# Merrymount Parkway Reconstruction Project

Quincy, MA

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Number of Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division 0 – Bidding and Contract Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>00100</td>
<td>Advertisement for Bids</td>
<td>1</td>
</tr>
<tr>
<td>00200</td>
<td>Instructions to Bidders</td>
<td>12</td>
</tr>
<tr>
<td>00300</td>
<td>Geotechnical Data</td>
<td>8</td>
</tr>
<tr>
<td>00410</td>
<td>Form for General Bid</td>
<td>32</td>
</tr>
<tr>
<td>00520</td>
<td>Agreement Between Owner and Contractor for Construction Contract</td>
<td>8</td>
</tr>
<tr>
<td>00610</td>
<td>Performance Bond Form</td>
<td>3</td>
</tr>
<tr>
<td>00615</td>
<td>Payment Bond Form</td>
<td>3</td>
</tr>
<tr>
<td>00700</td>
<td>General Conditions</td>
<td>65</td>
</tr>
<tr>
<td>00800</td>
<td>Supplementary Conditions</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Attachments to Supplementary Conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Massachusetts State Prevailing Wage Rates</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>B. Conservation Commission Order of Conditions</td>
<td>11</td>
</tr>
<tr>
<td><strong>Division 1 – General Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01110</td>
<td>Summary of Work</td>
<td>3</td>
</tr>
<tr>
<td>01140</td>
<td>Work Restrictions</td>
<td>1</td>
</tr>
<tr>
<td>01270</td>
<td>Measurement and Payment</td>
<td>1</td>
</tr>
<tr>
<td>01290</td>
<td>Application and Certificate for Payment</td>
<td>4</td>
</tr>
<tr>
<td>01295</td>
<td>Schedule of Values</td>
<td>1</td>
</tr>
<tr>
<td>01310</td>
<td>Coordination</td>
<td>4</td>
</tr>
<tr>
<td>01320</td>
<td>Construction Photographs</td>
<td>1</td>
</tr>
<tr>
<td>01325</td>
<td>Scheduling of Construction</td>
<td>2</td>
</tr>
<tr>
<td>01330</td>
<td>Submittal Procedures</td>
<td>10</td>
</tr>
<tr>
<td>01420</td>
<td>References</td>
<td>2</td>
</tr>
<tr>
<td>01450</td>
<td>Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>01451</td>
<td>Independent Testing Services</td>
<td>3</td>
</tr>
<tr>
<td>01520</td>
<td>Construction Facilities</td>
<td>1</td>
</tr>
<tr>
<td>01550</td>
<td>Traffic Regulation</td>
<td>3</td>
</tr>
<tr>
<td>01560</td>
<td>Temporary Barriers</td>
<td>3</td>
</tr>
<tr>
<td>01570</td>
<td>Temporary Controls</td>
<td>3</td>
</tr>
<tr>
<td>01600</td>
<td>Product Requirements</td>
<td>3</td>
</tr>
<tr>
<td>01630</td>
<td>Product Substitution During Construction</td>
<td>2</td>
</tr>
<tr>
<td>01720</td>
<td>Field Engineering</td>
<td>2</td>
</tr>
<tr>
<td>01725</td>
<td>Preservation and Restoration of Project Features</td>
<td>3</td>
</tr>
<tr>
<td>01770</td>
<td>Closeout Procedures</td>
<td>2</td>
</tr>
</tbody>
</table>
Merrymount Parkway Reconstruction Project  
Quincy, MA  
Table of Contents  

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Number of Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division 2 – Special Provisions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special Provisions</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Attachments to the Special Provisions</td>
<td>137</td>
</tr>
</tbody>
</table>

J:\Q\Q0019 Quincy, MA Consultant Review Services\Q0019-002 Merrymount Park\Design\Specifications\TOC.docx
CITY OF QUINCY, MASSACHUSETTS
Department of Public Works & Parks, Forestry, and Cemetery Department
Thomas P. Koch
Mayor

INVITATION TO BID

The Building Department for the City of Quincy, Massachusetts is seeking sealed bids for MERRYMOUNT PARKWAY RECONSTRUCTION PROJECT until 11:00 A.M. local time Tuesday August 21, 2018, in the offices of the Purchasing Agent, 1305 Hancock St., Quincy, Massachusetts 02169, at which time and place all bids will be publicly opened and read aloud. All questions are due no later than Friday, August 10th @ 12:00 p.m.

The work under this Contract consists of subsurface utility improvements including conduit installation, drainage system improvements, water main, and hydrant replacements, and streetscape improvements including replacement of sidewalk with cement concrete walk featuring ADA compliant curb cuts and wheelchair ramps, pedestrian crossings with high visibility signage and thermoplastic imprint crosswalks, on-street parallel parking, removing and resetting or replacing granite curb, linear landscape features including landscaped median, trees, plantings, and mulch, granite façade retaining wall, granite block gravity wall, micro-mill and overlay and full depth reconstruction of the roadway, application of new pavement markings. Bids shall be on a unit price basis as indicated in the Bid Form.

All work under this contract shall be completed within two hundred and seventy five (275) calendar days.

Detailed specifications are available on-line at the City of Quincy’s website, www.quincyma.gov and also available at the Office of the Purchasing Agent, Quincy City Hall, 1305 Hancock Street, Quincy, Massachusetts, 02169, between the hours of 8:30 AM and 4:30 PM for a non-refundable printing charge of $25.00. Specifications will be available July 26th, 2018.

A non-mandatory pre-Bid conference will be held at the Parks, Forestry, and Cemetery Department, One Merrymount Parkway, Quincy, MA 02170, August 2nd, 2018 at 11:00AM.

Each bid shall be accompanied by a bid security in the amount of five percent (5%) of the total value of the bid in the form of a bid bond or certified/treasurer’s check.

The bidding and award of this contract shall be in full compliance with Massachusetts General Laws, Chapter 30, Section 39M, as last revised. All Federal, State and City of Quincy regulations and subject to the minimum wage rates set under the Massachusetts Prevailing Wage Law Chapter 149, §26 to 27H and/or any applicable federal rates. The City reserves the right to waive any informalty in or to reject any or all bids when such an action is deemed in the best interests of the City.

Non-responsive and/or unbalanced bids may be rejected.

Thomas P. Koch
Mayor

Kathryn Logan
Purchasing Agent

Advertised
The Quincy Sun
July 26, 2018
The Central Register
July 25, 2018

1305 Hancock St., Quincy MA 02169
Telephone: (617) 376-1060 Fax: (617) 376-1074

Printed on Recycled Paper
00100-1
SECTION 00200
INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Defined Terms</td>
</tr>
<tr>
<td>2.</td>
<td>Copies of Bidding Documents</td>
</tr>
<tr>
<td>3.</td>
<td>Qualifications of Bidders</td>
</tr>
<tr>
<td>4.</td>
<td>Site and Other Areas; Existing Site Conditions; Examination of Site; Owner’s Safety Program; Other Work at the Site</td>
</tr>
<tr>
<td>5.</td>
<td>Bidder’s Representations</td>
</tr>
<tr>
<td>6.</td>
<td>Pre-Bid Conference</td>
</tr>
<tr>
<td>7.</td>
<td>Interpretations and Addenda</td>
</tr>
<tr>
<td>8.</td>
<td>Bid Deposit</td>
</tr>
<tr>
<td>9.</td>
<td>Contract Times</td>
</tr>
<tr>
<td>10.</td>
<td>Liquidated Damages</td>
</tr>
<tr>
<td>11.</td>
<td>Substitute and “Or Equal” Items</td>
</tr>
<tr>
<td>12.</td>
<td>Subcontractors, Suppliers, and Others</td>
</tr>
<tr>
<td>13.</td>
<td>Preparation of Bid</td>
</tr>
<tr>
<td>14.</td>
<td>Basis of Bid</td>
</tr>
<tr>
<td>15.</td>
<td>Submittal of Bid</td>
</tr>
<tr>
<td>16.</td>
<td>Modification or Withdrawal of Bid</td>
</tr>
<tr>
<td>17.</td>
<td>Opening of Bids</td>
</tr>
<tr>
<td>18.</td>
<td>Disqualification of Bidders</td>
</tr>
<tr>
<td>19.</td>
<td>Bids to Remain Subject to Acceptance</td>
</tr>
<tr>
<td>20.</td>
<td>Evaluation of Bids and Award of Contract</td>
</tr>
<tr>
<td>21.</td>
<td>Contract Securities</td>
</tr>
<tr>
<td>22.</td>
<td>Contract Insurance</td>
</tr>
<tr>
<td>23.</td>
<td>Signing of Agreement</td>
</tr>
<tr>
<td>24.</td>
<td>Sales Taxes</td>
</tr>
<tr>
<td>25.</td>
<td>Massachusetts Prevailing Wage Rates</td>
</tr>
<tr>
<td>26.</td>
<td>Owner Furnished Items</td>
</tr>
</tbody>
</table>
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 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

4. 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. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.

   b. those drawings known to Owner of physical conditions in or relating to existing surface and subsurface structures at the Site (except Underground Facilities).

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

   d. Technical Data contained in such reports and drawings.

2. Copies of reports and drawings referenced above will be made available for review at Engineer’s office. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

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

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

4.3 Site Visit and Testing by Bidders

A. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

B. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner’s authority regarding the Site.

C. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

D. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.4 Owner’s Safety Program

A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

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 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:

www.quincyma.gov
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 VKalikiriri@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, 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

Q-0019-002/07/26/18 00200-6 Instructions to Bidders
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  (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 Unit Price

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The “Bid Price” (sometimes referred to as the extended price) for each unit price Bid item will be the product of the “Estimated Quantity” (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding “Bid Unit Price” offered by the Bidder. The total of all unit price Bid items will be the sum of these “Bid Prices”; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

D. Unit prices for identical item numbers that are in more than one bid schedule shall be equal. Discrepancies will be resolved in favor of the lowest unit price.

E. The price for alternates included in the Bid form will be the amount added to] the base Bid if Owner selects the alternate. In the evaluation of Bids, alternates will be applied in the same order as listed in the Bid form. The award will be based on the lowest eligible Bid including all selected alternates.

14.2 Allowances

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor’s overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents in accordance with paragraph 13.02 of the General Conditions.
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 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 will be provided to the Successful Bidder.

ARTICLE 25 MASSACHUSETTS PREVAILING WAGE RATES

25.1 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.

25.2 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.

ARTICLE 26 OWNER FURNISHED ITEMS

26.1 Owner has stockpiles of granite located at 99 Quarry Street, Quincy, MA to be used on this project to construct relevant granite retaining walls. The granite stockpile consists of newly excavated/blasted stones that will require fabrication to meet the requirements of proposed wall systems. Coordination with the City is required to determine the extent of material available and to schedule pick-up times for removal from the stockpile location. The materials and equipment provided for in these contracts will be furnished and delivered to the site for installation by Contractor. Identification of the materials and equipment and the procedures to be followed appear in paragraph 6.21 of the Supplementary Conditions.

END OF SECTION
SECTION 00300

GEOTECHNICAL DATA

PART 1  GENERAL

1.1  SUMMARY

A. For the preparation of Bidding Documents, Engineer has relied upon the following reports and tests of subsurface and latent physical conditions of the site. The location of all bore holes is shown on the Drawings.

1. Soil boring data (attached)

   a. The subsurface data are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents.

   b. Bidders are cautioned that the subsurface data have been utilized for general design purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground.

   c. The making available of this subsurface data to Bidders is not intended to relieve them from their responsibility to familiarize themselves with the subsurface and other site conditions.

PART 2  PRODUCTS – NOT USED

PART 3  EXECUTION – NOT USED

END OF SECTION
Drilling Co.: New England Boring Contractors  
Foreman: M. St. John  
T&B Rep.: J. Libby  
Date Start: 06/05/18  
End: 06/05/18  
Location: Merrymount Park Renovation Project  
GPS: See Exploration Location Plan  
GS. Elev.: 7 ± Datum: NAVD88

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Sample Depth (ft.)</th>
<th>Blows Per 6&quot;</th>
<th>Blows</th>
<th>PID Reading (ppm)</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S-1 / 13</td>
<td>0-2</td>
<td>41-40</td>
<td>0.3</td>
<td></td>
<td>3&quot; Very dense, brown, fine SAND and GRAVEL, trace silt, dry, over very dense, grey/brown, fine to medium SAND and GRAVEL, little Silt, dry</td>
</tr>
<tr>
<td>10</td>
<td>S-4 / 20</td>
<td>10-12</td>
<td>5-4</td>
<td>6-5</td>
<td></td>
<td>Stiff, brown, CLAYEY SILT, little Fiberous Peat, wet</td>
</tr>
<tr>
<td>15</td>
<td>S-6 / 8</td>
<td>15-17</td>
<td>8-13</td>
<td>10-10</td>
<td></td>
<td>Medium dense, grey, fine to coarse SAND and GRAVEL, some Silt, wet</td>
</tr>
<tr>
<td>20</td>
<td>S-7 / 8</td>
<td>20-22</td>
<td>16-15</td>
<td>12-10</td>
<td></td>
<td>Medium dense, brown, fine to coarse SAND, little Silt, trace Gravel, wet</td>
</tr>
<tr>
<td>25</td>
<td>S-8 / 3</td>
<td>25-27</td>
<td>8-7</td>
<td>7-10</td>
<td></td>
<td>Medium dense, brown, fine to coarse SAND, little Silt, trace Gravel, wet</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of boring at 27'</td>
</tr>
</tbody>
</table>

Notes:
1. Groundwater estimated at 3.5' based on sample wetness.
2. Auger grinding observed 2'-4'.
3. Borehole backfilled with cuttings at completion of drilling. Surface restored with asphalt cold patch.

Proportions Used
- TRACE (TR.) 0 - <10%
- LITTLE (LI.) 10 - <20%
- SOME (SO.) 20 - <35%
- AND 35 - <50%
- trace (TR.) 0 - <10%
- little (LI.) 10 - <20%
- some (SO.) 20 - <35%
- and 35 - <50%

Density/Consistency
- VERY LOOSE 0-4
- SOFT 2-4
- MEDIUM 4-8
- STIFF 8-15
- HARD >15

Groundwater Readings

<table>
<thead>
<tr>
<th>Station</th>
<th>Time</th>
<th>Depth</th>
<th>Casing</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Well Construction

- ASPHALT 0.3
- FILL 1
- SAND and GRAVEL 8'
- CLAYEY SILT 12'
- SILT 13.4'
- SAND and GRAVEL 18'
- No Well Installed
### Drilling Co. New England Boring Contractors

**Project:** Merrymount Park Renovation Project  
**Location:** Merrymount Park, Quincy MA  
**Client:** City of Quincy - Park & Forestry Department

<table>
<thead>
<tr>
<th>Casing Type</th>
<th>Sampler Type</th>
<th>Date</th>
<th>Time</th>
<th>Depth</th>
<th>Casing</th>
<th>Sta.</th>
<th>Time</th>
<th>Casing</th>
<th>Sta.</th>
<th>Time</th>
<th>Casing</th>
<th>Sta.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D./O.D.</td>
<td>Hammer Wt.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Spoon</td>
<td>Hammer Fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hammer Make</td>
<td>Rig Make/Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Date Start:** 06/05/18  
**End:** 06/05/18  
**Location:** Merrymount Park Renovation Project

**GS. Elev.:** 7± Datum: NAVD88

### Groundwater Readings

**Refer to Note 1**

### Depth Casing Blows Per Ft. Sample Depth Blows Per 6" PID Reading (ppm) Sample Description General Stratigraphy Notes Well Construction

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Casing No.</th>
<th>Sample Depth (ft.)</th>
<th>Blows Per 6&quot;</th>
<th>PID Reading (ppm)</th>
<th>Sample Description</th>
<th>General Stratigraphy</th>
<th>Notes</th>
<th>Well Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3</td>
<td>S-1 / 13</td>
<td>0-2</td>
<td>2-1</td>
<td>0.3</td>
<td>Very loose, black/brown, fine SAND and SILT, dry</td>
<td>TOPSOIL</td>
<td>2'</td>
<td>No Well Installed</td>
</tr>
<tr>
<td>2-3</td>
<td>S-2 / 16</td>
<td>2-4</td>
<td>2-3</td>
<td>0.1</td>
<td>Loose, brown, fine to medium SAND, some Silt, moist</td>
<td>SAND</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3-5</td>
<td>S-3 / 18</td>
<td>4-6</td>
<td>3-2</td>
<td>0.0</td>
<td>Loose, brown, fine to medium SAND, some Silt, trace Gravel, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>5-4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-4 / 20</td>
<td>10-12</td>
<td>4-11</td>
<td></td>
<td>Medium dense, grey, fine to coarse SAND, some Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>S-5 / 6</td>
<td>15-17</td>
<td>3-7</td>
<td></td>
<td>Medium dense, grey, fine to coarse SAND, some Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>S-6 / 22</td>
<td>20-22</td>
<td>10-14</td>
<td></td>
<td>Medium dense, grey, fine to coarse SAND, some Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>S-7 / 6</td>
<td>25-27</td>
<td>8-9</td>
<td></td>
<td>Medium dense, grey, fine to coarse SAND, some Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of Exploration at 27 ft BGS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. Groundwater estimated at 4' based on sample wetness.  
2. Auger grinding observed 22'-23'.  
3. Borehole backfilled with cuttings at completion of drilling.

### Proportions Used

<table>
<thead>
<tr>
<th>Proportions</th>
<th>Density/Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRACE (TR.)</td>
<td>0 - &lt;10%</td>
</tr>
<tr>
<td>LITTLE (LI.)</td>
<td>10 - &lt;20%</td>
</tr>
<tr>
<td>SOME (SO.)</td>
<td>20 - &lt;35%</td>
</tr>
<tr>
<td>AND</td>
<td>35 - &lt;50%</td>
</tr>
<tr>
<td>VERY LOOSE</td>
<td>0-4</td>
</tr>
<tr>
<td>LOOSE</td>
<td>4-10</td>
</tr>
<tr>
<td>MEDIUM DENSE</td>
<td>10-30</td>
</tr>
<tr>
<td>DENSE</td>
<td>30-50</td>
</tr>
<tr>
<td>HARD</td>
<td>&gt;50</td>
</tr>
<tr>
<td>SOFT</td>
<td>2-4</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>4-8</td>
</tr>
<tr>
<td>STIFF</td>
<td>8-15</td>
</tr>
<tr>
<td>VERY STIFF</td>
<td>15-30</td>
</tr>
<tr>
<td>HARD</td>
<td>&gt;30</td>
</tr>
</tbody>
</table>
**Project:** Merrymount Park Renovation Project  
**Location:** Merrymount Park, Quincy MA  
**Client:** City of Quincy - Park & Forestry Department

<table>
<thead>
<tr>
<th>Casing</th>
<th>Sampler</th>
<th>Groundwater Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>HSA</td>
<td></td>
</tr>
</tbody>
</table>

**Date** | **Time** | **Depth** | **Casing** | **Rig Make/Model** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mobile B-39 (auto hammer)</td>
</tr>
</tbody>
</table>

**Notes:**  
1. Groundwater estimated at 4' based on sample wetness.  
2. Borehole backfilled with cuttings at completion of drilling. Surface restored with asphalt cold patch.

