled with water to minimize dust. Provide hoses and water connections for this purpose.
  6. Provide temporary weather protection during selective demolition and construction activities until such time that the new infill is constructed.
  7. If unanticipated mechanical, electrical, or structural elements which conflict with the intended function or design of the proposed improvements 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.
  8. Perform selective demolition work in a systematic manner. Provide scaffolding, as necessary. Use such methods as are required to complete the work indicated on the Drawings in accordance with the Contractor's demolition schedule and governing regulations.
  9. Do not use cutting torches unless approved by Owner and Engineer, and work area is cleared of flammable materials and cutting area is free of all paint. Maintain portable fire-suppression devices during flame-cutting operations.
  10. Contact local fire department with respect to flame -cutting operations and maintain fire watch as directed by the local fire department.

11. Maintain adequate ventilation when using cutting torches.
  12. Repair items impacted by selective demolition performed in excess of that required. Return structures and surfaces that remain to existing condition prior to commencement of selective demolition work.
  13. Dispose or recycle of demolished items and materials promptly.
- B. Removed Painted Items:
1. Render painted items “intact” before packaging for transportation. This includes removing and collecting loose and peeling paint.
  2. Loose and peeling paint or dust generated during these activities shall be collected and packaged for waste characterization and disposal.
  3. Pack or crate items after cleaning. Identify and label contents of containers.
  4. Protect items from damage during transport.
- C. Existing Items to Remain: Protect items indicated to remain against damage during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and reinstalled at their original locations after selective demolition operations are complete.

### 3.7 DISPOSAL OF DEMOLISHED MATERIAL

- A. General
1. The Contractor shall perform any necessary analytical testing to support facility acceptance of the waste. This includes but is not limited to approved waste characterization type paint TCLP testing/analytical for disposal. Waste characterization testing is typically subject to the requirements of the Contractors selected disposal facilities.
  2. Remove demolition waste materials from Project site and legally manage off-site in accordance with the Contractor’s Waste Management Plan.
  3. Accumulated waste and dust, spent PPE, plastic, etc. from drilling and coring operations, etc., shall be separated from unpainted solid waste streams and managed as lead waste. Waste characterization testing is subject to the requirements of the Contractors selected disposal facility.
  4. Do not allow demolished materials to accumulate on-site.
  5. Burning of demolition waste is not permitted.
  6. Painted components or equipment shall be rendered intact before packaging for disposal / recycling.
  7. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  8. If applicable, remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

- B. Provide evidence that the demolition materials have been received at a legal disposal, recycle, reuse or salvage location. Such proof may include waste shipment records, waste manifests, truck weight slips from an approved disposal facility or documentation of transfer of title. Transport of all materials off site shall be in accordance with applicable Department of Transportation Regulations. All materials leaving the site shall become the property of the Contractor.

END OF SECTION

J:\S\2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Abatement \ 02225 Selective Demolition.docx

## SECTION 02315

## EXCAVATION, BACKFILL, COMPACTION AND DEWATERING

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Excavation, backfill and compaction for bridges and other structures
  - 2. Excavation, backfill and compaction for subsurface utilities
  - 3. Earth retention systems
- B. Related Sections
  - 1. Section 01570 - Temporary Controls
  - 2. Section 02320 - Borrow Materials

## 1.2 REFERENCES

- A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
- B. Federal Register 40 CFR Part 122, United State Environmental Protection Agency (USEPA) Administered Permit Programs (National Pollution Discharge Elimination System or NPDES), Storm Water Discharge
- C. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- E. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- F. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F
- G. 520 CMR 14.00 Excavation and Trench Safety
- H. Commonwealth of Massachusetts Highway Department "Standard Specifications for Highways and Bridges," 1988 Edition as amended
- I. Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, latest edition

## 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. Licensed Site Professional - A person who is registered by the Commonwealth of Massachusetts to render Hazardous Waste Site Cleanup Activity Opinions.
- G. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- H. 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.
- I. 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.
- J. 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. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:
1. 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.
  2. For borrow materials; perform tests at frequency specified in Section 02320, Borrow Materials.
- D. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled or at a minimum of one test per lift. The Engineer will determine the locations and lifts to be tested. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.
1. Methods and equipment proposed for compaction shall be subject to prior review by the Engineer. Compaction generally shall be done with vibrating equipment. Static rolling without vibration may be required by the Engineer on sensitive soils that become unstable under vibration. Displacement of, or damage to existing utilities or structure shall be avoided. Any utility or structure damaged thereby shall be replaced or repaired as directed by the Engineer.
  2. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
    - a. Any costs associated with correcting and retesting as a result of a failure to meet compaction requirements shall be borne by the Contractor.
    - 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 the project requirements, 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 trenches are so narrow that trench walls impact the attenuation of the gamma radiation, when adjacent to concrete that impacts the accuracy of determining moisture content, or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.

## 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), 520 CMR 14.00, and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

## 1.6 PROJECT CONDITIONS

- A. Notify Dig Safe and obtain Dig Safe 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.

- C. Make explorations and Excavations to determine the location of existing underground structures, pipes, house connection services, and other underground facilities in accordance with Paragraph 3.2.D of this Section.
- D. In accordance with 520 CMR 14.00, no person shall, except in an emergency, make an excavation in any public way, public property, or privately owned land until a permit is obtained from the appropriate designated permitting authority. For this project, the permit should be obtained from the Town of Shelburne or Buckland as applicable.

## PART 2 PRODUCTS

### 2.1 SOIL MATERIALS

- A. Fill material is subject to the approval of the Engineer and may be borrow from off site. Fill material 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. Additional requirements are included in Section 02320.
- 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.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Public Safety and Convenience
  1. Adhere to the requirements of 520 CMR 14.00 for all excavation work.
  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. Sheeting
    - a. 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.
    - b. Drive sheeting ahead of and below the advancing excavation to avoid loss of materials from below and from in front of the sheeting.
    - c. Sheeting 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.
  4. Remove earth retention system, 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.
    - a. 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 to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section, at no additional cost to the Owner.
  2. Excavate with equipment selected to prevent damage to existing bridge, adjacent structures, 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. The sawcut shall be neat in appearance with no ragged lines; trim pavement as necessary.
  4. Perform excavation in such a manner as to prevent disturbance of the final subgrade. The Engineer or Owner may require the final six inches of excavation be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost if subgrade disturbance is considered excessive as judged by the Engineer or Owner.
  5. During excavation:
    - a. Excavated material not required or not suitable for backfill shall be removed from the site and disposed of in accordance with local, State and Federal laws and regulations.
    - 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.
  6. 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.
  7. Make pipe trenches as narrow as practicable and keep the sides of the trenches undisturbed until backfilling has been completed. Provide a clear distance of 12 inches on each side of the pipe.
  8. Perform the excavation in such a manner as to prevent disturbance of the final subgrade. If excessive subgrade disturbance is occurring, as judged by the Owner or Engineer, then the final 6 inches of the excavation shall be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost to the Owner.
    - a. Grade the excavation bottom to provide uniform bearing and support for the bottom quadrant of each section of pipe.
    - b. Excavate bell holes at each joint to prevent point bearing.
    - c. Remove stones greater than 6 inches in any dimension from the bottom of the trench to prevent point bearing.
- 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. Prior to backfilling or placement of structures, excavated subgrades shall be proof compacted with either 10 passes of a 10-ton vibratory drum roller for open excavations or 6 passes of a large, reversible, walk behind vibratory compactor capable of exerting a minimum force of 2,000 pounds in trench or pit excavations. Soft or weak spots shall be over-excavated and replaced with compacted Granular Fill or compacted Crushed Stone wrapped in a non-woven geotextile, as directed by the Owner or their representative. If proof compaction will prove detrimental to the subgrade due to the presence of groundwater, static rolling may be allowed at the discretion of the Engineer or Owner.
  4. Soil bearing surfaces shall be protected against freezing and the elements before and after concrete placement. If construction is performed during freezing weather, structures shall be backfilled as soon as possible after they are constructed. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.

5. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.
  - a. Use borrow material if there is no excess of excavated material available at other portions of the Project.
6. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.
7. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.
8. 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.
9. Do not drop large masses of backfill material into the trench endangering the pipe or adjacent utilities.
10. Install pipe in rock excavated trenches on a 3/4" crushed stone bedding with a minimum depth of 6 inches. Shape the stone bedding at the pipe bells to provide uniform support. Encase the pipe in the 3/4" crushed stone bedding to a grade 6 inches over the top of the pipe and the full width of the trench.
11. 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.
12. 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 conduit.
13. 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, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. 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.
14. The Contractor shall not place backfill against or on structures until they have attained sufficient strengths to support the loads to which they will be subjected, without distortion, cracking, or other damage. As soon as possible after the structures are adequate, they shall be backfilled with suitable backfill material.
15. Place and compact backfill around manholes, vaults, pumping stations, gate boxes or other structures in six-inch layers unless satisfactory compaction is

demonstrated otherwise to the Engineer through field-testing, from a point one foot over the pipe. Exercise care to protect and prevent damage to the structures.

### 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. Streets and drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep the street or road open and safe for two-way traffic unless otherwise indicated.
2. Construct and maintain such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. Provide substantial barricades at crossings of trenches, or along the trench to protect the traveling public.
3. Where deemed necessary, such additional passageways as may be directed shall be maintained free of such obstructions. All material piles, open excavations, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, signage, or guards as necessary.
4. All traffic controls shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.

#### 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.
3. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during construction as judged by the Engineer.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 02\02315.docx

## 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. Stone Borrow
  - 4. Ordinary Borrow
- B. Related Sections
  - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering
  - 2. Section 02921 – Vegetative Support Material

## 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  $\mu\text{m}$  (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./ft<sup>3</sup>)
- 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
- I. Commonwealth of Massachusetts Highway Department “Standard Specification for Highways and Bridges,” 1988 Edition as amended

## 1.3 SUBMITTALS

- A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.

- B. 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.
- C. Provide modified proctor analysis (ASTM D1557) from certified soils testing laboratory for all borrow materials.
  - 1. Take and test a sample of low permeability soil for each 5,000 cy of material placed, or as directed by the Engineer.
  - 2. All other borrow materials shall be tested once unless more frequent testing is deemed necessary by the Engineer or Owner due to material variation.

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 WALKWAY 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 STONE BORROW

- A. Crushed Stone Borrow

1. Crushed stone borrow shall consist of one of the following materials:
  - a. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated or other objectionable pieces. A detrimental quantity will be considered as any amount in excess of 15% of the total weight. Thin stones shall be considered to be such stones whose average width exceeds 4 times their average thickness. Elongated stones shall be considered to be stones whose average length exceeds 4 times their average width.
  - b. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 8 inches.
2. The crushed stone shall be free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.
3. The crushed stone shall have a maximum percentage of wear as determined by the Los Angeles Abrasion Test (AASHTO-T-96) as follows:
  - a. For Class 1 Bit. Conc. 30%\*\*
  - b. For Cement Concrete Aggregate 45%\*\*\*
  - c. Crushed Stone for Subbase 45%

\*\*Crushed stone for this use shall consist of crushed or shattered natural rock only. Crushed gravel stone will not be permitted.

\*\*\*Except for 5000 psi or greater cement concrete and prestressed concrete which shall be 30%.
4. The crushed stone shall conform to the grading requirements shown in the following grading Table.

Sieve Size	Percent by Weight Passing Through	
	Minimum	Maximum
<b>¾" Crushed Stone</b>		
1"	100	--
¾"	90	100
½"	10	50
3/8"	0	20
No. 4	0	5

**2.3 ORDINARY BORROW**

- A. Ordinary borrow shall have the physical characteristics of soils designated as type GW, GP, GM, SW, SP or SM, under USCS and shall not be specified as gravel borrow, sand borrow, special borrow material or other particular kind of borrow. It shall have properties such that it may be readily spread and compacted for the formation of



embankments. The borrow shall not include rocks with a major dimension greater than 8 inches.

### 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. 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.
- G. 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.
- H. Place all borrow to keep it free of other materials and to prevent segregation.

END OF SECTION

\\tighebond.com\data\Data\Projects\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\02320.docx

## SECTION 02501

## DISINFECTION OF WATER DISTRIBUTION SYSTEMS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Procedures for disinfecting new and repaired water distribution systems
- B. Related Sections
  - 1. Section 02221 – Removal of Existing Hydrants and Gate Valves
  - 2. Section 02502 – Testing of Water Distribution Systems
  - 3. Section 02513 – Copper Pipe and Fittings
  - 4. Section 02514 – Ductile Iron Pipe and Fittings
  - 5. Section 02515 – Polyvinyl Chloride (PVC) Pipe and Fittings
  - 6. Section 02518 – Valves and Hydrants
  - 7. Section 02519 – Water Services

## 1.2 REFERENCES

- A. American Water Works Association, AWWA C651, *AWWA Standard for Disinfecting Water Mains*.
- B. American Public Health Association, American Water Works Association and Water Pollution Control Federation, *Standard Methods For the Examination of Water and Wastewater*.

## 1.3 SUBMITTALS

- A. A formal statement in writing to the Engineer that all crews responsible for installation and repairs within the operating distribution system have been properly trained and are aware of prescribed construction practices and disinfection procedures to avoid contamination to the operating distribution system.
- B. The name of competent person(s) responsible for the disinfection processes and performing the required bacteriological sampling. The Engineer will approve the disinfection process to be used in advance of any disinfection efforts.
- C. Certificate of compliance that the independent commercial laboratory performing the bacteriological sampling analyses is certified with the State Department of Environmental Protection and U.S. Environmental Protection Agency for analyzing public drinking water supplies.
- D. Certified results for all bacteriological sampling prior to restoring or placing the distribution system into service.
- E. For each section of pipe to be chlorinated, the Contractor shall inform the Engineer in writing of the locations for taps to be installed and utilized for the procedure.

## 1.4 QUALITY ASSURANCE

### A. Qualifications & Certifications

1. The Contractor shall employ trained personnel aware of the need to carefully observe prescribed construction practices and disinfection procedures in order to prevent contamination to the distribution system.
2. The competent person(s) responsible for the disinfection processes and bacteriological sampling shall be familiar with AWWA C651- Standards for Disinfecting Water Mains and experienced with the Continuous Feed Method of disinfection. The Engineer shall approve disinfection procedures in advance.
3. Bacteriological sampling shall be made in full accordance with AWWA C651 and under the supervision of the Engineer.
4. An independent commercial laboratory certified for analyzing public drinking water supplies by the State Department of Environmental Protection and U.S. Environmental Protection Agency shall analyze all bacteriological samples and provide certified results to the Engineer and/or Owner for review prior to restoring or placing the system into service.

## 1.5 PROJECT/SITE CONDITIONS

- A. The general procedure for disinfection and analyses is described in Part 3, Execution, of this section. If project conditions warrant the need for special disinfection procedures, obtain prior written approval from the Engineer.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. The forms of chlorine used in the disinfection operations shall conform to ANSI/AWWA B300. Materials Safety Data Sheets (MSDS) for the disinfectant shall be readily available for reference. The competent person responsible for the disinfection operation shall be fully trained and equipped to handle any emergency that may arise.

## PART 3 EXECUTION

### 3.1 DISINFECTION

- A. Before being placed into service, all new water pipelines shall be chlorinated using the Continuous Feed Method specified in AWWA C651 – Section 4.4.3. The Engineer shall approve the procedure in advance.
1. The Contractor will determine the location of the chlorination and sampling points in the field. The Contractor shall install taps for chlorinating, sampling and expulsion of air and shall uncover, backfill and plug the taps as required.
  2. Prior to disinfecting the water main, the main shall be completely filled to remove all air pockets and then flushed to remove particulate. The flushing velocity in the main shall not be less than 2.5 ft/s unless the Engineer and/or Owner determine that the conditions do not permit the required flow to be discharged to waste.

**TABLE 3.1-1**  
Required Flow to Flush Pipelines (40 psi residual pressure in water main)\*

<b>Pipe Diameter (in)</b>	<b>Flow Required to Produce 2.5 ft/s (Approximate) Velocity in Main</b>	<b>Number of 2 ½ inch Hydrant Outlets</b>
4	100 gpm	1
6	200 gpm	1
8	400 gpm	1
10	600 gpm	1
12	900 gpm	2
16	1600 gpm	2

\*AWWA C651, AWWA Standard for Disinfecting Water Mains

3. At a point not more than 10 feet downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will not have less than 25 mg/L (PPM) free chlorine throughout the entire section of pipe to be chlorinated.

**TABLE 3.1-2**  
Chlorine Required to Produce 25-mg/L Concentration in 100 Feet of Pipe – By Diameter\*

<b>Pipe Diameter (in)</b>	<b>100 % Chlorine (Pounds)</b>	<b>1% Chlorine Solution (Gals.)</b>
4	0.013	0.16
6	0.030	0.36
8	0.054	0.65
10	0.085	1.02
12	0.120	1.44
16	0.217	2.60

\*AWWA C651, AWWA Standard for Disinfecting Water Mains

4. The chlorinated water is to remain in the new pipeline for at least 24-hours. After a contact time of 24-hours there should be a free chlorine concentration of not less than 10 mg/L (PPM). During this period, proper precautions are to be taken to prevent this chlorinated water from flowing back into the existing system.
  5. All valves and hydrants within the treated section shall be operated to ensure disinfection of the appurtenances.
- B. The Tablet Method consisting of placing calcium hypochlorite granules or tablets in the water main as it is being installed and then filling the main with potable water and allowing it to set for a contact period is not acceptable.

- C. The interior of all pipe, fittings and valves used in making a repair or tie-in shall be swabbed or sprayed with a one percent (1%) hypochlorite solution before they are installed.

### 3.2 FINAL FLUSHING

- A. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system.
  - 1. Flushing the main is to be accomplished at as high a velocity as possible consistent with the ability of the Contractor to collect the discharge water for proper disposal.
  - 2. All treated water flushed from the lines shall be disposed of by discharging to the nearest sanitary sewer or by other approved means provided in AWWA C651.
  - 3. Flushing shall be done in strict conformance with all applicable local, state and federal regulations. No discharge of chlorinated water to any storm sewer or natural watercourse will be allowed.

### 3.3 BACTERIOLOGICAL ANALYSES

- A. After the 24-hour disinfection period and all chlorine solution has been thoroughly flushed, the bacteriological sampling and analysis of the replacement water may then be performed.
  - 1. Bacteriological sampling shall be made by the Contractor's competent person(s) in full accordance with AWWA C651- Section 5, *Bacteriological Tests* and under the supervision of the Engineer.
  - 2. Analysis shall be performed by an independent commercial laboratory certified by the State Department of Environmental Protection and U.S. Environmental Protection Agency for analyzing public drinking water supplies. All results shall be provided to the Engineer for review.
  - 3. Two consecutive sets of acceptable samples, taken at least 24-Hours apart are required prior to placing the main into service. Failure of any one of the bacteriological test samples shall require rechlorination and retesting by the Contractor.
  - 4. The line shall not be placed in service until the bacteriological requirements of AWWA C651 are met.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\02501.docx

## SECTION 02502

## TESTING OF WATER DISTRIBUTION SYSTEMS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Testing of pipe, castings, fittings, valves and accessories

## 1.2 REFERENCES

- A. American Water Works Association, AWWA C600, AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances
- B. ASTM B88, Standard Specification for Seamless Copper Water Tube

## 1.3 SUBMITTALS

- A. List of equipment and personnel to be used for the pressure test.

## PART 2 PRODUCTS – NOT USED

## PART 3 EXECUTION

## 3.1 TEST PARAMETERS

- A. For water mains, the pressure test shall not be conducted until the new main has been flushed clean, disinfected in accordance with Section 02501 and the chlorinated water properly disposed of. After acceptable completion of the water system disinfection, the Contractor may commence pressure testing of the new water main.
- B. Run pressure test and leakage test simultaneously in accordance with ANSI/AWWA C600.
- C. Test pressure shall not be less than 1.25 times the working pressure at the highest point along the test section. Test pressure shall not exceed pipe or thrust-restraint design pressures.
- D. The hydrostatic test shall be of at least 2-hour duration or until such time as the Engineer indicates acceptance of the pipeline.
- E. Test pressure shall not vary by more than  $\pm 5$  psi (35 MPa or 0.35 bar) for the duration of the test.
- F. On pipelines where the elevation along the route of construction varies substantially, the Engineer reserves the right to valve off and test portions of the line.
- G. On extensive construction jobs, the Engineer reserves the right to require the testing of individual portions of the line as construction proceeds rather than await completion of the entire project in order to undertake a pressure or leakage test.
- H. Do not operate valves in either direction at differential pressure exceeding the rated valve working pressure. Use of a test pressure greater than the rated valve pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests at these pressures, the test setup should include a provision, independent of the valve, to reduce the line pressure to the rated valve pressure on completion of the test. The

valve can then be opened enough to equalize the trapped pressure with the line pressure, or fully opened if desired.

- I. Test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

### 3.2 TIME FOR MAKING TESTS

- A. No pipeline is to be placed under pressure or subjected to hydrostatic pressure until at least 5 days have elapsed after the concrete thrust blocks have been installed. If high early strength concrete is used in the concrete thrust blocks, the hydrostatic pressure can be applied to the main after 2 days have elapsed from time of construction of the thrust blocks.
- B. The Contractor will be allowed to complete backfilling as hereinbefore specified, prior to undertaking the leakage and pressure tests. Backfilling prior to conducting tests will be at the option of the Contractor with the exception of intersections, driveways, crosswalks and other such locations where holding open the trench may adversely affect the public.
- C. Pipelines may be subjected to hydrostatic pressure and inspected for leakage at any convenient time after the trench has been partially backfilled. Partial backfilling shall consist of filling along the center of the pipe length and leaving the joint open for inspection.

### 3.3 OPERATION OF EXISTING WATER SYSTEM

- A. Do not operate any valve or other control device on the existing water system for any purpose. Do not make any tap or cut-in to the existing water system without the approval of the Engineer and unless an authorized representative of the Owner is present.
- B. When the Contractor's operations require the adjustment of any hydrant, valves, or other control device on the existing system, the Owner will provide authorized personnel for the purpose of supervising the operation of these control devices. Provide the personnel for the operation of these devices.

### 3.4 PREPARATION

- A. Conduct connections to the existing system under the Engineer's direction.
- B. To allow for proper filling, venting, testing, etc., install any corporation stops and/or special fittings which may be required. All such installation will be subject to the Engineer's approval.
- C. Foreign materials left in pipelines during installation often results in valve or hydrant seat leakage during pressure tests. Thorough flushing is recommended prior to a pressure test by partially opening and closing valves and hydrants several times under expected line pressure, with flow velocities adequate to flush foreign material out of the main, valves and hydrants. Flushing requirements are specified in Specification 02501, Part 3.1.A.2.

3.5 PROCEDURE

- A. On completion of the pipeline or any valved section thereof, fill pipeline with water and test. Draw water from the existing water system under the direction of the Engineer and the Department of Public Works.
- B. Before applying the specified test pressure, expel air completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, close the corporation cocks and apply the test pressure. At the conclusion of the pressure test, either remove and plug or leave in place the corporation cocks at the discretion of the Owner.
- C. Slowly fill each valved section of pipe with water, and apply the specified test pressure as described in Part 3.1 by means of a pump connected to the pipe in a manner satisfactory to the Engineer. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. The system shall be stabilized at the test pressure before conducting the leakage test.

3.6 EXAMINATION UNDER PRESSURE

- A. Examine exposed pipes, fittings, valves, hydrants, and joints carefully during the test.
- B. Repair or replace any cracked or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure tests with sound material, and repeat the test until it is satisfactory to the Engineer.

3.7 LEAKAGE TEST

- A. Leakage is defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof to maintain pressure after the pipe has been filled with water and the air has been expelled. Testing shall include all hydrants and hydrant branches. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
- B. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD \sqrt{P}}{148,000}$$

- Where: L = allowable leakage, in gallons per hour
- S = length of pipe tested, in feet
- D = nominal diameter of the pipe, in inches
- P = average test pressure during the leakage test, in pounds per square inch (gauge)

This formula is based on an allowable leakage of 10.5 gpd/mi/in of nominal diameter at a pressure of 150 psi.

- C. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gph/in. of nominal valve size will be allowed.



- D. When hydrants are in the test section, the test shall be made against the closed main valve in the hydrant.
- E. Acceptance of Installation - acceptance will be determined on the basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified in this section, locate and make approved repairs as necessary until the leakage is within the specified allowance at no additional cost to the Owner.
- F. Visible leaks are to be repaired, regardless of the amount of leakage.

END OF SECTION

J:\N\N0936 Northampton DPW\027 - Masonic Street Sewer Replacement\Specifications\Div 2\02502.docx

## SECTION 02514

## DUCTILE IRON PIPE AND FITTINGS

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Ductile iron pipe and fittings, direct buried or in below grade vaults
2. Restrained joints and fittings
3. Cast-in-place concrete anchor blocks and thrust blocks

## B. Related Sections

1. Section 02280 – Pipeline and Underground Structure Abandonment
2. Section 02315 – Excavation, Backfill, Compaction and Dewatering
3. Section 02317 – Underground Warning Tape
4. Section 02501 – Disinfection of Water Distribution Systems
5. Section 02502 – Testing of Water Distribution Systems

## 1.2 REFERENCES

## A. Pipe and fittings shall conform to the latest edition of the following standards unless otherwise specified:

1. ANSI/AWWA C104/A21.4, Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
2. ANSI/AWWA C110/A21.10, Ductile Iron and Grey Iron Fittings 3" through 48" for Water and Other Liquids.
3. ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
4. ANSI/AWWA C150/A21.50, Thickness Design of Ductile Iron Pipe.
5. ANSI/AWWA C151/A21.51, Ductile Iron Pipe, Centrifugally Cast, for Water.
6. ANSI/AWWA-C153/A21.53, Ductile Iron Compact Fittings Water Service.
7. ANSI/AWWA C600, Installation of Ductile Iron Water Mains and their Appurtenances.
8. ANSI/AWWA C800, Underground Service Line Valves and Fittings.
9. ANSI/AWWA C651, Disinfecting Water Mains.
10. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
11. ASTM A536, Standard Specification for Ductile Iron Castings
12. ASTM B88, Standard Specification for Seamless Copper Water Tube.

13. Ductile Iron Pipe Research Association, “Thrust Restraint Design for Ductile Iron Pipe” (Current Edition).

### 1.3 SUBMITTALS

#### A. Administrative Submittals

1. Detailed description of proposed pipe handling and installation methods along with the manufacturer’s approval of those methods.
2. Construction details and schedule of Work for each connection to existing piping at least 7 days prior to beginning the Work. Approval must be received before commencement of Work on-site.

#### B. Shop Drawings

1. Manufacturer’s drawings and catalog cuts, including descriptive literature indicating product characteristics and conformance with specifications and code requirements. Submit shop drawings for ductile iron pipe; fittings; couplings; filling rings; linings and coatings; and all accessories.
2. Location for each type of restrained joint or device to prevent joint separation along with installation, assembly and disassembly instructions.

#### C. Quality Control Submittals

1. Certificates of compliance on pipe materials.
2. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and ANSI/AWWA Standards specified herein.
3. Manufacturer of pipe and Manufacturer of fittings on the project shall have an established, annually audited and certified, quality control procedure for manufacturing of pipe and manufacturing of fittings respectively. Manufacturer shall be certified by an independent, third party auditor for compliance with all requirements of the AWWA standards. The manufacturer shall submit a current certificate of compliance for the plant facility where the pipe or fittings are to be made. Certificate of compliance shall be submitted for each additional year of manufacturing during the duration of the Project. The manufacturer shall not change the plant manufacturing the pipe or fittings during the duration of the Work.

### 1.4 QUALITY ASSURANCE

- A. Pipe and fittings shall be inspected at the foundry as required by the standard specifications to which the material is manufactured. In addition, the Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service, or by the Engineer, at either the manufacturer’s plant or other testing laboratory at their own expense.
- B. Ductile iron pipe shall be from a single manufacturer. Fittings shall be from a single manufacturer, not necessarily the pipe manufacturer.
- C. The Engineer will inspect the pipe and fittings after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements. Pipe rejected after delivery, or at any point during the progress of the

Work, shall be marked for identification and shall immediately be removed from the job site and replaced at no additional cost to the Owner.

- D. Test pipe under pressure for defects and leakage in accordance with Section 02502.

## 1.5 PROJECT CONDITIONS

- A. Secure permits and pay fees required to carry out the piping work. Comply with laws, ordinances, codes, rules, and regulations of the local and state authorities having jurisdiction over the Work. Where provisions of the Contract Documents are in conflict with the codes, the more stringent shall govern.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. American Cast Iron Pipe Company
- B. U.S. Pipe
- C. or equal

### 2.2 PIPE AND FITTINGS - GENERAL

- A. Ductile iron pipe shall be designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151. Fittings and other materials referenced in this section shall conform to the latest edition of the references listed in Paragraph 1.2 of this section.
- B. Unless otherwise indicated or specified in the Contract Documents, buried ductile iron pipe and fittings shall be Class 52 with push on joints.
- C. Unless otherwise indicated or specified, buried pipe shall have an asphaltic exterior coating in accordance with AWWA C110, C151 or C153, as applicable.
- D. Unless otherwise indicated or specified in the Contract Documents, buried fittings shall be ductile iron or gray iron with mechanical joints.
- E. Unless otherwise indicated or specified in the Contract Documents, ductile iron pipe and fittings installed above ground and/or in buried vaults, shall be Class 53 with flanged joints.
- F. Exposed piping shall be shop primed and painted in the field in accordance with Section 09900. Exposed piping to be painted shall not have an asphaltic exterior coating applied.
- G. Pipe and fittings shall be cement mortar lined and seal coated on the interior in accordance with AWWA C104. Cement mortar lining shall be twice the standard thickness; tolerance shall be minus 0 inches, plus 1/8 inch.

### 2.3 PIPE AND FITTING JOINTS

- A. Push-on-joints and mechanical joints shall conform to ANSI/AWWA C111/A21.11.
- B. Where indicated on the Drawings, provide restrained joints. Gaskets shall meet the material requirements of ANSI/AWWA A21.11/C111 for mechanical joint gaskets.
- C. Restrained gasketed joints for rubber push-on joint pipe shall be Fast-Grip® by American Cast Iron Pipe Company, Field Lok 350® by US Pipe and Foundry Co., or

equal. Contractor is to supply the Owner with four new gasket disassembly drive shims as a part of the project.

## 2.4 FITTINGS

- A. Fittings shall be ductile iron or gray iron.
- B. Fittings less than or equal to 12 inches in size shall conform to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 and shall have a 350 psi pressure rating.
- C. Fittings greater than 12 inches in size shall conform to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 and shall have the following pressure ratings:
  - 1. Fittings greater than 12 inches and less than or equal to 24 inches - 350 psi
  - 2. Fittings greater than 24 inches - 250 psi
- D. Mechanical joint retainer glands shall be installed on all mechanical joints. Retainer glands shall be specifically designed to fit standard mechanical joint bells with corrosion resistant, high strength, low-alloy T-head bolts conforming to ANSI/AWWA A21.11/C-111 and ANSI/AWWA A21.53/C-153. Retainer glands shall be manufactured of ductile iron conforming to ASTM A536-80, grade 60-42-10. Wedges shall be of hardened ductile iron and require the same torque in all sizes. These devices shall have a minimum 250 psi pressure rating with a minimum safety factor of 2:1 and shall be EBAA IRON, Inc., Megalug® series 1100 or equal. Glands shall be listed with Underwriters Laboratories and/or approved by Factory Mutual.
- E. Anchoring tees shall have main run ends as indicated on the Drawings or as required for the installation. The branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection with the adjacent valve or fitting (typically used for hydrant branches).