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Casing Blows</th>
<th>Sample Depth (ft.)</th>
<th>Blows Per 6&quot;</th>
<th>PID Reading (ppm)</th>
<th>General Stratigraphy</th>
<th>N o t e s</th>
<th>Well Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1 / 13</td>
<td>0-2</td>
<td>2-1</td>
<td>0.2</td>
<td></td>
<td>0.3 ASPHALT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-2 / 6</td>
<td>2-4</td>
<td>2-3</td>
<td>0.0</td>
<td></td>
<td>FILL</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S-3 / 11</td>
<td>4-6</td>
<td>3-2</td>
<td>0.0</td>
<td></td>
<td>SAND</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SAND and GRAVEL</td>
<td></td>
<td>No Well Installed</td>
</tr>
<tr>
<td>S-4 / 4</td>
<td>10-12</td>
<td>4-11</td>
<td>13-11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SAND</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S-5 / 15</td>
<td>15-17</td>
<td>3-7</td>
<td>12-18</td>
<td></td>
<td></td>
<td>18.5&quot;</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SAND and GRAVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-6 / 24</td>
<td>20-22</td>
<td>10-14</td>
<td>19-17</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-7 / 20</td>
<td>25-27</td>
<td>8-9</td>
<td>10-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of boring at 27'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Density/Consistency**

- SOFT: <10%  
- MEDIUM: 10-20%  
- STIFF: 20-35%  
- HARD: >35%

- VERY LOOSE: 0-4  
- LOOSE: 4-10  
- MEDIUM DENSE: 10-30  
- DENSE: 30-50  
- VERY DENSE: >50

**Proportions Used**

- Trace (TR.): 0 - <10%  
- Little (LT.): 10 - <20%  
- Some (SO.): 20 - <35%  
- And: 35 - <50%
### Drilling Co. New England Boring Contractors

**Foreman:** M. St. John  
**T&B Rep.:** J. Libby  
**Date Start:** 06/06/18  
**Location:** See Exploration Location Plan  
**GS. Elev.:** 9 ± Datum: NAVD88  
**Project:** Merrymount Park Renovation Project  
**Client:** City of Quincy - Park & Forestry Department

### Casing and Sampler

<table>
<thead>
<tr>
<th>Casing Type</th>
<th>Sampler Type</th>
<th>I.D./O.D.</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSA</td>
<td>Split Spoon</td>
<td>3.25&quot;/6.625&quot;</td>
<td>1-3/8&quot;/2&quot;</td>
</tr>
</tbody>
</table>

### Groundwater Readings

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Cap.</th>
<th>Hammer Wt.</th>
<th>Hammer Fall</th>
<th>Rig Make/Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-5</td>
<td></td>
<td>-</td>
<td>-</td>
<td>Mobile B-39 (auto hammer)</td>
</tr>
</tbody>
</table>

### General Notes

1. Groundwater estimated at 9.5' based on sample wetness.
2. Borehole backfilled with cuttings at completion of drilling. Surface restored with asphalt cold patch.

### Groundwater Readings

<table>
<thead>
<tr>
<th>Date Start</th>
<th>Time</th>
<th>Depth</th>
<th>Casing</th>
<th>Sta.</th>
<th>Time</th>
<th>Depth</th>
<th>Casing</th>
<th>Sta.</th>
<th>Time</th>
<th>Depth</th>
<th>Casing</th>
<th>Sta.</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/06/18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>06/06/18</td>
<td></td>
<td></td>
<td></td>
<td>06/06/18</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sample Description

<table>
<thead>
<tr>
<th>PID Reading (ppm)</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>Very dense, brown, fine to coarse SAND and GRAVEL, little Silt, dry</td>
</tr>
<tr>
<td>0.0</td>
<td>Dense, brown, fine to coarse SAND and GRAVEL, little Silt, dry</td>
</tr>
<tr>
<td>0.0</td>
<td>Medium dense, grey to brown, fine SAND and SILT, some Gravel, dry</td>
</tr>
<tr>
<td>0.2</td>
<td>Medium dense, brown, fine to coarse SAND, little Silt, wet</td>
</tr>
<tr>
<td>0.0</td>
<td>Dense, brown, fine to coarse SAND, little Silt, wet</td>
</tr>
<tr>
<td>0.0</td>
<td>Dense, brown, fine to coarse SAND, some Gravel, little Silt, wet</td>
</tr>
<tr>
<td>0.0</td>
<td>Dense, brown, fine to coarse SAND, little Silt, wet</td>
</tr>
<tr>
<td>End of boring at 27'</td>
<td></td>
</tr>
</tbody>
</table>

### Proportions Used

- **Trace (TR.):** 0 - <10%
- **Little (LI.):** 10 - <20%
- **Some (SO.):** 20 - <35%
- **And:** 35 - <50%

### Density/Consistency

- **Very Loose:** 0-4  
- **Very Soft:** <2  
- **Soft:** 2-4  
- **Medium:** 4-8  
- **Dense:** 8-15  
- **Very Dense:** >15  
- **Very Stiff:** >15  
- **Stiff:** >30

---

- **ASPHALT**
- **FILL**
- **SAND and SILT**
- **SAND**
- **No Well Installed**
**Project:** Merrymount Park Renovation Project  
**Location:** Merrymount Park, Quincy MA  
**Client:** City of Quincy - Park & Forestry Department

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Casing Blows Per Ft.</th>
<th>Sample No.</th>
<th>Sample Depth (ft.)</th>
<th>Blows</th>
<th>PID Reading (ppm)</th>
<th>Sample Description</th>
<th>General Stratigraphy</th>
<th>Notes</th>
<th>Well Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>WOH-1</td>
<td>0.1</td>
<td></td>
<td>2-4</td>
<td></td>
<td>Very loose, black, fine SAND and SILT, dry</td>
<td></td>
<td></td>
<td>TOPSOIL</td>
</tr>
<tr>
<td>2-4</td>
<td>S-1 / 8</td>
<td>6-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-4</td>
<td>S-2 / 3</td>
<td>0.1</td>
<td></td>
<td>8-8</td>
<td></td>
<td>Medium dense, brown, fine to medium SAND, some Gravel, little Silt, dry to moist</td>
<td></td>
<td></td>
<td>SAND</td>
</tr>
<tr>
<td>6-7</td>
<td>S-3 / 6</td>
<td>0.0</td>
<td></td>
<td>1-1</td>
<td></td>
<td>Loose, grey, fine to coarse SAND, some Gravel, trace Silt, dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-7</td>
<td>S-3 / 6</td>
<td>6-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-4</td>
<td>S-2 / 3</td>
<td>0.1</td>
<td></td>
<td>8-8</td>
<td></td>
<td>Medium dense, brown, fine to medium SAND, some Gravel, little Silt, dry to moist</td>
<td></td>
<td></td>
<td>SAND and GRAVEL</td>
</tr>
<tr>
<td>6-7</td>
<td>S-3 / 6</td>
<td>0.0</td>
<td></td>
<td>1-1</td>
<td></td>
<td>Loose, grey, fine to coarse SAND, some Gravel, trace Silt, dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-7</td>
<td>S-3 / 6</td>
<td>6-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-4 / 4</td>
<td>21-31</td>
<td></td>
<td>38-28</td>
<td></td>
<td>Very dense, grey, fine to coarse SAND and GRAVEL, trace Silt, dry</td>
<td></td>
<td>1</td>
<td>2 No Well Installed</td>
</tr>
<tr>
<td>9-12</td>
<td>S-5 / 10</td>
<td>15-21</td>
<td></td>
<td></td>
<td></td>
<td>Medium dense, brown, fine to coarse SAND and GRAVEL, trace Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-12</td>
<td>S-4 / 4</td>
<td>21-31</td>
<td></td>
<td>38-28</td>
<td></td>
<td>Very dense, grey, fine to coarse SAND and GRAVEL, trace Silt, dry</td>
<td></td>
<td>1</td>
<td>2 No Well Installed</td>
</tr>
<tr>
<td>2-4-4</td>
<td>S-2 / 3</td>
<td>0.1</td>
<td></td>
<td>8-8</td>
<td></td>
<td>Medium dense, brown, fine to medium SAND, some Gravel, little Silt, dry to moist</td>
<td></td>
<td></td>
<td>SAND and GRAVEL</td>
</tr>
<tr>
<td>6-7</td>
<td>S-3 / 6</td>
<td>0.0</td>
<td></td>
<td>1-1</td>
<td></td>
<td>Loose, grey, fine to coarse SAND, some Gravel, trace Silt, dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-7</td>
<td>S-3 / 6</td>
<td>6-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-4 / 4</td>
<td>21-31</td>
<td></td>
<td>38-28</td>
<td></td>
<td>Very dense, grey, fine to coarse SAND and GRAVEL, trace Silt, dry</td>
<td></td>
<td>1</td>
<td>2 No Well Installed</td>
</tr>
<tr>
<td>9-12</td>
<td>S-5 / 10</td>
<td>15-21</td>
<td></td>
<td></td>
<td></td>
<td>Medium dense, brown, fine to coarse SAND and GRAVEL, trace Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-4</td>
<td>S-2 / 3</td>
<td>0.1</td>
<td></td>
<td>8-8</td>
<td></td>
<td>Medium dense, brown, fine to medium SAND, some Gravel, little Silt, dry to moist</td>
<td></td>
<td></td>
<td>SAND and GRAVEL</td>
</tr>
<tr>
<td>6-7</td>
<td>S-3 / 6</td>
<td>0.0</td>
<td></td>
<td>1-1</td>
<td></td>
<td>Loose, grey, fine to coarse SAND, some Gravel, trace Silt, dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-7</td>
<td>S-3 / 6</td>
<td>6-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>S-6 / 18</td>
<td>28-31</td>
<td></td>
<td>29-30</td>
<td></td>
<td>Very dense, brown, fine to coarse SAND and GRAVEL, little Silt, wet</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>20-22</td>
<td>S-6 / 18</td>
<td>28-31</td>
<td></td>
<td>29-30</td>
<td></td>
<td>Very dense, brown, fine to coarse SAND and GRAVEL, little Silt, wet</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>S-7 / 18</td>
<td>48-46</td>
<td></td>
<td>23-31</td>
<td></td>
<td>Very dense, brown, fine to coarse SAND and GRAVEL, little Silt, wet</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>25-27</td>
<td>S-7 / 18</td>
<td>48-46</td>
<td></td>
<td>23-31</td>
<td></td>
<td>Very dense, brown, fine to coarse SAND and GRAVEL, little Silt, wet</td>
<td></td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Groundwater Readings**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Depth</th>
<th>Casing</th>
<th>Sta.</th>
<th>Casing</th>
<th>Datum: NAVD88</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/05/18</td>
<td>8:00 AM</td>
<td>5'</td>
<td>HSA</td>
<td>1'</td>
<td>150#</td>
<td>Mobile B-39 (auto hammer)</td>
</tr>
</tbody>
</table>

**Notes:**
1. Auger grinding observed 12' to 15'.
2. Groundwater estimated at 13.5' based on sample wetness.
3. Auger grinding observed 23' to 25'.
4. Borehole backfilled with cuttings at completion of drilling.

**Proportions Used**

- TOPSOIL: 0 - <10%
- SAND: 10 - <20%
- SAND and GRAVEL: 20 - <35%
- DENSE: 35 - <50%
- VERY DENSE: >50%

**Density/Consistency**

- TRACE (TR.): 0
- SOFT: 10 - 20%
- MEDIUM: 20 - 40%
- STIFF: 40 - 60%
- HARD: 60 - 80%
<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Casing Blows Per Ft.</th>
<th>Sample No.</th>
<th>Sample Depth (ft.)</th>
<th>Blows</th>
<th>PID Reading (ppm)</th>
<th>Sample Description</th>
<th>General Stratigraphy</th>
<th>Notes</th>
<th>Well Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>30-21</td>
<td>S-1 / 21</td>
<td></td>
<td>0.3</td>
<td></td>
<td>Very dense, brown/grey, fine to medium SAND, some Silt, trace Gravel, dry</td>
<td>0.3 ASPHALT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4</td>
<td>17-13</td>
<td>S-2 / 9</td>
<td></td>
<td>0.0</td>
<td></td>
<td>Medium dense, brown, fine to medium SAND, some Silt, wet at 3’</td>
<td>MEDIUM DENSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-6</td>
<td>2-4</td>
<td>S-3 / 0</td>
<td></td>
<td>0.0</td>
<td></td>
<td>No recovery (Cobble Fragment in spoon tip)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8</td>
<td>9-9</td>
<td>S-4 / 24</td>
<td></td>
<td>5-6</td>
<td></td>
<td>Medium dense, brown/grey, fine to medium SAND, some Silt, wet</td>
<td>SAND</td>
<td>4'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-12</td>
<td>8-8</td>
<td>S-5 / 24</td>
<td></td>
<td>8-10</td>
<td></td>
<td>Medium dense, brown/grey, fine to coarse SAND, some Silt, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of boring at 12’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Groundwater estimated at 3’ based on sample wetness.
2. Borehole backfilled with cuttings at completion of drilling. Surface restored with asphalt cold patch.

**Proportions Used:**
- TRACE (TR.) 0 - <10%
- LITTLE (LI.) 10 - <20%
- SOME (SO.) 20 - <35%
- AND 35 - <50%

**Density/Consistency:**
- VERY LOOSE 0-4
- SOFT 2-4
- MEDIUM 4-8
- DENSE 10-30
- STIFF 8-15
- VERY DENSE >50
## Drilling Co. New England Boring Contractors

### Foreman: Mike St. John

### T&B Rep.: J. Libby

### Date Start: 06/06/18

### End: 6/6/18

### Location: See Exploration Location Plan

### GS. Elev. 7 ± Datum: NAVD88

### Client: City of Quincy - Park & Forestry Department

### Project: Merrymount Park Renovation Project

### Rig Make/Model: Mobile B-39 (auto hammer)

### Hammer Wt. - 140#

### Hammer Fall - 30°

## Groundwater Readings

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Date Start</th>
<th>Date End</th>
<th>Depth</th>
<th>Casing</th>
<th>Sampled</th>
<th>PID Reading (ppm)</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-8</td>
<td>06/06/18</td>
<td>6/6/18</td>
<td>0-2</td>
<td>15-15</td>
<td>0.0</td>
<td>15-15</td>
<td>Medium dense, brown, fine to coarse SAND and GRAVEL, little Silt, dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-4</td>
<td>20-18</td>
<td>0.0</td>
<td>17-17</td>
<td>Medium dense, brown, fine to coarse SAND and GRAVEL, little Silt, wet at 3'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4-6</td>
<td>5-1</td>
<td>0.0</td>
<td>15-17</td>
<td>Very loose, black, SILT, some fine Sand, wet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6-8</td>
<td>2-2</td>
<td></td>
<td>3-6</td>
<td>11&quot; Very loose, black, SILT, some fine Sand, wet, over loose, black, fine to medium SAND, some Silt, wet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10-12</td>
<td>5-8</td>
<td></td>
<td>8-9</td>
<td>Medium dense, brown to grey, fine to coarse SAND, some Silt, wet</td>
</tr>
</tbody>
</table>

### Notes:

1. Groundwater estimated at 3' based on sample wetness.
2. Borehole backfilled with cuttings at completion of drilling. Surface restored with asphalt cold patch.

### Proportions Used:

- **Trace (TR.)** 0 - <10%
- **Little (LI.)** 10 - <20%
- **Some (SO.)** 20 - <35%
- **And** 35 - <50%

### Density/Consistency:

- **Very Loose** 0-4
- **Very Soft** <2
- **Soft** 2-4
- **Medium Soft** 4-8
- **Medium** 8-15
- **Dense** >15
- **Very Dense** >30
SECTION 00410

BID FORM

PROJECT IDENTIFICATION:

Merrymount Parkway Reconstruction Project

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:

Office of the City Clerk

1305 Hancock Street, Quincy, MA 02169

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.

2.2 The Work under this Contract shall be subject to the provisions of Chapter 30, Section 39M of the Massachusetts General Laws.

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.

Q-0019-002/07/26/18 00410-1 Bid Form
B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

K. Bidder is aware that the estimated quantities on the Bid Form are subject to Article 13.03 of the General Conditions (Section 00700).
ARTICLE 4 - BIDDER’S CERTIFICATION

4.1 Bidder hereby certifies under the penalties of perjury, to the best of Bidder’s knowledge and belief, that Bidder has filed all State tax returns and paid all State taxes required by law.

4.2 Bidder certifies under penalties of perjury that this Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used herein the word “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

4.3 Bidder certifies that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

4.4 Bidder certifies that Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

4.5 Bidder certifies that Bidder has not solicited or induced any individual or entity to refrain from bidding; and

4.6 Bidder certifies that Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:

A. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

B. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of the Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

C. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

D. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 - BASIS OF BID

5.1 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name and Unit Bid Prices Written in Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total Amount of Item (in figures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>101.</td>
<td>Clearing &amp; Grubbing, per acre, the price of:</td>
<td>x 1.5 acre =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120.1</td>
<td>Unclassified Excavation, per cubic yard, the price of:</td>
<td>x 7,200 c.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>141.1</td>
<td>Test Pit for Exploration, per cubic yard, the price of:</td>
<td>x 260 c.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>145.</td>
<td>Drainage Structure Abandoned, each, the price of:</td>
<td>x 2 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>146.</td>
<td>Drainage Structure Removed, each, the price of:</td>
<td>x 4 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>151.</td>
<td>Gravel Borrow, per cubic yard, the price of:</td>
<td>x 3,200 c.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>156.</td>
<td>Crushed Stone, per ton, the price of:</td>
<td>x 100 ton =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>170.</td>
<td>Fine Grading and Compacting, per square yard, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 15,000 s.y. =</td>
<td></td>
</tr>
<tr>
<td>201.</td>
<td>Catch Basin, each, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 16 each =</td>
<td></td>
</tr>
<tr>
<td>202.</td>
<td>Manhole, each, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 12 each =</td>
<td></td>
</tr>
<tr>
<td>203.1</td>
<td>Special Manhole Type A (SWTU), each, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 4 each =</td>
<td></td>
</tr>
<tr>
<td>203.2</td>
<td>Special Manhole Type B (SWTU), each, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 1 each =</td>
<td></td>
</tr>
<tr>
<td>203.3</td>
<td>Special Manhole Type C, each, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 2 each =</td>
<td></td>
</tr>
<tr>
<td>220.</td>
<td>Drainage Structure Adjusted, per each, the price of:</td>
<td>$</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x 3 each =</td>
<td></td>
</tr>
</tbody>
</table>
### Base Bid

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name and Unit Bid Prices Written in Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total Amount of Item (in figures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>220.6</td>
<td>Sanitary Structure Rebuilt, per foot, the price of:</td>
<td>x 4 ft. =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>220.7</td>
<td>Sanitary Structure Adjusted, each, the price of:</td>
<td>x 4 each =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>221.</td>
<td>Frame and Cover, per each, the price of:</td>
<td>x 15 each =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>222.1</td>
<td>Frame and Grate – MassDOT Cascade Type, per each, the price of:</td>
<td>x 4 each =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>222.3</td>
<td>Frame and Grate – Municipal Standard, per each, the price of:</td>
<td>x 12 each =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>223.1</td>
<td>Frame and Grate (or Cover) Removed and Stacked, per each, the price of:</td>
<td>x 3 each =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>243.18</td>
<td>18 Inch Reinforced Concrete Pipe Class IV, per foot, the price of:</td>
<td>x 80 ft. =</td>
<td>$__________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td>$__________________________</td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>252.118</td>
<td>18 Inch Corrugated Plastic Pipe Flared End, per each, the price of:</td>
<td>x 2 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>252.12</td>
<td>12 Inch Corrugated Plastic (Polyethylene) Pipe, per foot, the price of:</td>
<td>x 1,050 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>252.18</td>
<td>18 Inch Corrugated Plastic (Polyethylene) Pipe, per foot, the price of:</td>
<td>x 380 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>252.24</td>
<td>24 Inch Corrugated Plastic (Polyethylene) Pipe, per foot, the price of:</td>
<td>x 30 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>258.</td>
<td>Stone for Pipe Ends, per square yard, the price of:</td>
<td>x 100 s.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>258.1</td>
<td>Underground Infiltration System, per lump sum, the price of:</td>
<td>x lump sum =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>302.06</td>
<td>6 Inch Ductile Iron Water Pipe (Rubber Gasket), per foot, the price of:</td>
<td>x 100 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>302.08</td>
<td>8 Inch Ductile Iron Water Pipe (Rubber Gasket), per foot, the price of:</td>
<td>x 1,100 ft. = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>309.</td>
<td>Ductile Iron Fittings for Water Pipe, per pound, the price of:</td>
<td>x 1,200 lb. = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>336.11</td>
<td>Irrigation Hose Bib, per each, the price of:</td>
<td>x 7 each = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>347.2</td>
<td>2 Inch Copper Tubing Type K, per foot, the price of:</td>
<td>x 100 ft. = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>350.06</td>
<td>6 Inch Gate And Gate Box, per each, the price of:</td>
<td>x 5 each = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>350.08</td>
<td>8 Inch Gate and Gate Box, per each, the price of:</td>
<td>x 2 each = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>358.</td>
<td>Gate Box Adjusted, per each, the price of:</td>
<td>x 4 each = $</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($                                                           )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>358.1</td>
<td>Gate Box/Service Box Removed and Stacked, each, the price of:</td>
<td></td>
<td>x 2 each = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>363.2</td>
<td>2 Inch Corporation Cock, per each, the price of:</td>
<td></td>
<td>x 1 each = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>376.</td>
<td>Hydrant, per each, the price of:</td>
<td></td>
<td>x 1 each = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>376.3</td>
<td>Hydrant - Removed and Reset, per each, the price of:</td>
<td></td>
<td>x 2 each = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>402.</td>
<td>Dense Graded Crushed Stone for Sub-base, per cubic yard, the price of:</td>
<td></td>
<td>x 1,300 c.y. = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>415.</td>
<td>Pavement Micro-Milling, per square yard, the price of:</td>
<td></td>
<td>x 2,300 s.y. = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>431.</td>
<td>High Early Strength Cement Concrete Base Course, per square yard, the price of:</td>
<td></td>
<td>x 60 s.y. = $___________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>440.</td>
<td>Calcium Chloride for Roadway Dust Control, per pound, the price of:</td>
<td>x 22,500 lb =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>443.</td>
<td>Water for Roadway Dust Control, per million gallon, the price of:</td>
<td>x 2 MGL =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>450.50</td>
<td>HMA Leveling Course, per ton, the price of:</td>
<td>x 210 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>450.90</td>
<td>Contractor Quality Control (Paving), per ton, the price of:</td>
<td>x 5,170 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>452.</td>
<td>Asphalt Emulsion for Tack Coat, per gallon, the price of:</td>
<td>x 1,600 gallons =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>455.22</td>
<td>Superpave Surface Course - 9.5 (SSC - 9.5), per ton, the price of:</td>
<td>x 1,410 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>455.31</td>
<td>Superpave Intermediate Course - 12.5 (SIC - 12.5), per ton, the price of:</td>
<td>x 1,150 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>455.32</td>
<td>Superpave Base Course – 19.0 (SBC – 19.0), per ton, the price of:</td>
<td>x 2,610 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td>472.</td>
<td>Hot Mix Asphalt for Miscellaneous Work, per ton, the price of:</td>
<td>x 400 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td>473.</td>
<td>Thermoplastic Panel Asphalt Crosswalk, per square yard, the price of:</td>
<td>x 110 s.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td>482.3</td>
<td>Sawing Asphalt Pavement, per foot, the price of:</td>
<td>x 1,100 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td>482.4</td>
<td>Sawing Cement Concrete, per foot, the price of:</td>
<td>x 20 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td>506.</td>
<td>Granite Curb Type VB - Straight, per foot, the price of:</td>
<td>x 2,100 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td>506.1</td>
<td>Granite Curb Type VB - Curved, per foot, the price of:</td>
<td>x 200 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>506.2</td>
<td>Double Stack Granite Curb, per foot, the price of:</td>
<td>x 3,100 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>509.</td>
<td>Granite Transition Curb for Wheelchair Ramps, Straight, per foot, the price of:</td>
<td>x 60 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td>509.1</td>
<td>Granite Transition Curb for Wheelchair Ramps - Curved, per foot, the price of:</td>
<td>x 30 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td>580.</td>
<td>Curb Removed and Reset, per foot, the price of:</td>
<td>x 1,900 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td>590.</td>
<td>Curb Removed and Stacked, per foot, the price of:</td>
<td>x 200 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td>594.</td>
<td>Curb Removed and Discarded, per foot, the price of:</td>
<td>x 1,900 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td>665.</td>
<td>Chain Link Fence Removed and Reset, per foot, the price of:</td>
<td>x 180 ft.</td>
<td>$________________</td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>685.3</td>
<td>Granite Block Retaining Wall, per cubic yard, the price of:</td>
<td>x 230 c.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>685.4</td>
<td>Concrete Retaining Wall with Granite Façade, per foot, the price of:</td>
<td>x 85 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>697.1</td>
<td>Silt Sack, each, the price of:</td>
<td>x 19 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>701.</td>
<td>Cement Concrete Sidewalk, per square yard, the price of:</td>
<td>2,700 s.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>701.1</td>
<td>Cement Concrete Sidewalk at Driveways, per square yard, the price of:</td>
<td>x 60 s.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>701.2</td>
<td>Cement Concrete Wheelchair Ramp, per square yard, the price of:</td>
<td>x 100 s.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>703.</td>
<td>Hot Mix Asphalt Driveway, per ton, the price of:</td>
<td>x 100 tons =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($</td>
<td>)</td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>707.81</td>
<td>Steel Swing Gate, each, the price of:</td>
<td>x 1 each  =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>748.</td>
<td>Mobilization, lump sum, the price of:</td>
<td>lump sum =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>751.</td>
<td>Loam Borrow, per cubic yard, the price of:</td>
<td>x 250 c.y.</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>765.</td>
<td>Seeding, per square yard, the price of:</td>
<td>x 1,900 s.y. =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>767.12</td>
<td>Compost Filter Tubes, per foot, the price of:</td>
<td>x 1,030 ft. =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>804.</td>
<td>Trenching for Conduit Installation, per foot, the price of:</td>
<td>x 4,350 ft. =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>804.010</td>
<td>Conduit Cement Concrete Encasement, per foot, the price of:</td>
<td>x 1,600 ft. =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>804.11</td>
<td>1 Inch Electrical Conduit Type NM - Plastic in Open Trench, per foot, the price of:</td>
<td>x 3,350 ft. =</td>
<td>$______________________________</td>
</tr>
<tr>
<td></td>
<td>($                                                              )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
<td>-------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>804.151</td>
<td>1-1/2 Inch Electrical Conduit Type NM - Plastic in Open Trench, per foot, the price of:</td>
<td>x 510 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>804.41</td>
<td>4 Inch Electrical Conduit Type NM - Plastic In Open Trench, per foot, the price of:</td>
<td>x 8,910 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.20</td>
<td>24 Inch x 24 Inch Electric Handhole, each, the price of:</td>
<td>x 2 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.21</td>
<td>12 Inch x 12 Inch Electric Handhole, each, the price of:</td>
<td>x 2 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.36</td>
<td>Electric Handhole Adjusted, each, the price of:</td>
<td>x 9 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.952</td>
<td>National Grid 2-Way Manhole, each, the price of:</td>
<td>x 2 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.953</td>
<td>National Grid 3-Way Manhole, each, the price of:</td>
<td>x 1 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>811.954</td>
<td>National Grid 4-Way Manhole, each, the price of:</td>
<td>x 1 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.955</td>
<td>National Grid 1 Phase Junction Box and Meter, each, the price of:</td>
<td>x 1 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.961</td>
<td>Verizon Precast Vault, each, the price of:</td>
<td>x 4 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>811.971</td>
<td>Comcast Vault, each, the price of:</td>
<td>x 4 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>812.17</td>
<td>Period Lighting – Single Fixture, each, the price of:</td>
<td>x 17 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>812.18</td>
<td>Period Lighting – Double Fixture, each, the price of:</td>
<td>x 22 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>813.30</td>
<td>Wire Type 7 No. 10 General Purpose, per foot, the price of:</td>
<td>x 3,300 ft. =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Bid</td>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td>813.31</td>
<td>Wire Type 7 No. 8 General Purpose, per foot, the price of:</td>
<td>x 8,800 ft. =</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>813.562</td>
<td>Transformer Pad - Single Phase, each, the price of:</td>
<td>x 1 each =</td>
<td>$_______________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>813.801</td>
<td>Service Connection - 1 Phase, each, the price of:</td>
<td>x 1 each =</td>
<td>$_______________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>813.805</td>
<td>Service Meter - 1 Phase, each, the price of:</td>
<td>x 1 each =</td>
<td>$_______________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>823.60</td>
<td>Highway Lighting Load Center, each, the price of:</td>
<td>x 1 each =</td>
<td>$_______________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>826.51</td>
<td>Fire Alarm Box Removed and Stacked, each, the price of:</td>
<td>x 1 each =</td>
<td>$_______________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>832.</td>
<td>Warning-Regulatory and Route Marker – Alum. Panel (Type A), per square foot, the price of:</td>
<td>x 150 s.f. =</td>
<td>$_______________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($                                                        )</td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>833.</td>
<td>Rectangular Rapid Flashing Beacon (RRFB), each, the price of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>847.1</td>
<td>Sign Sup (N/Guide) + RTE MKR W/1 Brkway Post Assembly – Steel, each, the price of:</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>850.</td>
<td>Traffic Controls for Construction Operations, per lump sum, the price of:</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>854.014</td>
<td>Temporary Paving Markings – 4 In (Painted), per foot, the price of:</td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>860.104</td>
<td>4 Inch Reflectorized White Line (Painted), per foot, the price of:</td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>864.04</td>
<td>Pavement Arrows and Legends Refl. White (Thermoplastic), per square foot, the price of:</td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>866.104</td>
<td>4 Inch Reflectorized White Line (Thermoplastic), per foot, the price of:</td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_________________</td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name and Unit Bid Prices Written in Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total Amount of Item (in figures)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>866.112</td>
<td>12 Inch Reflectorized White Line (Thermoplastic), per foot, the price of:</td>
<td>x 540 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>867.104</td>
<td>4 Inch Reflectorized Yellow Line (Thermoplastic), per foot, the price of:</td>
<td>x 2,300 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>874.</td>
<td>Street Name Sign, each, the price of:</td>
<td>x 2 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>874.4</td>
<td>Traffic Sign Removed and Stacked, each, the price of:</td>
<td>x 5 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>874.7</td>
<td>Miscellaneous Plaque Removed and Stacked, each, the price of:</td>
<td>x 1 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>900.</td>
<td>Police Detail for Traffic Control, per hour, the price of:</td>
<td>x 1,800 hours =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($                                                             )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>999.1</td>
<td>Monthly Price Adjustment for Liquid Asphalt, the price of:</td>
<td>Allowance =</td>
<td>$10,000.00</td>
</tr>
<tr>
<td></td>
<td>Ten Thousand Dollars and Zero cents ($10,000.00)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-0019-002/07/26/18 00410-19 Bid Form
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name and Unit Bid Prices Written in Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total Amount of Item (in figures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>999.2</td>
<td>Monthly Price Adjustment for Diesel Fuel, ALL, the price of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Two Thousand Dollars and Zero cents ($2,000.00)</td>
<td>Allowance =</td>
<td>$2,000.00</td>
</tr>
<tr>
<td>999.3</td>
<td>Monthly Price Adjustment for Gasoline, the price of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One Thousand Dollars and Zero cents ($1,000.00)</td>
<td>Allowance =</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>999.4</td>
<td>Monthly Price Adjustment for Portland Cement in Concrete, the price of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One Thousand Five Hundred Dollars ($1,500.00)</td>
<td>Allowance =</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>999.5</td>
<td>Monthly Price Adjustment for Structural Steel and Reinforcing Steel, the price of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One Thousand Five Hundred Dollars ($1,500.00)</td>
<td>Allowance =</td>
<td>$1,500.00</td>
</tr>
</tbody>
</table>

TOTAL AMOUNT OF BASE BID – Items 101. through 999.5

$______________________________ dollars

(words)

($______________________________ )

(figures)
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name and Unit Bid Prices</th>
<th>Estimated Quantity</th>
<th>Total Amount of Item (in figures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>102.</td>
<td>Selective Clearing and Thinning, per acre, the price of:</td>
<td>2 acre =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>655.3</td>
<td>Ornamental Fence, per foot, the price of:</td>
<td>85 ft. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>751.1</td>
<td>Topsoil Rehandled and Spread, per cubic yard, the price of:</td>
<td>720 c.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>765.1</td>
<td>Seeding – Mix as Noted in Drawings, per square yard, the price of:</td>
<td>391 s.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>767.6</td>
<td>Aged Pine Bark Mulch, per cubic yard, the price of:</td>
<td>120 c.y. =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>773.436</td>
<td>Pine-White 5 – 6 feet, bare root, per each, the price of:</td>
<td>5 each =</td>
<td>$_________________</td>
</tr>
<tr>
<td></td>
<td>($ )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Number</td>
<td>Description</td>
<td>Quantity</td>
<td>Unit Price</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>775.027</td>
<td>Elm - 'Valley Forge' - 4-4.5 inch caliper, per each</td>
<td>x 21 each =</td>
<td>$</td>
</tr>
<tr>
<td>777.263</td>
<td>Oak - Swamp White 2-2.5 inch caliper, bare root, per each</td>
<td>x 3 each =</td>
<td>$</td>
</tr>
<tr>
<td>777.265</td>
<td>Oak - Swamp White 4-4.5 inch caliper, per each</td>
<td>x 11 each =</td>
<td>$</td>
</tr>
<tr>
<td>777.673</td>
<td>Sweetgum 2-2.5 inch caliper, bare root, per each</td>
<td>x 4 each =</td>
<td>$</td>
</tr>
<tr>
<td>777.675</td>
<td>Sweetgum 4-4.5 inch caliper, bare root, per each</td>
<td>x 20 each =</td>
<td>$</td>
</tr>
<tr>
<td>782.735</td>
<td>Baldcypress 2-2.5 inch caliper, bare root, per each</td>
<td>x 7 each =</td>
<td>$</td>
</tr>
</tbody>
</table>
783.467  Tupelo 2-2.5 inch caliper, bare root, per each, the price of:

__________________________________________  x 10 each =  $______________

($                     )

785.633  Inkberry 2-3 feet, per each, the price of:

__________________________________________  x 5 each =  $______________

($                     )

786.110  Juniper - 'Broadmoor' 15-18 inch, per each, the price of:

__________________________________________  x 305 each =  $______________

($                     )

786.400  Juniper - Shore 15-18 inch, per each, the price of:

__________________________________________  x 99 each =  $______________

($                     )

787.033  Pine Shrub - 'Spaan's Dwarf' 2.5-3 feet, per each, the price of:

__________________________________________  x 3 each =  $______________

($                     )

788.231  Azalea - 'Karen' 18-24 inch, per each, the price of:

__________________________________________  x 80 each =  $______________

($                     )

788.251  Azalea - 'Rosy Lights' 18-24 inch, per each, the price of:

__________________________________________  x 60 each =  $______________

($                     )
<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Quantity</th>
<th>Price per Item</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>788.262</td>
<td>Azalea - 'Weston's Pink and Sweet' 18-24 inch, per each, the price of:</td>
<td>x 110 each =</td>
<td>$________________</td>
<td></td>
</tr>
<tr>
<td>788.271</td>
<td>Mountain-laurel 'Pristine' 3-4 feet, per each, the price of:</td>
<td>x 70 each =</td>
<td>$________________</td>
<td></td>
</tr>
<tr>
<td>794.322</td>
<td>Sumac Shrub - Fragrant 'Gro-Low' 15-18 inch, per each, the price of:</td>
<td>x 515 each =</td>
<td>$________________</td>
<td></td>
</tr>
<tr>
<td>795.187</td>
<td>Witch Hazel - Autumn Blooming 3-4 feet, per each, the price of:</td>
<td>x 6 each =</td>
<td>$________________</td>
<td></td>
</tr>
<tr>
<td>796.714</td>
<td>Black Eyed Susan 'Viette's Little Suzie' 1 Gallon, per each, the price of:</td>
<td>x 50 each =</td>
<td>$________________</td>
<td></td>
</tr>
<tr>
<td>796.805</td>
<td>New York Aster 'Wood's Blue' 3 Gallon, per each, the price of:</td>
<td>x 633 each =</td>
<td>$________________</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Price per Each</td>
<td>Quantity</td>
<td>Total</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------</td>
<td>----------------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>796.819</td>
<td>Purple Coneflower 'Bravado' 1 Gallon</td>
<td>$</td>
<td>11 each</td>
<td>$</td>
</tr>
<tr>
<td>796.829</td>
<td>Marginal Wood Fern 1 Gallon</td>
<td>$</td>
<td>250 each</td>
<td>$</td>
</tr>
<tr>
<td>796.835</td>
<td>Russian Sage 'Crazyblue' 3 Gallon</td>
<td>$</td>
<td>686 each</td>
<td>$</td>
</tr>
<tr>
<td>796.869</td>
<td>Catmint 'Six Hills Giant' 5 Gallon</td>
<td>$</td>
<td>12 each</td>
<td>$</td>
</tr>
<tr>
<td>796.873</td>
<td>Bluestar 3 Gallon</td>
<td>$</td>
<td>21 each</td>
<td>$</td>
</tr>
<tr>
<td>797.</td>
<td>Blue False Indigo 3 Gallon</td>
<td>$</td>
<td>144 each</td>
<td>$</td>
</tr>
</tbody>
</table>

**TOTAL AMOUNT OF ALTERNATE 1 – Items 102. through 797.**

($_________________ dollars)