## 2.5 COUPLINGS

- A. Solid sleeves shall have long body type (12 inches min.) and mechanical joints with retainer glands.
- B. Couplings and transitional couplings for pipe less than or equal to 12 inches in diameter shall consist of a long body cast iron sleeve and shall have gaskets suitable for the pipe being joined. The bolts and nuts shall be corrosion resistant high strength, low alloy steel such as Cor-Ten steel or an approved equal. Couplings shall be Romac style 501, Dresser style 153, Rockwell type 441, or equal. Transition couplings for pipe less than or equal to 12 inches in diameter shall be Dresser Style 162, Rockwell Type 441, Smith Blair Omni Style 442, or equal.
- C. Couplings and transitional couplings for pipe greater than 12 inches in diameter shall consist of a steel sleeve with gaskets suitable for the pipe being joined. The bolts and nuts shall be corrosion resistant high strength, low alloy steel such as Cor-Ten steel or an approved equal. Couplings shall be Dresser Style 38, Smith Blair Style 311, Romac Style 400, or equal. Transition couplings for pipe greater than 12 inches in diameter shall be Dresser Style 62, Smith Blair Style 413, Romac Style TC400, or equal.
- D. Provide couplings with an exterior epoxy coating.

## 2.6 GASKETS, GLANDS, NUTS, AND BOLTS

- A. Gaskets, glands, nuts, bolts and accessories shall conform to ANSI/AWWA C111/A21.11 or C153/A21.53, as appropriate.

- B. Gaskets shall be of plain tipped rubber, suitable for exposure to the liquid within the pipe.
- C. Lubricants must be suitable for the type of fluid to be carried by the pipeline, and shall be NSF approved for water service.
- D. Glands shall be ductile or cast iron.
- E. Bolts shall be high strength, low alloy.

## 2.7 THRUST BLOCKS AND ANCHOR BLOCKS

- A. Concrete shall have a 28-day compressive strength of 3,000 psi.

## 2.8 TEST CONNECTIONS

- A. Install air release, test connections, and blow offs in the piping for pressure testing and disinfection at locations to be determined by the Contractor and approved by the Engineer.
  - 1. Corporation cocks shall be in accordance with ANSI/AWWA C800 and shall be  $\frac{3}{4}$  inch diameter with CC thread on inlet by iron pipe thread flare on outlet as manufactured by Mueller, Ford, McDonald or equal.
  - 2. Copper tubing shall be annealed Type K soft tubing and shall conform to the requirements of ASTM B88.
  - 3. Upon completion of testing and disinfection, remove the corporation cock and replace with a brass plug and the copper tubing removed. Field swab the brass plug for disinfection in accordance with AWWA C651.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Deliver, handle, store and install ductile iron pipe in accordance with ANSI/AWWA C600.

### 3.2 DELIVERY, STORAGE AND HANDLING

- A. Delivery of Pipe and Fittings
  - 1. Coordinate delivery of pipe and fittings with installation and unload along the line of work outside the trench near as practicable to the point of final placement, and properly wedged secure. Give minimum 24 hour notice to the Engineer prior to pipe deliveries. Notice shall include the method of unloading.
  - 2. Unload and handle pipe and fittings with a crane or backhoe of proper capacity outfitted with a steel cable sling, belt sling or other specially designed attachment to protect the pipe coating.
  - 3. At the end of each work week, no more than the amount of pipe to be installed the following work week shall remain along the construction route. All pipes remaining along the construction route are to be properly wedged to prevent movement and not interfere with traffic or pedestrian movement. All excess pipes are to be stockpiled at an approved staging yard in accordance with AWWA C600.

**B. Storage of Materials**

1. Store pipe in a manner to keep pipe interior free from dirt and foreign matter. Store pipe on wood blocking, rails or other suitable materials. Pipe shall not be stored on stones.
2. Pipe may be stored on top of each other to the maximum stacking height specified by AWWA C600.
3. Protect materials subject to corrosion in accordance with manufacturer's recommendations.
4. If pipe or project materials are stored at the Contractor's approved staging yard, the Engineer shall be permitted reasonable access to the staging yard for inspection of the pipe and materials.
5. Pipe ends shall be sealed tight using polyethylene bags and tape immediately after unloading, regardless of the storage time length, in order to keep foreign matter and wind blown debris out.
6. All fittings are to be stored off of the ground on wooden pallets.

**C. Handling Materials**

1. Handle materials in such a manner so as to prevent damage to the concrete or mortar coating or lining.
2. Materials are to be handled using methods approved by the pipe manufacturer.
3. Materials damaged during handling will be rejected and shall be replaced at the Contractor's expense.
4. Ensure that no foreign materials enter the pipe and fittings during handling.

**3.3 COORDINATION**

- A. Existing mains may have to be shut down to complete the connections, as shown on the Drawings and as specified herein.
1. Existing valves will only be operated by the Owner.
  2. Submit requests for shutdown of existing piping to the Engineer at least 5 working days prior to the operations, and reschedule operations to prevent conflicts with the Owner's operations.
  3. The Owner reserves the right to cancel the shut-down at any time without penalty if system conditions exist in which it would be a matter of public health or safety to do so.
  4. The Owner does not guarantee complete shut down of valves. Make necessary provisions to do work under existing conditions.

**3.4 DEFECTIVE PIPE**

- A. Defective pipe or fittings will be rejected for use on this project. Defective pipe is classified as follows:
1. Damage to interior lining
  2. Insufficient lining thickness

3. Pipe out of round
  4. Damaged pipe barrel area
  5. Damaged pipe bells or spigots
  6. Missing, misplaced or illegible marking and identification
  7. Outside pipe diameter exceeding allowable tolerance
- B. If defective pipe is discovered after it has been installed, it shall be removed and replaced with sound pipe, at no additional cost to the Owner.

### 3.5 JOB CONDITIONS

- A. Environmental Requirements
1. Do not lay pipe when weather conditions are unsuitable, as determined by the Engineer, for pipe laying work.
  2. Equipment for pipe laying shall be maintained in good operating order.
  3. Job site shall be kept clean of debris and organized.
- B. Protection
1. At all times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug. This provision shall apply at all times when pipe laying operations are suspended.
- C. Work Affecting Existing Pipelines
1. Work on Existing Pipelines:
    - a. Prior to any work on existing pipelines, remove soils, rust and other debris from the exterior wall of the pipe a minimum of 12 inches beyond the work area.
    - b. Cut pipes as shown or required with machines specifically designed for this work.
    - c. Install temporary plugs to keep out all mud, dirt, water and debris.
    - d. Provide necessary adapters, fittings, pipe and appurtenances required.
    - e. Cut or tap existing mains at the mid span of a pipe barrel. In no case shall a pipe be cut or tapped within 24 inches of a pipe joint.

### 3.6 CLEANING PIPE AND FITTINGS

- A. Clean and remove foreign matter from the interior of each pipe and fitting before placing in the trench. Remove pipe and fittings whose interior has been contaminated with oil, gasoline or kerosene and replace at no additional cost to the Owner. Remove pipe and fittings whose interior has been contaminated with any material which is a regulated drinking water contaminant or which damages the cement and replace at no additional cost to the Owner. Should foreign material or contaminants be observed in previously installed pipe, cease work until foreign material or contaminated pipe is decontaminated or removed.



- B. Remove all lumps, blisters, and excess asphaltic coating from the bell and spigot ends of each pipe or fitting. The outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and be dry and free from oil and grease before the pipe or fitting is laid.
- C. On all ductile iron pipe or fittings, the bell of the pipe and the spigot of the adjacent pipe or fitting shall be wire-brushed and cleaned of rust and dirt. The bell of the pipe or fitting and the spigot of the adjacent pipe shall then be lubricated with the joint lubricant furnished with the pipe, and used in accordance with the manufacturer's directions.

### 3.7 ALIGNMENT AND GRADE

- A. Lay and maintain the pipe at the required lines and grades as shown on the Drawings. Fittings shall be at the locations indicated on the Drawings with joints centered, and spigots properly fitted. No deviation shall be made from the line and grade indicated on the Drawings, except with the approval of the Engineer.
- B. Joint Openings and Deflection:
  - 1. The maximum allowable joint openings and deflection for push-on joint pipe and restrained joint pipe shall be one-half the manufacturer's maximum allowable opening and deflection.
  - 2. Radius curves indicated on the Drawings or approved during Shop Drawing review shall be made using full lengths of pipe. The use of short lengths of pipe and extra joints in order to make a smaller radius turn will not be allowed without the written approval of the Engineer.
- C. Line or Grade Conflicts with Other Structures
  - 1. Wherever obstructions not shown on the Drawings are encountered during the progress of the Work and interfere to such an extent that an alteration in the pipe layout is required, the Engineer will order a deviation from the line and grade at locations where obstructions such as culverts, ducts, wire and/or pipes are encountered. The pipe shall be laid over or under such obstacles with a minimum clearance of 6 inches. The Engineer reserves the right to make the decision to go over or under obstructions during construction.
- D. Where underground conditions indicate a change of alignment or grade, such change shall be made only with the written consent of the Engineer.
- E. Except at locations indicated on the Drawings by the profile, do not establish high points where air can accumulate.

### 3.8 PIPE INSTALLATION

- A. General Requirements
  - 1. Prepare the pipe trench in accordance with Section 02315.
  - 2. Keep trenches dewatered while installing pipe until all required pipe joints have been made and the trench has been backfilled above the water table to a point where pipe uplift will not occur when the pipe is empty.
  - 3. Carefully lower pipe and fittings into the trench piece by piece by means of a crane, ropes or other tools or equipment, in such a manner as to prevent damage

to pipeline materials and protective coatings and linings. Under no circumstances shall pipeline materials be dropped or dumped into the trench.

4. Carefully inspect pipe and fittings for cleanliness and defects prior to placing them in the trench.
5. Install underground warning tape over the pipe in accordance with Section 02317.

**B. Laying Pipe**

1. Install pipe with a minimum of 5 feet of cover, unless indicated otherwise on the Drawings or directed by the Engineer.
2. Prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.
3. When laying pipe, the spigot end shall be centered in the bell, the pipe forced home and the joint completely assembled. The pipe shall be adjusted to correct line and grade and secured in place with approved backfill material, properly tamped under and around the pipeline.

**C. Cutting Pipe**

1. Furnish pipe in full lengths. Cut ductile iron pipe without damage to the pipe or cement lining. The cutting shall be done to leave a smooth end at right angles to the axis of the pipe.
2. Cut ductile iron pipe either by the use of compression-type chain cutters which exert an even continuous force on the wall of the pipe or by power driven abrasive wheels.
3. On ductile iron pipe using rubber joints, the outside edge of the cut end must be tapered back approximately  $\frac{1}{4}$  inch at an angle of about 30 degrees so as to provide for the proper assembly of this joint.

**3.9 PUSH-ON JOINTS**

- A. Push-on joints shall be made in accordance with the manufacturer's instructions. Install gaskets in the pipe bell after lowering the pipe into the trench for installation. Thoroughly clean the bell and spigot of dirt and tar blisters in the trench utilizing a wire brush or bristle brush. Insert rubber gasket in the groove of the bell end of the pipe beginning at the bottom of the bell and working to the top of the bell. Apply lubricant per the manufacturer's recommendations utilizing a paint brush to the pipe gasket and the pipe spigot to be joined. Place a clean rag under the joint to protect the joint from dirt caused by unintentional grounding of the pipe during jointing. Upon completion, remove the rag. Align the plain end of the pipe to be laid and insert in the bell of the pipe to which it is to be joined and push home with a jack or by other means. After joining the pipe use a metal feeler to make certain that the rubber gasket is correctly located.
- B. On water pipe and fittings, make provisions for the electrical continuity of the pipeline. Insert two bronze wedges per joint to provide electrical continuity. Place wedges as close to the 3 o'clock and 9 o'clock positions as possible.

### 3.10 MECHANICAL JOINTS

- A. Mechanical joints shall be made in accordance with Appendix A of ANSI A21.11/AWWA C111 and the manufacturer's instructions. Thoroughly clean and lubricate the joint surfaces and rubber gasket before assembly. Tighten bolts to the specified torques. Under no conditions shall extension wrenches or an extended handle ratchet wrench be used to secure greater leverage.

### 3.11 RESTRAINED JOINTS

- A. Install restrained joint pipe where indicated on the Drawings. Make the joint assemblies in accordance with the manufacturer's recommendations.

### 3.12 CONCRETE THRUST BLOCKS

- A. Place cast-in-place concrete thrust blocks at all bends (regardless of the angle of deflection or direction), caps, offsets, hydrants, and tees, as well as in locations shown on the Drawings or directed by the Engineer. Cast-in-place thrust blocks shall be formed with wood forms; rough earth forms are not acceptable. Protect pipeline materials and fittings from direct adherence of the concrete thrust block by wrapping in plastic, roofing felt, reinforced manila paper or similar material. The thrust block shall not bear directly on the joint and shall not interfere with future adjustments, tightening, or removal of the joint. Thrust blocks shall bear against undisturbed soil at the side or end of the trench and this undisturbed surface shall be carefully cleaned off so as to be vertical. The thrust blocks shall have a minimum horizontal thickness of 2 feet and shall have the minimum bearing area listed on the Drawings, measured perpendicular to the direction of thrust.
- B. Cast-in-place concrete thrust blocks are required at all fittings and will be used in conjunction with retainer glands. Provide thrust blocks and anchor blocks at the locations shown on the Drawings or as Directed by the Engineer.

### 3.13 DISINFECTION

- A. Disinfect pipe, fittings and valves in accordance with Section 02501, before placing into service.

### 3.14 TESTING

- A. Pipe, fittings and valves installed under this contract shall be tested in accordance with Section 02502, before being placed into service.

### 3.15 DEACTIVATION OF WATER MAINS

- A. Excavate and remove sections of the existing water main as shown on the Drawings. Repairs and capping of the main shall be in accordance with the Drawings.
- B. After the pipe has been capped, the top sections of all gate boxes shall be removed and stacked, the holes filled in with suitable backfill material and patched with bituminous concrete in the area of the gate box.
- C. The deactivation of the water mains shall be done upon completion of:
  - 1. Installation and successful testing of the new pipeline, including all hydrants and appurtenances, and
  - 2. Removal and reconnection of all building services from the existing pipelines to the new pipelines.

3. Approval for the deactivation of the water mains by the Engineer or Owner.
- D. Surface repair methods shall meet the requirements of the applicable surface repair items.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\02514.docx

## SECTION 02518

## VALVES AND HYDRANTS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. This Section is for buried valves, including valves inside below-grade valve vaults.
- B. Section Includes
  - 1. Types of valves specified herein include:
    - a. Gate Valves
    - b. Valve Boxes
    - c. Fire Hydrants
- C. Related Sections
  - 1. Section 02315 - Excavation, Backfill, Compaction and Dewatering
  - 2. Section 02502 – Testing of Water Distribution Systems
  - 3. Section 02513 – Copper Pipe and Fittings
  - 4. Section 02514 - Ductile Iron Pipe and Fittings
  - 5. Section 02519 – Water Services

## 1.2 REFERENCES

- A. ASTM A126 – Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
- B. ASTM A536 – Standard Specification for Ductile Iron Castings
- C. ASTM B584 – Standard Specification for Copper Alloy Sand Castings for General Applications
- D. AWWA C111 - Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings
- E. AWWA C502 –Dry-Barrel Fire Hydrants
- F. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
- G. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants
- H. NSF/ANSI Standard 61 and NSF/ANSI Standard 372 – Drinking Water System Components

## 1.3 SYSTEM DESCRIPTION

- A. Furnish all labor, materials, equipment, and incidentals required to install, complete and ready for operation, all valves, hydrant assemblies, and appurtenances as shown on the Contract Drawings and as specified herein.
- B. Valves for water distribution systems.

- C. Buried valves for water lines.

#### 1.4 SUBMITTALS

- A. Submit complete Shop Drawings of all valves, valve boxes, hydrants and other material specified in this Section including but not limited to the following:
  - 1. 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.

#### 1.5 QUALITY ASSURANCE

- A. Valves and accessories shall be manufactured in the United States of America.

#### 1.6 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:
    - a. Set gate valves closed to prevent rattling;
- 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.
- C. Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels and stems as lifting or rigging points.

#### 1.7 SCHEDULING

- A. Refer to Section 01325 for limitations on the sequence of work to be performed by the Contractor.

### PART 2 PRODUCTS

#### 2.1 GENERAL

- A. Valve sizes shall be the same size as the upstream pipe, unless otherwise indicated.
- B. Provide accessories including bolts, nuts, glands, and gaskets.
- C. Extended Stems - Where insulation is indicated or specified, provide extended stems arranged to receive insulation.
- D. Valves shall have the same end connections as the pipeline in which it is installed.
- E. Buried valves shall have mechanical joint ends compatible with the piping systems in which they are installed in accordance with ANSI/AWWA C111/A21.11-85 and Mega-Lug type retainer glands. Provide mechanical joint accessories, including glands, SBR

rubber gaskets, tee head bolts, and nuts with the valves. Provide stainless steel bolts and nuts.

- F. Mechanical joint ends shall be compatible with ductile iron O.D. pipe.
- G. Valves and appurtenances shall be of the size shown on the Contract Drawings.
- H. Equipment of the same type shall be from one manufacturer, unless otherwise approved.
- I. Valves, hydrants, and appurtenances shall have the name of the manufacturer, flow directional arrows, and the working pressure for which they are designed cast in raised letter upon some appropriate part of the body.
- J. Valves for water distribution systems shall be certified to NSF 61 and NSF 372.
- K. Bolts shall be 304 stainless steel with hex heads and hex nuts in accordance with ASTM A-307 and A-563, respectively.
- L. Provide buried valves with standard valve box with tee-handle operator.
- M. Valves installed inside buried structures shall be hand-wheel or lever operated.

## 2.2 GATE VALVES (RESILIENT SEAT)

- A. Gate valves shall be resilient seat type suitable for underground service complying with the requirements of AWWA C509 or C515. C509 gate valves shall be cast iron or ductile iron. C515 gate valves shall be ductile iron.
- B. Gate valves shall be designed to be bubble tight for 250 psig water working pressure with no leakage past the seat from either side of the disc, and shall be hydrostatically tested to 500 psig.
- C. Gate valves shall be of the non-rising stem (N.R.S.) design.
- D. Gate valves shall be set vertically (spur gearing).
- E. Gate valves shall open left (counter-clockwise).
- F. Buried gate valves shall be furnished with 2-inch square operating nuts.
- G. Gate valves shall be cast iron or ductile iron. Cast iron shall meet the specifications of ASTM A126, Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Ductile iron shall meet the standards of ASTM A536.
- H. The resilient-seated disc wedge shall be of the resilient wedge fully supported type, either cast iron or ductile iron. Solid guide lugs shall travel within channels in the body of the valve. The disc and guide lugs shall be fully encapsulated in SBR (styrene butadiene rubber) or EPDM rubber. Disc wedges that are not 100% fully encapsulated shall not be acceptable. Provide guide caps of an acetal copolymer bearing material to protect the rubber-encapsulated solid guide lugs from abrasion for long life and ease of operation.
- I. The seat shall be SBR or EPDM rubber, matching the disc encasement. The seating surface (rubber) shall be specially designed so as to provide a smooth waterway, without depressions or cavities, which might trap debris and interfere with tight closures.
- J. The body, bonnet, and gate shall be cast/ductile iron, constructed in accordance with AWWA C509 or C515. The bonnet to body seal shall incorporate a flat neoprene

gasket. Bonnet and body flanges shall be fully machined to assure proper sealing of the gasket.

- K. Gate valve stems shall be of bronze rolled bar stock in accordance with ASTM B584, and shall have a forged thrust collar. The thrust collar shall be factory lubricated, and the thrust collar and its lubrication shall be isolated by the O-Rings from the water way and from outside contamination, providing permanent lubrication for long term ease of operation. An anti-friction thrust washer shall be provided both above and below the thrust collar for ease of operation.
- L. Gate valves shall have O-Ring sealed stems with one O-Ring located below the thrust collar and two O-Rings located above the thrust collar. The two O-Rings located above the thrust collar shall be replaceable with the valve still in service in the fully open position.
- M. Coat internal and external exposed ferrous surfaces of the valve with a fusion-bonded, thermosetting powder epoxy coating suitable for potable water service conforming to AWWA C550. Coating shall be non-toxic and shall impart no taste to water. Coating thickness shall be nominal 10 mils. Gate valves for water distribution systems shall be certified to NSF 61.
- N. Gate valves shall be as manufactured by U.S. Pipe Metroseal (Model 250), Mueller (Model 2360), American Flow Control (AFC-2500), Clow (2630 Series), equivalent by M&H Valve Company, or equal.

### 2.3 VALVE BOXES (FOR BURIED VALVES)

- A. Provide a valve box of the adjustable type of heavy pattern, constructed of cast iron and provided with a 6 inch cast iron cover for each buried valve.
- B. Valve boxes shall be manufactured in North America by Clow Corporation, Tyler/Union Corporation, United States Foundries, or equal.
- C. Valve boxes shall be round, 2-piece, sliding type, cast iron. The upper section of each box shall have a flange on top having sufficient bearing area to prevent settling. The bottom of the lower section shall be belled to enclose the operating nut of the valve. The barrel shall be 5-1/2 inch O.D. minimum.
- D. Boxes shall be of lengths consistent with pipe depths. Boxes shall be adjustable, with a lap of at least 6 inches when in the most extended position.
- E. Slot covers for easy removal.
- F. Covers for valve boxes on water mains shall have the word "WATER" or "SEWER" cast in the top.
- G. Coat valve boxes with coal-tar pitch enamel or other approved coating.
- H. Valve boxes shall be suitable for the size valve on which they are used. The length of the lower section shall be adequate for trench adjustment, no top or mid-section adapters.
- I. Provide one tee-handled wrench for every four valves installed, unless additional wrenches are required due to variations in valve bury depth. Wrenches shall be field measured to accommodate the depth of bury and provide waist high operation.



**2.4 FIRE HYDRANTS (PROPRIETARY PRODUCT)****A. Fire Hydrants**

1. The hydrant shall meet the requirements of AWWA Standard C-502, latest edition.
2. The hydrant operating nut shall open left.
3. Operating nut
  - a. Shall be D.I. or bronze.
  - b. Shall be pentagon in shape with dimensions of top 1-13/16 inch tapering to 1-7/8 inch on bottom.
4. Nozzles
  - a. 2 each – 2-1/2 inch National Standard Thread
  - b. 1 each – 4-1/2 inch National Standard Thread
5. Provide nozzle caps without chains and with the same size pentagon operator as specified above.
6. Provide traffic model hydrant with breakaway feature.
7. Hydrant shoe or base features
  - a. Ductile iron with 6 inch MJ inlet
  - b. 5-1/4 inch valve opening with draining bronze seat and drain ports to allow water within the hydrant barrel to drain to the exterior.
  - c. Valve seat and sub-seat arrangement shall be bronze to bronze.
8. Bolts and Nuts
  - a. Bolt and nuts shall be stainless steel.
9. Protective coatings
  - a. Provide a minimum of 3 mils total dry film thickness for all paintings and coatings.
  - b. The internal components of the hydrant shall be fusion-epoxy coated.
  - c. Coat internal and external cast iron or ductile iron components with an approved bituminous sealer or a fusion bonded epoxy coating, 3 mils minimum.
10. Approved hydrants
  - a. Mueller Super Centurion 250
  - b. Or equal

- B.** The hydrants shall comply with all requirements of AWWA Standard C502-80 and the following requirements:

1. The hydrant shall be a compression type shut-off with valve opening against the pressure. A negligible loss of water shall occur with breakage of the hydrant, whether breakage occurs in the open position or the closed position.
2. The main valve seat shall be 5¼ inches in diameter.
3. The inlet connection shall be 6-inch mechanical joint furnished with gasket, gland and bolts.
4. The color of the hydrant above ground be red with silver caps and reflective top/bonnet to mat the City's standard color.
5. Connecting pipe and pipe nipples between the main line tee and hydrant shall be 6 inch ductile iron, Class 52, conforming to the requirements of Section 02514.
6. 6 inch hydrant valve and valve box shall conform to paragraphs 2.2 and 2.3.
7. Anchoring tees shall have main run ends as indicated on the Drawings or as required for the installation. The 6 inch branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection for the valve.
8. Minimum working pressure shall be 200 psi.
9. The hydrant tee shall be designed so that the hydrant valve can be securely attached to the main line.

C. Hydrant Paint

1. Thoroughly clean hydrants and paint with two shop or field coats in accordance with AWWA C502 and the instructions of the paint manufacturer.
2. Provide a factory-applied fusion-bonded epoxy coating. Coating color shall be the Owner's standard.
3. Alkyd gloss enamel shall be 801 DTM by Sherwin-Williams, 2H-Tneme by Tnemec, or equal. Reflective paint shall be Scotchlite #7211 by 3M.
4. Hydrant color shall be Owner's standard color.

D. Additional Hydrant Components

1. Supply a minimum of 2 operating wrenches compatible with hydrants.
2. Supply a minimum of 2 repair kits compatible with the hydrants being supplied that includes all special tools required to maintain the hydrants (e.g., hose nozzle insertion tool, pumper nozzle insertion tool, hydrant disassembly wrench, etc.).

E. Removing and Resetting Existing Hydrants

1. Existing hydrants designated to be reinstalled shall be removed from the existing water main and reinstalled on the new water main as shown on the Drawings. Provide a new main-line anchoring tee to connect to the new main, 6 inch gate valve and box, and 6 inch nipple as required to reconnect the existing hydrant.

F. Anchoring Tees

1. Hydrant tees shall be the "anchoring" type and shall have mechanical joint bells conforming to the requirements of the main pipe. The anchoring tee outlet shall be 6 inch mechanical joint, equipped to anchor the hydrant valve to the tee.

2. Anchoring tees shall have mechanical joint main run ends. The branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection.

G. Tie Rods

1. Tie rods utilized for joint restraints shall be manufactured by Star national Products, Columbus, OH, and shall consist of Star Figure SST7 tie bolts with Figure SST8 nuts, Figure SST17 tie washers, and Figure SST12 all thread tie rods. Tie bolts, tie washers, tie rods, and nuts shall be COR-TEN type steel.

### 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-or-round or local identification) and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.
- E. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.
- F. Replace defective valves with new valves.

#### 3.2 HYDRANT INSTALLATION

- A. Excavation, trenching and back filling procedures shall be in accordance with Section 02315.
- B. Provide thrust blocks for all hydrants with bearing against the foot or bottom of the hydrant and against the vertical face of undisturbed soil behind the hydrant. The bearing areas of the thrust block on the soil shall be as shown on the Drawings.
- C. Provide one cubic yard of washed  $\frac{3}{4}$  inch stone around hydrant drains.
- D. Hydrants shall be located as shown on the Drawings. Coordinate location with City personnel.
- E. Hydrant breakaway flanges shall be located no higher than 3 inches above-grade or lower than at-grade.
- F. Support buried valves 6 inches and larger with a concrete pad.
- G. Install gate valves in the vertical position.
- H. Air test tapping sleeves prior to beginning tapping operations.
- I. Existing valves and hydrants will be operated only by Northampton Water Department personnel.

- J. All newly installed hydrant and branch connections shall be subject to line pressure in an open trench to determine tightness of joints before backfilling, unless they are part of the overall pipeline pressure and leakage testing.
- K. Install fire hydrants in accordance with the Drawings and the manufacturer's recommendation.

### 3.3 VALVE INSTALLATION

- A. 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 in horizontal piping with stem at or above the center of the pipe.
- D. Install valves in a position to allow full stem movement.
- E. Install valves and actuators to be plumb in the vertical direction.
- F. Mechanical Joint Connections
  - 1. Refer to Section 02514 for requirements for installing mechanical joint connections.

### 3.4 INSPECTION AND TESTING

- A. Valves and hydrants shall be inspected and tested in conjunction with the pipelines in which they are installed in accordance with Section 02502 .

### 3.5 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.

### 3.6 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\02518.docx

SECTION 02810  
IRRIGATION SYSTEM

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and Sections within DIVISION 01 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Coordinate work of this Section with other utilities and with trades responsible for their installation. Refer to respective drawings pertaining to other work.
- C. Carefully examine the Contract Documents for requirements that affect the Work of this section. Particular attention is directed to the following Divisions that affect the Work of this section.
  - 1. Division 26 - Electrical
  - 2. Division 32 - Exterior Improvements
  - 3. Division 33 - Utilities

1.2 WORK TO BE DONE

- A. Work under this section consists of furnishing and installing labor, materials, equipment and services required to furnish and install a fully operational, automatic landscape irrigation system for the identified landscape planters depicted on the final approved plans. This includes areas which are planted with shrubs and groundcovers. Shop drawings of the irrigation design must be provided for review and approval prior to installation.
- B. As part of the bid, the system shall automatically irrigate from an existing potable water supply connection using sprinklers as needed.
  - 1. Mechanical point of connection for the irrigation system shall be to an existing 1-inch irrigation water supply. Output is approximately 20 gpm.
  - 2. Electrical point of connection for the irrigation controller shall be to an existing 1-phase, 120-volt hard wired circuit.
  - 3. Work shall be constructed and finished in every respect in a good, workmanlike and substantial manner, to the full intent and meaning of the specifications. Parts necessary for the proper and complete execution of the Work, whether the same may have been specifically mentioned or not, shall be done or furnished in a manner corresponding with the rest of the work as if the same were specifically herein described.
  - 4. Testing of the completed system shall also be included in the Work.
  - 5. Record Drawings as well as Operating & Maintenance Manual generation in accordance to these specifications, shall also be included in this Work.

- C. Irrigation system described within this performance specification shall closely mimic the existing irrigation system.
- D. Irrigation system to be installed shall conform to up-to-date design standards and common practices of the irrigation industry (Irrigation Association Landscape Irrigation Best Management Practices), as pre-approved prior to installation by the Owner's Representative. Minimum standards shall include a system that waters the planters illustrated on the plans. System shall be designed with spray sprinklers with fixed arc nozzles.

### 1.3 PERMITS AND INSPECTIONS

- A. Work under this section shall comply with ordinances and regulations of authorities having jurisdiction.
- B. Obtain and pay for permits required for the execution of Work under this section.
- C. Furnish copies of Permits and Approval Notices to the Owner's Representative before requesting final payment.

### 1.4 SUBMITTALS

- A. General: Submit each item in this section according to the Conditions of the Contract and Division 1.
- B. Provide copies of product specification sheets for proposed equipment to be installed to ensure product installation is consistent with this performance specification. Work on the irrigation system may not commence until product sheets are submitted and approved. Equipment to be included, but not limited to:
  - 1. Sprinklers and Nozzles
  - 2. Controller
  - 3. Rain Sensor and Guard
  - 4. Valves (Manual and Automatic)
  - 5. Valve Boxes
  - 6. Sleeving Pipe
  - 7. PVC Pipe and Fittings
  - 8. Wire and Connectors
  - 9. Wire Conduit and Sweeps
  - 10. Quick Coupling Valves
  - 11. Grounding Equipment
  - 12. Identification Tags
  - 13. Miscellaneous Materials
- C. Contractor shall submit for review and approval, prior to the start of work, a complete irrigation design plan. Design plan shall include the necessary information to clearly show the intent of the system to be installed per the specifications and installation details. Information which must appear on the plans shall include at a minimum:
  - 1. Sprinkler locations and nozzle.
  - 2. Flow in gallons per minute of each zone noted.
  - 3. Mainline and lateral pipe locations with sizing and material type information.