Q-0019-002/07/26/18 00410-25 Bid Form
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name and Unit Bid Prices Written in Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total Amount of Item (in figures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>751.1</td>
<td>Topsoil Rehandled and Spread, per cubic yard, the price of:</td>
<td>x 300 c.y. =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                     )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>767.6</td>
<td>Aged Pine Bark Mulch, per cubic yard, the price of:</td>
<td>x 50 c.y. =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                     )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>778.255</td>
<td>Birch - Gray - Multistem 6-8 feet, bare root, per each, the price of:</td>
<td>x 18 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                     )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>786.477</td>
<td>Russian Cypress - 12-15 inch, per each, the price of:</td>
<td>x 24 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                     )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>788.217</td>
<td>Azalea - 'Delaware Valley White' 24-30 inch, per each, the price of:</td>
<td>x 29 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                     )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>788.231</td>
<td>Azalea - 'Karen' 18-24 inch, per each, the price of:</td>
<td>x 42 each =</td>
<td>$________________</td>
</tr>
<tr>
<td></td>
<td>($                                                     )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Quantity</td>
<td>Price per Unit</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>788.273</td>
<td>Mountain-laurel 'Sarah' 3-4 feet, per each</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>794.735</td>
<td>Summersweet Shrub 'Hummingbird' 18-24 inch, per each</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>794.739</td>
<td>Fothergilla 18-24 inch, per each</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>796.419</td>
<td>Common Rush 1 Gallon, per each</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>796.421</td>
<td>Sweetgale 5 Gallon, per each</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL AMOUNT OF ALTERNATE 2 – Items 751.1 through 796.421**

(______________ dollars)

($)
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name and Unit Bid Prices</th>
<th>Estimated Quantity</th>
<th>Total Amount of Item (in figures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120.1</td>
<td>Unclassified Excavation, per cubic yard, the price of:</td>
<td>x 87 c.y. =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($)</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td>151.</td>
<td>Gravel Borrow, per cubic yard, the price of:</td>
<td>x 58 c.y. =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($)</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td>476.</td>
<td>Cement Concrete Pavement, per square yard, the price of:</td>
<td>x 265 s.y. =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($)</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td>751.1</td>
<td>Topsoil Rehandled and Spread, per cubic yard, the price of:</td>
<td>x 175 c.y. =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($)</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td>765.</td>
<td>Seeding – Standard Turf, per square yard, the price of:</td>
<td>x 870 s.y. =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($)</td>
<td></td>
<td>$_________________</td>
</tr>
<tr>
<td>767.6</td>
<td>Aged Pine Bark Mulch, per cubic yard, the price of:</td>
<td>x 30 c.y. =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>($)</td>
<td></td>
<td>$_________________</td>
</tr>
</tbody>
</table>
785.633 Inkberry 2-3 feet, bare root, per each, the price of:

($ )

x 36 each = $_________________

786.110 Juniper - 'Broadmoor' 15-18 inch, per each, the price of:

($ )

x 6 each = $_________________

786.400 Juniper - Shore 15-18 inch, per each, the price of:

($ )

x 13 each = $_________________

786.477 Russian Cypress - 12-15 inch, per each, the price of:

($ )

x 12 each = $_________________

792.019 Hydrangea - Oakleaf 'Snow Queen' 2.5-3 feet, per each, the price of:

($ )

x 41 each = $_________________

794.733 Summersweet Shrub 'Ruby Spice' 18-24 inch, per each, the price of:

($ )

x 17 each = $_________________
795.187 Witch Hazel - Autumn Blooming 3-4 feet, per each, the price of:

$_________________ x 3 each = $_________________

796.869 Catmint 'Six Hills Giant' 5 Gallon, per each, the price of:

$_________________ x 8 each = $_________________

796.871 Golden Leaved Hyssop 3 Gallon, per each, the price of:

$_________________ x 10 each = $_________________

TOTAL AMOUNT OF ALTERNATE 3 – Items 102.1 through 796.871

$_________________ dollars

TOTAL AMOUNT OF BASE BID, ALTERNATE 1, ALTERNATE 2, AND ALTERNATE 3

$_________________ dollars

5.2 This Bid includes Addenda numbered ____________.

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 __ 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 __ years, including a brief explanation for each instance listed.
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
BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned,

__________________________________________ as Principal and

__________________________________________ as Surety, are hereby held and firmly bound unto

__________________________________________ as OWNER in the penal sum of

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns ____________________________.

Signed this ______ day of ________________ , 20

The Condition of the above obligation is such that whereas the Principal has submitted to:

__________________________________________ a certain BID, attached hereto and hereby made a part hereof

to enter into a contract in writing for the:


NOW, THEREFORE,

(A) If said BID shall be rejected, or

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

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.
This form may be substituted with standardized form issued by insurance/bonding agent.

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

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

__________________________________ (L.S.)
Principal

________________________
Surety

BY: ____________________________

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Cir. 570, as amended) and be authorized to transact business in the state where the project is located.
RELEVANT PREVIOUS EXPERIENCE

The Bidder shall list below the relevant prior work experience on similar projects, and give references that will enable the City to evaluate his qualifications to perform the work under this Contract. The length of the relevant experience must be at least 2 years on projects of comparable size and complexity. The evaluation shall be based on prior experience, work performance and level of key personnel skills, and business standing (add additional page if necessary).

I. PROJECTS

<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Project Name</th>
<th>Contract Amount</th>
<th>Design Reference Engineer Name</th>
<th>Reference Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. KEY PERSONNEL:

Key personnel to be employed on the job, in the event of contract award. Attach brief education and experience where applicable.

1. 
2. 
3. 
4. 
STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the date given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheet. The bidder may submit any additional information, if desired.

1. Name of Bidder:

2. Permanent main office address:
   a. Treasury Number (Employer's Identification No.):

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?
   a. Names and home addresses of principal officers and their social security numbers: (attach separate sheet).

6. Contracts on hand: (Schedule these, showing gross amount of each contract and the approximate anticipated dates of completion. Name and address of client and name of person supervising for client.) (Attach separate sheet)

7. General character of work performed by your company?

8. Have you ever failed to complete any work awarded to your? If so, where and why?

9. Have your ever defaulted on a contract? If so, where and why?

10. List the more important contracts recently completed by you stating approximate cost of each, and the month and year completed. (Give names and addresses of client and name of person supervising for client). (See attached form.)

11. List your major equipment available for this contract. (Use separate sheet)

12. Experience in construction work similar in importance to this project. (See form)

13. Background and experience of the principle members of your organization, including the officers.
14. Credit available: $__________________.

15. Give bank reference, including bank name, address, telephone and contact name.

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required?

17. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the City of Quincy in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated this _____ day of ____________, 20__.

Name of Bidder: ________________________________.

By: ________________________________.

Title: ________________________________.

State of ________________________________.

County of ________________________________.

______________________________ being duly sworn, deposed and says that he is ________________________________, of ______________, (office) (Name of Organization)

and that the answers to the foregoing questions and all statements contained therein are true and correct.

SUBSCRIBED AND SWORN TO, before me the _____ day of ____________, 20

______________________________
(Notary Public) Seal

My commission expires: ________________________________.
CERTIFICATE OF ACKNOWLEDGMENT
OF CONTRACTOR FOR BID

State of __________________________ .          Date: __________ 20___.
County of __________________________ .

On this ______ day of ______________________________ , 20____,
before me personally appeared ________________________________ ,
who being duly sworn, did depose and say as follows:

__________________________________________________________, that said firm consists of
     (Company Name)

__________________________________________________________ .
     (name of principals in firm and position)

__________________________________________________________ .

that he executed the foregoing instrument on behalf of said firm for the uses and purposes stated
herein. If a corporation, the seal affixed to the foregoing instrument is such corporate seal and it was
so affixed by order of the Board of Directors of said corporation, and that by like order, he signed
thereeto his name and official designation.

__________________________________________________________ .
     (Notary Public)                      (Seal)

My commissioner expires: ______________________________ .
SIGNATURE AUTHORIZATION

At a duly authorized meeting of the Board of Directors of the

_____________________________
(NAME OF CORPORATION)

held on ______________________, at which all the Directors were present or waived notice, it was

(DATE)

VOTED, that:

___________________________________  __________________________ __________
(NAME)        (OFFICER)

of this company, be and he/she hereby is authorized to execute Contracts and Bonds in the name and behalf of said

Company, and affix its Corporate Seal thereto, and such execution of any Contract or obligation in this

Company’s name on its behalf by such _______________________ under seal of the Company, shall be valid

(OFFICER)

and binding upon this Company. It was further voted that the City of Quincy may rely on such authorization of

future Contracts until notified to the contrary.

A true copy,

ATTEST: ______________________________
(CLERK’S SIGNATURE)

PLACE OF BUSINESS: ______________________________

DATE OF THIS CONTRACT: _____________________________

I hereby certify that I am the Clerk of the:

______________________________
(COMPANY)

that ____________________________ is the

(NAME)

duly elected _______________________ of said Company, and that the above VOTE has not been

(TITLE)

amended or rescinded and remains in full force and effect as of the date of this Contract.

___________________________________ CORPORATE SEAL
SIGNATURE PAGE

DATED: _______________________________

BY: ______________________________________________________
    (Signature and Title of Person Authorized to Sign Bid)

________________________________
    (Name of General Bidder)

________________________________
    (Business Address)

________________________________
    (Social Security Number – Federal Tax ID No.)

Telephone Number: (____) ______________________________

Email: _____________________________________________

(SEAL: IF BID IS BY A CORPORATION)

ATTEST: _____________________________________________

The proposed surety company on the bond to be given as follows:

________________________________
    (Contact Name)

________________________________
    (Name of Surety)

________________________________
    (Address of Home Office)

________________________________
    (Massachusetts Address, if different)

________________________________
    (Business Telephone)
CERTIFICATE OF NON-COLLUSION

The undersigned certifies under 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 word “person” shall mean natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature of person signing proposal

Agency Name
CITY OF QUINCY
Purchasing Department
1305 Hancock Street, Quincy, MA  02169

TAX COMPLIANCE CERTIFICATE
MASS. GENERAL LAWS, CH. 62c, s:  49A(b)

I hereby certify that I have complied with all laws of the Commonwealth of Massachusetts
Relating to taxes.

Signed under the pains and penalties of perjury.

(1) Individual Contractor

______________________________________________

Contractor’s Name and Signature)

(2) Corporation, Association
or Partnership

______________________________________________

(Contractor’s Name)

Federal Tax ID Number, or
Social Security Number

______________________________________________

By: __________________________________________

(Authorized Signature)

Note to Contractor: Please sign at (1) or (2), whichever applies.
1983 Enactment. St. 1983, c. 233, § 35, by § 101 made effective upon passage, was approved July 1, 1983. Emergency declaration by the Governor was filed on the same date.

Library References
Licenses ← 22. S.J.S. Licenses § 34, 38, 39.

§ 48. Liability of lessee for tax due from lessor

The lessee of real estate or tangible personal property of any corporation, company or association subject to taxation under chapter sixty-three shall also be liable for the payment of the tax due from the lessor under chapter sixty-three. Upon such payment, the lessee may, in the absence of an agreement to the contrary, retain it out of the rent of the property, or recover it in an action against the lessor.

Added by St. 1976, c. 415, §22.

1976 Enactment. This section was derived from c. 63, §74.

§ 49. Information for collection of taxes; injunction

Taxes due from a company, association or corporation may be collected by an information brought in the supreme judicial court by the attorney general at the relation of the commissioner. The court may issue an injunction upon such information, restraining the further prosecution of the business of the company, association or corporation until such taxes, with interest and costs thereon, have been paid and until the returns required by this chapter have been filed.

Added by St. 1976, c. 415, §22.

1976 Enactment. This section was derived from c. 63. § 745; c. 64D, § 5.

Cross References
Penalties and forfeitures imposed by chapter 63 or § 74 of this chapter, collection remedies under this section and §47 of this chapter, see c. 63, §80.

§ 49A. Certification of compliance with tax laws as prerequisite to obtaining license or governmental contract

(a) Any person applying to any department, board, commission, division, authority, district or other agency of the commonwealth or any subdivision of the commonwealth, including a city, town or district, for a right or license to conduct a profession, trade or business, or for the renewal of such right or license, shall certify upon such application, under penalties of perjury, that he has complied with all laws of the commonwealth relating to taxes. Such right or license shall not be issued or renewed unless such certification is made.

(b) No contract or other agreement for the purposes of providing goods, services or real estate space to any of the foregoing agencies shall be entered into, renewed or extended with any person unless such person certifies in writing, under penalties of perjury, that he had complied with all laws of the commonwealth relating to taxes.

(c) Any such agency, which has been notified by the commissioner pursuant to section forty-seven A that a person who holds a license or certificate of authority issued by such agency or who has agreed to furnish goods, services or real estate space to such agency has neglected or refused to file any returns or to pay any tax required under this chapter and that such person has not filed in good faith a pending application for abatement of such tax or a pending petition before the appellate tax board contesting such tax, shall refuse to reissue, renew or extend such license, certificate of authority, contract or agreement until the agency receives a certificate issued by the commissioner that the person is in good standing with respect to any and all returns due and taxes payable to the commissioner as of the date of issuance of said certificate, including all returns and taxes referenced in the initial notification.


1983 Enactment. St. 1983, c. 233, §36, by §101 made effective upon passage, was approved July 1, 1983. Emergency declaration by the Governor was filed on the same date.

1985 Amendment. St. 1985, c. 593, §22, purported to amend par. (c) by substituting “forty-seven A” for “forty-seven” as appearing in line 14 of the 1984 GLM but apparently intended to substitute such amendment where appearing in line 15 of the 1984 GLM.

St. 1985, c. 593, was approved Dec. 18, 1985. Emergency declaration by the Governor was filed on the same date.


1986 Legislation

St. 1986, c. 557, §72, an emergency act, approved Dec. 8, 1986, in par. (c) substituted “forty-seven A” for “forty-seven” as apparently intended by the 1985 amendment.

Library References  Licenses ← 22. C.J. S. Licenses §§ 34, 38, 39.
CERTIFICATION OF BIDDER
REGARDING EQUAL EMPLOYMENT OPPORTUNITY

This certification is required pursuant to Executive Order 112A6 (30 R.R. 123 1935). The implementing rules and regulations, provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity cause: and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven (7) calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION BY BIDDER

NAMES AND ADDRESS OF BIDDER (Include Zip Code):

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.
   
   Yes     No

2. Compliance reports were required to be filed in connection with such contract or subcontract.
   
   Yes     No

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.
   
   Yes     No

4. Have you ever been or are you being considered for sanction due to violation of the Executive of 112A6, as amended?
   
   Yes     No

Name and Title of Signatory (Please Type)

Signature:__________________________ Date:__________________________
RIGHT-TO-KNOW LAW

A bidder will not be eligible for award of this contract under this invitation for bids unless such bidder has submitted as part of its bid the following certification which will be deemed a part of the resulting contract.

CERTIFICATION

The Bidder hereby certifies that, if awarded this contract, he will fully comply with the Massachusetts Right-To-Know Law, c.470 of the Acts of 1983, (the Act). In addition, he shall:

1. obtain a Material Safety Data Sheet (MSDS), for all substances or mixtures of which appear on the Massachusetts Substance List that he or any of his subcontractors brings to or uses on the work site and will keep a copy of the MSDS on the work site of this contract;

2. label each container of a substance or mixture of substances on the Massachusetts Substance List, as required, in section 7 of the Act;

3. provide the same training and non-technical instruction that he is required to provide under section 15 of the Act to all Quincy personnel. Training shall include instructing on the nature and effects of any substance or mixture of substances listed on the Massachusetts Substance List which the Bidder or any of his subcontractors brings to or uses on the worksite.

4. provide to Quincy DPW employees on the work site the same protective equipment that the bidder or any of his subcontractors provides to his employees.

__________________________________________________________________________

Signature of Authorized Representative of Bidder

Bidder's Name: ____________________________________________________________

Bidder's Address: ___________________________________________________________
NON-COLLUSION AFFIDAVIT

A bidder will not be eligible for award of this contract under this invitation for bids unless such bidder has submitted as part of its bid the following certification which will be deemed a part of the resulting contract.

State of __________________________ Date: __________________ 20_______
County of __________________________

The undersigned being duly sworn, deposes and says that he is the:
_____________________________________________________________________________
(sole owner, partner, president, treasurer, or other duly authorized official)
of __________________________
(name of company - bidder - as appears in submitted proposal)

for work in __________________________ on __________________________
(City/Town) (Bid Opening Date)

and certifies under penalties of perjury that 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.

____________________________________
Signature/Title of Person Making Affidavit

Sworn to before me this:

__________________ day of __________________________ 20_______

____________________________________
(Notary Public)

My commission expires: __________________________ 20_______
CERTIFICATION
NON-SEGREGATED FACILITIES

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

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

Date: ______________________, 20____

(Official Address (including Zip Code))

____________________________________
(Name of Bidder)

By:

____________________________________
(Title)
AFFIDAVIT
REGARDING PRIOR LABOR DISPUTES

The Bidder must execute and complete the following statements as to whether it has been the subject of, or otherwise been involved in, any labor dispute during the past five (5) years. If the Bidder has been the subject of, or otherwise been involved in any labor dispute during this period, the bidder must also provide a detailed description of each labor dispute, including the name and location of the project worked on, the nature of the dispute was resolved. For these purposes, "labor disputes" shall include picketing or any other activity which disrupted or delayed the work.

I _____________________________, being first duly sworn, do hereby depose/state:

(Name)

1. I make each of the following statements with full authorization to bind

______________________________ to each of the representations made below.

(Name of Bidder)

2. _______________ has/has not been involved in a labor dispute

(Name of Bidder)

as described above, within the past five (5) years.

3. (Complete only if bidder has been involved in dispute).

The dispute(s) occurred on the following project(s). (Use separate sheet if necessary)

<table>
<thead>
<tr>
<th>Name and Location of Project</th>
<th>Date Dispute Began</th>
<th>Date Concluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Attach separate sheet and give full description of the nature of each dispute and an explanation of how it was resolved. (Please give a full description below, for each such dispute).

Signed under the penalty of perjury this _____ day of _______________, 20____.

BY: _________________________________________

on behalf of: _________________________________________

(Company name)
Dear Mr. Timmins:

Please be advised that I have reviewed the statement on internal accounting controls prepared by/for [Company Name] (Name of Company), in connection with the above captioned project. This statement is required under Massachusetts General Laws, Chapter 30, Section 39R. In our opinion, representations of management are consistent with our evaluation of the system of internal accounting controls. In addition, we believe that they are reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the firm's financial statements.

Yours sincerely,

Certified Public Accountant

Note: This form is to be completed only when the contract exceeds $100,000 and is for the purchase of materials or for the construction, renovation, etc. of public works or public buildings.
CERTIFICATION
INTERNAL ACCOUNTING

The Contractor certifies that it has internal accounting controls, as required by Chapter 30, Section 39R and that the Contractor will:

1. maintain accurate and detailed accounts for a six (6) year period after the final payment;

2. file regular statements of management concerning internal auditing controls;

3. file an annual audited financial statement; and

4. submit a statement from an independent certified public accountant that such CPA has examined management's internal auditing controls and expresses an opinion as to their consistency with management's statements in (2) above, and whether such statements are reasonable with respect to transactions and assets that are substantial in relation to designer's financial statements. General Laws, Chapter 7, Section 301 (e).

Signed under the pains and penalties of perjury:

_____________________________________
Name of Company

_____________________________________
Authorized Signature

Note: This form is to be completed only when the contract exceeds $100,000 and is for the purchase of materials or for the construction, renovation, etc. of public works or public buildings.
CERTIFICATION OF GENERAL BIDDERS ON PUBLIC CONSTRUCTION PROJECTS

1. CERTIFICATION REGARDING HEALTH AND SAFETY

The undersigned hereby certifies that he 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 ten 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 he will comply fully with all laws and regulations application to awards made subject to section 44A.

2. CERTIFICATION REGARDING NON-COLLUSION AND DEBARMENT

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date: __________________

__________________________________________
Name of General Bidder

By _______________________________________
Signature

__________________________________________
Print name and title

__________________________________________
Business Address

__________________________________________
Street Address City and State
CERTIFICATION OF SUB- BIDDERS (IF ANY) ON PUBLIC CONSTRUCTION PROJECTS

1. CERTIFICATION REGARDING HEALTH AND SAFETY

The undersigned hereby certifies that he 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 Occupation Safety and Health Administration that is at least ten 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 he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.

2. CERTIFICATION REGARDING NON-COLLUSION AND DEBARMENT

The undersigned further certifies under penalties of perjury that this subbid is in all responses bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date ____________________

________________________________________
Name of Sub-bidder

By ______________________________________
Signature

________________________________________
Print Name and Title

________________________________________
Business Name

________________________________________
Street Address, City and State
SECTION 00520

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT

This Agreement is by and between the City of Quincy, as requested by its City Council 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: “Merrymount Parkway Reconstruction Project”.

ARTICLE 2 ENGINEER

2.1 The part of the Project that pertains to the Work has been designed by Tighe & Bond, Inc

2.2 The Owner has retained Tighe & Bond (“Engineer”) to act as Owner’s representative, assuming all duties and responsibilities, rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 3 CONTRACT TIMES

3.1 Time of the Essence

A. All time limits for 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.

B. The Work will be substantially completed within 260 days from the date of the Notice to Proceed and completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions within 275 days from the date of the Notice to Proceed.

3.2 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 $1000.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 3.1 above for Substantial Completion until the Work is substantially complete.
2. Complete and Ready for Final Payment: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract), for completion and readiness for final payment, Contractor shall pay Owner $1,000.00 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 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. Special Provision contains monthly price adjustment provisions for each of the above materials.

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, and Portland cement contained in concrete. Special Provisions 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 [of the entire construction to be provided under the Contract Documents], 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.
ARTICLE 7 CONTRACT DOCUMENTS

7.1 Contents

A. The Contract Documents consist of the following:

1. This Agreement (pages 00520-1 to 00520-7, inclusive);
2. Performance Bond (pages 1 to 3, inclusive);
3. Payment Bond (pages 1 to 3, inclusive);
4. General Conditions (title pages, table of contents, and pages 1 to 65, inclusive);
5. Supplementary Conditions (pages 00800-1 to 00800-13 inclusive);
6. Specifications (Divisions 1 through Special Provisions);
7. Drawings consisting of a cover sheet and sheets numbered 1 through L-201, inclusive, with each sheet bearing the following general title: Merrymount Parkway Reconstruction Project;
8. Addenda (numbers _____ to _____, inclusive);
9. Exhibits to this Agreement (enumerated as follows):
   a. Contractor’s Bid (pages 00410-1 to 00410-23, inclusive);
   b. 
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.
8.6 Other Provisions

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

OWNER:

By: ____________________________
Title: ____________________________

[CORPORATE SEAL]

Attest ____________________________
Title: ____________________________

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.)

CONTRACTOR:

By: ____________________________
Title: ____________________________

[CORPORATE SEAL]

Attest ____________________________
Title: ____________________________

Address for giving notices:

____________________________________
____________________________________

License No. ____________________________

(Where applicable)

(If Contractor is a corporation or a partnership, attach evidence of authority to sign.)
As required by M.G.L. Chapter 44 Section 31c, this is to certify that the City of Quincy has an appropriation which is adequate to cover the cost of this Contract.

Certified as to the availability of funds:

________________________
Date

________________________
Signed

________________________
Title

END OF SECTION
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

By:  ____________________________
     Signature

Print Name

Title

Attest:  ____________________________
        Signature

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:
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

__________________________ (seal)
Contractor’s Name and Corporate Seal

By: __________________________
Signature

Print Name

Title

Attest: _______________________
Signature

Title

SURETY

__________________________ (seal)
Surety’s Name and Corporate Seal

By: __________________________
Signature (attach power of attorney)

Print Name

Title

Attest: _______________________
Signature

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 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:
STANDARD GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

National Society of Professional Engineers®
TABLE OF CONTENTS

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
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.04</td>
<td>Limitation of Damages</td>
<td>65</td>
</tr>
<tr>
<td>18.05</td>
<td>No Waiver</td>
<td>65</td>
</tr>
<tr>
<td>18.06</td>
<td>Survival of Obligations</td>
<td>65</td>
</tr>
<tr>
<td>18.07</td>
<td>Controlling Law</td>
<td>65</td>
</tr>
<tr>
<td>18.08</td>
<td>Headings</td>
<td>65</td>
</tr>
</tbody>
</table>
ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

A. Whenever 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 01 and CG 20 37 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. *Purpose 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, expediters, 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. **Reducions 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
removing 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

PART 1 AMENDMENTS TO GENERAL CONDITIONS

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

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

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

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

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

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

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 and insert the following in its place:

2.02A Owner shall furnish to Contractor one printed or hard copies of the Drawings and Project Manual, and one copy in electronic portable document format (PDF). Additional copies will be furnished upon request at the cost of reproduction.

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.

5.03C In the preparation of Drawings and Specifications, Engineer has relied upon the data obtained from tests of subsurface and latent physical conditions of the site. Such data is in the form of boring logs which are included in the Project Manual and soil samples which may be examined at Engineer’s office during regular business hours. The locations of the test borings are shown on the Drawings. Such logs and samples are not part of the Contract Documents.

5.03C.1 The subsurface data are not guaranteed as to accuracy or completeness.

5.03C.2 Bidders are cautioned that the subsurface data have been utilized for general design purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground.

5.03C.3 The making available of this subsurface data to Bidders is not intended to relieve them from their responsibility to familiarize themselves with subsurface and other site conditions.

5.03D

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 6.03.J:

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

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

   Statutory

   Employer’s Liability:
   - Bodily injury, each accident $1,000,000
   - Bodily injury by disease, each employee $1,000,000
   - Bodily injury/disease aggregate $1,000,000

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 $2,000,000
   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 $1,000,000
   - Each accident $1,000,000
Property Damage:
Each accident $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 $1,000,000

☐ 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:

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

Bodily Injury $1,000,000 Each Occurrence
$1,000,000 Aggregate

Property Damage $1,000,000 Each Occurrence
$1,000,000 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 (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 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-7.06 Add the following language at the end of Paragraph 7.06L:

except as required otherwise by Massachusetts General Law Chapter 149, Section 44F.

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.”
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. Quincy Conservation Commission Order of Conditions

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 will be provided to the Contractor.

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.

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 8 - (NOT USED)

ARTICLE 9 - (NOT USED)

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

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

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

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.5

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 City of Quincy 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-15.03 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 39K of the Massachusetts General Laws.

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-17.02 Add the following paragraph after paragraph 17.01:

Q0019-002/07/03/18 00800-10 Supplementary Conditions
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 administrating 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.

E. State schedules of minimum wage rates are included in Part II of these Supplementary Conditions. Where rates differ, the higher rates shall apply as a minimum for that trade.

18.10 US EPA Phase II Storm Water Program
Comply with requirement of the US EPA Phase II Storm Water Program for Construction Activities Greater than 1 Acre.
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.

2.2 Massachusetts General Laws

2.3.1 Chapter 30, Section 39F
2.3.2 Chapter 30, Section 39G
2.3.3 Chapter 30, Section 39I
2.3.4 Chapter 30, Section 39J
2.3.5 Chapter 30, Section 39K
2.3.6 Chapter 30, Section 39L
2.3.7 Chapter 30, Section 39M
2.3.8 Chapter 30, Section 39N
2.3.9 Chapter 30, Section 39O
2.3.10 Chapter 30, Section 39P
2.3.11 Chapter 30, Section 39Q
2.3.12 Chapter 30, Section 39R
2.3.13 Chapter 44, Section 31C
2.3.14 Chapter 82, Section 40
2.3.15 Chapter 149, Section 34
2.3.16 Chapter 149, Section 44F

2.3.17 Chapter 149, Section 44G

2.3.18 Chapter 149, Section 44J

2.4 520 CMR 14.00 Excavation Trench Safety

2.5 State Wage Rates

2.6 Conservation Commission Order of Conditions

END OF SECTION
ATTACHMENTS TO SUPPLEMENTARY CONDITIONS
ATTACHMENT A
MASSACHUSETTS STATE WAGE RATES
ATTACHMENT B
CONSERVATION COMMISSION ORDER OF CONDITIONS
Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- 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 from the Department of Labor Standards ("DLS") 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 any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person 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 DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.
- 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. Awarding authorities are required to request these updates 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, 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. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F “rental of equipment” contracts.
- Every contractor or subcontractor which performs construction work on the project is required to 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. A sample of a payroll reporting form may be obtained at 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.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- 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
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(2 AXLE) DRIVER - EQUIPMENT</strong></td>
<td>12/01/2016</td>
<td>$33.25</td>
<td>$10.91</td>
<td>$10.89</td>
<td>$0.00</td>
<td>$55.05</td>
</tr>
<tr>
<td>TEAMSTERS JOINT COUNCIL No. 10 ZONE A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(3 AXLE) DRIVER - EQUIPMENT</strong></td>
<td>12/01/2016</td>
<td>$33.32</td>
<td>$10.91</td>
<td>$10.89</td>
<td>$0.00</td>
<td>$55.12</td>
</tr>
<tr>
<td>TEAMSTERS JOINT COUNCIL No. 10 ZONE A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(4 &amp; 5 AXLE) DRIVER - EQUIPMENT</strong></td>
<td>12/01/2016</td>
<td>$33.44</td>
<td>$10.91</td>
<td>$10.89</td>
<td>$0.00</td>
<td>$55.24</td>
</tr>
<tr>
<td>TEAMSTERS JOINT COUNCIL No. 10 ZONE A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ADS/SUBMERSIBLE PILOT</strong></td>
<td>08/01/2017</td>
<td>$92.97</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$124.02</td>
</tr>
<tr>
<td>PILE DRIVER LOCAL 56 (ZONE 1)</td>
<td>08/01/2018</td>
<td>$97.80</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$128.85</td>
</tr>
<tr>
<td>08/01/2019</td>
<td>$102.78</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td></td>
<td>$133.83</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- PILE DRIVER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AIR TRACK OPERATOR</strong></td>
<td>06/01/2018</td>
<td>$38.75</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.65</td>
</tr>
<tr>
<td>LABORERS - ZONE 1</td>
<td>12/01/2018</td>
<td>$39.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.60</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$63.60</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$64.60</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.69</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$65.59</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.67</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$66.57</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.69</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$67.59</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$68.60</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LABORER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ASBESTOS REMOVER - PIPE / MECH. EQUIPT.</strong></td>
<td>06/01/2018</td>
<td>$36.90</td>
<td>$11.50</td>
<td>$7.10</td>
<td>$0.00</td>
<td>$55.50</td>
</tr>
<tr>
<td>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</td>
<td>12/01/2018</td>
<td>$37.90</td>
<td>$11.50</td>
<td>$7.10</td>
<td>$0.00</td>
<td>$56.50</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$38.90</td>
<td>$11.50</td>
<td>$7.10</td>
<td>$0.00</td>
<td></td>
<td>$57.50</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$39.90</td>
<td>$11.50</td>
<td>$7.10</td>
<td>$0.00</td>
<td></td>
<td>$58.50</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$40.90</td>
<td>$11.50</td>
<td>$7.10</td>
<td>$0.00</td>
<td></td>
<td>$59.50</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$41.90</td>
<td>$11.50</td>
<td>$7.10</td>
<td>$0.00</td>
<td></td>
<td>$60.50</td>
</tr>
<tr>
<td><strong>ASPHALT RAKER</strong></td>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td>LABORERS - ZONE 1</td>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$63.10</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$64.10</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$65.09</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$66.07</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$67.09</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td></td>
<td>$68.10</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LABORER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE</strong></td>
<td>06/01/2018</td>
<td>$47.08</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.58</td>
</tr>
<tr>
<td>OPERATING ENGINEERS LOCAL 4</td>
<td>12/01/2018</td>
<td>$48.23</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.73</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$49.33</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td></td>
<td>$75.83</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$50.48</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td></td>
<td>$76.98</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$51.58</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td></td>
<td>$78.08</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$52.73</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td></td>
<td>$79.23</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$53.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td></td>
<td>$80.33</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$54.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td></td>
<td>$81.48</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- OPERATING ENGINEERS&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### BACKHOE/FRONT-END LOADER
**OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$47.08</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.58</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$48.23</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.73</td>
<td></td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$49.33</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.83</td>
<td></td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$50.48</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.98</td>
<td></td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$51.58</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.08</td>
<td></td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$52.73</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.23</td>
<td></td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$53.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.33</td>
<td></td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$54.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$81.48</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

### BARCO-TYPE JUMPING TAMPER
**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
<td></td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
<td></td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
<td></td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
<td></td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
<td></td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
<td></td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

### BLOCK PAVER, RAMMER / CURB SETTER
**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.75</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.65</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.60</td>
<td></td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.60</td>
<td></td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.60</td>
<td></td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.69</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.59</td>
<td></td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.67</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.57</td>
<td></td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.69</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.59</td>
<td></td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.60</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

### BOILER MAKER
**BOILERMakers LOCAL 29**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/01/2017</td>
<td>$42.92</td>
<td>$6.97</td>
<td>$16.21</td>
<td>$0.00</td>
<td>$66.10</td>
<td></td>
</tr>
</tbody>
</table>

**Apprentice - BOILERMaker - Local 29**

<table>
<thead>
<tr>
<th>Effective Date - 01/01/2017</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 65</td>
<td>$27.90</td>
<td>$6.97</td>
<td>$10.54</td>
<td>$0.00</td>
<td>$45.41</td>
<td></td>
</tr>
<tr>
<td>2 65</td>
<td>$27.90</td>
<td>$6.97</td>
<td>$10.54</td>
<td>$0.00</td>
<td>$45.41</td>
<td></td>
</tr>
<tr>
<td>3 70</td>
<td>$30.04</td>
<td>$6.97</td>
<td>$11.35</td>
<td>$0.00</td>
<td>$48.36</td>
<td></td>
</tr>
<tr>
<td>4 75</td>
<td>$32.19</td>
<td>$6.97</td>
<td>$12.16</td>
<td>$0.00</td>
<td>$51.32</td>
<td></td>
</tr>
<tr>
<td>5 80</td>
<td>$34.34</td>
<td>$6.97</td>
<td>$12.97</td>
<td>$0.00</td>
<td>$54.28</td>
<td></td>
</tr>
<tr>
<td>6 85</td>
<td>$36.48</td>
<td>$6.97</td>
<td>$13.78</td>
<td>$0.00</td>
<td>$57.23</td>
<td></td>
</tr>
<tr>
<td>7 90</td>
<td>$38.63</td>
<td>$6.97</td>
<td>$14.59</td>
<td>$0.00</td>
<td>$60.19</td>
<td></td>
</tr>
<tr>
<td>8 95</td>
<td>$40.77</td>
<td>$6.97</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$63.14</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Apprentice to Journeyworker Ratio:1:5

---

**Issue Date:** 07/23/2018  **Wage Request Number:** 20180723-020  **Page 3 of 42**
## Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) BRICKLAYERS LOCAL 3 (QUINCY)</td>
<td>02/01/2018</td>
<td>$52.06</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$82.84</td>
</tr>
<tr>
<td></td>
<td>08/01/2018</td>
<td>$52.91</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$84.32</td>
</tr>
<tr>
<td></td>
<td>02/01/2019</td>
<td>$53.55</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$84.96</td>
</tr>
<tr>
<td></td>
<td>08/01/2019</td>
<td>$54.90</td>
<td>$10.75</td>
<td>$20.80</td>
<td>$0.00</td>
<td>$86.45</td>
</tr>
<tr>
<td></td>
<td>02/01/2020</td>
<td>$55.54</td>
<td>$10.75</td>
<td>$20.80</td>
<td>$0.00</td>
<td>$87.09</td>
</tr>
<tr>
<td></td>
<td>08/01/2020</td>
<td>$56.89</td>
<td>$10.75</td>
<td>$20.95</td>
<td>$0.00</td>
<td>$88.94</td>
</tr>
<tr>
<td></td>
<td>02/01/2021</td>
<td>$57.53</td>
<td>$10.75</td>
<td>$20.95</td>
<td>$0.00</td>
<td>$89.23</td>
</tr>
<tr>
<td></td>
<td>08/01/2021</td>
<td>$58.93</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$0.00</td>
<td>$90.79</td>
</tr>
<tr>
<td></td>
<td>02/01/2022</td>
<td>$59.52</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$0.00</td>
<td>$91.38</td>
</tr>
</tbody>
</table>

## Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Quincy

### Effective Date - 02/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$26.03</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$56.81</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$31.24</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$62.02</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$36.44</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$67.22</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$41.65</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$72.43</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$46.85</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$77.63</td>
</tr>
</tbody>
</table>

### Effective Date - 08/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$26.46</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$57.87</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$31.75</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$63.16</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$37.04</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$68.45</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$42.33</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$73.74</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$47.62</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$79.03</td>
</tr>
</tbody>
</table>

### Notes:

Apprentice to Journeyworker Ratio: 1:5

## Bulldozer/Grader/Scraper Operating Engineers Local 4

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$46.61</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.11</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$47.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.25</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$48.84</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.34</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$49.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.48</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$51.06</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$77.56</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$52.20</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.70</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$53.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.79</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$54.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.93</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAISSON &amp; UNDERPINNING BOTTOM MAN</td>
<td>06/01/2018</td>
<td>$39.10</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$62.20</td>
</tr>
<tr>
<td>LABORERS - FOUNDATION AND MARINE</td>
<td>12/01/2018</td>
<td>$40.05</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$63.15</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$41.05</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.15</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$42.05</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$65.15</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$43.04</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$66.14</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$44.02</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$67.12</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$45.04</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$68.14</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$46.05</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$69.15</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LABORER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAISSON &amp; UNDERPINNING LABORER</td>
<td>06/01/2018</td>
<td>$37.95</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$61.05</td>
</tr>
<tr>
<td>LABORERS - FOUNDATION AND MARINE</td>
<td>12/01/2018</td>
<td>$38.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$62.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$39.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$40.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$41.89</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.99</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$42.87</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$65.97</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$43.89</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$66.99</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$44.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$68.00</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LABORER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAISSON &amp; UNDERPINNING TOP MAN</td>
<td>06/01/2018</td>
<td>$37.95</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$61.05</td>
</tr>
<tr>
<td>LABORERS - FOUNDATION AND MARINE</td>
<td>12/01/2018</td>
<td>$38.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$62.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$39.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$40.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$41.89</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.99</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$42.87</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$65.97</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$43.89</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$66.99</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$44.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$68.00</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LABORER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CARBIDE CORE DRILL OPERATOR</td>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td>LABORERS - ZONE 1</td>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LABORER&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CARPENTER</td>
<td>03/01/2018</td>
<td>$40.28</td>
<td>$9.90</td>
<td>$17.50</td>
<td>$0.00</td>
<td>$67.68</td>
</tr>
<tr>
<td>CARPENTERS - ZONE 2 (Eastern Massachusetts)</td>
<td>09/01/2018</td>
<td>$41.32</td>
<td>$9.90</td>
<td>$17.50</td>
<td>$0.00</td>
<td>$68.72</td>
</tr>
<tr>
<td></td>
<td>03/01/2019</td>
<td>$42.35</td>
<td>$9.90</td>
<td>$17.50</td>
<td>$0.00</td>
<td>$69.75</td>
</tr>
</tbody>
</table>