4. Electric valve locations with clear information as to valve type, ID number, size and flow.
5. Controller and rain sensor locations.
6. Wire size and routing.
7. Legend identifying symbols on the drawing.
8. Sleeve piping locations and sizes.
9. Point of connection.
10. Quick coupling valve locations.
11. Isolation valve locations.
12. Grounding type and locations.
13. Friction loss calculations from dynamic pressure.
14. Velocity calculations (not to exceed 5 feet per second)

#### 1.5 QUALITY ASSURANCE

- A. Installer: A firm which has at least five (5) years experience in work of the type and size required by this section and which is acceptable to the Owner's Representative.
- B. References: Contractor must supply five references for work of this type and size with their bid including names and phone numbers of contact person(s).
- C. Applicable requirements of accepted Standards and Codes shall apply to the Work of this Section and shall be so labeled or listed:
  1. American Society for Testing & Materials (ASTM)
    - a. ASTM: D1784 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
    - b. ASTM: D1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and CI200.
    - c. ASTM: D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
    - d. ASTM: D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
    - e. ASTM: D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe System.
    - f. ASTM: D2855 Standard Practice for Making Solvent-Cemented Joints with PVC Pipe and Fittings
  2. National Electric Code (NEC)
  3. Underwriters Laboratories, Inc. (UL)
  4. Occupational Safety and Health Administration (OSHA)

#### 1.6 TESTS

- A. Pressure: Field verify dynamic pressure before commencement of work. Deviation from requirements shall be reported to the Owner's Representative before start of work.
- B. Observation: Owner's Representative will be on site to ensure the system is being installed according to the specifications, details and approved design.
- C. Coverage Test: After completion of the system, test the operation of the system and adjust irrigation equipment as directed by the Owner's Representative. Demonstrate to the Owner's Representative that landscaped planters are being adequately irrigated.

Furnish and install materials required to correct inadequacies of coverage or where the system is obviously inadequate or inappropriate. (See Part 3 - Execution).

- D. Owner's Representative shall be notified 7 days in advance for observations.
- E. During final observation, two-way communication and sufficient personnel to provide instantaneous communication between the observation area and the controller shall be provided.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Store and handle materials in compliance with manufacturer instructions and recommendations. Protect from possible damage. Minimize on-site storage.

#### 1.8 GUARANTEE

- A. Obtain in the Owner's name the standard written manufacturer's guarantee of materials furnished under this section where such guarantees are offered in the manufacturer's published product data. These guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law.
- B. In addition to the manufacturers guarantees, warrant irrigation system, both parts and labor for a period of two (2) years from the date of acceptance by the Owner.
- C. As part of the two-year warranty, perform the first year-end winterization and spring start-up for the irrigation system.
- D. Should any problems develop within the warranty period because of inferior or faulty materials or workmanship, they shall be corrected to the satisfaction of the Owner's Representative at no additional expense to the Owner.
- E. A written warranty showing date of completion and period of warranty shall be supplied upon completion of the irrigation system.

#### 1.9 COORDINATION

- A. Coordinate work closely with the Owner's Representative and other construction disciplines to avoid misunderstandings and to efficiently bring the project to completion. Owner's Representative shall be notified as to the start of work, progression, and completion, as well as changes to the approved drawings before the change is made.
- B. Contractor shall be held responsible for and shall pay for damage to other work caused by his work, workmen or sub-contractors. Repairing of such damage shall be done by the Contractor who installed the work, as directed by the Owner's Representative.

#### 1.10 MAINTENANCE AND OPERATING INSTRUCTIONS

- A. Included in the bid shall be an allowance for two (2) hours of instruction of Owner and/or Owner's personnel upon completion of check/test/start-up/adjust operations by a competent operator (Owner's Representative's office shall be notified at least one (1) week in advance of check/test/start-up/adjust operations).



- B. Upon completion of work and prior to application for acceptance and final payment, an electronic file titled MAINTENANCE AND OPERATING INSTRUCTIONS FOR THE BRIDGE OF FLOWERS IRRIGATION SYSTEM, shall be submitted to the Owner's Representative's office. After review and approval, the copies will be forwarded to the Owner. Included in Maintenance and Operating binders shall be:
1. Table of Contents
  2. Written description of Irrigation System.
  3. System drawings:
    - a. One (1) copy of the approved irrigation plans;
    - b. One (1) copy of the Record Drawings;
    - c. One (1) copy of the controller, valve system wiring diagrams
  4. A complete set of "APPROVED" submittals of irrigation equipment;
  5. A copy of the suggested "System Operating Schedule" which shall call out the controller program required (zone run time in minutes per day and days per week) in order to provide the desired amount of water to each area under "no-rain" conditions.
  6. One (1) copy of the controller/valve/rain sensor system wiring diagram.

#### 1.11 EXAMINATION OF CONDITIONS

- A. Contractor shall fully inform themselves of existing conditions at the site before submitting their bid, and shall be fully responsible for carrying out the work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual Work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described in the GENERAL CONDITIONS.
- B. Provide and install temporary support, adequate protection and maintenance of planters, structures, drains, sewers, water lines and other obstructions encountered. Where grade or alignment is obstructed, the obstruction shall be permanently supported, relocated, removed or reconstructed as directed by the Owner's Representative.

### PART 2 PRODUCTS

#### 2.1 GENERAL

- A. Materials to be incorporated in the system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of the system. Material overages at the completion of the installation are the property of the Contractor and shall be removed from the sites.
- B. For warranty purposes, equipment shall be supplied from authorized distributors of the various products.

#### 2.2 PVC PIPE AND FITTINGS

- A. Pipe shall bear the following markings: Manufacturer's name, nominal pipe size, schedule, pressure rating in psi, and date of extrusion.
- B. Mainline pipe, and lateral pipe shall be PVC, Schedule 80, Type 1120, Solvent-Weld PVC, conforming to ASTM No. D1785 as manufactured by Ipex, JM Eagle or Silverline.

- C. Fittings for solvent weld PVC pipe shall be Schedule 80 solvent weld PVC fittings as manufactured by Dura, Lasco, Spears or equal.
- D. Fittings shall bear manufacturer's name or trademark, material designation, size, and applicable I.P.S. schedule.
- E. PVC threaded connections in and out of valves shall be made using Schedule 80 tee nipples and Schedule 80 couplers or socket fittings. Schedule 40 threads will not be approved for installation.
- F. PVC solvent shall be NSF approved, for Type I and Type II PVC pipe, and Schedule 80 fittings. Cement is to meet ASTM D2564 and FF493 for potable water pipes. Cement shall be medium set not fast (no wet and dry or hot). PVC solvent cement shall be Rectorseal Gold, IPS Weld-ON 711, Oatey Heavy Duty Cement or equal, and shall be used in conjunction with the appropriate primer. Primer shall be NSF approved, and formulated for PVC and CPVC pipe applications. Primer is to meet ASTM F 656. Primer shall be Rectorseal Jim PR-2, IPS Weld-ON P-68, Oatey Primer for PVC and CPVC, or equal. No clear primers or cements are allowed.
- G. Nipples to be schedule 80 PVC.

### 2.3 PIPE SLEEVES

- A. Pipe sleeves beneath non-soil areas shall be minimum PVC, Schedule 40, pipe as manufactured by Ipex, JM Eagle, Silverline or equal in sizes and locations where indicated on the design drawings. Minimum sleeve size to be 3-inch.

### 2.4 WIRE CONDUIT

- A. Conduit for wiring beneath non-soil areas shall be PVC, Schedule 40 conduit with solvent-weld joints, as manufactured by Carlon, Cresline, JMM or equal.
- B. Sweep ells shall be standard electrical type PVC Schedule 40 long sweep elbows. Cap sweep ell with tri-plug with the ring for securing nylon pull rope.

### 2.5 SPRAY SPRINKLERS

- A. Spray sprinklers shall be pressure regulating (30-psi), plastic construction with ratcheting riser, removable nozzle and check valve. Pop-up height shall be 12 inches.
- B. Suggested nozzle size is 5 foot but should be indicated on the design drawing legend. Nozzles shall be Rain Bird fixed arc, MPR or equal. VAN nozzles shall not be used.
- C. Sprinkler shall carry a minimum 3-year exchange warranty against defects. Sprinklers shall be manufactured by Hunter Industries, model PROS-12-PRS30-CV, Rain Bird, model 1812-PRS-SAM or equal.

### 2.6 ELECTRIC CONTROL VALVES

- A. Electric control valves shall be one-inch remote control, diaphragm type, fiberglass or reinforced nylon body plastic valves with manual flow control, manual bleed screw and 200 psi pressure rating.

- B. Valves shall be manufactured by Hunter Industries model ICV or Rain Bird model PEB.

## 2.7 PLASTIC VALVE BOXES

- A. Valve boxes shall be manufactured from unformed resin with a tensile strength of 3,100-5,500 psi conforming to ASTM D638. Boxes shall be green in color.
- B. Valve boxes for at grade isolation valves, single electric valves, wire splices and quick coupling valves shall be 10-inch round valve boxes with metal detection, T-top lids and bolt down cover where specified. Splice boxes shall have gray lids.
- C. Valve boxes for at grade dual 1-inch electric valves shall be 12-inch standard valve boxes with metal detection, T-top lids and bolt down covers. When multiple 1-inch valves are installed in the same area, they are to be installed no more than two (2) valves per 12-inch standard box.
- D. Valve box extensions shall be provided and installed as required for proper box depth. Valve box extensions shall be made by the same manufacturer as the box.
- E. Valve boxes shall be manufactured by Dura Plastics, NDS Pro Series or Olde Castle Specification Grade.

## 2.8 AUTOMATIC CONTROLLER

- A. Controller shall be modular in construction with capability of up to 6 hour run times per zone in increments of 1 or 10 minutes. Controller to have minimum three independent programs, 4 start times per program, auto/off switch and be capable of manual, semi-automatic and automatic operation. Controller shall have one sensor input terminal, locking, weather resistant outdoor plastic cabinet, internal transformer and 2-year warranty. Terminal strip connection shall be easily accessible. The controller shall be U.L. listed, 120-volt, 60 Hertz, A.C. type.
- B. Controller shall be as manufactured by Hunter Industries, model Pro-C (PC-X00) or equal.

## 2.9 RAIN SENSOR

- A. Rain sensor shall be polycarbonate in construction with adjustable interruption point and metal extension arm. Rain sensor shall operate up to 200 feet from controller.
- B. Rain sensor shall be manufactured by Hunter Industries, model Rain Klik or approved equal.

## 2.10 WIRE

- A. Valve control and common wires shall be minimum #14-awg, single strand, solid copper, UL- approved direct burial AWG-U.F. 600V and shall meet state and local codes for this service. Individual wires must be used for each zone valve. Common wire shall be white in color, control wire shall be red in color. White color shall be used for common wires only. Wire shall be as manufactured by Paige Electric, P7079D or approved equal.

- B. Wire connections shall be UL listed (486D), manufactured by Paige, 3M, model DBR/Y-6 splice kits. Wire splices shall be made in valve boxes, electrical junction boxes or at the controller. Connections shall be installed as per their manufacturers' instructions.
- C. Wiring to irrigation control valves shall be installed in conduit.
- D. Wire type and method of installation shall be in accordance with local codes for NEC Class II circuits of 30-volt A.C. or less.
- E. Wiring shall be in strict accordance with national, state and local electrical codes.

#### 2.11 ISOLATION VALVES

- A. Isolation valves shall be gate type, of bronze construction, US Manufacture, 200 WOG with bronze cross handle and 200 psi rating. Gate valves to be as manufactured by Apollo model 102T or Nibco, model T-113-K.

#### 2.12 GROUNDING EQUIPMENT

- A. Controller shall be installed with insulated grounding strap connected to metal water pipe.
- B. Ground strap shall be 1-inch wide by 0.015-inch-thick with punched holes. Length and hole sizes shall be to NEC requirements.
- C. Grounding wire shall be #6 AWG, solid bare copper wire for controller.
- D. Ground strap shall be as manufactured by ABL Electronic Supplies Inc., model GS-I-8 or approved equal.

#### 2.13 SPRINKLER SUPPORTS

- A. ½-inch sprinklers shall be installed on Schedule 80 slip x thread tees using 1-1/4-inch Schedule 80 nipples.
- B. B. Quick coupling valves shall be installed on Schedule 80 slip x thread tees using 1-inch x appropriate length brass nipples.

#### 2.14 QUICK COUPLING VALVES

- A. Valve body shall be of cast brass construction with a working pressure of 125 psi. The valve seat disc plunger body shall be spring loaded so that the valve is normally closed under conditions when the key is not inserted.
- B. Top of the valve body receiving the key shall be equipped with ACME threads and smooth face to allow the key to open and close the valve slowly. The quick coupling valve shall be equipped with a vinyl cover.
- C. Valve body construction shall be such that the coupler seal washer may be removed from the top for cleaning or replacement without disassembling any other parts of the valve.

- D. Keys shall be ACME with 1-inch male thread and 3/4-inch female thread at the top.
- E. Provide two (2) keys for quick couplers and two (2) 1-inch x 3/4-inch swivel hose ends. Quick coupling valves, keys and swivels shall be manufactured by Hunter Industries, model HQ-44RC-AW, HK-44A and HS-1.

2.15 IDENTIFICATION TAGS

- A. Electric valves shall have ID tags attached. ID tags shall be manufactured from Polyurethane Behr Desopan. Provide one tag for each manual flush and electric valve. Each tag shall provide controller and valve station information.
- B. Tags shall be as manufactured by T. Christy Enterprises or Paige Electric.

2.16 CRUSHED STONE

- A. 1/2-inch crushed stone shall be washed at the source facility to remove fine-grained soils and shall be well graded within the following limits:

Sieve Size (ASTM D422)	Percent Passing by Weight
3/4 inch	100
1/2 inch	90-100
3/8 inch	0-20
No. 4	0-5

2.17 SPARE PARTS

- A. Supply the following tools and equipment to the Owner's Representative before final observation:
  1. Two (2) quick coupling valve keys.

PART 3 EXECUTION

3.1 GENERAL

- A. Examine contract documents applying to this Section noting any discrepancies and bringing the same to the attention of the Owner's Representative for timely resolution.
- B. Before work is commenced, hold a conference with the Owner's Representative to discuss general details of the work and areas to receive automatic irrigation.
- C. Verify dimensions and grades at job site before work is commenced. Do not proceed with installation of the irrigation system when it is apparent that obstructions or grade differences exist or if there are conflicts in construction details. Such obstructions, conflicts, or discrepancies shall be brought to the attention of the Owner's Representative.
- D. Make field measurements necessary for the work noting the relationship of the irrigation work to the other trades. Coordinate with other trades (landscaping and other site work trades). Project shall be laid out essentially as indicated on the approved Irriga-

tion Plans, making minor adjustments for variations in the planting arrangement. Major changes shall be reviewed with the Owner's Representative prior to proceeding.

- E. Coordinate installation of irrigation system materials, including pipe, to avoid conflict with plantings and other bridge materials.
- F. During progress of work, a competent superintendent and assistants necessary shall be on site and shall be satisfactory to the Owner's Representative. Superintendent shall not be changed, except with the consent of the Owner's Representative, unless that person proves unsatisfactory and ceases to be employed. Superintendent shall represent the Contractor in his absence and directions given to the superintendent shall be as binding as if given to the Contractor.
- G. Protect landscaping, waterproofing, paving, pavers, curbs, planters, structures, walls, footings, etc. from damage. Any inadvertent damage to the Work of another trade shall be reported at once.

### 3.2 PIPE AND FITTINGS INSTALLATION

- A. Pipe shall be installed above the bridge curbs at the bottom of the fence on each side of the bridge.
- B. Make solvent-weld joints in strict accordance with manufacturer's recommendations and ASTM 2855, making certain not to apply an excess of primer or solvent, and wiping off excess solvent from each connection. Allow welded joints at least 15 minutes' set-up/curing time before moving or handling. When the temperature is above 80° F, allow connections to set minimum 24 hours before pressure is applied to the system. When temperature is below 80° F, follow manufacturer's recommendations. Wire conduit shall be installed beside pipe (see Wire Installation).
- C. Pipe below grade shall have minimum 16 inches of COVER (excavate to invert as required by pipe size).
- D. Cut plastic pipe with handsaw or pipe-cutting tool, removing burrs at cut ends. Pipe cuts are to be square and true. Bevel cut end as required to conform to manufacturer's specifications.
- E. Every precaution shall be taken to prevent foreign material from entering the pipes while it is being installed. At times, when installation of the piping is not in progress, the open end(s) of the pipes shall be closed by a watertight plug or other means. Pipe which cannot temporarily be joined, shall be sealed to make as watertight as possible. This provision shall apply during the lunch hour as well as overnight. Pipe not to be installed that day shall not be laid out. Pipe shall not be installed when the ambient temperature is at 40° F or below. Pipe installed at temperatures below 40° F shall be removed and replaced at no cost to the Owner.
- F. In installing irrigation pipe route, the pipe as necessary to prevent damage to plantings.
- G. Maintain 6-inch minimum clearance between sprinkler lines and lines of other trades. Do not install sprinkler lines directly above another line of any kind.
- H. Maintain 1-inch minimum between lines which cross at angles of 45 to 90 degrees.

### 3.3 ELECTRICAL WIRE CONDUIT INSTALLATION

- A. Electrical conduit shall be installed in non-soil areas, as well as for all above ground wiring.

### 3.4 PIPE SLEEVING INSTALLATION

- A. Sleeving shall be installed wherever piping is going under a non-soil area, and shall be indicated on the design plan. Minimum cover over sleeving pipe shall be 18 inches.
- B. Sleeving shall extend 18 inches beyond edges of walls and pavement/pavers/curbs.
- C. Ensure that required sleeving is installed prior to starting any paving/paver operations or casting concrete structures which require sleeving to pass through the items. Review sleeve locations in the field to confirm that sleeves are properly located for the required irrigation pipe and wire runs.
- D. Sleeve size shall be minimum 3-inch.

### 3.5 SPRINKLER INSTALLATION

- A. Sprinklers shall be installed perpendicular to pipe on Schedule 80 nipples.
- B. Sprinklers shall be spaced head-to-head, 100% overlap.

### 3.6 ISOLATION VALVE INSTALLATION

- A. Install isolation valves on a level crushed stone base if below grade so that they can be easily opened or closed by hand.
- B. Install isolation valves minimally at point of connection and for each side of the bridge after it tees off from the point of connection.

### 3.7 VALVE BOX INSTALLATION

- A. Furnish and install a valve access box for each electric valve, quick coupling valve, isolation valve and wire splice that is below grade.
- B. Valve access boxes shall be installed on a minimum 4-inch crushed stone base. Finish elevation of boxes shall be at grade. Crushed stone to be supplied by the Contractor and installed before valve box. Crushed stone shall not be poured into previously installed valve boxes.
- C. Valve boxes shall be installed neatly. Boxes shall be parallel or perpendicular to hardscape edges and to other valve boxes installed in the same location. A sufficient amount of landscape/hardscape shall remain in place between each valve box and between valve boxes and hardscapes.
- D. Valve box extensions shall be provided as required on valve boxes in order to install valve box covers at grade, where applicable.
- E. Bricks, stones, etc. shall not be used to support valve boxes.

- F. Valve box locations shall be approved by the Landscape Architect before installation.
- G. Center equipment in valve boxes.
- H. Bolt down covers shall not be installed on isolation or quick coupling valves.

### 3.8 24 VOLT CONTROL VALVE INSTALLATION

- A. Control valves shall be installed on a level crushed stone base, where applicable. Grade of bases shall be consistent throughout the project so that finish grades fall within the limits of work. Valves shall be set plumb with adjusting handle and bolts, screws and wiring accessible through the valve box opening. Valves shall be set in a plumb position with 24-inch minimum maintenance clearance from other equipment.

### 3.9 WIRE INSTALLATION

- A. Sufficient slack for expansion and contraction shall be maintained and wiring shall at no point be installed tightly. Provide and install an additional 8 inches to 12 inches slack at changes of direction.
- B. Service wiring per local codes for low voltage service. In-ground wire connections shall be waterproofed splice kits. Splices shall be made at electric valves (wire runs requiring splices between valve locations shall be provided and installed in splice box-valve box shall be used). Splice locations shall be shown on the record drawings.
- C. Provide a complete wiring diagram showing wire routing for the connections between the controller and valves. See section one for the inclusion of wiring diagram in operation and maintenance manuals.
- D. Wire conduit shall be installed along with mainline pipe and indicated on the record drawings.
- E. Wire to electric valves shall be installed in appropriately sized conduit per NEC.

### 3.10 QUICK COUPLING VALVE INSTALLATION

- A. Provide a minimum of two (2) quick coupling valves within the automatic irrigation system spread out evenly on each side of the bridge in addition to the one after the isolation valve, outside at the point of connection. Final quick coupling valve locations shall be approved by the Owner's Representative.
- B. Quick coupling valves to be mounted on 1-inch brass nipple as per details.

### 3.11 CONTROLLER INSTALLATION

- A. Install controller at existing controller location. Contractor to install wires, rain sensor and ground wire into controller and set proper programs.
- B. Wire controller to 120-volt electrical supply.
- C. Keys shall be turned over to Owner's Representative.
- D. Wire shall be installed in conduit.



### 3.12 CONTROLLER GROUNDING INSTALLATION

- A. Attach #6 solid, insulated copper wire to controller using 1-1/2-inch conduit. Route wire to a domestic cold water pipe in 1-1/2-inch conduit and attach wire to copper grounding strap using a copper grounding split nut and bolt through ground strap holes. Water pipe should be exiting building into soil.
- B. When tested, grounding grid shall meet the minimum requirements of the NEC.

### 3.13 RAIN SENSOR INSTALLATION

- A. Install rain sensor on light pole near controller, generally where approved by the Owner's Representative. Coordinate final location of rain sensor with Owner's Representative. Rain sensor shall be in direct contact with the rain and not in contact with the irrigation spray. Install rain sensor wires within 1/2-inch inch conduit where exposed. Above ground wire shall be installed in conduit.
- B. Install rain sensor in specified sensor guard per detail.

### 3.14 CHECK/TEST/START-UP/ADJUST

- A. After pipe, valves and risers are in place and connected, but prior to installation of sprinkler internals, open the control valves and flush out the system under a full head of water
- B. Contractor shall be responsible for flushing of system after installation is complete and will be responsible for any clogged equipment for thirty (30) days after substantial completion of the irrigation system.

Leakage test: test lines for leaks under operating pressure. Repair leaks and re-test.

### 3.15 CLEANING AND ADJUSTING

- A. At the completion of the work, parts of the installation shall be thoroughly cleaned. Equipment, pipe, valves and fittings shall be cleaned of grease, metal cuttings and sludge which may have accumulated by the operation of the system for testing.
- B. Adjust valve boxes to grade as required, so that they will not be damaged by landscape maintenance.
- C. Continue irrigation coverage adjustment as required by settlement, etc., throughout the guarantee period.
- D. Each control zone shall be operated for a minimum of 5 minutes and irrigation checked for consistency of delivering water. Adjustments shall be made to irrigation that is not consistent to the point that it matches the manufacturer's standards. Irrigation equipment, valves or other mechanical or electrical components, which fail to meet these standards, shall be rejected, replaced and tested until they meet the manufacturer's standards.

### 3.16 ACCEPTANCE AND OPERATION BY OWNER

- A. Upon completion of the work and acceptance by the Owner, train Owner's personnel in the operation of their system (provide minimum 7 days written notice in advance of training). Furnish, in addition to the Record Drawings and operational manuals, copies of available specification sheets and catalog sheets to the Owner's personnel responsible for the operation of the irrigation system. Guarantee parts and labor for a minimum period of two (2) years from date of acceptance.

### 3.17 CLEAN UP

- A. Upon completion of the irrigation installation work, remove leftover materials and equipment from the site in a safe and legal manner.
- B. Remove debris resulting from work of this section.

## SECTION 02920

## LAWNS AND GRASSES

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Restoration of all vegetated areas disturbed during construction including:
  - a. Lawn areas
  - b. Grass surfaces
2. Loam, starter fertilizer, lime, lawn seed, and hydric seed

## 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 15<sup>th</sup> to June 1<sup>st</sup>, and from August 15<sup>th</sup> to October 1<sup>st</sup>, unless otherwise approved by the Engineer.

## PART 2 PRODUCTS

## 2.1 MATERIALS

## A. Loam to support Lawn Areas and Grass Surfaces

1. Loam from offsite, as required for Work, shall be taken from a well-drained, arable site, and shall be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Loam shall also be free of quack-grass rhizomes, Agropyron Repens, and the nut-like tubers of nutgrass, Cyperus Esculentus, and all other primary noxious weeds. Loam shall not be delivered or used for planting while in a frozen or muddy condition. Topsoil as delivered to the Site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free Samples dried at 100 degrees Celsius.
2. Onsite loam may be available from stripping of onsite topsoil. Onsite topsoil shall be tested as specified below and shall be amended as necessary to meet Specification requirements for loam.
3. Soil Analysis: The Contractor shall submit representative Samples of loam, which he intends to bring onto the Site, and Samples of loam from onsite sources, to a Soil and Plant Testing Laboratory acceptable to the Engineer. All

reports shall be sent to the Engineer for approval. Samples of loam to be brought to the Site must be approved prior to delivery of soil. Deficiencies in the loam shall be corrected by the Contractor, as directed by the Engineer after review of the testing agency report by a soils consultant. Testing reports shall include the following tests and recommendations.

- a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.
  - b. The silt clay content shall be determined by a Hydrometer Test.
  - c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test.
  - d. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and acidity (pH).
  - e. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular lawn and planting objectives noted.
  - f. All tests shall be performed in accordance with the current standards of the Association of Official Agriculture Chemists.
4. Loam for General Lawn and Site Restoration Areas: Loam shall conform to the following grain size distribution for material passing the #10 sieve:

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	----
18	84	100
35	63	72
140	26	40
270	22	34
0.002 mm	2	5

<sup>1</sup>The ratio of the particle size for 80% passing ( $D_{80}$ ) to the particle size for 30% passing ( $D_{30}$ ) shall be 6 or less ( $D_{80}/D_{30} < 6$ ).

<sup>2</sup>Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.

<sup>3</sup>Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

<sup>4</sup>The organic content shall be between 4.0 and 6.0 percent.

**B. Typical Sand Amendment**

1. Sand to be mixed with topsoil shall meet the following requirements. The material shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	----
18	60	80
35	35	55
60	8	20
140	0	8
270	0	3
0.002 mm	0	0.3

<sup>1</sup>Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight of the total sample.

<sup>2</sup>The ratio of the particle size for 70% passing ( $D_{70}$ ) to the particle size for 20% passing ( $D_{20}$ ) shall be 3.0 or less ( $D_{70}/D_{20} < 3.0$ ).

<sup>3</sup>Tests shall be combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

**C. 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.

**D. 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.

**E. 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.

**Lawn Area Seed Mix**

**% Weight**

“Rebel II” Tall Fescue	70%
“Baron” Kentucky Bluegrass	10%
“Palmer” Perennial Ryegrass	20%

4. All seed shall comply with State and Federal seed Laws and Regulations.

**PART 3 EXECUTION**

**3.1 PREPARATION**

- A. After rough grading of the subgrade has been completed and approved, the subgrade surface shall be scarified to a depth of four (4) inches. Then furnish and install a layer of loam providing a rolled four (4) inch thickness. Any depressions which may occur during rolling shall be filled with additional loam, regraded and rerolled until the surface is true to the finished lines and grades. All loam necessary to complete the Work under this section shall be supplied by the Contractor.
- B. The ground surface shall be fine graded and raked to prepare the surface of the loam for lime, fertilizer and seed.
- C. 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.
- D. All stones over one-half (1/2) inch in diameter remaining on the surface after raking shall be removed.
- E. Shape the areas to the lines and grades required. The Contractor's attention is directed to the scheduling of Loaming and Seeding of graded areas to permit sufficient time for the stabilization of these areas.
- F. All areas disturbed by construction within the property lines and not covered by structures, pavement, or bark mulch shall be loamed and seeded.
- G. Limestone shall be thoroughly incorporated into the loam layer at a minimum rate of 3 ton per acre or more as recommended by the loam analysis in order to provide a pH value of 5.5 to 6.5.
- H. Fertilizer shall be spread on the top layer of loam at the minimum rate of 500 pounds per acre or more as recommended by the loam analysis and worked into the surface

**3.2 LOAM AND SEED AREAS**

- A. Seed shall be sown at the rates indicated above by rotary or drop spreader. Sowing shall be done on a calm, dry day. Immediately before seeding, the soil shall be lightly raked. One half the seed shall be sown in one direction and the other half at right angles to the original direction. It shall be lightly raked into the soil to a depth not over 1/4 inch and rolled with a hand roller weighing not over 100 pounds per linear foot of width.
  - 1. Straw mulch shall be applied immediately after seeding at a rate of 1.5 to 2 tons per acre. Mulch that blows or washes away shall be replaced immediately and anchored using appropriate techniques.
  - 2. The surface shall be watered and kept moist with a fine spray as required, without eroding the soil, until the grass is well established. Any areas, which

are not satisfactorily covered with grass, shall be reseeded, and all noxious weeds shall be removed.

- B. Unless otherwise approved, seeding shall be done between the periods from April 15<sup>th</sup> to June 1<sup>st</sup>, and August 15<sup>th</sup> to October 1<sup>st</sup>, when soil conditions and weather are suitable for such Work.

### 3.3 MAINTENANCE

- A. Maintenance shall include watering, weeding, removal of stones and other foreign objects over one half ( $\frac{1}{2}$ ) inch in diameter, cutting the grass until final acceptance. Mow at least weekly, removing no more than 30-40 percent of the leaf tissue using well sharpened blades. Mow grass between one (1) and two (2) inches high in the spring and fall. Mowing heights shall be an additional one-half to an inch in the summer to reduce temperature stress. Leave the clippings in place to help recycle essential plant nutrients needed for growth. All bare or dead spots which become apparent shall be properly prepared, re-loamed, limed, aerated, fertilized, and reseeded as many times as necessary to secure a good growth. The entire area shall be maintained, watered and cut until final acceptance of the lawn installation.
- B. The dressed and seeded areas shall be sprinkled with water as necessary from time to time. Signs and barricades should be placed to protect the seeded areas.
- C. To be acceptable, seeded areas shall consist of a uniform stand without bare or dead spots of at least 90 percent established permanent grass species, with uniform count of at least 200 plants per square foot.
- D. The Engineer shall determine whether maintenance shall continue in any part.
- E. After all necessary corrective Work and clean-up has been completed, and maintenance instructions have been received by the Owner, the Engineer will certify in writing the acceptance of the lawns.
- F. Final Completion will not be achieved until the seeded areas have demonstrated a satisfactory stand of growth as determined by the Engineer. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 02\02920.docx

SECTION 02921

VEGETATIVE SUPPORT MATERIAL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
  - 1. Topsoil
  - 2. Planting mix

1.2 SUBMITTALS

- A. Provide representative samples of borrow materials taken from the source. Tag, label, and package the samples as requested by the Engineer. Provide access to the borrow site for field evaluation and inspection.
- B. Provide analytical test results at the rate specified. Results shall indicate whether sample was taken from the upper or lower 6 inches of the vegetative support materials. All samples shall be representative and analyzed for the following:
  - pH
  - Nitrogen
  - Phosphorus
  - Potash
  - Grain size
  - Organic content

PART 2 PRODUCTS

2.1 MATERIALS

- A. Vegetative Support Material – Topsoil
  - 1. Vegetative support material shall consist of fertile, friable, natural topsoil typical of the locality without admixture of subsoil, refuse or other foreign materials and shall be obtained from a well-drained arable site. It shall be such a mixture of sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions. It shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter. Topsoil as delivered to the site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free samples dried at 100 degrees Celsius.
  - 2. The topsoil shall meet the following mechanical analysis:

<b>Percentage Finer</b>	
1-in screen opening	100
No. 10 mesh	95 to 100
No. 270 mesh	35 to 75



0.002 mm\*

5 to 25

---

\*Clay size fraction determined by pipette or hydrometer analysis.