Issue Date: 07/23/2018  Wage Request Number: 20180723-020  Page 5 of 42
<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$20.14</td>
<td>$9.90</td>
<td>$1.73</td>
<td>$0.00</td>
<td>$31.77</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$24.17</td>
<td>$9.90</td>
<td>$1.73</td>
<td>$0.00</td>
<td>$35.80</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$28.20</td>
<td>$9.90</td>
<td>$12.31</td>
<td>$0.00</td>
<td>$50.41</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>$30.21</td>
<td>$9.90</td>
<td>$12.31</td>
<td>$0.00</td>
<td>$52.42</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$32.22</td>
<td>$9.90</td>
<td>$14.04</td>
<td>$0.00</td>
<td>$56.16</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$32.22</td>
<td>$9.90</td>
<td>$14.04</td>
<td>$0.00</td>
<td>$56.16</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>$36.25</td>
<td>$9.90</td>
<td>$15.77</td>
<td>$0.00</td>
<td>$61.92</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$36.25</td>
<td>$9.90</td>
<td>$15.77</td>
<td>$0.00</td>
<td>$61.92</td>
</tr>
</tbody>
</table>

**Effective Date - 09/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$20.66</td>
<td>$9.90</td>
<td>$1.73</td>
<td>$0.00</td>
<td>$32.29</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$24.79</td>
<td>$9.90</td>
<td>$1.73</td>
<td>$0.00</td>
<td>$36.42</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$28.92</td>
<td>$9.90</td>
<td>$12.31</td>
<td>$0.00</td>
<td>$51.13</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>$30.99</td>
<td>$9.90</td>
<td>$12.31</td>
<td>$0.00</td>
<td>$53.20</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$33.06</td>
<td>$9.90</td>
<td>$14.04</td>
<td>$0.00</td>
<td>$57.00</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$33.06</td>
<td>$9.90</td>
<td>$14.04</td>
<td>$0.00</td>
<td>$57.00</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>$37.19</td>
<td>$9.90</td>
<td>$15.77</td>
<td>$0.00</td>
<td>$62.86</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$37.19</td>
<td>$9.90</td>
<td>$15.77</td>
<td>$0.00</td>
<td>$62.86</td>
</tr>
</tbody>
</table>

**Notes:**

- % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
- Step 1&2 $29.76/ 3&4 $35.45/ 5&6 $52.14/ 7&8 $57.89

Apprentice to Journeyworker Ratio: 1:5

**CARPENTER WOOD FRAME**

<table>
<thead>
<tr>
<th>Step Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/01/2018</td>
<td>$26.67</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$41.60</td>
</tr>
<tr>
<td>10/01/2018</td>
<td>$27.09</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$42.02</td>
</tr>
<tr>
<td>04/01/2019</td>
<td>$27.52</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$42.45</td>
</tr>
<tr>
<td>10/01/2019</td>
<td>$27.95</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$42.88</td>
</tr>
</tbody>
</table>

As of 9/1/09 Carpentry work on wood-frame WEATHERIZATION projects shall be paid the WOOD FRAME CARPENTER rate.
### Apprentice - CARPENTER (Wood Frame) - Zone 2

#### Effective Date: 04/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>$16.00</td>
<td>$7.07</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$23.07</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$16.00</td>
<td>$7.07</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$23.07</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$17.34</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$32.27</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$18.67</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$33.60</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$20.00</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$34.93</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$21.34</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$36.27</td>
</tr>
<tr>
<td>7</td>
<td>85</td>
<td>$22.67</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$37.60</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$24.00</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$38.93</td>
</tr>
</tbody>
</table>

#### Effective Date: 10/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>$16.25</td>
<td>$7.07</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$23.32</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$16.25</td>
<td>$7.07</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$23.32</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$17.61</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$32.54</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$18.96</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$33.89</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$20.32</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$35.25</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$21.67</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$36.60</td>
</tr>
<tr>
<td>7</td>
<td>85</td>
<td>$23.03</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$37.96</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$24.38</td>
<td>$7.07</td>
<td>$7.86</td>
<td>$0.00</td>
<td>$39.31</td>
</tr>
</tbody>
</table>

#### Notes:
- % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
- Step 1&2 $19.07/ 3&4 $26.49/ 5&6 $33.60/ 7&8 $36.27
- Apprentice to Journeyworker Ratio: 1:5

### CARPENTER WOOD FRAME (All Other Work)

<table>
<thead>
<tr>
<th>Date</th>
<th>Rate Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2016</td>
<td>$25.32</td>
<td>$9.80</td>
<td>$16.82</td>
<td>$0.00</td>
<td>$51.94</td>
</tr>
</tbody>
</table>

### CEMENT MASONRY/PLASTERING

#### BRICKLAYERS LOCAL 3 (QUINCY)

<table>
<thead>
<tr>
<th>Date</th>
<th>Rate Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/01/2018</td>
<td>$46.20</td>
<td>$12.42</td>
<td>$22.41</td>
<td>$0.30</td>
<td>$81.33</td>
</tr>
<tr>
<td>01/01/2019</td>
<td>$47.58</td>
<td>$12.42</td>
<td>$22.41</td>
<td>$0.30</td>
<td>$82.71</td>
</tr>
<tr>
<td>07/01/2019</td>
<td>$48.32</td>
<td>$12.42</td>
<td>$22.41</td>
<td>$0.30</td>
<td>$83.45</td>
</tr>
<tr>
<td>01/01/2020</td>
<td>$49.72</td>
<td>$12.42</td>
<td>$22.41</td>
<td>$0.30</td>
<td>$84.85</td>
</tr>
<tr>
<td>Classification</td>
<td>Effective Date</td>
<td>Base Wage</td>
<td>Health</td>
<td>Pension</td>
<td>Supplemental Unemployment</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------------</td>
<td>-----------</td>
<td>--------</td>
<td>---------</td>
<td>----------------------------</td>
</tr>
<tr>
<td><strong>Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Quincy)</strong></td>
<td>07/01/2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
<td>Supplemental Unemployment</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>-----------------------</td>
<td>--------</td>
<td>---------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>$23.10</td>
<td>$12.42</td>
<td>$15.41</td>
<td>$0.00</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$27.72</td>
<td>$12.42</td>
<td>$17.41</td>
<td>$0.30</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$30.03</td>
<td>$12.42</td>
<td>$18.41</td>
<td>$0.30</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$32.34</td>
<td>$12.42</td>
<td>$19.41</td>
<td>$0.30</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$34.65</td>
<td>$12.42</td>
<td>$20.41</td>
<td>$0.30</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$36.96</td>
<td>$12.42</td>
<td>$21.41</td>
<td>$0.30</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>$41.58</td>
<td>$12.42</td>
<td>$22.41</td>
<td>$0.30</td>
</tr>
</tbody>
</table>

**Effective Date - 01/01/2019**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$23.79</td>
<td>$12.42</td>
<td>$15.41</td>
<td>$0.00</td>
<td>$51.62</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$28.55</td>
<td>$12.42</td>
<td>$17.41</td>
<td>$0.30</td>
<td>$58.68</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$30.93</td>
<td>$12.42</td>
<td>$18.41</td>
<td>$0.30</td>
<td>$62.06</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$33.31</td>
<td>$12.42</td>
<td>$19.41</td>
<td>$0.30</td>
<td>$65.44</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$35.69</td>
<td>$12.42</td>
<td>$20.41</td>
<td>$0.30</td>
<td>$68.82</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$38.06</td>
<td>$12.42</td>
<td>$21.41</td>
<td>$0.30</td>
<td>$72.19</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>$42.82</td>
<td>$12.42</td>
<td>$22.41</td>
<td>$0.30</td>
<td>$77.95</td>
</tr>
</tbody>
</table>

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

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

**CHAIN SAW OPERATOR**

<table>
<thead>
<tr>
<th>LABORERS - ZONE 1</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

**CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/01/2017</td>
<td>$47.63</td>
<td>$10.50</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.63</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$31.90</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$58.40</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$32.68</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$59.18</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$33.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$59.93</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$34.22</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$60.72</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$34.97</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$61.47</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$35.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$62.25</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$36.50</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$37.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$63.79</td>
</tr>
</tbody>
</table>
### DELEADER (BRIDGE)

**PAINTERS LOCAL 35 - ZONE 2**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/01/2018</td>
<td>$50.01</td>
<td>$8.15</td>
<td>$20.15</td>
<td>$0.00</td>
<td>$78.31</td>
</tr>
<tr>
<td>01/01/2019</td>
<td>$50.36</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$79.36</td>
</tr>
<tr>
<td>07/01/2019</td>
<td>$51.46</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$80.46</td>
</tr>
<tr>
<td>01/01/2020</td>
<td>$52.56</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$81.56</td>
</tr>
<tr>
<td>07/01/2020</td>
<td>$53.66</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$82.66</td>
</tr>
<tr>
<td>01/01/2021</td>
<td>$54.76</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$83.76</td>
</tr>
</tbody>
</table>

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

**Effective Date - 07/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$25.01</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$33.16</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$27.51</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
<td>$41.00</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$30.01</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
<td>$43.98</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$32.51</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
<td>$46.97</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$35.01</td>
<td>$8.15</td>
<td>$17.24</td>
<td>$0.00</td>
<td>$60.40</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$37.51</td>
<td>$8.15</td>
<td>$17.73</td>
<td>$0.00</td>
<td>$63.39</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$40.01</td>
<td>$8.15</td>
<td>$18.21</td>
<td>$0.00</td>
<td>$66.37</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$45.01</td>
<td>$8.15</td>
<td>$19.18</td>
<td>$0.00</td>
<td>$72.34</td>
</tr>
</tbody>
</table>

**Effective Date - 01/01/2019**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$25.18</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$33.33</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$27.70</td>
<td>$8.15</td>
<td>$5.64</td>
<td>$0.00</td>
<td>$41.49</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$30.22</td>
<td>$8.15</td>
<td>$6.15</td>
<td>$0.00</td>
<td>$44.52</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$32.73</td>
<td>$8.15</td>
<td>$6.66</td>
<td>$0.00</td>
<td>$47.54</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$35.25</td>
<td>$8.15</td>
<td>$17.78</td>
<td>$0.00</td>
<td>$61.18</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$37.77</td>
<td>$8.15</td>
<td>$18.29</td>
<td>$0.00</td>
<td>$64.21</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$40.29</td>
<td>$8.15</td>
<td>$18.80</td>
<td>$0.00</td>
<td>$67.24</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$45.32</td>
<td>$8.15</td>
<td>$19.83</td>
<td>$0.00</td>
<td>$73.30</td>
</tr>
</tbody>
</table>

**Notes:**

- Steps are 750 hrs.

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

### DEMO: ADZEMAN

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.15</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.05</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.00</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.00</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

### DEMO: BACKHOE/LOADER/HAMMER OPERATOR

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$39.15</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.05</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$40.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$41.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.00</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$42.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.00</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEMO: BURNERS LABORERS - ZONE 1</td>
<td>06/01/2018</td>
<td>$38.90</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.80</td>
</tr>
<tr>
<td>DEMO: BURNERS LABORERS - ZONE 1</td>
<td>12/01/2018</td>
<td>$39.85</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.75</td>
</tr>
<tr>
<td>DEMO: BURNERS LABORERS - ZONE 1</td>
<td>06/01/2019</td>
<td>$40.85</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.75</td>
</tr>
<tr>
<td>DEMO: BURNERS LABORERS - ZONE 1</td>
<td>12/01/2019</td>
<td>$41.85</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.75</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

| DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1 | 06/01/2018 | $39.15 | $7.70 | $15.20 | $0.00 | $62.05 |
| DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1 | 12/01/2018 | $40.10 | $7.70 | $15.20 | $0.00 | $63.00 |
| DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1 | 06/01/2019 | $41.10 | $7.70 | $15.20 | $0.00 | $64.00 |
| DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1 | 12/01/2019 | $42.10 | $7.70 | $15.20 | $0.00 | $65.00 |

For apprentice rates see "Apprentice- LABORER"

| DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1 | 06/01/2018 | $38.90 | $7.70 | $15.20 | $0.00 | $61.80 |
| DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1 | 12/01/2018 | $39.85 | $7.70 | $15.20 | $0.00 | $62.75 |
| DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1 | 06/01/2019 | $40.85 | $7.70 | $15.20 | $0.00 | $63.75 |
| DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1 | 12/01/2019 | $41.85 | $7.70 | $15.20 | $0.00 | $64.75 |

For apprentice rates see "Apprentice- LABORER"

| DEMO: WRECKING LABORER LABORERS - ZONE 1 | 06/01/2018 | $38.15 | $7.70 | $15.20 | $0.00 | $61.05 |
| DEMO: WRECKING LABORER LABORERS - ZONE 1 | 12/01/2018 | $39.10 | $7.70 | $15.20 | $0.00 | $62.00 |
| DEMO: WRECKING LABORER LABORERS - ZONE 1 | 06/01/2019 | $40.10 | $7.70 | $15.20 | $0.00 | $63.00 |
| DEMO: WRECKING LABORER LABORERS - ZONE 1 | 12/01/2019 | $41.10 | $7.70 | $15.20 | $0.00 | $64.00 |

For apprentice rates see "Apprentice- LABORER"

| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 06/01/2018 | $46.61 | $11.00 | $15.50 | $0.00 | $73.11 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 12/01/2018 | $47.75 | $11.00 | $15.50 | $0.00 | $74.25 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 06/01/2019 | $48.84 | $11.00 | $15.50 | $0.00 | $75.34 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 12/01/2019 | $49.98 | $11.00 | $15.50 | $0.00 | $76.48 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 06/01/2020 | $51.06 | $11.00 | $15.50 | $0.00 | $77.64 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 12/01/2020 | $52.20 | $11.00 | $15.50 | $0.00 | $78.76 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 06/01/2021 | $53.29 | $11.00 | $15.50 | $0.00 | $79.99 |
| DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 | 12/01/2021 | $54.43 | $11.00 | $15.50 | $0.00 | $80.93 |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| DIVER PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2017 | $61.98 | $9.90 | $21.15 | $0.00 | $93.03 |
| DIVER PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2018 | $65.20 | $9.90 | $21.15 | $0.00 | $96.25 |
| DIVER PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2019 | $68.52 | $9.90 | $21.15 | $0.00 | $99.57 |

For apprentice rates see "Apprentice- PILE DRIVER"

| DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2017 | $44.27 | $9.90 | $21.15 | $0.00 | $75.32 |
| DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2018 | $46.57 | $9.90 | $21.15 | $0.00 | $77.62 |
| DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2019 | $48.94 | $9.90 | $21.15 | $0.00 | $79.99 |

For apprentice rates see "Apprentice- PILE DRIVER"

| DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2017 | $66.41 | $9.90 | $21.15 | $0.00 | $97.46 |
| DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2018 | $69.86 | $9.90 | $21.15 | $0.00 | $100.91 |
| DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2019 | $73.41 | $9.90 | $21.15 | $0.00 | $104.46 |

For apprentice rates see "Apprentice- PILE DRIVER"

| DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2017 | $92.97 | $9.90 | $21.15 | $0.00 | $124.02 |
| DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2018 | $97.80 | $9.90 | $21.15 | $0.00 | $128.85 |
| DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1) | 08/01/2019 | $102.78 | $9.90 | $21.15 | $0.00 | $133.83 |

For apprentice rates see "Apprentice- PILE DRIVER"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRAWBRIDGE OPERATOR (Construction)</strong></td>
<td>03/01/2018</td>
<td>$50.15</td>
<td>$13.00</td>
<td>$17.85</td>
<td>$0.00</td>
<td>$81.00</td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRICIANS LOCAL 103</strong></td>
<td>09/01/2018</td>
<td>$51.34</td>
<td>$13.00</td>
<td>$17.89</td>
<td>$0.00</td>
<td>$82.23</td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRICIANS LOCAL 103</strong></td>
<td>03/01/2019</td>
<td>$52.53</td>
<td>$13.00</td>
<td>$17.93</td>
<td>$0.00</td>
<td>$83.46</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- ELECTRICIAN"

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELECTRICIAN - Local 103</strong></td>
<td>03/01/2018</td>
<td>$50.15</td>
<td>$13.00</td>
<td>$17.85</td>
<td>$0.00</td>
<td>$81.00</td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRICIAN - Local 103</strong></td>
<td>09/01/2018</td>
<td>$51.34</td>
<td>$13.00</td>
<td>$17.89</td>
<td>$0.00</td>
<td>$82.23</td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRICIAN - Local 103</strong></td>
<td>03/01/2019</td>
<td>$52.53</td>
<td>$13.00</td>
<td>$17.93</td>
<td>$0.00</td>
<td>$83.46</td>
<td></td>
</tr>
</tbody>
</table>

**Apprentice - ELECTRICIAN - Local 103**

**Effective Date - 03/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>$20.06</td>
<td>$13.00</td>
<td>$0.60</td>
<td>$0.00</td>
<td>$33.66</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$20.06</td>
<td>$13.00</td>
<td>$0.60</td>
<td>$0.00</td>
<td>$33.66</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>$22.57</td>
<td>$13.00</td>
<td>$13.61</td>
<td>$0.00</td>
<td>$49.18</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>45</td>
<td>$22.57</td>
<td>$13.00</td>
<td>$13.61</td>
<td>$0.00</td>
<td>$49.18</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>$25.08</td>
<td>$13.00</td>
<td>$13.99</td>
<td>$0.00</td>
<td>$52.07</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>55</td>
<td>$27.58</td>
<td>$13.00</td>
<td>$14.38</td>
<td>$0.00</td>
<td>$54.96</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>$30.09</td>
<td>$13.00</td>
<td>$14.76</td>
<td>$0.00</td>
<td>$57.85</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>65</td>
<td>$32.60</td>
<td>$13.00</td>
<td>$15.15</td>
<td>$0.00</td>
<td>$60.75</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>70</td>
<td>$35.11</td>
<td>$13.00</td>
<td>$15.53</td>
<td>$0.00</td>
<td>$63.64</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>75</td>
<td>$37.61</td>
<td>$13.00</td>
<td>$15.93</td>
<td>$0.00</td>
<td>$66.54</td>
<td></td>
</tr>
</tbody>
</table>

**Effective Date - 09/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>$20.54</td>
<td>$13.00</td>
<td>$0.62</td>
<td>$0.00</td>
<td>$34.16</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$20.54</td>
<td>$13.00</td>
<td>$0.62</td>
<td>$0.00</td>
<td>$34.16</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>$23.10</td>
<td>$13.00</td>
<td>$13.62</td>
<td>$0.00</td>
<td>$49.72</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>45</td>
<td>$23.10</td>
<td>$13.00</td>
<td>$13.62</td>
<td>$0.00</td>
<td>$49.72</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>$25.67</td>
<td>$13.00</td>
<td>$14.01</td>
<td>$0.00</td>
<td>$52.68</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>55</td>
<td>$28.24</td>
<td>$13.00</td>
<td>$14.40</td>
<td>$0.00</td>
<td>$55.64</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>$30.80</td>
<td>$13.00</td>
<td>$14.78</td>
<td>$0.00</td>
<td>$58.58</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>65</td>
<td>$33.37</td>
<td>$13.00</td>
<td>$15.17</td>
<td>$0.00</td>
<td>$61.54</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>70</td>
<td>$35.94</td>
<td>$13.00</td>
<td>$15.56</td>
<td>$0.00</td>
<td>$64.50</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>75</td>
<td>$38.51</td>
<td>$13.00</td>
<td>$15.96</td>
<td>$0.00</td>
<td>$67.47</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio: 2:3***