3. Prior to stripping, the topsoil shall have demonstrated; by the occurrence upon it of healthy crops, grass or other vegetative growth; that it is reasonably well drained and that it does not contain toxic amounts of either acid or alkaline elements.

**B. Vegetative Support Material – Planting Mix**

1. Vegetative support material shall consist of fertile, friable, natural occurring soil typical of the locality without admixture of subsoil, refuse or other foreign materials and shall be obtained from a well-drained arable site. It shall be such a mixture of sandy loam, with medium and coarse sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions. It shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter. Planting mix as delivered to the site or stockpiled shall have pH between 5.5 and 6.6 and shall contain not less than 5 percent or more than 15 percent organic matter as determined by loss of ignition of moisture-free samples dried at 100 degrees Celsius. The soil shall have no herbicides, heavy metals, biological toxins, or hydrocarbons that exceed the EPA’s standards for soil contaminants.
2. Soil density needs to be high enough to avoid settling yet low enough to allow root growth.
3. Percolation rates of 1 to 2 inches per hour are preferred.
4. Plant available nutrients should be tested prior to soil installation. If soils are found to be at levels that are listed as “medium” or less on the analysis report, the soil should be amended with the appropriate nutrients.

**2.2 EQUIPMENT**

- A. Earth Moving Equipment
- B. Adequate types and number of equipment shall be used to ensure that the vegetative support material is spread evenly and at the proper depth to all areas intended to be covered without damaging underlying soil layers or structures.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- A. Vegetative support material shall be placed over approved areas to a depth sufficiently greater than required so that after natural settlement and light rolling, the complete work will conform to the lines, grades and elevations indicated. No loam shall be spread in water or while frozen or muddy.
- B. The vegetative support material shall be hauled, deposited, spread, compacted, tracked and raked to the lines and grades shown on the Plans or as directed by the Engineer. After the vegetative support material has been spread, it shall be carefully prepared for

seeding by spading or harrowing, and raking. All large, stiff clods, lumps, stones, brush, roots, stumps, litter, and other foreign material shall be removed.

- C. The compaction shall be equivalent to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. The compaction may be obtained by rolling, dragging or any method that produces satisfactory results. All depressions caused by settlement or rolling shall be filled with additional materials and the surfaces shall be regraded and rolled until it presents a reasonably smooth and even finish and is up to the required grade.
- D. During hauling operations, all public and private roadway surfaces shall be kept clean and any topsoil or other dirt which may be brought upon the surface shall be removed promptly and thoroughly before it becomes compacted by traffic. If necessary, the wheels of all vehicles used for hauling shall be cleaned frequently and kept clean to avoid bringing any dirt upon the surface.

### 3.2 QUALITY CONTROL

- A. The responsibility for satisfactory results on work carried out under this item rests entirely on the Contractor regardless of the prior approval of the materials and methods on the part of the Engineer.
- B. The Contractor shall provide laboratory test results for the vegetative support material intended for use as specified herein, at a frequency of 1 round per 1,000 cy of material.
- C. The Engineer shall randomly sample the borrow material and have a certified analytical laboratory perform testing as described herein. The testing shall be a verification of the results submitted by the Contractor and shall be entirely at the Contractor's expense.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 02\02921.docx

**DIVISION 3 - CONCRETE**

## SECTION 03100

## CONCRETE FORMS AND ACCESSORIES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Wood Form Material
  - 2. Prefabricated Forms
  - 3. Formwork Accessories
- B. Related Sections
  - 1. Section 03300 - Cast-in-Place Concrete

## 1.2 REFERENCES

- A. American Concrete Institute (ACI)
  - 1. ACI 301 - Specifications for Structural Concrete for Buildings
  - 2. ACI 318 - Building Code Requirements for Reinforced Concrete
  - 3. ACI 347 - Guide to Formwork for Concrete
- B. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing
- C. National Institute of Standards and Technology (NIST)
  - 1. Voluntary Product Standard PS 1-95 - Construction and Industrial Plywood

## 1.3 SUBMITTALS

- A. Drawings showing schedule of placement, location of all construction joints and all control joints with methods of forming. Show the location and elevation of all sleeves, wall pipes and embedded items.
- B. Drawings showing sizes and materials for forms, form bracing, and form ties.
- C. Product Data on form release agent, permanent formwork and inserts.
- D. Samples for the following materials:
  - 1. Form ties (including cones) and spreaders
  - 2. Other materials requested by the Engineer

## 1.4 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. Plywood: Class I High Density Overlay plyform, exterior grade, not less than 5 ply nor less than 5/8 inches thick conforming to Voluntary Product Standard PS 1-95
- B. 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. Flat bar snap ties for panel forms shall have plastic or rubber inserts with 1½ inch minimum depth to allow patching of tie hole after removal.
  - 2. 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.
  - 3. Common wire ties shall not be used.
- B. Form Release Agent:
  - 1. Non-staining and non-emulsifiable type which will not stain concrete or absorb moisture nor interfere with adherence of any material to be applied to concrete surfaces.
- C. Corners:
  - 1. Chamfered No. 1 Poplar wood strips; ¾ inch by ¾ inch; maximum possible lengths
- D. Hydrophilic Strip Waterstop:
  - 1. Hydrophilic waterstop shall be Hydrotite as supplied by Greenstreak or equal.
  - 2. The waterstop shall be composed of chloroprene rubber and chloroprene rubber modified to impart hydrophilic properties.

3. The waterstop shall have a delay coating to inhibit initial expansion due to moisture present in fresh concrete.
4. The hydrophilic waterstop shall have the following performance requirements:

**CHLOROPRENE RUBBER**

<b>Property</b>	<b>Test Method</b>	<b>Required Limits</b>
Tensile Strength	ASTM D 412	1300 PSI min.
Ultimate Elongation	ASTM D 412	400% min.
Hardness (Shore A)	ASTM D 2240	50 +/- 5
Tear Resistance	ASTM D 624	100 lb/inch min.
Tensile Strength	ASTM D 412	350 PSI min.
Ultimate Elongation	ASTM D 412	600% min.
Hardness (Shore A)	ASTM D 2240	52 +/- 5
Tear Resistance	ASTM D 624	50 lb/inch
Expansion Ratio	Volumetric Change - Distilled Water @ 70° F	3 to 1 min.

5. The hydrophilic waterstop shall be adhered to the concrete surface in accordance with the manufacturer's requirements.

**E. Premolded Joint Filler:**

1. Buildings and Structures: Self-expanding cork, ASTM D1752, Type III; and Federal Specification HH-F-341-F, Type II, Class C; capable of one directional swelling up to 140% of its original thickness

**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 JOINTS

- A. Construction joints indicated on the Drawings are mandatory and shall not be omitted.
- B. Form construction joints with a keyway and waterstop unless otherwise shown on the Drawings. The depth of the keyway shall be approximately 3 inches, and the minimum width of keyway shall be one-third the width of the wall or floor section unless otherwise shown on the Drawings. The maximum width of any key at a joint with waterstop shall be 3 inches. Construction joints are to be formed in place prior to notifying the Engineer for inspection of formwork.
- C. Where joints other than those shown are required, obtain approval prior to installation.
- D. Joints shall be straight and true. Brace all slab bulkheads adequately to keep joints straight. Construction joints in slabs exceeding 5 inches in thickness shall be keyed using a keyway nominally 3-5/8 inches by 1/3 of the slab thickness but not greater than 3 inches wide.
- E. Wall construction joints shall be placed as shown on the Drawings, or the maximum spacing of vertical construction joints in walls shall not exceed 40 feet where construction joints are not shown.
- F. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of the Engineer.

### 3.6 INSERTS, EMBEDDED ITEMS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in or passing through concrete work in conformance with requirements of ACI 318, paragraph 6.3, "Conduits and pipes embedded in concrete."
- B. Locate and set in place items that will be cast directly into concrete.

- C. Coordinate work of other Sections in forming and placing openings, slots, reglets, recesses, chases, sleeves, wall pipes, anchor bolts and other inserts. Wall pipes and sleeves shall conform to the requirements of Section 15050.
- D. Install accessories in accordance with manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed or damaged during placement of concrete.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at the bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight fitting panels, flush with inside face of forms and neatly fitted so that joints will not be apparent in exposed concrete surfaces after concrete placement.

### 3.7 WATERSTOPS

- A. Hydrophilic waterstop shall be installed in accordance with the manufacturer's recommendations.
- B. The Engineer shall approve of the proposed location, concrete cover and steel reinforcement prior to the installation of any Hydrophilic waterstop.
- C. The Hydrophilic waterstop ends shall be cut square or mitered at corners. In addition, all waterstop splices shall be sealed in accordance with the manufacturer's accessories
- D. Position metal fabrications accessories and inserts supplied under Section 05500 as specified therein and shown on the Drawings.

### 3.8 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.

### 3.9 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV 03\03100.docx



## SECTION 03200

## CONCRETE REINFORCEMENT

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Reinforcing Steel Bars
  - 2. Welded Wire Fabric
  - 3. Reinforcing Accessories
- B. Related Sections
  - 1. Section 03100 - Concrete Forms and Accessories
  - 2. Section 03300 - Cast-in-Place Concrete

## 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing
- 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 350R - Environmental Engineering Concrete Structures
  - 4. ACI SP-66 - Detailing Manual
- C. American Society for Testing and Materials (ASTM)
  - 1. A615 - Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
  - 2. 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 SUBMITTALS

- A. Provide shop drawings in accordance with the recommendations of ACI 315, "Details and Detailing of Concrete Reinforcement" and show the following: elevations,

dimensions of concrete work with specified reinforcement clearances; ledges, brackets, openings, sleeves or other items furnished by other Sections, where interference with reinforcement may occur; bending diagrams; assembly diagrams; splices and laps of reinforcement; temperature and shrinkage reinforcement; construction joint reinforcement and shape; dimensions, grade designations, and details of reinforcement and accessories. Show dowels with concrete work to be placed first. Shop drawings shall be drawn to scale.

- B. Bar Bending Details - The bars shall be referenced to the same identification marks shown on the placement drawings. Bars to have special coatings and/or to be of special steel or special yield strength are to be clearly identified.
- C. Prior to delivery of reinforcing steel or concrete to job site, submit certified mill test reports of reinforcing steel and cement (including names and locations of mills and shops, and analyses of chemical and physical properties), properly correlated to concrete to be used in this project.

#### 1.4 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.
- C. Where reinforcing steel bars are called for to be grouted into existing concrete, the anchorage shall develop an allowable bond strength equal to 24,000 psi times the cross section area of the bar, or an ultimate strength equal to the tensile strength of the bar.
  - 1. For installations in non-submerged concrete with an ambient temperature greater than or equal to 40 degrees Fahrenheit, the epoxy adhesive shall be, Hilti HIT\_HY 200, Simpson SET-XP, Powers PE 1000+ or approved equal.
  - 2. For installation in wet or submerged concrete with an ambient temperature greater than or equal to 40 degrees Fahrenheit, the epoxy adhesive shall be Hilti HIT RE-500SD, Simpson ET-HP, Powers Pure 110+ or approved equal.
  - 3. For installation in concrete below 45 degrees Fahrenheit the epoxy adhesive shall be Hilti HIT ICE, Simpson AT-XP or equal.

#### 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 a 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.
- B. Reinforcing bars shall be cold bent and shall not be straightened or re-bent. Bars shall not be field bent unless approved by the Engineer.
- C. Reinforcing bars shall be bent around a revolving collar having a diameter of not less than that recommended by the CRSI.
- D. Reinforcing bar ends that are to be butt spliced or threaded, shall have the applicable end saw-cut. Such ends shall terminate in flat surfaces at a right angle to the axis of the bar.
- E. Where reinforcing bars are called for to be welded, the welding shall conform to AWS D1.4 Structural Welding Code - Reinforcing Steel.

#### 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. For slabs, grade beams, etc. where concrete is poured on grade, use additional setup bars and concrete brick to provide required cover over reinforcement.

- 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. Reinforcement shall be continuous through construction joints unless otherwise indicated on Drawings.
- E. Reinforcement shall be spliced only in accordance with requirements of Contract Documents or as otherwise specifically approved. Splices of reinforcement at points of maximum stress shall generally be avoided.
- F. Welded wire fabric shall lap 6 inches or one space plus 2 inches whichever is larger, and shall be wired together. Provide No. 4 set up bars spaced 30 inches on center for slabs-on-grade or elevated slabs with composite decks.
- G. 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

\\tighebond.com\data\Data\Projects\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\03200.docx

## 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
  - 3. Section 03900 – Concrete Restoration and Cleaning
  - 4. Section 03930 – Concrete Repair

## 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing
- B. Massachusetts Department of Transportation (MassDOT)
  - 1. 2023 Standard Specifications for Highways and Bridges (including latest supplements)
- C. American Concrete Institute (ACI)
  - 1. ACI 301-95 - Specifications for Structural Concrete for Buildings, (included as part of this specification)
  - 2. ACI 305 - Hot Weather Concreting
  - 3. ACI 306.1-90 - Standard Specifications for Cold Weather Concreting
  - 4. ACI 318-14 - Building Code Requirements for Reinforced Concrete", American Concrete Institute
- 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. C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
5. C87 - Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar
6. C94 - Standard Specification for Ready-Mixed Concrete
7. C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
8. C150 – Standard Specification for Portland Cement
9. C260 - Standard Specification for Air-Entraining Admixtures for Concrete
10. C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
11. C494 - Standard Specification for Chemical Admixtures for Concrete
12. C535 - Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
13. C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
14. C685 – Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
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. C1059 – Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete

### 1.3 SUBMITTALS

- A. Submit prequalified MassDOT concrete mix proposed for use, indicating design strength, supplier, batch quantities, and constituents. Provide test report copies indicating prior satisfactory performance in accordance with MassDOT.
- B. Submit data and descriptive literature for concrete constituents including admixtures, aggregate tests, bond breaker, bonding agent, and repair grout.
- C. Submit detailed methods proposed for curing and protection of concrete. This submittal shall be made not less than 10 days prior to the placement of any concrete.
- D. 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.
- E. Maintain an accurate daily record of the locations and quantity of concrete placed.

### 1.4 QUALITY ASSURANCE

- A. Provide inspection of cast-in-place concrete work, and testing, including slump tests, air content, and standard compression testing. Materials and workmanship shall be

subjected to inspection and testing in mill, shop and/or field by the Engineer. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of this Section.

- B. 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, rebar, etc.).
- C. Facilitate observation by the Engineer as well as inspection and testing by the concrete testing agency, and furnish the following:
  - 1. Safe access to the work at all times to allow proper inspection of the work
  - 2. Full and ample means and assistance for sampling and testing materials and proper facilities for inspection of work in plant and at project site
  - 3. Covered box large enough to contain twenty-four standard concrete cylinders. At temperatures below 60°F, box shall be electrically heated and thermostatically controlled to maintain inside temperature of 60° to 80°F. Cylinders shall be placed in box immediately after molding and shall be covered with moist burlap until delivery to laboratory, 24 to 72 hours after molding.
  - 4. Access by the Engineer or his representative to the batch plant supplying the concrete at any time.
- D. Compression tests shall consist of one set of 4 cylinders for each test made, cured, and tested by testing laboratories during progress of job. 6 cylinders shall be required for each test made with concrete mix containing fly ash or ground granulated blast furnace slag. One set of cylinders shall be taken for every 100 cubic yards of concrete or fraction thereof placed in any one day.
  - 1. 1 cylinder of each set shall be tested for 7-day compressive strength; 2 cylinders shall be tested for 28-day compressive strength. The remaining cylinder shall be tested for 56-day compressive strength if either one of the 28-day tests are below the specified strength, otherwise the 56-day test will be eliminated.
  - 2. For modified mix with fly ash or ground granulated blast furnace slag, 1 cylinder of each set shall be tested for 7-day compressive strength, 2 cylinders shall be tested for 28-day compressive strength and 2 cylinders shall be tested for 56-days compressive strength. The remaining cylinder shall be tested for 84-day compressive strength if either one of the 56-day tests are below the specified strength, otherwise the 84-day test will be eliminated.
  - 3. The Owner will provide and pay for the services of an approved testing laboratory to test the cylinders. The Contractor shall coordinate and schedule all concrete testing performed by approved agency.
  - 4. Compression strength test of cylinders shall conform to ASTM C39, latest revision. The testing laboratory will submit certified copies of the test results directly to the Engineer and the Owner within 24 hours after tests are made.
  - 5. Sampling, molding, curing and testing of cylinders shall conform to ASTM requirements. Specimens shall be cured under laboratory conditions. The

Engineer may require additional cylinders to be cured under field conditions when unusual conditions may tend to reduce concrete strength.

6. Report of tests shall include: name of project, date and location of concrete placement, design strength of concrete, mix data, slump, air content (if tested), compressive strength, age and condition of test cylinder, type of fracture, and type of curing.
- E. Slump test, to check consistency, shall be made from the sample used to mold cylinders. Additional slump tests may be taken of every batch delivered to job site.
- F. Tests for determination of air content shall be made as required to verify conformance with the specifications.
- G. The strength level of the concrete mix shall be considered satisfactory if both of the following criteria are satisfied:
  1. Every arithmetic average of any three consecutive strength tests equals or exceeds the specified design strength.
  2. No individual strength test (average of two cylinders from the same test group) falls below the specified design strength by more than 500 psi when the specified design strength is 5000 psi or less or by more than 10 percent of the specified design strength when the design strength is more than 5000 psi.
- H. When tests of control specimens fall below these requirements, the Engineer will require 56 day or 84 day cylinder tests or core specimens taken from concrete in question and tested in accordance with ASTM C42. If these specimens do not meet strength requirements, the Engineer has the right to require additional curing, load tests, strengthening or removal and replacement of those parts of the structure which are unacceptable, and in addition, removal of such sound portions of structure as necessary to ensure safety, appearance, and durability of structure. Additional testing, load tests, strengthening or removal and replacement of parts or structure and any costs associated with delay of project shall be at no additional cost to the Owner.
- I. Any material or workmanship which is rejected, either at the batch plant or at the site, shall be replaced promptly at no additional cost to the Owner.
- J. 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.
- K. 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.
- L. 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.
- M. 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. Air entraining cements are prohibited.
- B. Pozzolans and Blast Furnace Slag
  - 1. Fly Ash: Class F conforming to the requirements of ASTM C618.
  - 2. Ground Granulated Iron Blast-Furnace Slag: Conforming to ASTM C989.
- C. Normal weight Fine Aggregate
  - 1. Washed, inert, natural sand conforming to ASTM C33. Gradation per MassDOT prequalified mix requirements.
- D. 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% by weight "percentage of wear" as determined by the Los Angeles Abrasion and Impact Tests in ASTM C131 and C535.
- E. Water shall be from approved source, potable, clean and free from oils, acids, alkali, organic matter and other deleterious material.

## 2.2 ADMIXTURES

- A. Water-reducing agent:
  - 1. 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. 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.
- C. 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. Select proportions of ingredients to meet the design strength and materials limits specified 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.
- B. The concrete mix design shall be a MassDOT prequalified ¾-inch, 610 cement concrete, 4000 psi (at 28 days).
- C. 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 in accordance with MassDOT.
- D. All concrete is normal weight with air-dry weight not to exceed 150 lbs. per cubic foot.
- E. Fly ash may be substituted for up to 20 percent by weight of the total cementitious material. Ground granulated iron blast-furnace slag may be substituted for up to 40 percent by weight of the total cementitious material.
- F. For 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.
- G. All concrete shall contain the approved air-entraining admixture as per manufacturer's written instructions to provide entrained air by volume in the cured concrete between 4.5 and 7.5%.
- H. The design mix shall meet the following slump limiting values in Table A:

**TABLE A**  
Concrete Slump<sup>1</sup>

Portion of Structure	Recommended (inches)	Maximum Range (inches)
Walls	4	3-5

<sup>1</sup>After addition of high range water reducer

- I. The approved water-reducing admixture shall be used in all concrete, in accordance with manufacturer's written instructions.

**2.4 MISCELLANEOUS 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. 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.

- B. Concrete Construction Joint Roughener:
  - 1. Provide a water soluble non-flammable, surface-retardant roughener.
  - 2. Product and Manufacturer:
    - a. Rugasol-S by Sika Corporation for horizontal joints only
    - b. MasterFinish QD 200 by BASF Corporation for vertical joints
    - c. Approval equal
- C. Bond Breaker:
  - 1. Provide an adhesive-backed glazed butyl or polyethylene tape which will satisfactorily adhere to the premolded joint filler or concrete surface as required. The tape shall be the same width as the joint.
  - 2. Bond breaker for concrete other than where tape is specifically called for shall be either bond breaker tape or an ASTM C309 non-staining type bond prevention coating such as Masterkure 100WB by Degussa Construction Chemicals, Dayton Superior Sure Lift J6WB, StarSeal Clean Lift by Vexcon Chemicals or equal.
- D. Bonding Agent:
  - 1. Provide a two-component, 100% solids, moisture –tolerant structural epoxy adhesive conforming to ASTM C881, Type II. The bonding agent shall be Sikadur 32 Hi-Mod by Sika Corporation of Lyndhurst, NJ, Concessive Liquid (LPL) by Degussa Admixtures, Inc. of Cleveland, OH or equal.
  - 2. Latex bonding agent shall be a non-remulsifiable acrylic-polymer latex conforming to ASTM C1059 Type II.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify cover requirements over all reinforcement.
- B. 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.
- C. Verify site conditions to ensure that full access is available for placement of concrete.

### 3.2 JOINTS

- A. Construction joints indicated on Drawings are mandatory and shall not be omitted. Construction joints shall conform to the requirements of Section 03100 and the following:
  - 1. Before placing new concrete against concrete already in place and hardened, the surface shall again be cleaned with a jet where practical. The exposed aggregate shall then be mopped with a mortar composed of the same proportions of sand

and placed and mopped in place immediately prior to the placing of concrete and shall not have set up or hardened prior to the placing of concrete.

2. Where joints other than those shown are required, they shall be made at such locations as the Engineer may allow, and shall in no case impair the structural strength of the structure.
- B. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of the Engineer.
- C. Saw-cut joints shall be installed in the locations shown on the Drawings. Saw-cut joints shall not be substituted for formed construction joints unless approved by the Engineer. Saw-cut joints shall conform to the following requirements:
1. The depth of the saw cut shall be at least  $\frac{1}{4}$  of the slab thickness or a minimum depth of one inch unless otherwise shown on the Drawings.
  2. Do not saw cut through slab reinforcing steel unless directed to do so in writing by the Engineer.
  3. Joints produced using conventional wet-cut process shall be completed within 4 to 12 hours after the slab has been finished - 4 hours in hot weather conditions and 12 hours in cold weather conditions.
  4. Joints produced using the early-entry dry cut process shall be formed using diamond-impregnated blades and shall be completed within 1 to 4 hours after the slab has been finished – 1 hour in hot weather conditions and 4 hours in cold weather conditions. The maximum depth of joints produced by the dry cut process shall not exceed 1-1/4 inches. Care should be taken to make sure that the saw does not ride up over large or hard coarse aggregates.
  5. Regardless of the saw cutting process chosen, the saw cutting must be performed before the concrete starts to cool, as soon as the concrete surface is firm enough not to be torn or damaged by the cutting blade, and before random-drying-shrinkage cracks can form in the concrete slab.

### 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, 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 specified in Table A .
- 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 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/ft<sup>2</sup>/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 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 B below.

**TABLE B**  
Concrete Temperature During Cold Weather

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 72	45	30
Greater than 72	40	20

- 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.
- 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. 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.
- B. 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 re-handling. 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° nor more than 45° from horizontal. Concrete shall be lowered and maintained as near to the surface of deposit as practicable. 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.
- C. 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.
- D. 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.

- E. 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.
- F. Cold joints, particularly in exposed concrete, including "honeycombs", are unacceptable. If they occur in concrete surfaces exposed to view, the Engineer will require that entire section in which blemish occurs be removed and replaced with new materials at the Contractor's expense.

### 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 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 or sprinklers, or by use of plastic roll materials to cover the concrete, which shall be thoroughly wetted at least once a day or more often as required in very hot weather. Such plastic shall be placed as soon as possible after finishing of concrete so that scarring of the surface will not occur. 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.

- 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. Curing compounds in lieu of wet curing will not be allowed.
- F. Keep permanent temperature records 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.

**3.6 REMOVAL OF FORMWORK**

- A. Forms 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. With the exception of construction joint bulkheads and keyways, 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 vertical surfaces shall not be removed before the concrete has attained a strength of not less than 30 percent of the minimum allowable prescribed compressive strength nor not less than the minimum time period specified in Table D.
  - 2. 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 D.

**TABLE D**  
Minimum Degree Day Requirement for Form Removal

Form Use	Degree-Days
Walls and Vertical Surfaces	200

- 3. 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 C above.
- C. Forms for construction joint bulkheads and keyways may be removed the following day, after the concrete pour. Extreme caution must be used to avoid damage to the concrete surface and keyway.
- D. Any test cylinders required to verify the specified minimum strengths for form removal shall be field cured under the same conditions as the concrete they represent. Such cylinders and testing shall be at the Contractor's expense.

**3.7 FINISHING OF CAST-IN-PLACE CONCRETE**

- A. Upper Horizontal Surfaces
  - 1. Horizontal surfaces not subjected to wear, such as tops of parapets, copings, walls, etc., shall be formed by placing an excess of material in the forms and

removing or striking off such excess with a template, forcing the coarse aggregate below the surface of the mortar.

2. Horizontal surfaces shall be attained by striking off excess concrete and in no case shall concrete be added to the tops of walls, etc., once initial set has taken place.
3. The top of such surfaces shall be finished in a manner as required and dictated by the necessary appearance of the part being finished. For covered surfaces, a wood float finish will in most cases be sufficient. Steel troweling may be necessary where concrete is exposed to view and adjacent surfaces have a steel trowel finish. In other cases, a "broom" finish may be required.

**B. Slab Surfaces**

- a. "Broom Finish" - On exterior work such as sidewalks and where else called for, a broom finish shall be used. The finishing shall be accomplished in the following manner. Screeding shall be done and the surface worked up with a wood float. At a proper time thereafter, the surface shall be steel troweled at least once and more if so directed. Upon completion of troweling, a sufficiently stiff bristled broom shall be drawn lightly across the surface to produce a slightly striated finish. The brooming shall in general be perpendicular to the main traffic route. Coordinate required finish with the Engineer before application.

**C. 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.

**D. Surfaces Requiring Rub Finish**

1. Rubbed finish of surfaces shall be provided on all poured interior and exterior vertical concrete surfaces and the underside of horizontal surfaces exposed to view, including all structure surfaces. Rubbing shall include but not be limited to:
  - a. The exterior face of spandrel walls and the like.
2. Surfaces requiring a rubbed finish shall, when completed, shall present a smooth, even textured surface and proper appearance. The Engineer shall be the sole judge of the acceptability of a rubbed finish. Cement utilized in rubbing shall be of the same type manufacturer and source as that used in batching the concrete. The following procedure shall be required for all surfaces requiring a rubbed finish.
  - a. Immediately upon removal of the forms, snap all form ties and fill tie holes with non-shrink grout to a point slightly indented from the finished surface. Hand chip all air pockets and laitance covered holes greater than 1/4 inch. A mechanical grinder of a type approved by the Engineer shall then be used to remove any form marks, ribs, or bulges, or other protruding surface defects.



- b. The surface shall then be wetted with clean water and a cement (4 parts), presifted fine sand (5 parts), and water grout shall be evenly applied utilizing a sponge float filling all exposed voids. The surface shall be rubbed with a burlap bag and allowed to thoroughly dry.
- c. The surface shall again be wetted and the grout reapplied with the sponge float and again rubbed with burlap, removing all excess material.
- d. After the final rubbing is completed, the surface shall be thoroughly drenched and kept wet for a period of 7 days unless otherwise directed by the Engineer. No other cement powder, grout or other surface coating will be allowed. Plastering of surfaces requiring a rubbed surface will NOT be tolerated.

### 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 to reduce the 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 3/4 inch gravel) mixed slightly damp to the touch (just short of "balling"). The "dry-pack" consistency of the concrete shall be zero slumps, 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. 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.

- F. 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 which could cause sagging.
- G. Repair areas and adjacent parent concrete surfaces shall be continuously moist cured immediately after finishing for at least 7 days. Surfaces shall be covered with damp burlap and sealed with taped polyethylene. Membrane curing compounds shall not be used.
- H. 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.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
03\03300S.docx

SECTION 03930  
CONCRETE REPAIR

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Deteriorated Concrete Demolition
2. Surface Preparation of Concrete Surfaces to be Repaired
3. Replacement of Deteriorated Reinforcing Bars
4. Concrete Repairs
5. Curing and Protection

B. Related Sections

1. Section 02225 – Selective Demolition
2. Section 03100 – Formwork and Accessories
3. Section 0330 – Cast-in-Place Concrete

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing

B. Massachusetts Department of Transportation (MassDOT)

1. 2023 Standard Specifications for Highways and Bridges (including latest supplements)

C. American Concrete Institute (ACI)

1. ACI 318 - Building Code Requirements for Reinforced Concrete

D. American Society for Testing and Materials (ASTM)

1. A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
2. C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems used with Concrete by Slant Shear
3. C884 –Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay.
4. D638 - Standard Test Method for Tensile Properties of Plastic

5. D732 Standard Specification for Shear Strength for Plastics by Punch Tool
6. D790 - Standard Test Method for Flexural Properties of Unreinforced Plastics and Electrical Insulating Materials
7. D2369 - Standard Test Method for Volatile Content of Coatings

### 1.3 SUBMITTALS

- A. Submit data and descriptive literature for repair mortar and bonding agent.
- B. Submit data and descriptive literature for the proposed pneumatic equipment proposed for demolition.
- C. Submit literature for proposed scaffolding system, man lift, or other type of work platform equipment proposed for the work. Include fall protection plan with the submittal.
- D. Submit a concrete repair placement plan. The plan should include the proposed sequence of placement for the concrete repair mortar, the locations of all rustication joints, and the location of all proposed construction joints.

### 1.4 QUALITY ASSURANCE

- A. Contractor qualifications: Contractor shall be qualified in the field of structural concrete repair and architectural concrete repair. The contractor shall have minimum of 10 years of experience performing work similar in method and extent. The Contractor's experience shall include concrete repairs to building walls that are architectural in nature and exposed to view when completed. Provide documentation of experience in accordance with specification section 00200.
- B. Contractor shall use equipment adequate in size, capacity and number sufficient to accomplish the work of this Section in a timely manner.
- C. Inspection of concrete deficiency repairs, including spalls and cracks will be performed by the Engineer. Materials and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of this Section.
- D. The Contractor will provide and pay for the services of an approved testing laboratory to fabricate test cylinders for the repair mortar.
  1. Compression strength test of cylinders shall conform to ASTM C39, latest revision. The cost of all testing work under this Section will be borne by the Contractor. The testing laboratory will submit certified copies of the test results directly to the Engineer and the Contractor within 24 hours after tests are made.
  2. Sampling, molding, curing and testing of cylinders shall conform to ASTM requirements. Specimens shall be cured under laboratory conditions. The Engineer may require additional cylinders to be cured under field conditions when unusual conditions may tend to reduce concrete strength.

3. Report of tests shall include: name of project, date and location of concrete placement, design strength of concrete, mix data, slump, air content (if tested), compressive strength, age and condition of test cylinder, type of fracture, and type of curing.
- E. Provide notification prior to the start of any phase of concrete crack or spall repair so as to provide the opportunity to inspect the work. Such notification shall be made at least 24 hours in advance of performance of repairs.
- F. Facilitate inspection and testing by the Engineer, and furnish the following:
  1. Safe access to the work at all times to allow proper inspection of the work
- G. One year from substantial completion of the specified repairs the Owner shall determine the soundness of the repairs. Any repairs found to be deficient at that time shall be repaired by the Contractor at no additional cost to the owner.

## PART 2 PRODUCTS

### 2.1 REPAIR MORTAR FOR DETERIORATED CONCRETE SURFACES

1. One-component, Portland-cement repair mortar conforming to the following properties:
  - a. Compressive Strength (ASTM C-39)
    - 1) 1 day: 2,000 psi (min).
    - 2) 7 days: 4,500 psi (min).
    - 3) 28 days: 5,000 psi (min).
  - b. Compressive Strength (ASTM C-109)
    - 1) 1 day: 2,500 psi (min).
    - 2) 7 days: 5,000 psi (min).
    - 3) 28 days: 6,000 psi (min).
  - c. Splitting Tensile Strength (ASTM C-496) at 28 days: 500 psi (min).
  - d. Flexural Strength (ASTM C-78) at 28 days: 700 psi (min).
  - e. Freeze/Thaw Resistance (ASTM C-666): 300 cycles - 98% (min).
  - f. Bond Strength (ASTM C-882 Modified) at 28 days: 1,500 psi (min).
  - g. The Portland cement repair mortar shall not produce a vapor barrier.
  - h. Repair mortar for vertical surfaces shall be as follows:
    - 1) Master Builders MasterEmaco S 440 as manufactured by the BASF Corporation. [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
    - 2) Sikacrete 211 as manufactured by the Sika Corporation, Lyndhurst, New Jersey. [www.usa.sika.com](http://www.usa.sika.com)

- 3) No equals will be allowed

## 2.2 BONDING AGENT

1. Epoxy-modified, cementitious bonding agent:
  - a. Compressive Strength (ASTM C-109)
    - 1) 3 days: 4,500 psi (min).
    - 2) 7 days: 6,500 psi (min).
    - 3) 28 days: 8,000 psi (min).
  - b. Splitting Tensile Strength (ASTM C-496) at 28 days: 600 psi (min).
  - c. Flexural Strength (ASTM C-348) at 28 days: 1,000 psi (min).
  - d. Tensile Bond Strength (ACI 503R) at 28 days: 200 psi (min).
  - e. The bonding agent shall not produce a vapor barrier.
  - f. Repair mortar bonding agent for vertical surfaces shall be as follows:
    - 1) Master Builders MasterEmaco P 124 as manufactured by the BASF Corporation. [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
    - 2) Sika Armtec 110 EpoCem as manufactured by the Sika Corporation, Lyndhurst, New Jersey. [www.usa.sika.com](http://www.usa.sika.com)
    - 3) No equals will be allowed

## 2.3 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.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Prior to any concrete repairs, the Contractor will remove all dust, dirt, debris from the concrete surfaces.
- B. The Contractor shall supply and erect appropriate protection barriers/shrouding or other approved means as required to completely contain all loose or flying debris generated during the demolition and surface preparation of the concrete surfaces.
- C. The Engineer will mark out all areas of unsound concrete to be repaired prior to the Contractor beginning demolition work.

### 3.2 REPAIRS TO DETERIORATED CONCRETE SURFACES

- A. These repair procedures are for deteriorated concrete surfaces delineated in the field by the Engineer to be repaired.
- B. Edges of areas to be repaired shall be cut square to a minimum depth of 1/2 inch so that there will be no feathered edges.
- C. Care shall be exercised during concrete removal to protect the reinforcing bars from damage.
- D. The concrete within a repair area shall be chipped back to a minimum depth of 4 inches or until sound concrete is encountered, whichever depth is greater. The Engineer shall determine and mark out any areas requiring greater than 4 inches of concrete removal following the initial demolition of 4 inches. Removal of greater than 4 inches of depth as a result of the Contractor's own actions will not be paid for as repairs greater than 4 inches.
- E. All existing reinforcing bars shall remain in place except as herein provided for corroded bars. Reinforcing bars which have been cut or have lost 25% or more of their original cross-sectional area shall be supplemented by new reinforcing bars in kind. The new bars shall be lapped a minimum of 32 bar diameters to the existing bars on each side of the section of corroded reinforcement or cut rebar. Any loose reinforcing bars shall be properly tied. Thoroughly clean the reinforcing steel of any mill scale, concrete debris, grease, dirt or dust at the completion of the demolition process.
- F. Existing deteriorated spalled surfaces shall be mechanically prepared to remove deteriorated concrete. Concrete shall be chipped away to provide a minimum of 3/4 inch of clearance all around any exposed steel reinforcement to permit proper placement of repair mortar around the steel to the parent, sound concrete. Spalled surfaces shall be thoroughly cleaned of mud, paint, grime, scum, laitance, organic matter, detritus, calcareous growths and other foreign matter, by sand-and-water blasting or other acceptable means as approved by the Engineer. Immediately after cleaning, the surface shall be checked by the Engineer for proper condition, including fractured concrete or loose aggregate. Any such material shall be removed by pneumatic or hand tools. The final surfaces shall be thoroughly rinsed with clean water to remove all remaining dirt and dust. Prepare all surfaces to be repaired in accordance with all repair material manufacturer's recommendations.
- G. Prepare concrete surfaces to be repaired in accordance with repair mortar manufacturers recommendations. The substrate should be saturated surface dry with no standing water.
- H. Saturate the prepared concrete substrate by filling the prepared formwork with clean potable water for 24 hours before placement of the repair mortar.
- I. Apply bonding agent to the concrete surfaces in accordance with the manufacturers recommendations. Care should be taken not to exceed the maximum recommended open time between application of the bonding agent and placing the repair mortar
- J. Secure wood forms to the surface of the concrete wall to be repaired. The forms shall include wood chamfer strips to reproduce the existing architectural rustications in the existing concrete wall.
- K. The Portland cement repair mortar shall be mechanically mixed in accordance with the manufacturer's recommendations.
- L. Place the Portland cement mortar in accordance with the manufacturers recommendations.

- M. Immediately after mixing, pour or pump the repair mortar into the formed area.
- N. 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.
- O. Leave finished work and adjacent concrete surfaces in a neat, clean condition with no evidence of spillovers or staining.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
03\03930\_ConcreteRepair.docx



**DIVISION 5 - METALS**

## SECTION 05500

## MISCELLANEOUS METALS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Ornamental Pedestrian Railing System.
  - 2. Electrolysis isolators.
  - 3. Fasteners for Miscellaneous Metals items.
  - 4. Concrete anchors.
  - 5. Tie Rods
- B. Related Sections – Not Applicable

## 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing
- B. American Society for Testing and Materials (ASTM)
  - 1. A653 – Standard specification for Steel Sheet, Zinc-coated
  - 2. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 3. F1145, Standard Specification for Turnbuckles, Swaged, Welded, Forged
  - 4. F1554, Standard Specification for Anchor Bolts, Steel, 36-, 55-, and 105-ksi Yield Strength
  - 5. F2408 – Ornamental Fences Employing Galvanized Steek Tubular Pickets
- C. Steel Structures Painting Council (SSPC)

## 1.3 SUBMITTALS

- A. Product Data:
  - 1. Concrete and Masonry Drilled Anchors:
    - a. Manufacturer's product descriptions.
    - b. Specific installation instructions, including drilled hole size, preparation, placement procedures, and instructions for safe handling of anchoring systems.
  - 2. Ornamental Pedestrian Railing System:
    - a. Manufacturer's product descriptions.

- b. System installation and assembly instructions.
  3. Turnbuckles
  4. Prime Paint.
  5. Bitumastic Troweling for Surfaces in Contact with Concrete.
  6. Fasteners (when requested by the Engineer).
  7. Railing Fittings.
  8. Galvanizing touch-up / repair materials.
- B. Shop Drawings:
  1. Detailed shop drawings, including erection drawings, for all metal fabrications, including welding and fastener information:
    - a. Submit for approval before fabrication.
    - b. Identify sizes of structural members, method of assembly, anchorage, and connection to other members.
  2. Setting drawings, templates, and directions for the installation of anchor bolts, or other items to be installed by others.
- C. Samples (when requested by the Engineer):
  1. Ornamental Pedestrian Rail System.
    - a. Available paint colors
  2. Concrete and Masonry Drilled Anchors.
  3. Turnbuckle body
- D. Quality Control Submittals:
  1. Connection Design Calculations: stamped by a licensed professional structural engineer, registered in the State where the work will be performed, properly coordinated with Shop Drawings.
  2. Concrete and Masonry Drilled Anchors:
    - a. Current test data or ICBO evaluation report.
    - b. Adhesive Anchor Installer Certification.
  3. Provide Certificates of Compliance on other materials as requested by the Engineer.

#### 1.4 QUALITY ASSURANCE

- A. Shop Assembly: Pre-assemble items in shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

- C. Ornamental pedestrian railing system shall comply with AASHTO LRFD including anchorage.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handle and stack materials carefully to prevent deformation or damage.
- B. Store materials carefully on substantial timbers and blocking, so arranged that materials will be free from earth and properly drained, preventing any splattering with dirt or accumulation of water or snow in or about materials.
- C. Prevent accumulation of mud, dirt, or other foreign matter on materials. Any accumulation shall be completely removed prior to erection.
- D. Protect painted, hot-dip galvanized, and other finishes from damage due to metal banding and rough handling. Use padded slings and straps.
- E. Adhesive Anchor Systems:
  - 1. Store adhesive cartridges on pallets or shelving in covered storage area, in accordance with manufacturer’s written instructions.
  - 2. Cartridge Markings: Include manufacturer’s name, product name, material type, batch or serial number, and adhesive expiration date.
  - 3. Dispose of cartridges if shelf life has expired.

1.6 WARRANTY

- A. Upon completion and acceptance of the work required by this section, the ornamental pedestrian railing system manufacturer shall issue a warranty agreeing to promptly replace defective materials for a period of 10 years at no cost to the Owner. Warranty shall cover any defects in material finish including cracking, peeling, chipping, blistering, or corroding.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Steel Shapes:	
Plates	A36
Stainless Steel:	
Steel Plate, Sheet, and Strip	A240, AISI Type 316
Bolts, Threaded Rods, Anchor Bolts, and Anchor Studs	F593, AISI Type 316
Nuts	F594, AISI Type 316
Steel Bolts and Nuts:	
Carbon Steel	A307 bolts, with A563 nuts
High-Strength	A325, Type 1 bolts, with A563 nuts A153 for galvanized components

Item	ASTM Reference
Anchor Bolts and Rods	F1554, Grade 55, with weldability supplement S1
Threaded Rods	A36
Flat Washers (Unhardened)	F844
Flat and Beveled Washers (Hardened)	F436
Thrust Ties for Steel Pipe:	
Threaded Rods	A193, Grade B7
Nuts	A194, Grade 2H
Plate	A283, Grade D

## 2.2 MANUFACTURED UNITS

### A. Anchor Bolts

#### 1. Cast-In-Place Anchor Bolts:

- a. Minimum Bolt Size: ½ inch diameter by 12 inches long, unless otherwise shown.
- b. Headed type, unless otherwise shown on Drawings.
- c. Material type and protective coating as shown in Data Sheet – 05500 – A, FASTENER MATERIALS SCHEDULE, at the end of this section.

### B. Concrete and Masonry Drilled Anchors

1. General: Materials shall be AISI Type 316 stainless, hot-dip galvanized, or zinc-plated steel, as shown in Data Sheet – 05500 – A, FASTENER MATERIALS SCHEDULE, at end of this section.

#### 2. Adhesive Anchors:

##### a. Threaded Rod:

- 1) ASTM F593 stainless steel threaded rod, diameter as shown on Drawings.
- 2) Length as required, to provide minimum depth of embedment.
- 3) Clean and free of grease, oil, or other deleterious material.
- 4) For hollow-unit masonry, provide galvanized or stainless steel wire cloth screen tube to fit threaded rod.

##### b. Adhesive:

- 1) Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.
- 2) Two-component, designed to be used in adverse freeze/thaw environments, with gray color after mixing.

- 3) Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.
- 4) Nonsag, with selected viscosity base on installation temperature and overhead application where applicable.
- c. Manufacturers and Products:
  - 1) ITW Ramset/Red Head, Wood Dale, IL; Epcon Ceramic 6 Epoxy or A7 Adhesive Anchor System. (Use only Epcon A7 Adhesive System for hollow masonry.)
  - 2) Hilti, Inc., Tulsa, OK; HIT Injection Adhesive System, HIT HY 200 (HIT HY 70 for hollow masonry).
  - 3) Powers Rawl, New Rochelle, NY; Power Fast Epoxy Injection Gel Cartridge System.
  - 4) Simpson Strong-Tie Co., Inc., Pleasanton, CA; Epoxy-Tie Adhesive ET.
  - 5) Covert Operations, Inc., Long Beach, CA; CIA-Gel 7000 Epoxy Anchors.
  - 6) Unitex, Kansas City, MO; Pro-Poxy 300 and Pro-Poxy 300 Fast Epoxy Adhesive Anchors.
3. Adhesive Threaded Inserts:
  - a. Stainless steel, internally threaded insert.
  - b. Manufacturer and Product: Hilti, Inc., Tulsa, OK; HIS-R Insert with HIT HY 200 adhesive.
- C. Fasteners:
  1. Use stainless steel or hot-dip galvanized steel
  2. Bolts, Nuts and Washers: ASTM A325, galvanized to ASTM A153 for galvanized members.
  3. Anchor Bolts: ASTM F1554, Grade 36
- D. Turnbuckle:
  1. Hot-dip galvanized to ASTM 153
  2. UNC threads
  3. Drop forged carbon steel to ASTM F1145, Type 1, Grade B
- E. Ornamental Pedestrian Handrail System
  1. System shall be fabricated in accordance with the dimensions and details shown on the drawings and as specified herein meeting the requirements of AASHTO LRFD Bridge Design Specifications.
  2. Material:

- a. Steel material for framework (pickets, rails, and posts, etc.) shall have a minimum yield strength of 50,000 psi.
  - 1) Pickets shall be 1" square x 14 ga tubing, minimum.
  - 2) Posts shall be 4" x 11 ga with 5/8" thick post plates, minimum.
3. Interconnect railing and handrail members with internal connectors, at fabricator's option, unless otherwise indicated.
  - a. Provide coped joints at tee and cross intersections.
  - b. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's options.
  - c. PVC grommets shall be supplied and used to seal all picket-to-rail intersections.
4. Form simple and compound curves by bending pipe in jigs to produce a uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout the entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
5. Close exposed ends of hollow shapes by welding by use of prefabricated fittings.
6. All posts shall have standard flat caps.
7. Brackets, Flanges, Fittings and Anchors – Provide end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of the system to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.
8. Acceptable manufacturers:
  - a. Ameristar Aegis II Xtreme
  - b. Approved Equal

### 2.3 ACCESSORIES

- A. Electrolysis Isolators: All dissimilar metals shall be isolated over their full length with 1/8 inch thick neoprene unless otherwise noted.

### 2.4 SHOP FABRICATION

- A. General
  1. All dimensions shall be verified at the site before fabrication is started.
  2. Galvanized items shall be shop fabricated and completely welded prior to galvanizing.
  3. Fit and shop assemble items in largest practical sections, for delivery to site.
  4. Fabricate items with joints tightly fitted and secured.
  5. Welding shall be in accordance with the requirements of AWS.

6. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
7. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with the design of the component, except where specifically noted otherwise.
8. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
9. Miscellaneous metals work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.
10. Metal Surfaces: For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
11. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.
12. No splicing of any member or part of the work will be allowed where full-length members are commercially available.
13. Screws, bolts, studs and other connecting devices required in the work shall be concealed wherever possible. On all finish work where fasteners must be exposed to view, they shall be countersunk and finished flush with the exposed surfaces. All screws, bolts and other fastening devices used for exterior work shall be aluminum, bronze or stainless steel, whichever is appropriate for the work in which it is to be used.

B. Fabrication Tolerances:

1. Squareness: 1/8 inch maximum difference in diagonal measurements.
2. Maximum Offset Between Faces: 1/16 inch.
3. Maximum Misalignment of Adjacent Members: 1/16 inch.
4. Maximum Bow: 1/8 inch in 48 inches.
5. Maximum Deviation From Plane: 1/16 inch in 48 inches.

## 2.5 FINISHES

- A. Material for fence framework (pickets, rails, posts, etc.) shall be galvanized prior to forming in accordance with the requirements of ASTM A653.
- B. The finish for Ornamental Pedestrian Handrail System shall be polyester powder coat. Color to be selected by Owner.

## 2.6 SOURCE QUALITY CONTROL

- A. Miscellaneous Metals fabrications, materials, and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer.



- B. Inspection and testing of shop welding shall be in accordance with the requirements of AWS .
- C. Maintain inspection and quality control records of shop and field work.
- D. The Contractor shall maintain records of each impact wrench used in the shop, showing dates, sizes of bolts tested and the corresponding torque values. Certified copies of the records shall be made available to the Engineer, upon request.
- E. Notify the Engineer prior to start of any fabrication, the start of sandblasting and painting, or other phases of work so as to afford them reasonable opportunity to inspect work.
- F. Furnish the Engineer upon request, with the following:
  - 1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.
  - 2. Cutting lists, order lists, material bills, and shipping lists.
  - 3. Information as to time and place of all shipments of material to shops and field.
  - 4. Representative sample pieces requested for testing.
  - 5. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.
- G. Do not remove any marks or tags identifying rejected work.
- H. Miscellaneous Metals work that has been rejected by the Engineer in the mill or shop shall be corrected without delay and at no expense to the Owner.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify that anchor bolts, bearing plates, and other items furnished to be installed by others have been installed correctly.

#### 3.2 PREPARATION

- A. All steel and aluminum surfaces to come in contact with exposed concrete or masonry shall receive a protective coating of an approved heavy bitumastic troweling applied in accordance with manufacturer's instructions prior to installation.

#### 3.3 FIELD FABRICATION

- A. No fabricated section shall be cut in the field without the permission of the Engineer.
- B. All miscellaneous metals work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.
- C. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.

- D. No splicing of any member or part of the work will be allowed where full-length members are commercially available. Jointing shall meet the approval of the Engineer.
- E. Screws, bolts, studs and other connecting devices required in the work shall be concealed wherever possible. On finish work where fasteners must be exposed to view, they shall be countersunk and finished flush with the exposed surfaces. Screws, bolts and other fastening devices used for exterior work shall be aluminum, bronze or stainless steel, whichever is appropriate for the work in which it is to be used.

**3.4 INSTALLATION**

- A. Install all items furnished except items to be imbedded in concrete or masonry. Items to be attached to concrete or masonry after such work is completed shall be installed in accordance with the details shown. Fastening to wood plugs will not be permitted.
- B. Handrails:
  - 1. Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Plumb posts in each direction.
  - 2. Expansion Joints - Provide expansion joints at the locations indicated, or if not indicated, at intervals not to exceed 40 feet. Provide a slip joint with an internal sleeve extending 2 inches beyond the joint on either side; fasten the internal sleeve securely to one side; locate joints within 6 inches of posts.
- C. Turnbuckles – provide greased sleeve on turnbuckles and tie-rods.

**3.5 ANCHOR BOLTS**

- A. Accurately locate and hold anchor bolts in place with templates at the time concrete is placed.
- B. Use sleeves for location adjustment and provide two nuts and one washer per bolt of same material as bolt.

**3.6 CONCRETE AND MASONRY DRILLED ANCHORS**

- A. Begin installation only after concrete or masonry to receive anchors has attained design strength.
- B. Install in accordance with manufacturer's instructions.
- C. Provide minimum embedment, edge distance, and spacing as follows, unless indicated otherwise by anchor manufacturer’s instructions or shown otherwise on Drawings:

<b>Anchor Type</b>	<b>Min. Embedment (bolt diameters)</b>	<b>Min. Edge Distance (bolt diameters)</b>	<b>Min. Spacing (bolt diameters)</b>
Adhesive	9	9	13.5

- D. Use only drill type, bit type, and diameter recommended by anchor manufacturer. Clean hole of debris and dust with brush and compressed air.
- E. When embedded steel or rebar is encountered in the drill path, slant drill to clear obstruction. If drill must be slanted more than 10 degrees to clear obstruction, notify Engineer for direction on how to proceed.
- F. Adhesive Anchors:

1. Do not install adhesive anchors when temperature of concrete is below 40 degrees F or above 100 degrees F.
2. Remove any standing water from hole with oil-free compressed air. Inside surface of hole shall be dry where required by manufacturer's instructions.
3. Do not disturb anchor during recommended curing time.
4. Do not exceed maximum torque as specified in manufacturer's instructions.

### 3.7 FIELD QUALITY CONTROL

- A. The fact that Miscellaneous Metals work has been accepted at the shop shall not prevent its final rejection at the job site, even after it has been erected, if it is found to be defective in any way.
- B. Miscellaneous Metals erection, materials, and workmanship shall be subjected to inspection and testing in mill, shop and/or field by the Engineer.
- C. Maintain inspection and quality control records of shop and field work.
- D. Notify the Engineer prior to start of any miscellaneous metals erection, or other phases of work so as to afford them reasonable opportunity to inspect work.
- E. Furnish the Engineer upon request, with the following:
  1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.
  2. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.
- F. Do not remove any marks or tags identifying rejected work.
- G. Any work found deficient shall be corrected or replaced in accordance with these specifications, without delay and at no expense to the Owner.

### 3.8 ADJUST AND CLEAN

- A. Touch-Up Painting - Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as approved for use for shop painting.
- B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

### 3.9 FASTENERS

- A. Anti-seizing Lubricant: Use on all stainless-steel threads and sheathed turnbuckles.
- B. Do not use adhesive anchors to support fire-resistive construction or where ambient temperature will exceed 120 degrees F.
- C. Provide fasteners in accordance with the drawings.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\Div 05\05500.docx

**DIVISION 7 - THERMAL AND MOISTURE PROTECTION**

## SECTION 07130

## SHEET MEMBRANE WATERPROOFING

## 1.1 SUMMARY

- A. Section Includes
  - 1. Sheet Membrane Waterproofing
  - 2. Protection Course
  - 3. Drainage Composite

## 1.2 REFERENCES

- A. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers -Tension
- B. ASTM D 570 – Standard Test Method for Water Absorption of Plastics
- C. ASTM D 751 – Standard Test Methods for Coated Fabrics
- D. ASTM D 882 – Standard Test Method for Tensile Properties of Thin Plastic Sheeting
- E. ASTM D 1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
- F. ASTM D 3767 – Standard Practice for Rubber – Measurement of Dimensions
- G. ASTM E 96 (B) – Standard Test Method for Water Vapor Transmission of Materials
- H. ASTM E 154 – Standard Test Method for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

## 1.3 SYSTEM DESCRIPTION

- A. Product is a self-adhesive membrane of not less than 60 mils thickness, consisting of a rubberized asphalt membrane laminated to a 4 mil cross-laminated polyethylene film.

## 1.4 SUBMITTALS

- A. Manufacturer's product literature and installation instructions
- B. Documentation stating manufacturer's acceptance of subcontractor as an approved applicator for the specified materials
- C. Sample warranty identifying the terms and conditions stated in Section 1.8

## 1.5 QUALITY ASSURANCE

- A. Comply with applicable codes, regulations, ordinances, and laws regarding use and application of products that contain volatile organic compounds (VOC).
- B. Prior to beginning work, convene a conference to review conditions, installation procedures, schedules and coordination with other work.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original, factory-sealed, unopened containers bearing manufacturer's name and label intact and legible with following information.
  - 1. Name of material
  - 2. Manufacturer's stock number and date of manufacture
  - 3. Material safety data sheet
- B. Store materials in protected and well ventilated area.

## 1.7 PROJECT CONDITIONS

- A. Do not apply membrane when surface temperature is below or inclement weather conditions conflict with manufacturer's published requirements.
- B. Coordinate waterproofing work with other trades. The approved applicator shall have sole right of access to the specified areas for the time needed to complete the installation.
- C. Warn personnel against breathing of vapors and contact of material with skin or eyes. Wear applicable protective clothing and respiratory protection gear.
- D. Keep flammable products away from spark or flame. Do not allow the use of spark producing equipment during application and until all vapors have dissipated. Post "NO SMOKING" signs.
- E. Maintain work area in a neat and orderly condition, removing empty containers, rags, and rubbish daily from the site.

## 1.8 WARRANTY

- A. Upon completion and acceptance of the work required by this section, the manufacturer shall issue a warranty agreeing to promptly replace defective materials for a period of 5 years at no cost to the Owner.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide Sheet Membrane Waterproofing from one of the following manufacturers.
  - 1. MiraDRI 860/861 by Carlisle Coatings and Waterproofing Incorporated.
  - 2. Bituthane System 4000 by Grace Construction Products.
  - 3. Or equal.

### 2.2 PRODUCTS

- A. Self-Adhesive Sheet Membrane Waterproofing shall consist of a 56 mil rubberized asphalt membrane laminated to 4 mil cross-laminated polyethylene film, and shall meet or exceed the following requirements:
  - 1. Tensile Strength: 325 psi minimum, ASTM D 412
  - 2. Ultimate Elongation: 300% minimum, ASTM D 412

3. Puncture Resistance: 50 lbs. minimum, ASTM E 154
4. Permeance: 0.05 Perm maximum, ASTM E 96 (B)
5. Low Temperature Flexibility: Unaffected at -45°F, ASTM D 1970, 1" mandrel
6. Tensile to Film: 5000 psi, ASTM D 882
7. Thickness: 60 mils, ASTM D 3767
8. Hydrostatic Head: 230 ft., ASTM D 751
9. Water Absorption: 0.1% by wt., ASTM D 570

### 2.3 ACCESSORY PRODUCTS

- A. Surface Primer: Water-based primer.
- B. Mastic: Mastic recommended by manufacturer for each condition.
- C. Sealants: Two-component polyurethane sealant by membrane manufacturer.
- D. Backing Rod: Closed-cell polyethylene foam rod.
- E. Protection Course: Recommended product by manufacturer for horizontal or vertical surfaces.
- F. Drainage Composite: Recommended by the manufacturer for each condition.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Before any waterproofing work is started the approved applicator shall examine all surfaces for any deficiencies. Should any deficiencies exist, the Owner, Engineer, and Contractor shall be notified in writing and corrections made.
- B. Condition of Concrete Surfaces:
  1. The concrete surfaces shall be of sound structural grade and shall have a smooth finish, free of fins, ridges, protrusions, rough spalled areas, loose aggregate, exposed coarse aggregate, voids or entrained air holes. Rough surfaces shall receive a well-adhered parged coat.
  2. Concrete shall be cured by water curing method. Any curing compounds must be of the pure sodium silicate type and be approved by the manufacturer's representative.
  3. Concrete shall be cured at least 7 days and shall be sloped for proper drainage.
  4. Voids, rock pockets and excessively rough surfaces shall be repaired with approved non-shrink grout or ground to match the unrepaired areas.
  5. Two-stage drains shall have a minimum 3 inch flange and be installed with the flange flush and level with the concrete surface.
  6. Surfaces at cold joints shall be on the same plane.

### 3.2 SURFACE PREPARATION

- A. The concrete surface shall be clean, dry and free from any surface contaminants or cleaning residue that may harmfully affect the adhesion of the membrane.
- B. Install a 3/4 inch face, 45 degree cant of polyurethane sealant at all angle changes and inside corners including penetrations through the deck, walls, curbs, etc.
- C. Cracks greater than 1/16 inch in width and all moving cracks less than 1/16 inch in width shall be routed out to 1/4 inch minimum in width and depth and filled flush with polyurethane sealant.
- D. Expansion joints less than 1 inch wide shall be cleaned, primed, fitted with a backing rod and caulked with polyurethane sealant. For larger joints, use standard detail recommended by membrane manufacturer.
- E. Allow sealant to cure overnight.
- F. Stir primer. Apply a thin film of primer 10 inches wide, centered over sealed cracks and joints, hairline cracks, and cold joints. Apply primer 8 inches on each side of all corners. Prime concrete around drain flanges. Allow primer to dry per manufacturer's recommendations.
- G. Install an 8 inch wide strip of sheet membrane centered over joints and cracks. Install a 12 inch wide strip of sheet membrane centered over the axis of all corners.

### 3.3 APPLICATION

- A. Priming: Clean surfaces to remove residual dust before priming. Stir primer. Apply by spray or roller at a rate recommended by manufacturer. Allow to dry per manufacturer's recommendation.
- B. Horizontal surfaces: Install sheet membrane from low to high point, so that laps will shed water. Overlap edge seams 2½ inches, end laps 5 inches. Stagger end seams. Roll in place with an 18 to 24 inch wide, 100 lb. (min.) resilient roller. Ensure that laps are firmly adhered and that there are no gaps or fish-mouths.
- C. Vertical Surfaces: Apply in lengths of 8 feet or less. Overlap edge seams 2½ inches. On walls over 8 feet high, apply in 8 foot sections, starting at the lowest point with the higher section overlapping the lower section 5 inches. Roll in place using firm pressure with a hand roller.
- D. Terminations: Consult manufacturer's standard details for proper terminations. Roll terminating edges firmly. Apply mastic to terminations and "T" joints. Apply mastic to laps at angle changes, extending 9 inches in each direction.

### 3.4 PROTECTION COURSE

- A. VERTICAL APPLICATION:
  - 1. Install protection board on all vertical surfaces.
- B. HORIZONTAL APPLICATION:
  - 1. Install protection board on all horizontal surfaces. If flood testing is delayed, install a temporary covering to protect membrane from damage by other trades.

END OF SECTION



**DIVISION 9 - FINISHES**

## SECTION 09900

## PAINTING

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Surface preparation and application of exterior coating
- B. Related Sections
  - 1. Section 03930 – Concrete Repair

## 1.2 REFERENCES

- A. The Society for Protective Coatings (SSPC):
  - 1. Surface Preparation Specifications
    - a. SP-3 - Power Tool Cleaning
    - b. SP-7 - Brush-Off Blast Cleaning
    - c. SP-13/NACE 6 - Abrasive Blast Cleaning: using compressed air, hydroblasting techniques.
  - 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
  - 5. SSPC Guide 6 – Guide for Containing Debris Generated During Paint Removal Operations
- B. Occupational Safety and Health Administration (OSHA) Standards
- C. International Concrete Repair Institute (ICRI): CSP 3

## 1.3 SCOPE OF WORK

- A. Items of work include but are not limited to the surface preparation and coating of the following:
  - 1. Exterior Concrete Wall, at locations specified on the Drawings

## 1.4 SUBMITTALS

- A. List of coating products and systems proposed, giving brand, type and manufacturer
  - 1. Manufacturer's current printed recommendations and product data sheets for each system
- B. Paint manufacturer's Compatibility Guide, to be a complete listing of all compatible paint systems/combinations produced by the paint manufacturer
- C. Copies of manufacturer's complete color charts for each coating system for finish color selection by the Owner.

- D. When requested by the Engineer, provide product container labels and labeled mixing instructions for products utilized in the Work.
- E. A submission plan including step-by-step installation methods for coating and painting installations. Plan shall include details on surface preparation required, including type and how surface preparation will occur. Plan shall also include the coating/painting application details, including number of coats, how the coats will be applied, cure time between coats, and installation details of all additional components as recommended by the manufacturer.
- F. Details pertaining to type of lift, scaffolding, or other type of fall protection equipment to be utilized.
- G. Methods for containment of debris from cleaning and painting process to prevent material from entering the river.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications – Minimum 5 years of experience in application of specified products.
- B. Regulatory Requirements – Meet federal, state and local requirements limiting the emission of volatile organic compounds.
- C. A qualified and experienced representative of the paint manufacturer shall meet with Contractor and Engineer to coordinate items requiring painting and to schedule the Work. Monthly field visits shall occur to ensure proper application of the painting system.