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELEVATOR CONSTRUCTOR</strong></td>
<td>01/01/2018</td>
<td>$57.62</td>
<td>$15.43</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$89.66</td>
<td></td>
</tr>
<tr>
<td><strong>ELEVATOR CONSTRUCTORS LOCAL 4</strong></td>
<td>01/01/2019</td>
<td>$59.47</td>
<td>$15.58</td>
<td>$17.51</td>
<td>$0.00</td>
<td>$92.56</td>
<td></td>
</tr>
<tr>
<td><strong>ELEVATOR CONSTRUCTORS LOCAL 4</strong></td>
<td>01/01/2020</td>
<td>$61.42</td>
<td>$15.73</td>
<td>$18.41</td>
<td>$0.00</td>
<td>$95.56</td>
<td></td>
</tr>
<tr>
<td><strong>ELEVATOR CONSTRUCTORS LOCAL 4</strong></td>
<td>01/01/2021</td>
<td>$63.47</td>
<td>$15.88</td>
<td>$19.31</td>
<td>$0.00</td>
<td>$98.66</td>
<td></td>
</tr>
<tr>
<td><strong>ELEVATOR CONSTRUCTORS LOCAL 4</strong></td>
<td>01/01/2022</td>
<td>$65.62</td>
<td>$16.03</td>
<td>$20.21</td>
<td>$0.00</td>
<td>$101.86</td>
<td></td>
</tr>
</tbody>
</table>
## Apprentice - ELEVATOR CONSTRUCTOR - Local 4

### Effective Date - 01/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$28.81</td>
<td>$15.43</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$44.24</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$31.69</td>
<td>$15.43</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$63.73</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$37.45</td>
<td>$15.43</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$69.49</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$40.33</td>
<td>$15.43</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$72.37</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$46.10</td>
<td>$15.43</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$78.14</td>
</tr>
</tbody>
</table>

### Effective Date - 01/01/2019

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$29.74</td>
<td>$15.58</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$45.32</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$32.71</td>
<td>$15.58</td>
<td>$17.51</td>
<td>$0.00</td>
<td>$65.80</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$38.66</td>
<td>$15.58</td>
<td>$17.51</td>
<td>$0.00</td>
<td>$71.75</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$41.63</td>
<td>$15.58</td>
<td>$17.51</td>
<td>$0.00</td>
<td>$74.72</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$47.58</td>
<td>$15.58</td>
<td>$17.51</td>
<td>$0.00</td>
<td>$80.67</td>
</tr>
</tbody>
</table>

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

Apprentice to Journeyworker Ratio: 1:1

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

---

### ELEVATOR CONSTRUCTOR HELPER

**ELEVATOR CONSTRUCTORS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/01/2018</td>
<td>$40.33</td>
<td>$15.43</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$72.37</td>
</tr>
<tr>
<td>01/01/2019</td>
<td>$41.63</td>
<td>$15.58</td>
<td>$17.51</td>
<td>$0.00</td>
<td>$74.72</td>
</tr>
<tr>
<td>01/01/2020</td>
<td>$42.99</td>
<td>$15.73</td>
<td>$18.41</td>
<td>$0.00</td>
<td>$77.13</td>
</tr>
<tr>
<td>01/01/2021</td>
<td>$44.43</td>
<td>$15.88</td>
<td>$19.31</td>
<td>$0.00</td>
<td>$79.62</td>
</tr>
<tr>
<td>01/01/2022</td>
<td>$45.93</td>
<td>$16.03</td>
<td>$20.21</td>
<td>$0.00</td>
<td>$82.17</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR HELPER"

---

### FENCE & GUARD RAIL ERECTOR

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

---

### FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY

**OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/01/2018</td>
<td>$42.84</td>
<td>$10.50</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$68.84</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

---

### FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY

**OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/01/2018</td>
<td>$44.31</td>
<td>$10.50</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$70.31</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

---

### FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY

**OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/01/2018</td>
<td>$22.51</td>
<td>$10.50</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$48.51</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE ALARM INSTALLER</td>
<td>03/01/2018</td>
<td>$50.15</td>
<td>$13.00</td>
<td>$17.85</td>
<td>$0.00</td>
<td>$81.00</td>
</tr>
<tr>
<td></td>
<td>09/01/2018</td>
<td>$51.34</td>
<td>$13.00</td>
<td>$17.89</td>
<td>$0.00</td>
<td>$82.23</td>
</tr>
<tr>
<td></td>
<td>03/01/2019</td>
<td>$52.53</td>
<td>$13.00</td>
<td>$17.93</td>
<td>$0.00</td>
<td>$83.46</td>
</tr>
<tr>
<td>FIRE ALARM REPAIR / MAINTENANCE</td>
<td>03/01/2018</td>
<td>$37.61</td>
<td>$13.00</td>
<td>$15.93</td>
<td>$0.00</td>
<td>$66.54</td>
</tr>
<tr>
<td></td>
<td>09/01/2018</td>
<td>$38.51</td>
<td>$13.00</td>
<td>$15.96</td>
<td>$0.00</td>
<td>$67.47</td>
</tr>
<tr>
<td></td>
<td>03/01/2019</td>
<td>$39.40</td>
<td>$13.00</td>
<td>$15.98</td>
<td>$0.00</td>
<td>$68.38</td>
</tr>
<tr>
<td>FIREMAN (ASST. ENGINEER)</td>
<td>06/01/2018</td>
<td>$38.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$65.33</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$39.78</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$66.28</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$40.69</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$67.19</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$41.64</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$68.14</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$42.55</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$69.05</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$43.50</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$70.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$44.41</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$70.91</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$45.36</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$71.86</td>
</tr>
<tr>
<td>FLAGGER &amp; SIGNALER</td>
<td>06/01/2018</td>
<td>$21.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$44.40</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$22.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$45.40</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$22.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$45.40</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$23.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$46.40</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$23.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$46.40</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$24.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$47.40</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$24.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$47.40</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$24.50</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$47.40</td>
</tr>
<tr>
<td>FLOORCOVERER</td>
<td>03/01/2016</td>
<td>$42.13</td>
<td>$9.80</td>
<td>$17.62</td>
<td>$0.00</td>
<td>$69.55</td>
</tr>
</tbody>
</table>

### Apprenticeship Wage Structure - Local 2168 Zone 1

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$21.07</td>
<td>$9.80</td>
<td>$1.79</td>
<td>$0.00</td>
<td>$32.66</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$23.17</td>
<td>$9.80</td>
<td>$1.79</td>
<td>$0.00</td>
<td>$34.76</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$25.28</td>
<td>$9.80</td>
<td>$12.25</td>
<td>$0.00</td>
<td>$47.33</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$27.38</td>
<td>$9.80</td>
<td>$12.25</td>
<td>$0.00</td>
<td>$49.43</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$29.49</td>
<td>$9.80</td>
<td>$14.04</td>
<td>$0.00</td>
<td>$53.33</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$31.60</td>
<td>$9.80</td>
<td>$14.04</td>
<td>$0.00</td>
<td>$55.44</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$33.70</td>
<td>$9.80</td>
<td>$15.83</td>
<td>$0.00</td>
<td>$59.33</td>
</tr>
<tr>
<td>8</td>
<td>85</td>
<td>$35.81</td>
<td>$9.80</td>
<td>$15.83</td>
<td>$0.00</td>
<td>$61.44</td>
</tr>
</tbody>
</table>

**Notes:** Steps are 750 hrs.  
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)  
Step 1&2 $30.55/ 3&4 $36.49/ 5&6 $53.33/ 7&8 $59.33  
Apprentice to Journeyworker Ratio: 1:1
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORK LIFT/CHERRY PICKER</td>
<td>06/01/2018</td>
<td>$47.08</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.58</td>
</tr>
<tr>
<td>OPERATING ENGINEERS LOCAL 4</td>
<td>12/01/2018</td>
<td>$48.23</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.73</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$49.33</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.83</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$50.48</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.98</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$51.58</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.08</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$52.73</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.23</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$53.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.33</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$54.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$81.48</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERATOR/LIGHTING PLANT/HEATERS</td>
<td>06/01/2018</td>
<td>$31.90</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$58.40</td>
</tr>
<tr>
<td>OPERATING ENGINEERS LOCAL 4</td>
<td>12/01/2018</td>
<td>$32.68</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$59.18</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$33.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$59.93</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$34.22</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$60.72</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$34.97</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$61.47</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$35.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$62.25</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$36.50</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$37.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$63.79</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)</td>
<td>07/01/2018</td>
<td>$39.51</td>
<td>$8.15</td>
<td>$20.15</td>
<td>$0.00</td>
<td>$67.81</td>
</tr>
<tr>
<td>GLAZIERS LOCAL 35 (ZONE 2)</td>
<td>01/01/2019</td>
<td>$39.86</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$68.86</td>
</tr>
<tr>
<td></td>
<td>07/01/2019</td>
<td>$40.96</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$69.96</td>
</tr>
<tr>
<td></td>
<td>01/01/2020</td>
<td>$42.06</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$71.06</td>
</tr>
<tr>
<td></td>
<td>07/01/2020</td>
<td>$43.16</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$72.16</td>
</tr>
<tr>
<td></td>
<td>01/01/2021</td>
<td>$44.26</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$73.26</td>
</tr>
<tr>
<td>Classification</td>
<td>Effective Date</td>
<td>Base Wage</td>
<td>Health</td>
<td>Pension</td>
<td>Supplemental Unemployment</td>
<td>Total Rate</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>-----------</td>
<td>--------</td>
<td>---------</td>
<td>---------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>GLAZIER - Local 35 Zone 2</td>
<td>07/01/2018</td>
<td>$19.76</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$27.91</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$21.73</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
<td>$35.22</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$23.71</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
<td>$37.68</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$25.68</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
<td>$40.14</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$27.66</td>
<td>$8.15</td>
<td>$17.24</td>
<td>$0.00</td>
<td>$55.05</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$29.63</td>
<td>$8.15</td>
<td>$17.73</td>
<td>$0.00</td>
<td>$55.51</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$31.61</td>
<td>$8.15</td>
<td>$18.21</td>
<td>$0.00</td>
<td>$57.97</td>
</tr>
<tr>
<td></td>
<td>07/01/2018</td>
<td>$35.56</td>
<td>$8.15</td>
<td>$19.18</td>
<td>$0.00</td>
<td>$62.89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOISTING ENGINEER/CRANES/GRADALLS</td>
<td>06/01/2018</td>
<td>$47.08</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.58</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$48.23</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.73</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$49.33</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.83</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$50.48</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.98</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$51.58</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.08</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$52.73</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.23</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$53.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.33</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$54.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$81.48</td>
</tr>
</tbody>
</table>

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio: 1:1

Issue Date: 07/23/2018

Wage Request Number: 20180723-020
### Operating Engineers - Local 4

#### Effective Date: 06/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55</td>
<td>$25.89</td>
<td>$11.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$36.89</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$28.25</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$54.75</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$30.60</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$57.10</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$32.96</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$59.46</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$35.31</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$61.81</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$37.66</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$64.16</td>
</tr>
<tr>
<td>7</td>
<td>85</td>
<td>$40.02</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$66.52</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$42.37</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$68.87</td>
</tr>
</tbody>
</table>

#### Effective Date: 12/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55</td>
<td>$26.53</td>
<td>$11.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$37.53</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$28.94</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$55.44</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$31.35</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$57.85</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$33.76</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$60.26</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$36.17</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$62.67</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$38.58</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$65.08</td>
</tr>
<tr>
<td>7</td>
<td>85</td>
<td>$41.00</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$67.50</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$43.41</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$69.91</td>
</tr>
</tbody>
</table>

**Notes:**

- Apprentice to Journeyworker Ratio: 1:6
- HVAC (DUCTWORK)
  - SHEETMETAL WORKERS LOCAL 17 - A
  - For apprentice rates see "Apprentice- SHEET METAL WORKER"
  - Issue Date: 02/01/2018
  - Wage Request Number: 20180201-02

- HVAC (ELECTRICAL CONTROLS)
  - ELECTRICIANS LOCAL 103
  - For apprentice rates see "Apprentice- ELECTRICIAN"
  - Issue Date: 03/01/2018
  - Wage Request Number: 20180301-02

- HVAC (TESTING AND BALANCING - AIR)
  - SHEETMETAL WORKERS LOCAL 17 - A
  - For apprentice rates see "Apprentice- SHEET METAL WORKER"
  - Issue Date: 02/01/2018
  - Wage Request Number: 20180201-02

- HVAC (TESTING AND BALANCING - WATER)
  - PIPEFITTERS LOCAL 537
  - For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"
  - Issue Date: 09/01/2017
  - Wage Request Number: 20180901-02
### HYDRAULIC DRILLS

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.75</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.65</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.60</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.60</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.60</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.69</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.59</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.67</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.57</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.69</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.59</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.70</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.60</td>
</tr>
</tbody>
</table>

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

### INSULATOR (PIPES & TANKS)

**HEAT & FROST INSULATORS LOCAL 6 (BOSTON)**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/01/2017</td>
<td>$47.09</td>
<td>$11.75</td>
<td>$14.20</td>
<td>$0.00</td>
<td>$73.04</td>
</tr>
<tr>
<td>09/01/2018</td>
<td>$49.34</td>
<td>$11.75</td>
<td>$14.20</td>
<td>$0.00</td>
<td>$75.29</td>
</tr>
<tr>
<td>09/01/2019</td>
<td>$51.84</td>
<td>$11.75</td>
<td>$14.20</td>
<td>$0.00</td>
<td>$77.79</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER".

#### Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

**Effective Date - 09/01/2017**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$23.55</td>
<td>$11.75</td>
<td>$10.45</td>
<td>$0.00</td>
<td>$45.75</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$28.25</td>
<td>$11.75</td>
<td>$11.20</td>
<td>$0.00</td>
<td>$51.20</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$32.96</td>
<td>$11.75</td>
<td>$11.95</td>
<td>$0.00</td>
<td>$56.66</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$37.67</td>
<td>$11.75</td>
<td>$12.70</td>
<td>$0.00</td>
<td>$62.12</td>
</tr>
</tbody>
</table>

**Effective Date - 09/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$24.67</td>
<td>$11.75</td>
<td>$10.45</td>
<td>$0.00</td>
<td>$46.87</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$29.60</td>
<td>$11.75</td>
<td>$11.20</td>
<td>$0.00</td>
<td>$52.55</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$34.54</td>
<td>$11.75</td>
<td>$11.95</td>
<td>$0.00</td>
<td>$58.24</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$39.47</td>
<td>$11.75</td>
<td>$12.70</td>
<td>$0.00</td>
<td>$63.92</td>
</tr>
</tbody>
</table>

**Notes:**

Steps are 1 year

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

### IRONWORKER/WELDER

**IRONWORKERS LOCAL 7 (BOSTON AREA)**

| Issue Date: 07/23/2018 | Wage Request Number: 20180723-020 | Page 17 of 42 |
### Apprentice - IRONWORKER - Local 7 Boston

**Effective Date:** 03/16/2017

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>$26.79</td>
<td>$7.80</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$55.44</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
<td>$31.26</td>
<td>$7.80</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$59.91</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>$33.49</td>
<td>$7.80</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$62.14</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$35.72</td>
<td>$7.80</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$64.37</td>
</tr>
<tr>
<td>5</td>
<td>85</td>
<td>$37.95</td>
<td>$7.80</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$66.60</td>
</tr>
<tr>
<td>6</td>
<td>90</td>
<td>$40.19</td>
<td>$7.80</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$68.84</td>
</tr>
</tbody>
</table>

**Notes:**
- **Structural 1:6; Ornamental 1:4**

### JACKHAMMER & PAVING BREAKER OPERATOR

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$61.15</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$62.10</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$63.10</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$64.10</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$65.09</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$66.07</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$67.09</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

**Apprentice to Journeyworker Ratio:**

For apprentice rates see "Apprentice- LABORER"

### LABORER

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.00</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$60.90</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$38.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$61.85</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$39.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$62.85</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$40.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$63.85</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$41.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$64.84</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$42.92</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$65.82</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$43.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$66.84</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$44.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$67.85</td>
</tr>
<tr>
<td>Classification</td>
<td>Effective Date - 06/01/2018</td>
<td>Effective Date - 12/01/2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------</td>
<td>-----------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Apprentice - LABORER - Zone 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
<td>$22.80</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
<td>$26.60</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>$30.40</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
<td>$34.20</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
<td>$23.37</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
<td>$27.27</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>$31.16</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
<td>$35.06</td>
<td>$7.70</td>
<td>$15.20</td>
</tr>
</tbody>
</table>

**Notes:**

Apprentice to Journeyworker Ratio: 1:5

LABORER: CARPENTER TENDER

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.00</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$60.90</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$38.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.85</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$39.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.85</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$40.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.85</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$41.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.84</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$42.92</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.82</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$43.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.84</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$44.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.85</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.00</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$60.90</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$38.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.85</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$39.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.85</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$40.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.85</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$41.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.84</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$42.92</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.82</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$43.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.84</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$44.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.85</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.15</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.05</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.00</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.10</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.00</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABORER: MASON TENDER</td>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td>LABORERS - ZONE 1</td>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

| LABORER: MULTI-TRADE TENDER      | 06/01/2018     | $38.00    | $7.70  | $15.20  | $0.00                     | $60.90     |
| LABORERS - ZONE 1                | 12/01/2018     | $38.95    | $7.70  | $15.20  | $0.00                     | $61.85     |
|                                  | 06/01/2019     | $39.95    | $7.70  | $15.20  | $0.00                     | $62.85     |
|                                  | 12/01/2019     | $40.95    | $7.70  | $15.20  | $0.00                     | $63.85     |
|                                  | 06/01/2020     | $41.94    | $7.70  | $15.20  | $0.00                     | $64.84     |
|                                  | 12/01/2020     | $42.92    | $7.70  | $15.20  | $0.00                     | $65.82     |
|                                  | 06/01/2021     | $43.94    | $7.70  | $15.20  | $0.00                     | $66.84     |
|                                  | 12/01/2021     | $44.95    | $7.70  | $15.20  | $0.00                     | $67.85     |

For apprentice rates see "Apprentice- LABORER"

| LABORER: TREE REMOVER            | 06/01/2018     | $38.00    | $7.70  | $15.20  | $0.00                     | $60.90     |
| LABORERS - ZONE 1                | 12/01/2018     | $38.95    | $7.70  | $15.20  | $0.00                     | $61.85     |
|                                  | 06/01/2019     | $39.95    | $7.70  | $15.20  | $0.00                     | $62.85     |
|                                  | 12/01/2019     | $40.95    | $7.70  | $15.20  | $0.00                     | $63.85     |
|                                  | 06/01/2020     | $41.94    | $7.70  | $15.20  | $0.00                     | $64.84     |
|                                  | 12/01/2020     | $42.92    | $7.70  | $15.20  | $0.00                     | $65.82     |
|                                  | 06/01/2021     | $43.94    | $7.70  | $15.20  | $0.00                     | $66.84     |
|                                  | 12/01/2021     | $44.95    | $7.70  | $15.20  | $0.00                     | $67.85     |