#### 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. Store coated items carefully. 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.
- C. Confine mixing, thinning, clean-up and associated operations, and storage of painting debris before authorized disposal, to these areas.
- D. Do not expose primed surfaces to weather for more than six months before top coating. Allow less time if recommended by coating manufacturer.
- E. Do not use plumbing fixtures, piping or mechanical equipment for mixing or disposal of paint materials.
- F. 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.
- G. During surface preparation, cleaning and painting operations, protect all surfaces not to be painted.
- H. Protect coated items, whether prime or finish, from damage due to shipping and handling. Use padding, blocking, fabric slings and extra care as required.

- I. 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. Conform with the Ozone Transport Commission (OTC) regulations for maximum VOC levels.
  - 2. Comply with manufacturer's recommendations as to environmental conditions including substrate moisture content, under which coatings and coating systems can be applied.
  - 3. 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. Painting materials shall be manufactured by Themec Company Inc., or Sika Corporation US, no equals.

##### 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. Contractor shall bear entire responsibility in providing complete compatibility of all shop and field painting systems.
- E. Coatings shall not contain Styrene or Isocyanate. Coatings must meet OTC guidelines for VOC levels.
- F. Coatings shall be environmentally friendly, low odor, water-based systems containing zero solvents.

##### 2.3 COLORS AND FINISHES

- A. Contractor shall paint a minimum of two test patches on the existing concrete repair area for the Owner to give final approval for the selected coating finish color. All finish colors will be selected from manufacturer's color chips. The Owner will select the colors. Match final colors to selected color from test patch, as scheduled.
- B. All finish colors will be selected from manufacturer's color chips. The Owner will select the colors. Match final colors to selected color from test patch, as scheduled.

- C. To provide contrast between successive coats, lightly tint each coat to distinguish it from preceding coats.
- D. Unless otherwise indicated, use gloss or semi-gloss for finish paint.

## 2.4 COATING TYPES

- A. Coatings are described in the Table 09900-A Coating Schedule. Description of coating types includes minimum acceptable percent, by volume of component solids. Paint systems and dry film thicknesses are included in Table 09900-B.

## 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. Repaired concrete surfaces must be cured in accordance with the repair material manufacturers recommendations prior to the application of the paint.
- D. Roll-on application of paint or coating system only. Spray application is not permitted.
- E. Surface preparation shall occur through mechanical means only. Chemical surface preparation is not permitted.
- F. 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. Testex Press-O-Film replica type x-coarse
  - 3. Surface temperature thermometer
  - 4. Sling psychrometer and psychrometric tables
  - 5. Type I or Type II dry film thickness gauges
  - 6. 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 50 degree F temperature. Do not apply paints to surfaces in direct sunlight.
  - 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, 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. Clean surfaces by power washing to a max pressure of 4,000 psi
    - a. Before power washing of bridge commences, the engineer will select up to three sample areas of 6' x 6' to be performed for assessment and approval of pressure and methods.
    - b. All debris must be captured and will not be allowed to enter the river.
    - c. Contractor to provide potable water for power washing operation. Water cannot be drawn from the river.
    - d. Localized power tool or sandblasting may be required to mitigate surface imperfections as determined by the engineer in the field. Debris be captured consistent with this specification requirements and will not be allowed to enter the water.
  2. Following cleaning, apply preparatory treatment in strict accordance with manufacturer's written instructions.
  3. Fill imperfections and holes in surfaces to be painted.
  4. Solvent cleaning will not be allowed.
- C. Provide higher degree of cleaning for acceptable equivalent paint products when paint manufacturer recommends in his printed surface preparation recommendations.
- D. Concrete for Paint Finishes
1. Clean thoroughly of all form oil, release agents, dirt, dust, grease, paint, loose material and foreign matter. Remove laitance; roughen smooth surfaces by brush sand blasting.
  2. After concrete has dried, prime where required in strict accordance with manufacturer's printed instructions.
- 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 substrate 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.

### 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. 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. Dry film thicknesses specified are constant for brush or roller.
  - a. Record quantities of materials of each type, for each coat used.
2. Apply paints and coatings using skilled painters, brushed or rolled or sprayed out carefully to a smooth, even coating without runs or sags. Flow enamel on evenly and smoothly. Allow each coat of paint to dry thoroughly, on the surface and throughout the film thickness, before the next coat is applied. High polymer coatings may be exempted from the drying requirement if recoat time is specified by manufacturer.
3. Finish surfaces - Uniform in finish and color, and free from flash spots and brush marks
4. Accessory items, finish hardware, lighting fixtures, escutcheons, plates, 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 EXISTING SURFACES TO BE RECOATED**

- A. Existing concrete surfaces so noted or scheduled shall be completely recoated.
- B. Primer and paint used for a particular surface shall, in general, be as scheduled for that type of new surface. Confirm with the paint manufacturer that the paint proposed for a particular recoating condition will be compatible with the existing painted surface. Perform adhesion and compatibility tests on existing substrates. Recoated areas shall be covered by the same guarantee specified for the remainder of the project.

**3.5 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.

**3.6 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.

**3.7 FIELD QUALITY CONTROL**

- A. Leave staging and lighting in place until the Engineer has inspected surface or coating. Replace staging removed prior to approval by the Engineer. Provide additional staging and lighting as requested by the Engineer.
- B. 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.
- C. Damaged coatings, Pinholes and Holidays
  - 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.

**TABLE 09900-A**  
Coating Schedule

<b>Manufacturer</b>	<b>Coating</b>	<b>Description (Solids Content by Volume)</b>
Tnemec Company Inc.	Elasto-Grip FC 151-1051	Modified Waterborne Acrylate (17.0 ± 2.0%)



**TABLE 09900-A**  
Coating Schedule

<b>Manufacturer</b>	<b>Coating</b>	<b>Description (Solids Content by Volume)</b>
	Enviro-crete Series 156	Modified Waterborne Acrylate (50.9 ± 2.0%)
Sika Corporation US	Sikagard 552W Primer	One component primer (20%)
	Sikagard 550W Elastocolor	Acrylic Protective Coating (55.0%)

**TABLE 09900-B**  
Paint System Schedule

<b>Surface</b>	<b>Surface Preparation</b>	<b>Finishes</b>		
		<b>Primer</b>	<b>2nd</b>	<b>Final</b>
<b>DFT = Dry Film Thickness, Mils</b>				
Exterior Concrete Wall	Power washing	Elasto-Grip FC 151-1051 (DFT =0.7-1.5)	Enviro-crete Series 156 (DFT=4.0-8.0)	Enviro-crete Series 156 (DFT=4.0-8.0)
		OR	OR	OR
		Sikagard 552W Primer	Sikagard 550W Elastocolor (DFT=8.0)	Sikagard 550W Elastocolor (DFT=8.0)

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers Evaluation\Design\Specifications\DIV  
09\09900-painting.docx

**DIVISION 13 - SPECIAL CONSTRUCTION**

## SECTION 13281

## ASBESTOS ABATEMENT

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Abatement of asbestos-containing materials
- B. Related Sections
  - 1. Section 01350, Health and Safety
  - 2. Section 02225, Selective Demolition

## 1.2 GENERAL

- A. This section addresses the abatement of asbestos-containing materials only. Furnish all labor, materials and equipment and perform all work required to safely remove and legally dispose of all asbestos-containing materials. Provide all insurance, certifications, and licenses necessary for the work.
- B. Under the work of this Section, “Engineer” is defined as a third-party consultant or other abatement project monitoring entity working on behalf of the Owner.
- C. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.
- D. Work closely with the Owner and all other trades to perform a successful abatement project. Attend progress and scheduling meetings on a weekly basis.
- E. Should the Contractor choose to submit a non-traditional (NT) Work Plan, the Contractor is responsible for NT Work Plan approval applications and costs for work practices that are different from the specific work practices prescribed in the MassDEP Asbestos Regulation. NT Work Plans must be created by a Massachusetts licensed Project Designer.
- F. Obtain, prepare, and submit applicable forms and permits required for asbestos abatement.

## 1.3 ABBREVIATIONS

- A. AAT: Asbestos Analyst Training
- B. ACM: Asbestos Containing Material
- C. AIHA: American Industrial Hygiene Association
- D. HEPA: High Efficiency Particulate Air
- E. MassDEP: Massachusetts Department of Environmental Protection
- F. MADLS: Massachusetts Department of Labor Standards
- G. MSHA: Mine Safety and Health Administration

- H. NESHAPS: National Emissions Standards for Hazardous Air Pollutants
- I. NIOSH: National Institute for Occupational Safety and Health
- J. OSHA: Occupational Safety and Health Administration
- K. PEL: Permissible Exposure Limit
- L. SDS: Safety Data Sheet
- M. USEPA: United States Environmental Protection Agency

#### 1.4 REFERENCES

- A. Comply with the most recent asbestos removal and disposal requirements established by applicable federal, state, and applicable local government laws, statutes, regulations, ordinances, standards, and guidelines including the following:
  - 1. USEPA Regulations for Asbestos, 40 CFR 61, Subpart M, NESHAPS
  - 2. USEPA Regulations for Asbestos, Asbestos Abatement Projects, 40 CFR 763, Subpart G
  - 3. US Department of Labor, OSHA Asbestos Regulations, 29 CFR 1926.1101
  - 4. NIOSH air sampling and evaluation standards
  - 5. AIHA Standards
  - 6. MSHA, United States Department of Labor regulations
  - 7. MassDEP Regulations 310 CMR 7.00, 310 CMR 18.0, and 310 CMR 19.00
  - 8. MADLS Regulations 454 CMR 28.00.
  - 9. All applicable local ordinances, regulations, or rules pertaining to asbestos. Including its storage, transportation, and disposal.

#### 1.5 SUBMITTALS

- A. Prior to the start of the abatement work. Prepare and submit the following items. Do not commence work activities until submittals are reviewed and accepted by the Engineer.
  - 1. Detailed work plan which identifies:
    - a. Methods and materials for isolating the work area(s) from non-work area(s)
    - b. Methods and materials for protecting remaining sections of concrete spandrel walls, the Deerfield River, and other fixed equipment
    - c. Locations and details of construction of the Decontamination Facility
    - d. Number and capacity for the portable HEPA-filtered exhaust units
    - e. Locations of water and electrical sources for intended usage
    - f. Details for the proper removal, handling, packaging, and disposal of ACM in compliance with this specification and applicable regulations

- g. Procedures which differ from those specified in this section. Any deviations from these specifications require approval from the Engineer. Any deviations from current asbestos regulations require written approval from regulatory agencies having jurisdiction.
  2. If applicable, submit copies of NT Asbestos Work Practice Approval applications for use at this time. Provide approval letters.
  3. Submit copies of all notifications, permits, applications, and like documents required by federal, state, or local regulations obtained or submitted in proper fashion.
  4. Submit a project specific chain-of-command for this project. Include cell phone numbers and email addresses of those listed on the chain-of-command.
  5. Submit the current valid MADLS Asbestos Abatement Contractor license and certificate of insurance.
  6. Submit a detailed project work schedule for each area listing the proposed number, dates, and hours of each work shift. Schedule shall encompass the entire project, including notifications, pre-abatement inspections, post-abatement inspections, clearance air sampling, and final clean up. Coordinate schedule with the OR and Owner.
  7. Submit documentation of asbestos training including 8-hour OSHA Class II Asbestos Training with hands-on training, OSHA-specified medical examinations (with examiner approval) and successful respirator fit test records of each employee who may be on the Site.
  8. Submit a site-specific Emergency Action Plan for the project. The Emergency Action Plan may include emergency procedures to be followed by Contractor personnel to evacuate the buildings; nearby hospital name, address, and phone number; most direct transportation route to the hospital from the Site; emergency telephone numbers, etc. If this information is contained within an Emergency Action Plan or Health and Safety Plan prepared by the Site's General Contractor, a copy shall be submitted for review.
  9. Submit the name and address of the waste hauling contractor and proposed landfill to be used. Also submit applicable licenses, current valid operating permits, and approvals.
  10. Submit copies of all Waste Shipment Records (WSR) and generator labels to be used for this project. Copies shall include generator's information.
  11. Submit a copy of the Contractor's OSHA-required written Respiratory Protection Program, including a fit testing methodology for respirators, maintenance, and decontamination details, and make, model and NIOSH approval numbers of respirators to be used at the Site,
  12. Submit detailed Safety Data Sheets and product information on all materials and equipment proposed for asbestos abatement work on this project.
  13. Submit documentation of Contractor's air sampling laboratory certification for analysis of Contractor's OSHA personal air samples.
- B. The Contractor shall submit the following to the Engineer during the course of the work:

1. Daily results of all personal air sampling.
  2. Certificate, training, medical, and fit-test records for new employees to start work (24 hours in advance of work).
  3. Contractor site logs.
  4. Revised Notification, if any.
  5. Copies of WSRs for waste that has left the site.
- C. The Contractor shall submit the following to the Engineer at the completion of work:
1. Completed copies of WSR (within forty-five days).
  2. Remaining personal air sampling results and site logs.

#### 1.6 LOCATION OF WORK AND SITE CONSTRAINTS

- A. Location of work areas and descriptions, estimated types and quantities of ACM are described in the attached Abatement Schedule. Some of the ACMs are also identified on the appended Photo Log. If additional ACMs are encountered, notify the Engineer immediately and have an asbestos abatement team be prepared to abate the material if it to be impacted as part of the work.
- B. The Abatement Schedule located at the end of this section identifies ACM encountered and bulk sampled during the survey. Bolded items indicate a positive result. Abate all ACM in areas identified in the Abatement Schedule.

#### 1.7 NOTIFICATION

- A. Notify appropriate regulatory agencies of abatement activities.
1. Submit the required written notification and appropriate fee at least 10-working days before the start of the asbestos abatement activity to all required state agencies, including MassDEP.
  2. Notify local Building Departments, Board of Health or Health Departments and any other applicable local departments as required.
- B. If a potential hazard relating to the asbestos abatement work is observed, immediately notify the Engineer by telephone, followed by written notice, of any risks of adverse health and safety impacts on the environment, exposure of workers or the general public, or possible failure to comply with the specifications. Promptly notify the Engineer of the reason and required resolution of all observed deficiencies and record them in ink in a hardbound notebook.

#### 1.8 MONITORING AND FINAL CLEARANCE

- A. Contractor Responsibilities
1. Conduct appropriate personal exposure monitoring to determine compliance with OSHA requirements. All air samples shall be analyzed by a laboratory accredited by the AIHA. Sampling equipment shall be calibrated before and after each use.

2. Contractor shall be responsible for the payment of all costs associated with any air sample collection and analysis performed by their third-party project monitor in accordance with OSHA requirements.

**B. Owner's Responsibilities**

1. The Engineer, a third-party representative working on behalf of the Owner, may conduct periodic monitoring and air sampling (if required), during the course of abatement operations to determine the effectiveness of regulated work areas/containment systems and work procedures per request of the Owner. The Engineer will perform final visual inspections and collect final air clearance samples (if required) for certifying work areas as clean following removal and cleanup tasks.
2. The Owner will be responsible for the payment of costs associated with the sampling and analysis of air sampling by the Engineer, including the initial final air clearance samples. The Contractor shall be responsible for the payment of all costs associated with the collection and analysis of additional final clearance air samples if the first set of samples fail to satisfy the clearance criteria.

- C. Air Quality Standard:** If required, all air tests made in proximity to any removal area, and to document "clean air," shall be compared to an air quality standard of 0.010 fibers per cubic centimeter (f/cc) as required by applicable regulations. If any air sample exceeds the air quality standard, immediately stop all work until the cause is identified and corrected.

- D. Air Monitoring Methods:** If sampling is performed, use NIOSH Method 7400 to measure levels of airborne asbestos fibers for all air sampling events. All monitoring methods shall comply with the requirements of 29 CFR 1926.1101 and applicable state regulations. Results – Provide copies of all personal exposure monitoring results, and post results at work site after obtaining the results, but not later than 48 hours.

- E.** Following the completion of the encapsulation phase of the work, the Engineer shall perform post abatement inspections prior to removal of any regulated or containment areas.

- F.** Upon completion of work in any defined work area, the Contractor and Engineer shall conduct a final inspection for the purpose of certifying compliance with these specifications, State/Federal regulations, and work completion. Immediately correct unsatisfactory conditions. The work will be considered complete only after a certificate of completion and all properly completed WSRs Forms are submitted, as required by law.

**1.9 WORKER PROTECTION AND SAFETY**

- A.** Prior to commencing work, instruct all workers in all aspects of personnel protection, work procedures, emergency procedures and use of equipment including procedures unique to this project.
- B.** Monitor airborne asbestos concentrations in the workers' breathing zone to establish conditions and work procedures for maintaining compliance with OSHA Regulations Title 29 CFR Parts, 1910.1001 and Part 1926.1101.

- C. The Contractor's air sampling professional shall document all air sampling results and provide all air sampling reports as soon as feasible. OSHA air monitoring results shall be posted at a conspicuous location at the job site.
- D. The Contractor is responsible for complying with all additional OSHA regulations, such as but not limited to Duty to have Fall Protection (1926.501) and Fall Protection Systems Criteria and Practices (1926.502), while performing work on this project.

#### 1.10 WORKER QUALIFICATIONS, TRAINING, AND EDUCATION

- A. Contractor is required to have a Competent Person supervise each work area at all times work is in progress and shall employ the use of trained asbestos workers with 8-hour OSHA Class II Asbestos Training with hands-on training.
- B. The Competent Person shall be thoroughly familiar and experienced with asbestos abatement and related work and shall enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of EPA, OSHA, and NIOSH requirements and guidelines. The Competent Person shall be trained in accordance with applicable state regulations.
- C. Enforce strict discipline and good working order at all times among employees, and do not employ any person not skilled in the work assigned, nor anyone who has not received documented notice of the hazards of asbestos abatement, formal training in the use of respirators, safety procedures, equipment, clothing, and work procedures.

### PART 2 PRODUCTS

#### 2.1 GENERAL

- A. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner that shall not interfere with operation of others at the facility, or employee's access and safety.
- B. Damaged or deteriorated materials shall not be used and shall be promptly removed from the premises. Materials that become contaminated with asbestos-containing material shall be thoroughly cleaned, or sealed in plastic bags or sheeting, labeled, and legally disposed of in an approved, secure landfill.
- C. All materials and equipment shall comply, at a minimum, with all sections of this specification, relevant federal, state, and applicable local codes, and industry standards.

#### 2.2 ABATEMENT EQUIPMENT & SUPPLIES

- A. HEPA-Filtered Exhausts (if required): For negative pressure enclosures, air inside each work area shall be exhausted through a High Efficiency Particulate Air (HEPA) filter. Commercially manufactured HEPA-filtered exhaust units, with specification plates intact, must be provided for each work area to attain, at a minimum, four air volume changes per hour and an inward flow of clean air into each work area at the Decontamination Facility of at least 100 feet per minute. The HEPA filter shall be preceded by replaceable prefilters, and the unit must be designed so that it cannot be operated unless all filters are in place. The units must also be designed with a gauge to indicate the pressure drop across filters, and lights or audible alarms to indicate that the filters are



properly installed, functional, and when they must be changed. Flexible ducting shall be required to allow exhaust to the exterior of the building.

- B. Plastic Sheetting (“Poly”) and Bags shall be polyethylene or equivalent with a thickness of at least 6 mil for all applications, unless regulations dictate otherwise. Contractor is responsible for determining if fire rated polyethylene sheeting is required by State or local Fire Marshal.
- C. Wetting Agent or Surfactant shall be 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether, or equivalent, mixed in proportion of one ounce of surfactant per five gallons of water. The material shall be odorless, nontoxic, nonirritating, and noncarcinogenic. It shall be applied as a mist using a low-pressure sprayer recommended by the surfactant manufacturer.
- D. Tape and Glue shall be capable of sealing plastic joints and attaching plastic to finished surfaces. The bonding strength and resulting seal integrity shall not be affected by mist or water, wetting or encapsulating agent, or any other materials to be used in the work area.
- E. Warning Signs, Asbestos Caution Tape and Labels shall comply with all federal, state, or local codes and regulations.
- F. Waste Containers and Transportation shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without risk of ripping, rupture, or exposure to persons, or emissions to the atmosphere. Transportation methods shall comply with the provisions of 40 CFR 61, Subpart M, and with any state or local hazardous or special waste regulations for temporary storage, transport, and disposal if such codes are enforced in states in which the waste will be stored, transported, or disposed of.

## 2.3 SAFETY SUPPLIES AND EQUIPMENT

- A. Respirator Types: Provide all workers with a full or half facepiece respirator that is approved by NIOSH/MSHA for protection against airborne asbestos and meets the requirements of the OSHA Asbestos Standard. Provide respirators for each worker and at least two extra respirators for use by approved visitors.
- B. Protective Clothing: Provide all workers and approved visitors with disposable coveralls, head and foot coverings, gloves, and eye protection (i.e., safety glasses) and half-face respiratory protection including HEPA cartridges.

## PART 3 EXECUTION

### 3.1 PRE-CONSTRUCTION MEETING

- A. Upon receipt of a Notice to Proceed, meet with the Engineer at the site to reach agreement on:
  - 1. Scope and manner of work performance and all schedules.
  - 2. Contractor, subcontractor, and vendor vehicle access and parking.
  - 3. Contractor access to the work areas, including approved doors, stairways, and corridors.
  - 4. Location of electrical, water supply, and wastewater drain connection points, if available.

5. Determination of all equipment and other items to be removed from the work areas, and the location of temporary storage space if applicable.
  6. Any other logistical factors to minimize interference with the Owner, public safety and health, and other Contractor activities.
- B. Prepare the work areas according to the following general sequence of procedures to ensure that proper fiber containment and protection systems are installed before any work which could generate airborne asbestos fibers.
1. Where exterior non-friable ACM is to be removed from outside the building, post asbestos abatement warning signs and erect temporary barricades to create regulated areas. Regulated areas should be kept clear of any persons not fully trained and protected against exposure.
  2. Maintain an operable remote worker decontamination system in accordance with Section 3.2 of this Specification.
  3. Maintain a work area access control log for each exterior work area.
  4. Where friable ACM or non-friable ACM that has or will become friable, is to be removed from outside the building, removal shall be conducted from within a negative pressure containment in accordance with applicable federal, state, and local regulations.

### 3.2 REMOTE PERSONNEL DECONTAMINATION SYSTEM

- A. For exterior abatement, or where contiguous decontamination systems are not feasible, the Contractor shall establish a remote personnel decontamination system. The use of a remote decontamination unit must be indicated on the state notification forms. Access between the contaminated and uncontaminated areas shall be through this decontamination enclosure only. The decontamination system shall be constructed of two layers of six-mil polyethylene sheeting. Prefabricated "pop-up" decontamination chambers will not be permitted on this project.
- B. Access between rooms in decontamination system shall be through double flap-curtained openings. Clean room, and equipment room within decontamination system shall be completely sealed ensuring that the sole source of air flow through this area originates from uncontaminated areas outside the work area.
- C. The equipment room shall be equipped with a cleaning hose used to decontaminate workers and equipment. A shower filtration pump containing two 5-micron sock filters, or the best available technology shall be installed to filter shower water. Filtered shower water shall be discharged into sanitation drains and shall not be discharged into storm drains or onto floor or ground surfaces.
- D. The shower room shall have soap and an adequate supply of drying towels. Provide an adequate number of shower units in accordance with OSHA Title 29 CFR, Part 1926.1101.

### 3.3 APPROVAL OF CONTAINMENT AREAS

- A. After the work area has been prepared as specified, request an inspection by the Engineer. No removal or disturbance of asbestos-contaminated materials or systems is to occur until the Engineer has inspected and approved each separate prepared work area.

- B. Any deficiencies in the preparation work shall be promptly corrected in a manner satisfactory to the Engineer.

### 3.4 ASBESTOS REMOVAL PROCEDURES

#### A. Non-friable Asbestos

1. Abatement of non-friable ACM must be performed in accordance with Environmental Protection Agency federal regulations which include the NESHAPS regulations and MassDEP 310 CMR 7.15.
2. All non-friable removal areas shall be properly segregated by posting caution signs meeting the specifications of OSHA 29 CFR 1926.1101 at all locations and approaches to a location where airborne concentrations of asbestos have the potential to exceed ambient background levels. Workers shall use all protective equipment. The material shall be removed very carefully to minimize any breakage that may release airborne fibers.
3. All ACM must be continuously wetted during impact operations. Ensure that a level of no visible emissions is always achieved; otherwise contain the materials within a negative pressure containment.

#### B. Encapsulation

1. After all asbestos-containing material is removed, seal the surface with a penetrating encapsulation material. Inform the Engineer whenever any asbestos-containing materials cannot be removed, whether in total or in part. Corrective actions will be determined by the Engineer.
2. The encapsulant shall be prepared according to the manufacturer's specifications, then applied to the surfaces. Provide all workers with an MSDS on the encapsulant. Ensure that workers wear appropriate personal protective equipment as designated on the SDS during encapsulant application.

#### C. Abrasive Cutting/Sawing/Drilling (if applicable)

1. An asbestos designated HEPA vacuum cleaner shall be used with the hose attachment positioned with the abrasive tool in such a manner to ensure that the vacuum will capture all dust.
2. Depending on the air velocity in the area, a shield may be required to ensure that the vacuum is able to capture all dust created. Air velocity may be affected by, but not limited to, wind, building ventilation, and temperature differentials.
3. Constantly wet the ACM during impact operations via tool attachment or by hand.

#### D. Concrete Curb Caulk/Sealant

1. Concrete curb caulk/sealants are located along the edge of the bridge on both the north and south sides. Refer to the Abatement schedule for details and specific locations. Perform work in accordance with MassDEP regulations involving exterior non-friable roofing materials. Operations involving the cutting or abrading of concrete curb asbestos caulk material are considered to release sufficient friable material thus constituting an asbestos abatement activity. Any work using such equipment must be performed by licensed asbestos

workers in a negative pressure enclosure. These restrictions shall be lifted if slicing equipment or manual means to remove the asbestos materials and EPA and/or state guidance on abatement of caulking materials is followed.

2. Work Procedure

- a. Perform procedures as necessary including the application of wet methods and covering materials to ensure that release of asbestos materials is reduced to no visible emissions. Work using any cutting or abrading equipment is prohibited.
- b. Remove asbestos caulking materials using tools and equipment specified in regulatory guidance documents.
- c. Continuously mist the work area as asbestos caulking materials are being removed from the structure.
- d. All asbestos caulking materials must be removed intact where feasible.
- e. All loose debris shall be immediately collected via HEPA vacuum or wet wipe. The vacuum debris and wipe materials shall be segregated and disposed of as asbestos contaminated waste.
- f. Wet methods shall be used whenever operations call for the scraping of caulking materials.

3.5 FINAL WORK AREA CLEANUP, DECONTAMINATION, AND WASTE DISPOSAL

A. General Requirements

1. After all asbestos-containing or contaminated materials have been removed, remove all waste, and perform a final cleanup and decontamination of each work area. Final cleaning shall be performed only after all waste is packaged and removed, but before reinstalling, demolishing any equipment, or dismantling any barrier, Decontamination Facility, or protective covering. Cleaning shall be subject to the approval of the Engineer based on a visual inspection and air testing if required.

B. Cleaning Methods and Approval

1. Thoroughly clean all waste containers and removal equipment with a HEPA-filtered vacuum, decontaminated with the use of the amended water, and then remove from the work area.
2. All surfaces in the work area shall be thoroughly wiped clean, and after drying, thoroughly decontaminated with a HEPA-filtered vacuuming device and encapsulated.
3. After cleaning, the Engineer shall inspect the site. To facilitate, notify the Engineer of the anticipated completion of the site cleaning at least 48 hours in advance.
4. If any waste or fibers are observed within the work area during the inspection, perform additional cleanup and decontamination.
5. If final air clearance sampling is required, any air sample results above the Air Quality Standard, require additional cleaning and decontamination. Repeat the inspection and air

tests, at no additional cost to the Owner. If the air sample results are below the Air Quality Standard, the Engineer will give approval for the Contractor to remove all protective coverings which do not comprise part of the work area seal, containment barrier, or decontamination facility.

6. Once these items have been properly packaged and removed from the work area as contaminated waste, package and properly dispose of all remaining plastic sheeting, disassemble, and remove the Decontamination Facility and HEPA exhausts, and perform a final HEPA vacuuming of all surfaces.
7. Upon completion of the cleaning, repair all temporary access openings and correct all unsafe conditions.

#### C. Waste Disposal

1. **Definition:** Asbestos wastes are defined as all building materials and debris, insulation, disposal clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, or any abatement equipment that has been contaminated with asbestos and cannot be completely cleaned by vacuuming and by washing in the Decontamination Facility.
2. **General Requirements:** All asbestos wastes (e.g., caulking material, poly sheeting, PPE, etc.) must be handled, packaged, stored, transported, and disposed of as specified in this subsection, and in compliance with all federal, state, and local regulations and codes.
3. **Waste Labeling:** If waste containers are not already so pre-printed, warning labels having waterproof print and permanent adhesive shall be affixed to the lid and/or sides of the containers, whether or not these containers are further packaged. Warning labels shall be conspicuous and legible, and conform to the latest OSHA, EPA, and DOT labeling requirements.
4. **Waste Packaging:** Thoroughly wet all waste when packaged and inspect each bag to observe that water condensation is visible. Open, rewet, and reseal insufficiently wetted bags. When a waste bag is full, securely seal it with tape, and place it in the designated temporary storage area inside of the work area.

#### D. Waste Container Removal and Disposal Documentation

1. To comply with the requirement that waste disposal to an approved landfill be documented, remove waste containers from work areas only under the direction of the Engineer, and complete appropriate documentation for each load of waste removed from the site.
2. Accurately measure the volume of each container or load of waste removed from the site.
3. Provide legal transportation of the waste to the disposal landfill, and complete or obtain all required licenses, manifests, dump slips, or other forms. Copies of all forms or licenses, and the signed original of the Waste Shipment Record (WSR) for each waste load shall be given to the Engineer.
4. Waste may be transported to and temporarily stored in a pre-approved off-site storage area owned by the Contractor, but it must ultimately be disposed of at the specified landfill before final payments are approved.

END OF SECTION

APPENDIX A - PAINT CHIP LABORATORY DATA

APPENDIX B - ASBESTOS ABATEMENT SCHEDULE

APPENDIX C - PHOTO LOG

**Tighe&Bond**

**APPENDIX A**



# EMSL Analytical, Inc.

528 Mineola Avenue, Carle Place, NY 11514

Phone/Fax: (516) 997-7251 / (516) 997-7528

<http://www.EMSL.com>

[carleplacelab@emsl.com](mailto:carleplacelab@emsl.com)

EMSL Order:	062318007
CustomerID:	TIGH62
CustomerPO:	
ProjectID:	

Attn: **Andrea Lacasse  
Tighe & Bond  
213 Court Street  
Suite 1100  
Middletown, CT 06457**

Phone: (860) 704-4760  
 Fax: (860) 704-4775  
 Received: 9/18/2023 09:46 AM  
 Collected: 9/14/2023

Project: **Bridge of Flowers Structural Condition Assessment - Project No. 28-2161-003A - 22 Water Street, Shelburne Falls, MA**

## Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
23-0914-LCHP-NY-01 Site: South Side of Bridge Desc: Gray/Off White Curb & Spandrel Wall Concrete	062318007-0001	9/14/2023	9/20/2023	0.072 % wt
23-0914-LCHP-NY-02 Site: South Side of Bridge Desc: Gray/Off White Curb & Spandrel Wall Concrete	062318007-0002	9/14/2023	9/20/2023	0.093 % wt
23-0914-LCHP-NY-03 Site: South Side of Bridge Desc: Green Handrail Metal	062318007-0003	9/14/2023	9/20/2023	0.038 % wt

James Han, Chemistry Laboratory Manager  
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

\* Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY AIHA LAP, LLC-ELLAP Accredited #102344, CT PH-0249, NYS ELAP 11469, CA 2339

Initial report from 09/21/2023 07:47:37



062318007

Tighe&Bond

213 Court Street, Suite 1100, Middletown, CT 06457

Phone 860-704-4760

**SAMPLE LOG FOR LEAD  
IN PAINT CHIPS**

Sheet 1 of 1

Project Name: Bridge of Flowers Structural Condition Assessment Project No. 28-2161-003A

Building: 22 Water Street, Shelburne Falls, MA Project Manager: Andrea Lacasse

Sample ID	Component	Color	Material Location	Substrate	Sample Area (size)
23-0914-LCHP-NY-01	Curb & Spandrel Wall	Gray/Off White	South Side of Bridge	Concrete	4 square inches
23-0914-LCHP-NY-02	Curb & Spandrel Wall	Gray/Off White	South Side of Bridge	Concrete	4 square inches
23-0914-LCHP-NY-03	Handrail	Green	South Side of Bridge	Metal	4 square inches

**Analysis Method:** Lead Flame AAA Analysis /EPA-SW-846-3050(MOD.) Turnaround Time 5 day

**Email Results To:** NYergeau@tighebond.com **Email Invoice To:** AMLacasse@tighebond.com

**Special Instructions:** Report LBP analytical results in Percent (%) by Weight

**Samples Collected By:** Nathan Yergeau Date: 09/14/2023 Time: 11:00 am  
**Samples Rec'd/Sent By:** [Signature] Date: 09/15/2023 Time: 3:45 pm  
**Samples Received By:** James Han Date: 9/18/23 Time: 9:46 am

**Shipped To:**  EMSL (State) NY  Other \_\_\_\_\_

**Method of Shipment:**  Fed Ex.  UPS Overnight  UPS Ground  Other \_\_\_\_\_

Pb [Signature] 9/20/23

RECEIVED  
EMSL ANALYTICAL INC.  
CARLE PLACE, CT  
2023 SEP 18 A 9:46



**Tighe&Bond**

**APPENDIX B**

**SECTION 13281  
 ASBESTOS CONTAINING MATERIALS ABATEMENT SCHEDULE  
 SHELBURNE FALLS FIRE DISTRICT  
 BRIDGE OF FLOWERS  
 22 WATER STREET, SHELBURNE FALLS, MASSACHUSETTS**

Sample ID #	Material Description	Material Location	Approximate Quantity	Condition	Asbestos Result	Comment
<b>23-0914-PLM-NY-01, -02</b>	<b>Concrete Curb Caulk</b>	<b>North &amp; South Sides of Bridge</b>	<b>40 LF</b>	<b>Fair</b>	<b>&lt;1% Chrysotile</b>	<b>1" wide gray concrete curb caulking applied to approximately 26 seams. Seams are located along edge of bridge on both North &amp; South sides, with each seam approximately 18" in length. EPA does not regulate materials containing &lt;1% asbestos, however MassDEP classifies &lt;1% asbestos materials as an ACWM and must be disposed of as such.</b>
23-0914-PLM-NY-03, -04	Concrete	North & South Sides of Bridge	-	Damaged	ND	From Spandrel Walls
23-0914-PLM-NY-05, -06	Lamp Post Caulk	North & South Sides of Bridge	-	Fair	ND	On Metal Lamp Posts
23-0914-PLM-NY-07, -08	Filter Fabric	North & South Sides of Bridge	-	Fair	ND	Below Grade on Inside of Spandrel Walls, Top Layer
23-0914-PLM-NY-09, -10	Waterproofing Protection Board	North & South Sides of Bridge	-	Fair	ND	Below Grade on Inside of Spandrel Walls, Middle Layer
23-0914-PLM-NY-11, -12	Waterproofing Membrane/Mastic	North & South Sides of Bridge	-	Fair	ND	Below Grade on Inside of Spandrel Walls, Bottom Layer

**LEGEND**

SURVEY PERFORMED BY: Nathan Yergeau  
 ACWM = ASBESTOS CONTAINING WASTE MATERIAL  
 LF = LINEAR FEET  
 ND = None Detected

State License #: AI901135      9/14/2022

Signature:

**BOLDED AREAS INDICATE ACWM**

**Tighe&Bond**

**APPENDIX C**

# Photographic Log

**Client:** Shelburne Falls Fire District  
Water Street, Shelburne Falls, CT  
**Site:** Bridge of Flowers


**Job Number:** 28-2161-003



# Photographic Log

**Client:** Shelburne Falls Fire District  
Water Street, Shelburne Falls, CT  
**Site:** Bridge of Flowers

**Job Number:** 28-2161-003

<b>Photograph No.:</b> 1	<b>Date:</b> 09/2023	<b>Direction Taken:</b> N/A
<b>Description:</b> Representative Green Painted Metal Handrails		
		

The photograph shows two curved, green-painted metal handrails. A clear glass light fixture is suspended from a wire between the two rails. The background consists of dense green foliage.

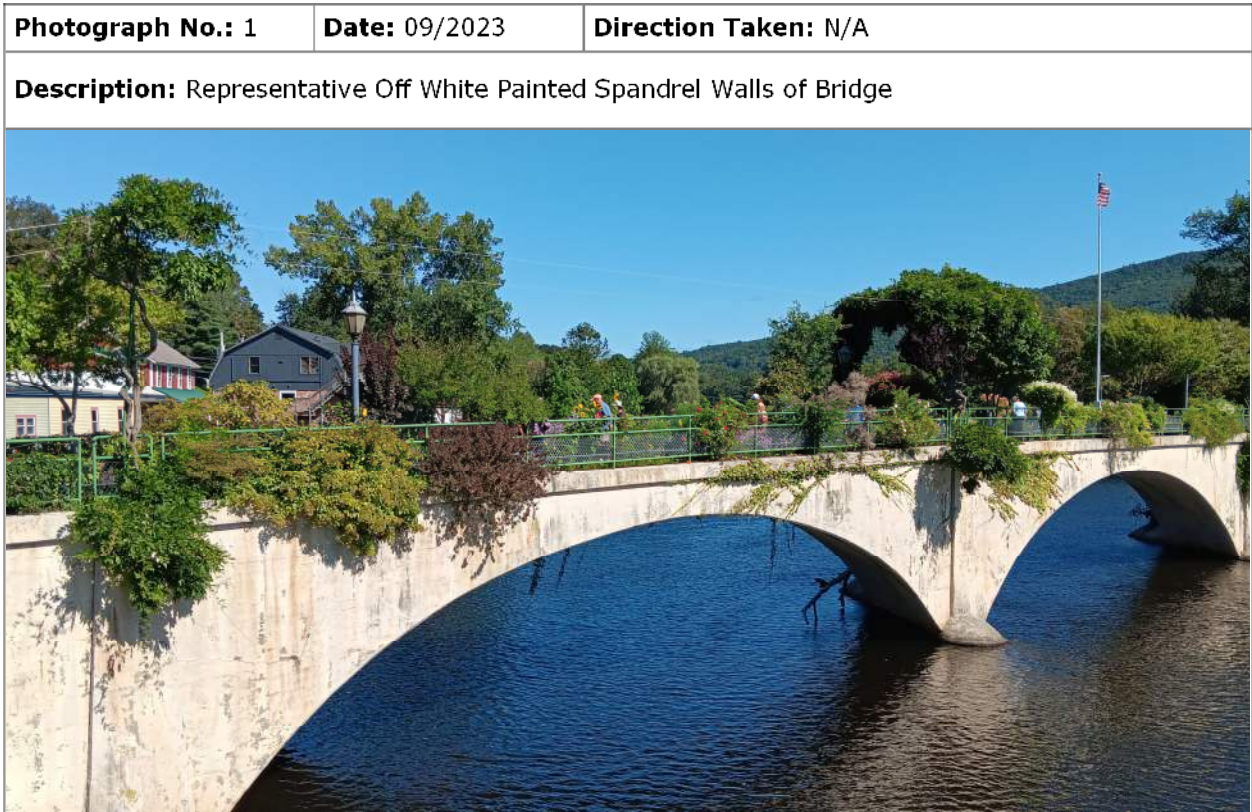
<b>Photograph No.:</b> 2	<b>Date:</b> 09/2023	<b>Direction Taken:</b> N/A
<b>Description:</b> Representative Off White Painted Concrete Curbing		
		

The photograph shows a close-up of an off-white painted concrete curb. A black pipe is attached to the curb with a metal bracket. The scene is outdoors with shadows cast on the concrete.

# Photographic Log

**Client:** Shelburne Falls Fire District  
Water Street, Shelburne Falls, CT  
**Site:** Bridge of Flowers

**Job Number:** 28-2161-003



**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
  - 3. Instruction – Staff Training
- B. Related Sections
  - 1. Section 01140 – Work Restrictions
  - 2. Section 01770 - Closeout Procedures
  - 3. Section 16080 - Electrical Testing

## 1.2 REFERENCES

- A. ASCE 7-10 – Minimum Design Loads for Buildings and Other Structures
- B. International Building Code – IBC 2015
- C. Massachusetts Electrical Code
- D. Massachusetts State Building Code, 9<sup>th</sup> Edition, 780 CMR
- E. NFPA 70 - National Electrical Code
- F. NFPA 79 – Electrical Standard for Industrial Machinery
- G. 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.
- D. Seismic restraint details including stamped certification from a professional engineer.
- E. Provide a schedule of all Electrical system related Owner training, within one month of the Notice to Proceed. Prior to training, resubmit schedule if training is rescheduled and resubmit upon completion of all training. At a minimum, for each piece of equipment or system to be demonstrated, the schedule should include the following:
  - 1. Equipment or system to be demonstrated

2. Related specification section
  3. Anticipated date of training
  4. Anticipated duration of training session
  5. Name and company of instructor providing the training
  6. Date completed
  7. Actual duration of training session
- F. Submit a Sequence of Construction for the demolition and installation of equipment with restrictions listed in this document and 01140. Sequence of Construction shall be updated during construction (if changes are required) and resubmitted for comment.

#### 1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable Massachusetts Building Code.
- B. Electrical - Conform to the state-adopted version of the National Electrical Code with Massachusetts amendments. All references to the National Electrical Code or NEC in the project manual or on the drawings shall be construed as references to the Massachusetts 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. Where it is necessary to core a hole through an existing concrete slab or wall, the Contractor shall conduct a survey with a pachometer or by similar means to identify the location of steel reinforcing bars. The new hole shall be located so as to avoid cutting reinforcing bars. Where reinforcing steel is close enough together that it is not possible to core the required hole without cutting reinforcing bars, contact the Engineer for further direction before cutting a hole. Where reinforcing bars are cut

without the consent of the Engineer, the slab or wall will be repaired at the expense of the Contractor.

F. 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.
4. Provide wiring shown on the Drawings unless specifically excluded.

G. 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.

H. 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.

I. Where underground electric facilities are installed, measure, record, and submit as built dimensions.

## 1.6 SEQUENCING AND SCHEDULING

- A. Shutdown quantity and durations shall be minimized and limited to restrictions specified in 01140 Work Restrictions and as described below.
- B. Provide temporary power source(s), motor controller(s), distribution equipment, wiring (power and signal) and conduit as required to keep all equipment operational at all times (except during switchovers), to meet requirements of 01140 Work Restrictions, and to meet requirements described below.
- C. Coordinate shutdown schedule and durations with the Owner.
- D. Install all conduit/wire to the extent feasible prior to shutdowns to minimize outage durations.

## 1.7 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.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. Products shall be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) recognized by OSHA if a listing for that product is available. NRTL shall be Underwriter's Laboratory (UL), Electrical Testing Laboratory (ETL), Factory Mutual (FM) or equal.
- B. Equipment Ampere Interrupting Capacity (AIC) and/or Short Circuit Current Rating (SCCR): Electrical equipment shall be labeled in accordance with NFPA 70 and have an Ampere Interrupting Capacity rating or Short Circuit Current Rating of equal to or greater than the following:
  - 1. 208 or 240 volt equipment: 35,000 amps

### 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. Test all electrical components in accordance with Section 16080 and as indicated in individual electrical equipment specification sections.
- E. 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
- F. Do not install electrical equipment in its permanent location until structures are weather-tight or equipment is properly protected from the weather.
- G. 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.

### 3.2 INSTRUCTION - STAFF TRAINING

- A. Provide training for facility personnel on the various electrical/controls/monitoring systems that are provided under Division 16. The training shall be conducted at the facility. The system training shall be structured such that the operating personnel will understand the system's operation and the functions available in the system. Training shall also include preventive and corrective maintenance of hardware and systems.
- B. The amount of training shall be a minimum of one 8-hour day, scheduled as convenient for the Owner.
- C. The System Supplier shall be responsible for providing detailed Operation and Maintenance (O&M) Manuals. The O&M Manuals shall include specific details of equipment supplied and details of operations specified to this project.
- D. The O&M Manuals shall include descriptions of all equipment, the nature and intended modes of operation, testing procedures of all units in the System, and safety measures to be taken in operation. All necessary procedures and methods for effective operation of the System shall be included.
- E. O&M Manuals shall include record drawings and instructions necessary for the planned maintenance of all equipment in the system. The O&M Manuals will incorporate maintenance procedures and schedules, and they will coordinate and be cross-referenced to detailed operation procedures provided by the manufacturers.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16050-Basic Electrical Requirements.docx

## SECTION 16060

## GROUNDING AND BONDING

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Power system grounding
  - 2. Electrical equipment and raceway grounding and bonding
  - 3. Grounding of piping, tanks, handrails and other conductive equipment
- B. Related Sections
  - 1. Section 16080 – Electrical Testing

## 1.2 REFERENCES

- A. NFPA 70 – National Electrical Code
- B. UL 467 - Grounding and Bonding Equipment
- C. UL 486A – Wire Connectors and Soldering Lugs for Use with Copper Conductors
- D. UL 1059 – Terminal Blocks
- E. IEEE/ANSI 142 – Latest Edition Recommended Practice for Grounding of Industrial and Commercial Power Systems.
- F. IEEE 837 – Standards for Qualifying Permanent Connections Used in Substation Grounding
- G. ASTM B3 - Solid Conductors
- H. ASTM B8 – Assembly of Stranded Conductors
- I. ASTM B33 – Tinned Conductors
- J. NEMA GR1 – Ground Rods and Ground Rod Couplings

## 1.3 SYSTEM DESCRIPTION

- A. Ground the electrical service system neutral and ground bus at the utility service entrance equipment to grounding electrodes. Grounding electrode system shall include a minimum of three driven ground rods, the underground water service pipe, and the metal frame of the building (if effectively grounded). For new construction, the grounding electrode system shall include the rebar in accordance with NEC 250.52(A)(3). Run exposed grounding electrode conductors in conduit.
- B. Ground each separately derived system neutral to the nearest effectively grounded building structural steel member or, if such is not available, to the nearest grounding electrode other than a water pipe.
- C. 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.

- D. Install grounding in accordance with NEC Article 250.

#### 1.4 SUBMITTALS

- A. Submit shop drawings, product data, and reports.
- B. Indicate layout of ground rods, location of system grounding electrode connections, and routing of grounding electrode conductor.
- C. Submit ground resistance testing reports in accordance with Section 16080.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Grounding Electrode Conductors
  - 1. Type: Medium-hard drawn bare copper
  - 2. Manufacturer
    - a. Okonite Co.
    - b. Rome Cable Corp.
    - c. American Insulated Wire Corp.
    - d. Southwire
    - e. or equal
- B. Grounding Conductors - insulated copper, minimum size #12 AWG and in accordance with NEC Tables 250.66, 250.102(C)(1) and 250.122, or larger if so indicated on the Drawings
- C. Ground Rods: Copper-clad steel, ¾inch diameter, minimum length 10 feet
- D. Connectors - Mechanical
  - 1. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used and specific types, sizes and combination of conductors and items connected.
  - 2. The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers and lock washers shall be made of silicon bronze and supplied as part of the connector body and shall be two bolted pressure types.
  - 3. The connectors shall meet or exceed UL467 and be clearly marked with the catalog number, conductor size and manufacturer.
    - a. Manufacturer
      - 1) ABB Blackburn Installation Products
      - 2) Burndy
      - 3) Ilsco
      - 4) Or equal

**E. Connectors - Compression**

1. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used and specific types, sizes and combination of conductors and items connected.
2. Irreversible compression connectors that meet or exceed the performance requirements of IEEE837, UL467 latest revisions. Compression connectors shall be listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and specific types, sizes and combinations of conductors and other items connected.
3. The irreversible compression connectors shall be manufactured of from pure wrought copper.
  - a. The installation of the connectors shall be made with a hydraulic compression tool and die system clearly showing embossed die stamp on each crimp as recommended by the manufacturer of the connectors
  - b. The connectors shall be clearly marked with the manufacturer, catalog number, conductor size
  - c. Each connector shall be factory filled with an oxide – inhibiting compound where applicable.
4. Manufacturer
  - a. ABB Blackburn Installation Products
  - b. Burndy
  - c. Ilsco
  - d. Or equal

**F. Connectors - Welded**

1. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used and specific types, sizes and combination of conductors and items connected.
2. Exothermic welded connections for copper to copper and copper to steel connections to ground rods, ground buses, ground wires, steel beams etc.
3. Conductors spliced with exothermic welded connections shall be considered as a continuous conductor, as stated in the noted accompanying NEC Article 250.50, 250.64 and IEEE Standard 80 latest edition.
  - a. Procedures outlined in the manufacturer's installation instructions shall be followed. Molds shall not be modified during installation in field applications
  - b. Weld metals shall be a mixture of copper oxide and aluminum. Only one weld metal mixture shall be required for each grounding connection.
  - c. Grounding connections shall be tested and certified in accordance with IEEE837, UL487A and UL 467.
  - d. Manufacturer



- 1) ABB Furseweld Installation Products
- 2) Burndy Thermoweld
- 3) Erico Cadweld
- 4) Or equal

## 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. Run all exposed grounding electrode conductors and equipment grounding conductors in conduit.
- C. Use a minimum of #8 AWG copper wire to ground all piping, tanks, handrails and other conductive equipment or structures including ductwork and floor gratings.
- D. Use grounding bushings on all conduits stubbed up below equipment, panelboards, switchboards and motor control centers. Bond all conduits to ground bus. Use grounding bushings to ground electrical equipment and exposed non-current carrying metal parts.
- E. Use the following types of ground connections for the grounding electrode system:
  1. Cable to cable & cable to ground rod: Use compression type
  2. Cable to building structural and reinforcing steel: Use compression or mechanical type
  3. Cable to piping: Use mechanical type
- F. Supplementary Grounding Electrode: Use effectively grounded metal frame and rebar of the building and ground rods spaced a minimum of 10 feet apart in sufficient quantity to have a measured resistance to ground of not more than 5 ohms.
- G. Use minimum #6 AWG copper conductor for communications service grounding conductor. Leave 10' slack conductor at terminal board.
- H. Drive ground rods one foot below finished grade.
- I. Ground the water pipe as required by NEC Article 250. Provide a grounding jumper over the water meter as required. Provide a grounding jumper over all meters installed on incoming metallic piping for utility equipment.

### 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.

### 3.3 TESTING

- A. Perform ground tests using a low resistance, Null balance type, ground testing ohmmeter, with test lead resistance compensated for. Use the type of test instrument which compensates for potential and current rod resistances.

- B. Test the grounding electrode system using a fall of potential three-point test and measure ground resistance. Submit tabulation of results to the Engineer. Include identification of electrodes, date of reading and ground resistance value in the test reports. If the resistance is not 5 ohms or less, contact the Engineer. The Engineer will initiate design changes, if necessary, to obtain acceptable values of ground resistance.
- C. Ground resistance of conduits, equipment cases, and supporting frames, shall not vary from that of system as a whole and shall not exceed 0.5 ohms to ground. Measure resistance to ground of representative items, as directed by the Engineer. Submit all readings to the Engineer.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16060-Grounding and Bonding.docx

## 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 shop drawings, product data, and reports.

## 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 hot dipped galvanized steel unless noted otherwise.
- B. Support channel assembly hardware shall galvanized steel.
- C. In wet locations, support channel components in contact with the floor shall be stainless steel.
- D. Manufacturer:
  - 1. Unistrut
  - 2. B-Line
  - 3. ABB Super Strut Installation Products
  - 4. Or equal

## 2.2 FASTENING HARDWARE

- A. All fastening hardware shall be galvanized steel unless noted otherwise.

## 2.3 ANCHOR BOLTS

- A. Anchor bolts shall be suitable for cracked or uncracked concrete and CMU construction.
- B. Anchor bolts, nuts, washers, bolt sleeves, and assembly hardware shall be Type 316 stainless steel.

- C. Use expansion anchors in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces.
- D. Manufacturer:
  - 1. Hilti, Kwik-Bolt TZ SS 316
  - 2. Powers Fasteners, Power-Stud+ SD6
  - 3. Simpson Strong-Tie, Strong-Bolt 2
  - 4. Or Equal

#### 2.4 PIPE CLAMPS AND STANDOFFS

- A. Pipe clamps and standoffs shall be rigid one hole, galvanized malleable iron type. They shall be of the same manufacturer and shall be designed to be used together.
- B. Strut pipe clamps shall be 2-piece type, galvanized steel.
- C. The finish shall be suitable for the piping system being supported.

#### 2.5 THREADED RODS

- A. Threaded hanging rods shall be galvanized and be one piece. The size shall be suitable for the loads being supported.

#### 2.6 SCREWS

- A. Use Sheet Metal Screws in sheet metal studs.
- B. Use Wood Screws in wood construction.

### 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. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.
- C. Do not use powder-actuated anchors.
- D. Hanger rods shall be subjected to tension only. Lateral and axial movements shall be accommodated by proper linkage in the rod assembly.
- E. Fabricate supports from support channel rigidly welded or bolted to present a neat appearance. Galvanized structural steel may be used where galvanized support channel is allowed. Use galvanized 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 anchors. Provide 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  $\frac{1}{4}$  inch space between conduits and walls.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16070-Electrical Hangers and Supports.docx

## 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 two-layer plastic, white letters on a black background
- B. Nameplate Wording:
  - 1. Wording of the nameplates shall be in conformance with Drawings and acceptable to the Owner.
  - 2. Wording of the nameplates for each piece of equipment shall be based on the common name and tag number (when applicable) of the equipment.

## 2.2 WIRE AND CABLE MARKERS

- A. Wires up to AWG10: Split sleeve or tubing type waterproof markers (Thomas & Betts, Panduit, Burndy 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. 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. 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 wiring as following:
  - 1. Power and lighting circuit wires: Wire markers shall identify (a) power source/panelboard name and circuit ID number (e.g. "LP-1,2,3"), and (b) load/equipment name (e.g. "VFD 1").
  - 2. Control & signal wiring: The identification on wire markers shall match the ID tag number of the wire/terminal shown on the associated equipment shop drawings.
- 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. Panelboards - ¼ inch to identify equipment designation, 1/8 inch to identify voltage rating and source.
- C. Switches in Panelboards - ¼ inch to identify circuit and load served, including location.
- D. Motor Starters and VFDs - ¼ inch to identify circuit and load served, including location.
- E. Individual Circuit Breakers, Enclosed Switches, Remote Operator Stations, Time Clocks, Control Devices, and Motor Starters – 1/8 inch to identify load served.

- F. Transformers - ¼ inch to identify equipment designation, 1/8 inch to identify primary and secondary voltages, primary source, and secondary load and location. Power transformer nameplates shall be in accordance with ANSI C57.
- G. Pumps, fans, and other electrical equipment - ¼ inch to identify circuit and equipment designation.
- H. Equipment with More Than One Power Source, Including Motors with Heaters - ¼ inch to identify power sources. Mount nameplate on motor disconnect switch, equipment enclosure, or other prominent location.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16075-Electrical Identification.docx



## SECTION 16080

## ELECTRICAL TESTING

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Testing of Electrical Systems - General
  - 2. Electrical Test Equipment
  - 3. Electrical Test Procedures
  - 4. Specific Electrical Tests
  - 5. System Function Tests
- B. Related Sections
  - 1. Section 16060 – Grounding and Bonding
  - 2. Section 16075 – Electrical Identification

## 1.2 REFERENCES

- A. Massachusetts Electrical Code
- B. NFPA 79 – Electrical Standard for Industrial Machinery
- C. ANSI/ISA-S5.4 – Instrument Loop Diagrams
- D. ANSI C37

## 1.3 SUBMITTALS

- A. General: Testing shall be performed, with satisfactory results, prior to connecting and energizing equipment. Problems discovered as a result of testing shall be corrected and retesting performed prior to connecting and energizing equipment.
- B. The following test reports shall be submitted
  - 1. Motor test results
  - 2. Megger test results
  - 3. Wire and cable continuity test results
  - 4. Grounding system test results
  - 5. System functional test reports

## PART 2 PRODUCTS – NOT USED

**PART 3 EXECUTION****3.1 TESTING OF ELECTRICAL SYSTEMS - GENERAL**

- A. Provide supervision, labor, materials, tools, test instruments and other equipment or services and expenses required to test, adjust, set, calibrate, and operationally check work and components of the various electrical and control systems and circuitry throughout the contract.
- B. Pay for all tests specified in Division 16, including expenses incident to re-tests occasioned by defects and failures of equipment to meet specifications. Unless otherwise specified, the Owner will supply the electric current necessary for tests.
- C. After completion of testing replace wiring and equipment found defective (defined as failing to meet specified requirements).
- D. Do not void equipment warranties or guarantees by testing and checkout work. Checks and tests shall be supplemental to and compatible with the manufacturer's installation instructions. Where deviations are apparent, obtain the manufacturer's approved review of procedure prior to testing. Where any repairs, modifications, adjustments, tests or checks are to be made, contact the Engineer to determine if the work should be performed by or with the manufacturer's representative. All checks and tests specified for proper operating and safety of equipment and personnel are to be performed concurrent with progression of the work, prior to final acceptance by the Owner.
- E. At any stage of construction and when observed, any electrical equipment or system determined to be damaged, or faulty, is to be reported to the Engineer. Corrective action requires Engineer's approval prior to re-testing, and inspection.
- F. Prior to testing and start-up, equipment and wiring shall be properly and permanently identified with nameplates, and other identification as specified in Section 16075. Check and tighten terminals and connection points, remove shipping blocks and thoroughly clean equipment, repair damaged or scratched finishes, inspect for broken and missing parts and review and collect manufacturer's drawings and instructions for delivery to the Engineer. Make routine checks and tests as the job progresses to ensure that wiring and equipment is properly installed.
- G. Testing and checkout work is to be performed with fully qualified personnel skilled in the particular tests being conducted. Personnel are to have at least 5 years of experience with tests of same type and size as specified.
- H. Conduct tests in presence of the Engineer. Notification is required 7 calendar days or more in advance when any test is to be performed, and do not start tests without approval.
- I. Make openings in circuits for test instruments and place and connect instruments, equipment, and devices, required for the tests. Upon completion of tests, remove instruments and instrument connections and restore circuits to permanent conditions.
- J. Identify test being performed, conductor or equipment the test is being performed on, date the test was performed, value of test results, person performing the test, the witness to the test, and the serial and model number and description of test instrument. Arrange information in tabular form and submit to the Engineer for approval.
- K. When the electrical tests and inspections specified or required within Division 16 are complete and results reported, reviewed, and approved, that portion of the electrical

equipment system or installation may be considered electrically complete. Affix appropriate, approved, and dated completion or calibration labels to the tested equipment and notify the Engineer of electrical completion. If the Engineer finds completed work unacceptable, he will notify the Contractor in writing of unfinished or deficient work, with the reason for his rejection, to be corrected by the Contractor. The Contractor will notify the Engineer in writing when exceptions have been corrected. The Contractor will prepare a "notification of Substantial Electrical Completion" for approval by the Engineer following the Engineer's acceptance of electrical completion. If later in-service operation or further testing identifies problems attributable to the Contractor, these will be corrected.

### 3.2 ELECTRICAL TEST EQUIPMENT

- A. Test equipment used is to be inspected and calibrated.
- B. Perform calibration and setting checks with calibrated test instruments of at least twice that of the accuracy of the equipment, device, relay or meter under test. Dated calibration labels shall be visible on test equipment. Calibrations over 6 months old are not acceptable on field test instruments. Inspect test instruments for proper operation prior to proceeding with the tests.
- C. Perform ground tests using a low resistance, Null balance type, ground testing ohmmeter, with test lead resistance compensated for. Use the type of test instrument which compensates for potential and current rod resistances.

### 3.3 TEST PROCEDURES

- A. Prepare procedures and schedules for the work specified herein. This work is to be coordinated and compatible with both the work and schedule of the other crafts. Sequence the tests and checks so that the equipment can be energized immediately after the completion of the application tests.
- B. The test procedures shall provide specific instructions for the checking and testing of each electrical component of each system. Schedule tests and inspections as the job progresses.
- C. Testing and checkout work shall be conducted in a safe manner. Provide the following special safety precautions, as appropriate:
  - 1. Locking and tagging procedures
  - 2. Barricades
  - 3. Deenergization and/or isolation of equipment prior to testing
  - 4. Review of procedures with the Engineer and Resident Project Representative
  - 5. Erection of warning signs
  - 6. Stationing of guards and watchmen
  - 7. Maintenance of voice communications
  - 8. Personnel orientation
- D. Before energizing any machine, visually inspect for serviceability. Check manufacturer's instruction manual for correct lubrication and ventilation. Align motor with driven equipment. Check nameplate for electrical power requirements.

- E. Insulation resistance measurements for motor feeders shall be performed with motors disconnected, measure insulation resistance from load side of contactors or circuit breakers.
- F. Perform insulation tests at the following times and conditions:
  - 1. Prior to energization and/or placing into service.
  - 2. When damage to the insulation is suspected or known to exist.
  - 3. After repairs or modifications to the equipment affecting the insulation.
  - 4. Where lightning or other surge conditions are known to have existed on the circuit.
- G. Where ground test results identify the need for additional grounding conductors or rods that are not indicated or specified, design changes will be initiated to obtain the acceptable values.

#### 3.4 SPECIFIC ELECTRICAL TESTS

- A. Motors
  - 1. Perform insulation tests on motor windings and record results.
  - 2. Test run motors 1 HP and above uncoupled or unloaded, before placing into operation. Check the motor for rotation, speed, current and temperature rise under normal load and record the results.
- B. Wire and Cable
  - 1. Continuity test each control and/or low voltage (below 480 volts) wire and cable to verify the field applied tag per conductor and record results.
- C. Perform insulation tests on electrical equipment, apparatus, generators, transformers, power circuit breakers and switches, and similar electrical equipment.
- D. Relay Panels, Operator and Instrument Control Panels, Programmable Controllers, Micro-Processors, Battery Systems and Other Miscellaneous Equipment
  - 1. Upon completion of equipment installation, visually and functionally test equipment and their control devices for tightness of connections and for proper operation. In the case of battery systems, static inverters and similar equipment, follow manufacturer's recommended test and installation manuals upon review and approval by the Engineer. In the case of operator, instrument, and relay panels and cabinets or devices used solely for control, functionally test each circuit for proper operation and compliance with the Drawings and Specifications. Where functional testing is deemed undesirable by the Engineer from a safety or plant operational standpoint, then continuity and terminal connection verification checks will be acceptable.
- E. Grounding Systems
  - 1. Test in accordance with Section 16060.

#### 3.5 SYSTEM FUNCTION TESTS

- A. It is the purpose of system function tests to prove the correct operation of systems/equipment and correct interaction of all sensing, processing, and action devices.
- B. Perform system function tests upon completion of the maintenance tests defined, as system conditions allow. Document results and submit a detailed report for all functional tests.
  - 1. Develop test parameters and perform tests for the purpose of evaluating performance of all integral components and their functioning as a complete unit within design requirements and manufacturer's published data.
  - 2. Verify the correct operation of all interlock safety devices for fail-safe functions in addition to design function.
  - 3. Verify the correct operation of all sensing devices, alarms, and indicating devices.
- C. Verify systems are left in normal operating mode or position, transfer and restoration schemes are enabled, and monitoring and protection devices are operational.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16080-Electrical Testing.docx

## 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 and existing record documents. Report discrepancies to the Engineer before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

## 3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Provide temporary power source(s), 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.
- C. Existing Electrical System: 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. Verify permission to disable with the Owner immediately before the work.

## 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, boxes, supports and fasteners, including above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Voids created by the removal of conduit in floors or walls above or below ceilings shall be patched and sealed with materials matching the existing construction.

- F. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Repair adjacent construction and finishes damaged during demolition and extension work with materials matching the existing construction.
- I. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- J. 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16091-Minor Electrical Demolition.docx

## SECTION 16120

## CONDUCTORS AND CABLES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Building wire and cable
  - 2. Metal clad (MC) 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 shop drawings, product data and reports.

## 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 Temperature Rating: 90°C
- E. Insulation: ANSI/NFPA 70; all power and control wiring shall be XHHW-2 unless otherwise indicated in this specification.



- F. Manufacturer
  - 1. Okonite Co.
  - 2. Rome Cable Corp.
  - 3. American Insulated Wire Corp.
  - 4. Southwire
  - 5. or equal

## 2.2 METAL CLAD (MC) CABLE

- A. Uses Permitted
  - 1. MC cable may be utilized in lieu of conduit and cable in dry, hollow partitions and ceiling cavities for general purpose, 20 ampere, single phase, 120 or 277 volt, normal branch circuits for receptacles and lighting fixtures only.
  - 2. For branch circuit homeruns to surface mounted panels, MC cable shall terminate in a junction box 5'-0" (minimum) horizontally away from the panel. If panelboards are located in rooms designated as electric rooms, mechanical rooms or closets, MC cable shall terminate in a junction box outside of the room or closet and conduit shall be run to the panel.
  - 3. MC cable shall not be used in electrical, mechanical or plumbing rooms, closets or shafts, including mechanical platform areas.
  - 4. MC Cable shall be run continuous without splices from the source to the first load and then from load to load. Intermediate splice points shall be prohibited except where noted otherwise.
- B. Conductor Construction
  - 1. Conductors shall be minimum #12 AWG, soft drawn 98% conductive copper with 90°C (Dry Location), 75°C (Wet Location), THHN, 600 volt rated insulation. Included with each length of MC cable shall be the required number of phase conductors (maximum 3), white neutral conductor(s) and an insulated full-size green grounding conductor.
  - 2. Each conductor, including ground conductor, shall be wrapped with nylon covering.
  - 3. Multi-conductor cables shall not have shared neutrals or shared grounds. Provide cable with one neutral and ground per phase conductor when serving multiple branch circuits in a multiconductor cable.
  - 4. Armored clad cable conductors shall be color coded, continuous insulation, as specified above.
- C. Exterior Armor Construction
  - 1. The exterior sheath shall be manufactured of galvanized steel armor.
  - 2. When used in damp or wet locations the armor shall be wrapped at the factory with a PVC jacket.
- D. Fittings

1. Fittings for MC cable shall be suitable for use with the appropriate cable assembly.
  2. Include manufacturer's literature with shop drawings stating application compatibility with each cable type.
  3. Fitting shall be as manufactured by Bridgeport, Electroline, OZ Gedney, Thomas and Betts, Emerson, ETP, Regal or equal.
- E. Manufacturer
1. AFC
  2. Allflex
  3. Alliance
  4. Or equal

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. 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. All wiring shall be run in conduit, unless otherwise noted.
- D. Install products in accordance with manufacturer's instructions.
- E. Use stranded conductors for all wire sizes.
- F. In raceways, mechanically complete the installation in all details. Pull all conductors into raceway at same time.
- G. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- H. Protect exposed cable from damage.
- I. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure. Do not rest cable on ceiling panels.
- J. Use suitable cable fittings and connectors.
- K. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- L. Clean conductor surfaces before installing lugs and connectors.
- M. Splices

1. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
2. Underground Splices or Splices called out to be Submersible
  - a. Provide Polaris Submersible Splice Connectors or equal one-piece system by Burndy, Blackburn or equal.
  - b. Underground splices shall be made in a handhole or manhole provided by the contractor and sized per the NEC.
3. Above grade splices
  - a. 8 AWG and Larger: Use split bolt connectors for copper conductor splices and taps. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
  - b. 10 AWG and smaller: Use insulated spring wire connectors with plastic caps for copper conductor splices and taps.
4. Above ground splices wire reducer
  - a. When wire size has been increased to account for derating and/or voltage drop, provide an In-Line Standard Barrel Reducer Splice Kit to reduce the wire down to the size necessary to terminate at the circuit breaker, disconnect, equipment, etc.
  - b. The reduced wire shall be sized by the contractor per NEC Table 310.15(B)(16) using the 60°C Column. The wire shall be sized according to the upstream over current protective device size.
  - c. The splice kit shall contain clear heat shrink tube to protect the butt splice.
  - d. Tape splice with electrical tape to 150 percent of insulation rating of conductor.
  - e. The Reducer splice kit shall be:
    - 1) Butt splice compression type with inspection window.
    - 2) Tin plated Copper
    - 3) Provide Burndy Hyreducer or equal by Blackburn, Polaris or equal.
- N. Ground signal cable shields on receiving end only.
- O. Provide Kellems grips for all cord connected devices.
- 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

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16120-Conductors and Cable.docx

## SECTION 16131

## CONDUIT

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Galvanized rigid steel conduit
  - 2. Electrical metallic tubing (EMT)
  - 3. Non-metallic (PVC) conduit
  - 4. Liquidtight flexible conduit
  - 5. Fittings and conduit bodies
  - 6. Conduit wall seals, existing walls
  - 7. Underground warning tape
  - 8. Conduit expansion joint
  - 9. Conduit sealing bushing
  - 10. Cold galvanizing compound
- 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. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing
- F. UL-6 – Standard for Rigid Metal Conduit
- G. ANSI C80.3 – Electrical Metallic Tubing, Zinc Coated
- H. ANSI C80.6 – Intermediate Metal Conduit, Zinc Coated

## 1.3 SUBMITTALS

- A. Shop drawings, product data and reports

- B. Riser Diagrams for the electrical installation

#### 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.
- C. Protect PVC conduit from sunlight.

#### 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.
- E. Where it is necessary to core a hole through an existing concrete slab or wall, the Contractor shall conduct a survey with a pachometer or by similar means to identify the location of steel reinforcing bars. The new hole shall be located so as to avoid cutting reinforcing bars or existing embedded conduits. Where reinforcing steel is close enough together that it is not possible to core the required hole without cutting reinforcing bars, contact the Engineer for further direction before cutting a hole. Where reinforcing bars are cut without the consent of the Engineer, the slab or wall will be repaired at the expense of the Contractor.

### PART 2 PRODUCTS

#### 2.1 GENERAL CONDUIT REQUIREMENTS

- A. Minimum Size: 3/4 inch unless otherwise specified
- B. Outdoor locations:
  - 1. Exposed: Use galvanized rigid steel conduit
  - 2. Buried: Use galvanized rigid steel conduit
  - 3. Buried-to-exposed conduit transitions shall be made below grade.
- C. Below floors and embedded in concrete floors and walls:
  - 1. In locations where below-floor or embedded conduits are allowed:
    - a. Use schedule 40 PVC conduit below floors or embedded in floors or walls.
    - b. Stub out of floors with rigid steel conduit.

- c. Stub out of walls with conduit type required for the location.
  - D. All Other Locations:
    - 1. Concealed: Use galvanized rigid steel conduit
    - 2. Exposed: Use galvanized rigid steel conduit
- 2.2 GALVANIZED RIGID STEEL CONDUIT
- A. Rigid Steel Conduit: ANSI C80.1
  - B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; all steel fittings
  - C. Hot dipped galvanized inside and outside with additional passivation coating for extra protection.
- 2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT AND FITTINGS
- A. Description: Interlocked steel construction with PVC jacket
  - B. Liquidtight flexible metal conduit and fittings shall be appropriate outer jacket and metallic core for application requirements.
  - C. For use where metallic conduit is used.
  - D. Fittings: ANSI/NEMA FB 1. Fittings shall be gasketed. Material shall be zinc-coated in dry locations, galvanized in wet and damp locations, and stainless steel in corrosive locations.
  - E. Manufacturer
    - 1. ABB Installation Products
    - 2. Carlon
    - 3. Anamet
    - 4. Electriflex
    - 5. Or equal
- 2.4 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT AND FITTINGS
- A. Description: Flexible PVC conduit with smooth inner surface and integral reinforcement within the conduit wall, designated as a Type LFNC-B.
  - B. For use where nonmetallic conduit is used.
  - C. Fittings: UL 514B. Fittings shall be gasketed. Material shall be nylon or PVC.
  - D. Manufacturer
    - 1. ABB Installation Products
    - 2. Carlon
    - 3. Anamet
    - 4. Electriflex

5. Or equal

## 2.5 CONDUIT WALL SEALS, EXISTING WALLS

- A. Type - Suitable for core drilled holes
- B. Manufacturer
  1. O-Z Gedney, Type CSM
  2. Equal by Crouse-Hinds
  3. Or equal

## 2.6 FIRE STOP FITTINGS

- A. Type - Fittings with elastomeric rings to seal smoke and fumes
- B. Fire rating of seal to be equal to or greater than rating of wall
- C. Manufacturers
  1. O-Z Gedney, Type CFS
  2. Or equal

## 2.7 UNDERGROUND WARNING TAPE, DETECTABLE

- A. Warning tape for all buried electrical conduit shall be solid aluminum foil core tape and printed with the words "CAUTION - BURIED ELECTRICAL LINE BELOW."
- B. Tape shall be red and 6 inches wide.
- C. Manufacturers
  1. Ideal Industries
  2. Cable Accessories
  3. E. L. S. Products Corp
  4. Or equal

## 2.8 FITTINGS AND CONDUIT BODIES

- A. Fittings
  1. Description - Threaded, malleable Iron or copper-free aluminum. Material and coating to correspond with type of conduit system being used, galvanized where galvanized steel conduit is used, PVC where PVC conduit is used, and PVC-coated where PVC-coated conduit is used.
- B. Conduit Bodies
  1. Description - Threaded, malleable Iron or copper-free aluminum. Material and coating to correspond with type of conduit system being used, galvanized where galvanized steel conduit is used, PVC where PVC conduit is used, and PVC-coated where PVC-coated conduit is used.
  2. Manufacturer



- a. Appleton-Type Mogul - malleable iron or copper-free aluminum
- b. Equal by ABB Installation Products
- c. Equal by O-Z Gedney
- d. Equal by Crouse-Hinds
- e. or equal

C. Conduit Hubs

1. Material:

- a. Zinc plated steel or cast zinc in dry locations
- b. Cast zinc or galvanized steel in damp or wet locations

2. 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

2.9 CONDUIT EXPANSION JOINT, RIGID METAL CONDUIT

A. Weather tight, internal ground, expansion joint for galvanized rigid steel conduit, 4 inch maximum conduit movement

B. Manufacturer

1. ABB Type XJG Installation Products
2. Crouse-Hinds Type XJG
3. Appleton Type XJ
4. O-Z Gedney Type AX
5. or equal

2.10 CONDUIT SEALING BUSHING

A. Description: Bushing that provides a waterproof seal around wire and cables in a conduit

B. Construction: Slotted PVC coated steel discs, neoprene sealing ring and stainless steel head cap screws and washers

C. Manufacturer

1. O-Z Gedney Type CSBI

2.11 COLD GALVANIZING COMPOUND

- A. Cold galvanizing compound shall be applied to all field threads and shall be as manufactured by ZRC Products Company, a division of Norfolk Corp. or equal.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Junction boxes shown on the Drawings shall be provided in locations indicated. Additional 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 rigid steel conduit using galvanized steel or galvanized malleable iron straps, pipe hangers, U-bolt clamps and beam clamps.
- E. Group related conduits; support using conduit rack. Construct rack using support 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. Arrange conduit to maintain headroom and present neat appearance.
- I. Route exposed conduit parallel and perpendicular to walls.
- J. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point unless drawings indicate otherwise.
- L. Cross conduits in slab only with the Engineer's approval.
- M. Maintain adequate clearance between conduit and piping.
- N. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104°F.
- O. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- P. Before installation of wires and cables, clean and dry inside of each conduit run.
- Q. Provide conduit bushings on the end of each conduit to prevent insulation damage. Bushing shall be grounding type where applicable.
- R. For galvanized conduit, apply cold galvanizing compound to all field threads.
- S. Connections to boxes/enclosures:
  - 1. Use conduit hubs with sealing gaskets on all boxes and enclosures, except those with NEMA 1 rating.
  - 2. Use conduit hubs with sealing gaskets to fasten conduit to boxes and enclosures in damp locations, and wet locations.

3. Use two locknuts, one inside and one outside of each box and enclosure when enclosure rating is NEMA 1.
- T. 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.
- U. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- V. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints per Manufacturer's best practice and recommendations.
- W. Provide 100-lb. test nylon pull string in each conduit 2 inch or larger except sleeves and nipples.
- X. Use suitable caps (cast metal or thermoplastic) to protect installed conduit against entrance of dirt and moisture.
- Y. Ground and bond conduit in accordance with Section 16060.
- Z. Do not penetrate waterproofing membranes in the structural floor slab or foundation walls without approval by, and in a manner acceptable to the Engineer.
- AA. Install rigid metal conduit using only threaded fittings.
- 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. Arrange for all underground systems to drain away from buildings.
- EE. Provide thru wall seals on all conduits passing through foundation walls.
- FF. Provide a 4 inch band of black asphaltic paint, 2 inches in the concrete and 2 inches above floor, at all galvanized rigid steel conduit floor penetrations in tunnels, cellars and other below grade high moisture areas.
- GG. Provide a 4 inch band of black asphaltic paint, 2 inches in the concrete and 2 inches in the soil, at all galvanized rigid steel penetrations through floors or walls into soil.
- HH. Install underground warning tape 12 inches above all underground conduits.
- II. Install underground conduit with minimum cover, in accordance with National Electric Code or utility requirements, but no less than 36 inches.
- JJ. For non-concrete encased underground conduit installations, backfill the trench with sand borrow for the full width of the trench (at least 3-inches around sides and bottom of conduit) and extend the sand borrow 12-inches over the conduit.
- KK. For penetrations in existing walls, patch with mortar and touch up paint. Match existing paint color.
- LL. For penetrations in fire rated walls, use materials that maintain the fire rating of the wall.

- MM. For all structures or buildings located at an elevation low enough to potentially allow water to infiltrate the structure through one or more conduit(s):
1. For conduits smaller than 1½”, provide conduit sealing foam where the conduit(s) enter the structure/building. Prepare conduit and provide foam in accordance with the manufacturer’s recommendations. Foam shall be Polywater FST-250 Expanding Foam or equal.
  2. For conduits 1½” or larger, provide conduit sealing bushing(s) where the conduit(s) enter the structure/building.
- NN. Provide conduit expansion joints for underground conduits that enter a building through an exterior wall or connect to an exterior mounted disconnect switch, meter, or other equipment.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16131-Conduit.docx

## SECTION 16136

## BOXES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Wall and ceiling outlet/device boxes
  - 2. Pull and junction boxes
  - 3. Floor Boxes
  - 4. Covers
  - 5. Conduit Hubs

## 1.2 REFERENCES

- A. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes and Conduit Bodies for Conduit and Cable Assemblies
- B. ANSI/NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports
- C. ANSI/NFPA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 volts maximum)
- E. UL514 A – Metallic Outlet Boxes
- F. UL514 C – Nonmetallic Outlet Boxes, Flush-Device Covers and Covers

## 1.3 SUBMITTALS

- A. Shop drawings, product data, and reports

## 1.4 PROJECT CONDITIONS

- A. Verify that the field measurements are as shown on the Drawings.
- B. Verify locations of outlets in offices and work areas prior to rough-in.
- C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose. Include installation within 5 feet of location shown.

## 1.5 DESIGN REQUIREMENTS

- A. Unless otherwise specified or indicated on Drawings, NEMA rating for boxes shall correspond as follows to location classifications indicated on Drawings. Indoor locations for which a classification is not indicated are to be considered dry locations unless otherwise designated by Code. Outdoor locations are to be considered wet locations unless otherwise indicated.
  - 1. Dry locations - NEMA 1 Metallic Boxes

2. Damp locations and Wet locations - NEMA 4 Metallic Boxes

## PART 2 PRODUCTS

### 2.1 WALL AND CEILING OUTLET/DEVICE BOXES

#### A. Sheet Metal (stamped steel) Outlet/Device Boxes

1. NEMA OS 1, galvanized steel.
2. Provide green grounding screw.
3. Stamped steel boxes shall be used only above accessible ceilings and within Gypsum wall board walls.
4. Acceptable Manufacturers
  - a. ABB Steel City Installation Products
  - b. Appleton
  - c. Raco
  - d. or equal

#### B. Cast Metal Outlet/Device Boxes

1. NEMA FB 1, Type FD, cast iron or copper-free aluminum with internal green grounding screw terminal.
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. Boxes shall have external mounting feet cast into the box assembly; screw-in feet will not be acceptable.
5. Material and coating shall match that of the conduit system being used.
6. Provide threaded sealing conduit hubs on all conduit entries.
7. Acceptable Manufacturers
  - a. ABB Installation Products
  - b. Crouse-Hinds
  - c. Appleton
  - d. Hubbell
  - e. or equal

#### C. Non-metallic Outlet/Device Boxes

1. NEMA OS 2.
2. Cover shall be by box manufacturer and shall have stainless steel cover screws and gasket.
3. Screws shall be stainless steel.

4. Acceptable Manufacturers
  - a. ABB Steel City Installation Products
  - b. Raco
  - c. or equal

## 2.2 PULL AND JUNCTION BOXES

### A. Sheet Metal Pull and Junction Boxes

1. NEMA OS 1, Galvanized or Painted Steel.
2. Provide green grounding screw.
3. Boxes shall not contain knockouts.
4. Acceptable Manufacturers
  - a. ABB Steel City Installation Products
  - b. Raco
  - c. Appleton
  - d. or equal

### B. Cast Metal Pull and Junction boxes.

1. NEMA FB 1, type 4 cast iron or copper-free aluminum
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. Material and coating shall match that of the conduit system being used.
5. Boxes shall have external mounting feet cast into the box assembly; screw-in feet will not be acceptable.
6. Provide threaded sealing conduit hubs on all conduit entries.
7. Provide green grounding screw.
8. Acceptable Manufacturers
  - a. Crouse-Hinds
  - b. Appleton
  - c. Hubbell, Inc.
  - d. or equal

## 2.3 COVERS

- A. Provide covers for all boxes. Cover material and coating shall match the box, unless otherwise specified. Covers shall be screw fastened or hinged and comply with NEMA Standards OS 1, OS 2 or FB 1.

## 2.4 CONDUIT HUBS

- A. Conduit hubs shall be threaded and sealing type with neoprene gasket.
- B. Conduit hub material and coating shall match that of the conduit.
- C. Acceptable Manufacturers
  - 1. ABB Thomas & Betts - type "BULLET"
  - 2. Crouse Hinds - type "HUB"
  - 3. Equal by Appleton
  - 4. or equal

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Install electrical boxes as shown on Drawings. Provide additional boxes as required to comply with NFPA 70 requirements, for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Provide separate boxes for 120/208/240 volts systems. Install motor feed and control wiring in the same box only when shown as combined in a single raceway on the Drawings or as approved by the Engineer.
- C. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- D. Boxes shall not be mounted to the floor in damp, wet or corrosive locations.
- E. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
- F. Use flush mounting outlet boxes in finished areas.
- G. Secure flush mounting box to interior wall without damaging wall insulation or reducing its effectiveness. Accurately position to allow for surface finish thickness.
- H. Do not fasten boxes to ceiling support wires.
- I. Fasten boxes to walls, ceilings or strut supports; do not support boxes from equipment, panels, etc.
- J. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- K. Use gang box where more than one device is mounted together. Do not use sectional box.
- L. Provide permanent barriers in common boxes to limit voltage between adjacent switches to 300 volts or less.
- M. Common boxes used for gang installation with switches, receptacles, and low voltage devices shall include barriers between the devices and the switches or receptacles.
- N. Through-the-wall outlet boxes shall not be permitted. Outlet boxes shall not be installed back-to-back but shall be staggered on opposite sides of partitions a minimum of 12" on center.



- O. The Contractor shall furnish and install outlet boxes for all wiring devices as shown on the drawings.
  
- P. Bar hanger type outlet boxes shall be used in hollow frame partitions, other than masonry or construction block partitions, with bar hanger supported from (2) partition studs for wood stud partitions. For metal stud partitions, bar hanger shall be secured with self-threading metal screws or drill through hangers with caddy clips.
  
- Q. Sheet Metal Outlet/Device Boxes
  - 1. Use only above accessible ceilings and within Gypsum wall board walls.
  
- R. Cast Metal Outlet/Device Boxes
  - 1. Use in locations exposed to the weather, wet locations, damp locations, surface mounted and pendant mounted locations and all locations where non-PVC coated rigid conduit is used. Use sealing conduit hubs on all conduit entries.
  
- S. Pull and Junction Boxes
  - 1. Use sealing conduit hubs on all conduit entries.
  - 2. Use Cast Metal pull and junction boxes in all locations where non-PVC coated rigid conduit is used and in locations rated as Wet Location.

### 3.2 ADJUSTING

- A. Install knockout closure in unused box opening.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16136-Boxes.docx

## SECTION 16140

## WIRING DEVICES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Wall switches
  - 2. Occupancy Sensors
  - 3. Receptacles
  - 4. Cover plates
  - 5. Floor Boxes/Poke-Throughs
  - 6. Miscellaneous
- B. Related Sections
  - 1. Section 16136 - Boxes

## 1.2 SUBMITTALS

- A. Product Data: Provide catalog sheets for wiring devices.

## PART 2 PRODUCTS

## 2.1 WALL SWITCHES

- A. Single Pole Switch - 20 Amp, 120/277 VOLT
  - a. Specification grade, standard toggle, handle color shall be brown Hubbell - Model 1221
  - b. Equal by Pass & Seymour
  - c. Equal by Bryant
  - d. or equal
- B. Three-way Switch - 20 Amp, 120/277 volt, handle color shall be brown
  - 1. Specification grade, standard toggle, brown handle
    - a. Hubbell - Model 1223
    - b. Equal by Pass & Seymour
    - c. Equal by Bryant
    - d. or equal
- C. Four-way Switch - 20 Amp 277 volt, handle color shall be brown
  - 1. Specification grade, standard toggle, brown handle

- a. Hubbell - Model 1224
  - b. Equal by Pass & Seymour
  - c. Equal by Bryant
  - d. or equal
- D. Dimmer Switch – 8A 120/277V Switch with 0-10V dimming controls
1. Specification grade, compatible with controlled fixtures and rated for the wattage of the controlled lighting circuit.
  2. Manufacturers
    - a. Lutron – DVSTV
    - b. Leviton
    - c. Cooper

## 2.2 RECEPTACLES

- A. GFCI Receptacle - 20 A, 120 V duplex
1. Specification grade, nylon, brown, straight blade, brown
    - a. Hubbell - Model GFR5362
    - b. Equal by Pass & Seymour
    - c. Equal by Bryant
    - d. or equal

## 2.3 COVER PLATES

- A. Decorative Cover Plate - smooth stainless steel
1. Hubbell - Catalog Number
    - a. One gang duplex receptacle - S8
    - b. One gang GFCI duplex receptacle - S26
    - c. Quad receptacle – J82
    - d. One gang toggle switch - S1
    - e. Two gang toggle switch - S2
    - f. Three gang toggle switch - S3
    - g. Four gang toggle switch - S4
    - h. Blank, one gang - S13
    - i. One gang telephone outlet - S12, S15
    - j. Switch, duplex receptacle - S18
  2. Equal by Pass & Seymour

3. Equal by Bryant
  4. or equal
- B. Weatherproof Cover – Weatherproof while in use type for outdoor, wet and damp locations.
1. Sealing gasket and stainless steel mounting screws, for duplex GFCI receptacle, vertical orientation
  2. Cast metal base and cast metal cover where metallic conduit is used and nonmetallic PVC base and clear polycarbonate cover where nonmetallic conduit is used.
    - a. ABB Red Dot Installation Products
    - b. Equal by Hubbell, Inc.
    - c. Equal by Pass & Seymour
    - d. Equal by Bryant

#### 2.4 MISCELLANEOUS

- A. Remote stop pushbutton station, Hazardous area, single gang, 1 circuit, ¾ inch hub.
1. Crouse - Hinds - Model EFS2184
  2. Equal by Killark
  3. Equal by Appleton
  4. or equal
- B. GFCI Switch/Motor Control - 20 A, 120 V A.C., specification grade, Ivory, 1-1/2 horsepower
1. Pass & Seymour - Model 2081-S1
  2. or equal

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

#### 3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean debris from outlet boxes.

#### 3.3 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install devices plumb and level.
- C. Install switches with OFF position down.
- D. Install receptacles with grounding pole on bottom.
- E. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
- F. Connect wiring devices by wrapping conductor around screw terminal.
- G. Install corrosion resistant, weatherproof cover plates on all devices located outside, in pump chambers, garages, chemical areas, areas subject to water spray or as indicated on drawings. Cover plate material and coating shall match the box unless otherwise specified.
- H. Install weatherproof while in use type covers for receptacles located outdoors and in damp or wet locations.
- I. Use jumbo size plates for outlets installed in masonry walls.
- J. Install galvanized steel plates on metallic outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- K. Use stainless steel screws and hardware for mounting, device plates, fixtures, etc. in wet, damp, hazardous and corrosive areas.

#### 3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 16136 to obtain mounting heights specified and indicated on Drawings.
- B. Install wall switch 48 inches above finished floor.
- C. Install convenience receptacle 18 inches above finished floor unless otherwise noted on plans.

#### 3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch .
- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

#### 3.6 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

END OF SECTION

## SECTION 16520

## EXTERIOR LUMINAIRES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes
  - 1. Exterior luminaires and accessories
  - 2. Poles

## 1.2 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.
- B. ANSI/IES RP-8 - Recommended Practice for Roadway Lighting.

## 1.3 SUBMITTALS

- A. Shop Drawings: Indicate dimensions and components for each luminaire and pole.

## 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years experience.

## 1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. and testing firm acceptable to authority having jurisdiction.

## 1.6 COORDINATION

- A. Furnish bolt templates and pole mounting accessories to installer of pole foundations.

## 1.7 SPARE PARTS

- A. Provide 1 of each lamp type and wattage installed.

## PART 2 PRODUCTS

## 2.1 LUMINAIRES SCHEDULE

## 2.2 POST TOP TYPE LUMINAIRE

- A. Manufacturers
  - 1. Spring City, William and Mary, ALMWML-LE-020-EVX-2F2-30-CR3-YPLF-FED-CU
  - 2. Or equal
- B. Description: Decorative pole mounted full cutoff LED fixture.
- C. Construction: Rain-tight, die cast aluminum, silicone gasketed.
- D. Dimensions: 33-7/8" high, 16-3/4 octagonal width

- E. Materials: Cast aluminum alloy ANSI 356 per ASTM B26-95
- F. Finish: Powder coat, black Submit RAL color chip for approval
- G. Provide wiring as required for proper operation.
- H. Reflector shall achieve a Type III light distribution.
- I. Voltage: 240
- J. Warranty: 5 years
- K. Lamp: 18 LEDs ( 1000mA drive current)

### 2.3 DECORATIVE LIGHT POST

- A. Manufacturers
  - 1. Spring City, Edgewater, DPSEDG-18-11.00-TN3.00-3.00-U
  - 2. Or equal
- B. Description: Decorative ductile iron, 11 ft. long, sized for 90 mph winds.
- C. Construction: Rain-tight, silicone gasketed.
- D. Dimensions: 18" octagonal width
- E. Ground stud provisions: Drill and tap inside wall of base opposite access door to accommodate a 1/4"-20 ground stud. Provide ground stud.
- F. Anchor bolts: (4) 3/4" dia. X 24" long + 3" hook (fully galvanized with (1) galvanized nut and (1) galvanized washer per bolt)
- G. Bolt projection: 3 inches minimum.
- H. Materials: cast ductile iron per A536-84 grade 65-45-12
- I. Finish: Powder coat, black Submit RAL color chip for approval
- J. Warranty: 5 years

### 2.4 FLAGPOLE LUMINAIRE

- A. Manufacturers
  - 1. Amerlux Rook X catalog number RXX-AR-A-NF-309-BLK-HEX-FGS
  - 2. Or equal
- B. Description: Small cylinder accent landscape lighting up light.
- C. Construction: IP66 sealed optical chamber and integral driver.
- D. Dimensions: 4.88" high, 2.7" diameter
- E. Materials: Machined aluminum housing and die-cast knuckle assembly.
- F. Finish: Powder coat, black Submit RAL color chip for approval
- G. Provide wiring as required for proper operation.
- H. Reflector shall achieve a 22degree light distribution.

- I. Voltage: 120
- J. Warranty: 5 years
- K. Lamp: 18 LEDs ( 1000mA drive current)

## 2.5 FLAGPOLE LUMINAIRE LANDSCAPE LIGHTING STANCHION

- A. Manufacturers:
  - 1. Kim Lighting SM-18/BL
  - 2. Or Equal
- B. Description: 3" O.D. by .188" wall cast aluminum stanchion with 1/2" NPSM fixture mount and hand hole with flush cover. Internal set screw fixture lock accessible through hand hole. Internal ground lug supplied with installed lead.
- C. Finish: Super TGIC powder coat paint over clear anodizing and titanated zirconium conversion coating.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine excavation and concrete foundation for lighting poles.
- B. Examine each luminaire to determine suitability for lamps specified.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install lighting poles at locations indicated.
- C. Install poles plumb. Double nuts to adjust plumb. Grout around each base.
- D. Install lamps in each luminaire.
- E. Bond luminaires, metal accessories and metal poles to branch circuit equipment grounding conductor. Provide supplementary grounding electrode at first pole.

### 3.3 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection. Inspect for improper connections and operation.
- B. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

### 3.4 ADJUSTING

- A. Aim and adjust luminaires to provide illumination levels and distribution as directed.
- B. Reaim and repair or replace luminaires which have failed at Date of Substantial Completion.

### 3.5 CLEANING

- A. Clean electrical parts to remove conductive and deleterious metals.
- B. Remove dirt and debris from enclosure.



- C. Clean photometric control surfaces as recommended by manufacturer.
- D. Clean finishes and touch up damage.

END OF SECTION

J:\S\S2161 Shelburne Falls Water Projects\3 - Bridge of Flowers  
Evaluation\Design\Specifications\Div16\16520-Exterior Luminaires.docx