This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"

| LASER BEAM OPERATOR              | 06/01/2018     | $38.25    | $7.70  | $15.20  | $0.00                     | $61.15     |
| LABORERS - ZONE 1                | 12/01/2018     | $39.20    | $7.70  | $15.20  | $0.00                     | $62.10     |
|                                  | 06/01/2019     | $40.20    | $7.70  | $15.20  | $0.00                     | $63.10     |
|                                  | 12/01/2019     | $41.20    | $7.70  | $15.20  | $0.00                     | $64.10     |
|                                  | 06/01/2020     | $42.19    | $7.70  | $15.20  | $0.00                     | $65.09     |
|                                  | 12/01/2020     | $43.17    | $7.70  | $15.20  | $0.00                     | $66.07     |
|                                  | 06/01/2021     | $44.19    | $7.70  | $15.20  | $0.00                     | $67.09     |
|                                  | 12/01/2021     | $45.20    | $7.70  | $15.20  | $0.00                     | $68.10     |

For apprentice rates see "Apprentice- LABORER"

| MARBLE & TILE FINISHERS          | 02/01/2018     | $39.82    | $10.75 | $18.34  | $0.00                     | $68.91     |
| BRICKLAYERS LOCAL 3 - MARBLE & TILE | 08/01/2018 | $40.40    | $10.75 | $18.97  | $0.00                     | $70.12     |
|                                  | 02/01/2019     | $40.91    | $10.75 | $18.97  | $0.00                     | $70.63     |
|                                  | 08/01/2019     | $41.99    | $10.75 | $19.11  | $0.00                     | $71.85     |
|                                  | 02/01/2020     | $42.50    | $10.75 | $19.11  | $0.00                     | $72.36     |
|                                  | 08/01/2020     | $43.58    | $10.75 | $19.26  | $0.00                     | $73.59     |
|                                  | 02/01/2021     | $44.09    | $10.75 | $19.26  | $0.00                     | $74.10     |
|                                  | 08/01/2021     | $45.21    | $10.75 | $19.42  | $0.00                     | $75.38     |
|                                  | 02/01/2022     | $45.68    | $10.75 | $19.42  | $0.00                     | $75.85     |
### Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

#### Effective Date - 02/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$19.91</td>
<td>$10.75</td>
<td>$18.34</td>
<td>$0.00</td>
<td>$49.00</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$23.89</td>
<td>$10.75</td>
<td>$18.34</td>
<td>$0.00</td>
<td>$52.98</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$27.87</td>
<td>$10.75</td>
<td>$18.34</td>
<td>$0.00</td>
<td>$56.96</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$31.86</td>
<td>$10.75</td>
<td>$18.34</td>
<td>$0.00</td>
<td>$60.95</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$35.84</td>
<td>$10.75</td>
<td>$18.34</td>
<td>$0.00</td>
<td>$64.93</td>
</tr>
</tbody>
</table>

#### Effective Date - 08/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$20.20</td>
<td>$10.75</td>
<td>$18.97</td>
<td>$0.00</td>
<td>$49.92</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$24.24</td>
<td>$10.75</td>
<td>$18.97</td>
<td>$0.00</td>
<td>$53.96</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$28.28</td>
<td>$10.75</td>
<td>$18.97</td>
<td>$0.00</td>
<td>$58.00</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$32.32</td>
<td>$10.75</td>
<td>$18.97</td>
<td>$0.00</td>
<td>$62.04</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$36.36</td>
<td>$10.75</td>
<td>$18.97</td>
<td>$0.00</td>
<td>$66.08</td>
</tr>
</tbody>
</table>

**Notes:**

Apprentice to Journeyworker Ratio: 1:3

---

### MARBLE MASON'S, TILELAYERS & TERRAZZO MECH

**BRICKLAYERS LOCAL 3 - MARBLE & TILE**

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/01/2018</td>
<td>$52.10</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$82.88</td>
</tr>
<tr>
<td>08/01/2018</td>
<td>$52.95</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$84.36</td>
</tr>
<tr>
<td>02/01/2019</td>
<td>$53.57</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$84.98</td>
</tr>
<tr>
<td>08/01/2019</td>
<td>$54.92</td>
<td>$10.75</td>
<td>$20.80</td>
<td>$86.47</td>
</tr>
<tr>
<td>02/01/2020</td>
<td>$55.55</td>
<td>$10.75</td>
<td>$20.80</td>
<td>$87.10</td>
</tr>
<tr>
<td>08/01/2020</td>
<td>$56.90</td>
<td>$10.75</td>
<td>$20.95</td>
<td>$88.60</td>
</tr>
<tr>
<td>02/01/2021</td>
<td>$57.54</td>
<td>$10.75</td>
<td>$20.95</td>
<td>$89.24</td>
</tr>
<tr>
<td>08/01/2021</td>
<td>$58.94</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$90.80</td>
</tr>
<tr>
<td>02/01/2022</td>
<td>$59.51</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$91.37</td>
</tr>
<tr>
<td>Classification</td>
<td>Effective Date</td>
<td>Base Wage</td>
<td>Health</td>
<td>Pension</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble &amp; Tile</strong></td>
<td>02/01/2018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective Date - 02/01/2018</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>$26.05</td>
<td>$10.75</td>
<td>$20.03</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$31.26</td>
<td>$10.75</td>
<td>$20.03</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$36.47</td>
<td>$10.75</td>
<td>$20.03</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$41.68</td>
<td>$10.75</td>
<td>$20.03</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$46.89</td>
<td>$10.75</td>
<td>$20.03</td>
</tr>
<tr>
<td><strong>Effective Date - 08/01/2018</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>$26.48</td>
<td>$10.75</td>
<td>$20.66</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$31.77</td>
<td>$10.75</td>
<td>$20.66</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$37.07</td>
<td>$10.75</td>
<td>$20.66</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$42.36</td>
<td>$10.75</td>
<td>$20.66</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$47.66</td>
<td>$10.75</td>
<td>$20.66</td>
</tr>
</tbody>
</table>

**Notes:**

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

**MECH. SWEEPER OPERATOR (ON CONST. SITES)**

*OPERATING ENGINEERS LOCAL 4*

- 06/01/2018: $46.61, $11.00, $15.50, $0.00, $73.11
- 12/01/2018: $47.75, $11.00, $15.50, $0.00, $74.25
- 06/01/2019: $48.84, $11.00, $15.50, $0.00, $75.34
- 12/01/2019: $49.98, $11.00, $15.50, $0.00, $76.48
- 06/01/2020: $51.06, $11.00, $15.50, $0.00, $77.56
- 12/01/2020: $52.20, $11.00, $15.50, $0.00, $78.70
- 06/01/2021: $53.29, $11.00, $15.50, $0.00, $79.79
- 12/01/2021: $54.43, $11.00, $15.50, $0.00, $80.93

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**MECHANICS MAINTENANCE**

*OPERATING ENGINEERS LOCAL 4*

- 06/01/2018: $46.61, $11.00, $15.50, $0.00, $73.11
- 12/01/2018: $47.75, $11.00, $15.50, $0.00, $74.25
- 06/01/2019: $48.84, $11.00, $15.50, $0.00, $75.34
- 12/01/2019: $49.98, $11.00, $15.50, $0.00, $76.48
- 06/01/2020: $51.06, $11.00, $15.50, $0.00, $77.56
- 12/01/2020: $52.20, $11.00, $15.50, $0.00, $78.70
- 06/01/2021: $53.29, $11.00, $15.50, $0.00, $79.79
- 12/01/2021: $54.43, $11.00, $15.50, $0.00, $80.93

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**MILLWRIGHT (Zone 1)**

*MILLWRIGHTS LOCAL 1121 - Zone 1*

- 04/01/2018: $40.42, $9.90, $18.50, $0.00, $68.82
- 10/01/2018: $41.32, $9.90, $18.50, $0.00, $69.72
- 04/01/2019: $42.22, $9.90, $18.50, $0.00, $70.62

**Issue Date:** 07/23/2018  **Wage Request Number:** 20180723-020  **Page 22 of 42**
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MILLWRIGHT - Local 1121 Zone 1</strong> Apprentice <strong>-</strong></td>
<td>04/01/2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective Date -</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
<td>Supplemental Unemployment</td>
<td>Total Rate</td>
</tr>
<tr>
<td>1</td>
<td>55</td>
<td>$22.23</td>
<td>$9.90</td>
<td>$5.31</td>
<td>$0.00</td>
<td>$37.44</td>
</tr>
<tr>
<td>2</td>
<td>65</td>
<td>$26.27</td>
<td>$9.90</td>
<td>$15.13</td>
<td>$0.00</td>
<td>$51.30</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>$30.32</td>
<td>$9.90</td>
<td>$16.10</td>
<td>$0.00</td>
<td>$56.32</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
<td>$34.36</td>
<td>$9.90</td>
<td>$17.06</td>
<td>$0.00</td>
<td>$61.32</td>
</tr>
</tbody>
</table>

**Notes:**
- Steps are 2,000 hours
- Apprentice to Journeyworker Ratio: 1:5

**MORTAR MIXER**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABORERS - ZONE 1 <strong>-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective Date -</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
<td></td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
<td></td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
<td></td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
<td></td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
<td></td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
<td></td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

**OILER (OTHER THAN TRUCK CRANES, GRADALLS)**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERATING ENGINEERS LOCAL 4 <strong>-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective Date -</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/01/2018</td>
<td>$23.14</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$49.64</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$23.71</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$50.21</td>
<td></td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$24.26</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$50.76</td>
<td></td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$24.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$51.33</td>
<td></td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$25.38</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$51.88</td>
<td></td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$25.95</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$52.45</td>
<td></td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$26.50</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$53.00</td>
<td></td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$27.08</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$53.58</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**OILER (TRUCK CRANES, GRADALLS)**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERATING ENGINEERS LOCAL 4 <strong>-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective Date -</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/01/2018</td>
<td>$27.40</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$53.90</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$27.90</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$54.57</td>
<td></td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$28.80</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$55.22</td>
<td></td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$29.39</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$55.89</td>
<td></td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$30.04</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$56.54</td>
<td></td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$30.72</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$57.22</td>
<td></td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$31.36</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$57.86</td>
<td></td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$32.04</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$58.54</td>
<td></td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"
## Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTHER POWER DRIVEN EQUIPMENT - CLASS II</td>
<td>06/01/2018</td>
<td>$46.61</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.11</td>
</tr>
<tr>
<td>OPERATING ENGINEERS LOCAL 4</td>
<td>12/01/2018</td>
<td>$47.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.25</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$48.84</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.34</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$49.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.48</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$51.06</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$77.56</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$52.20</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.70</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$53.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.79</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$54.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.93</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

## Painter (Bridges/Tanks)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAINTER (BRIDGES/TANKS) PAINTER'S LOCAL 35 - ZONE 2</td>
<td>07/01/2018</td>
<td>$50.01</td>
<td>$8.15</td>
<td>$20.15</td>
<td>$0.00</td>
<td>$78.31</td>
</tr>
<tr>
<td></td>
<td>01/01/2019</td>
<td>$50.36</td>
<td>$8.15</td>
<td>$20.36</td>
<td>$0.00</td>
<td>$79.36</td>
</tr>
<tr>
<td></td>
<td>07/01/2019</td>
<td>$51.46</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$80.46</td>
</tr>
<tr>
<td></td>
<td>01/01/2020</td>
<td>$52.56</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$81.56</td>
</tr>
<tr>
<td></td>
<td>07/01/2020</td>
<td>$53.66</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$82.66</td>
</tr>
<tr>
<td></td>
<td>01/01/2021</td>
<td>$54.76</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$83.76</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Effective Date - 07/01/2018</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$25.01</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$33.16</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$27.51</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
<td>$41.00</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$30.01</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
<td>$43.98</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$32.51</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
<td>$46.97</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$35.01</td>
<td>$8.15</td>
<td>$17.24</td>
<td>$0.00</td>
<td>$60.40</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$37.51</td>
<td>$8.15</td>
<td>$17.73</td>
<td>$0.00</td>
<td>$63.39</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$40.01</td>
<td>$8.15</td>
<td>$18.21</td>
<td>$0.00</td>
<td>$66.37</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$45.01</td>
<td>$8.15</td>
<td>$19.18</td>
<td>$0.00</td>
<td>$72.34</td>
</tr>
</tbody>
</table>

### Effective Date - 01/01/2019

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$25.18</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$33.33</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$27.70</td>
<td>$8.15</td>
<td>$5.64</td>
<td>$0.00</td>
<td>$41.49</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$30.22</td>
<td>$8.15</td>
<td>$6.15</td>
<td>$0.00</td>
<td>$44.52</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$32.73</td>
<td>$8.15</td>
<td>$6.66</td>
<td>$0.00</td>
<td>$47.54</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$35.25</td>
<td>$8.15</td>
<td>$17.78</td>
<td>$0.00</td>
<td>$61.18</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$37.77</td>
<td>$8.15</td>
<td>$18.29</td>
<td>$0.00</td>
<td>$64.21</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$40.29</td>
<td>$8.15</td>
<td>$18.80</td>
<td>$0.00</td>
<td>$67.24</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$45.32</td>
<td>$8.15</td>
<td>$19.83</td>
<td>$0.00</td>
<td>$73.30</td>
</tr>
</tbody>
</table>

**Notes:**

Steps are 750 hrs.

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

---

**Issue Date:** 07/23/2018  
**Wage Request Number:** 20180723-020  
**Page:** 24 of 42
PAINTER (SPRAY OR SANDBLAST, NEW) *
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAINTERS LOCAL 35 - ZONE 2</td>
<td>07/01/2018</td>
<td>$40.91</td>
<td>$8.15</td>
<td>$20.15</td>
<td>$0.00</td>
<td>$69.21</td>
</tr>
<tr>
<td></td>
<td>01/01/2019</td>
<td>$41.26</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$70.26</td>
</tr>
<tr>
<td></td>
<td>07/01/2019</td>
<td>$42.36</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$71.36</td>
</tr>
<tr>
<td></td>
<td>01/01/2020</td>
<td>$43.46</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$72.46</td>
</tr>
<tr>
<td></td>
<td>07/01/2020</td>
<td>$44.56</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$73.56</td>
</tr>
<tr>
<td></td>
<td>01/01/2021</td>
<td>$45.66</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$74.66</td>
</tr>
</tbody>
</table>

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/01/2018</td>
<td>$20.46</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$28.61</td>
</tr>
<tr>
<td>07/01/2019</td>
<td>$20.63</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$28.78</td>
</tr>
<tr>
<td>1 50</td>
<td>$22.50</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
<td>$35.99</td>
</tr>
<tr>
<td>2 55</td>
<td>$24.55</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
<td>$38.22</td>
</tr>
<tr>
<td>3 60</td>
<td>$26.59</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
<td>$38.80</td>
</tr>
<tr>
<td>4 65</td>
<td>$28.64</td>
<td>$8.15</td>
<td>$17.24</td>
<td>$0.00</td>
<td>$54.04</td>
</tr>
<tr>
<td>5 70</td>
<td>$30.68</td>
<td>$8.15</td>
<td>$17.73</td>
<td>$0.00</td>
<td>$56.56</td>
</tr>
<tr>
<td>6 75</td>
<td>$32.73</td>
<td>$8.15</td>
<td>$18.21</td>
<td>$0.00</td>
<td>$59.09</td>
</tr>
<tr>
<td>7 80</td>
<td>$34.82</td>
<td>$8.15</td>
<td>$19.18</td>
<td>$0.00</td>
<td>$64.15</td>
</tr>
<tr>
<td>8 90</td>
<td>$36.91</td>
<td>$8.15</td>
<td>$19.83</td>
<td>$0.00</td>
<td>$66.65</td>
</tr>
</tbody>
</table>

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio: 1:1

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAINTERS LOCAL 35 - ZONE 2</td>
<td>07/01/2018</td>
<td>$38.97</td>
<td>$8.15</td>
<td>$20.15</td>
<td>$0.00</td>
<td>$67.27</td>
</tr>
<tr>
<td></td>
<td>01/01/2019</td>
<td>$39.32</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$68.32</td>
</tr>
<tr>
<td></td>
<td>07/01/2019</td>
<td>$40.42</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$69.42</td>
</tr>
<tr>
<td></td>
<td>01/01/2020</td>
<td>$41.52</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$70.52</td>
</tr>
<tr>
<td></td>
<td>07/01/2020</td>
<td>$42.62</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$71.62</td>
</tr>
<tr>
<td></td>
<td>01/01/2021</td>
<td>$43.72</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$72.72</td>
</tr>
</tbody>
</table>

Issue Date: 07/23/2018  Wage Request Number: 20180723-020
### Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

#### Effective Date - 07/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$19.49</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$27.64</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$21.43</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
<td>$34.92</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$23.38</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
<td>$37.92</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$25.33</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
<td>$39.99</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$27.28</td>
<td>$8.15</td>
<td>$7.74</td>
<td>$0.00</td>
<td>$43.20</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$29.23</td>
<td>$8.15</td>
<td>$8.57</td>
<td>$0.00</td>
<td>$45.90</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$31.18</td>
<td>$8.15</td>
<td>$10.25</td>
<td>$0.00</td>
<td>$50.58</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$35.07</td>
<td>$8.15</td>
<td>$11.85</td>
<td>$0.00</td>
<td>$55.07</td>
</tr>
</tbody>
</table>

#### Effective Date - 01/01/2019

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$19.66</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$27.81</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$21.63</td>
<td>$8.15</td>
<td>$5.64</td>
<td>$0.00</td>
<td>$35.42</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$23.59</td>
<td>$8.15</td>
<td>$6.15</td>
<td>$0.00</td>
<td>$37.89</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$25.56</td>
<td>$8.15</td>
<td>$6.66</td>
<td>$0.00</td>
<td>$40.35</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$27.52</td>
<td>$8.15</td>
<td>$7.17</td>
<td>$0.00</td>
<td>$44.70</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$29.49</td>
<td>$8.15</td>
<td>$18.29</td>
<td>$0.00</td>
<td>$55.93</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$31.46</td>
<td>$8.15</td>
<td>$18.80</td>
<td>$0.00</td>
<td>$58.41</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$35.39</td>
<td>$8.15</td>
<td>$19.83</td>
<td>$0.00</td>
<td>$63.37</td>
</tr>
</tbody>
</table>

**Notes:**
- Steps are 750 hrs.
- Apprentice to Journeyworker Ratio: 1:1

**PAINTER (TRAFFIC MARKINGS)**

Labors - Zone 1

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.00</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$60.90</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$38.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.85</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$39.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.85</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$40.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.85</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$41.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.84</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$42.92</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.85</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$43.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.84</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$44.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.85</td>
</tr>
</tbody>
</table>

**PAINTER / TAPER (BRUSH, NEW)*

*If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/01/2018</td>
<td>$39.51</td>
<td>$8.15</td>
<td>$20.15</td>
<td>$0.00</td>
<td>$67.81</td>
</tr>
<tr>
<td>01/01/2019</td>
<td>$39.86</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$68.86</td>
</tr>
<tr>
<td>07/01/2019</td>
<td>$40.96</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$69.96</td>
</tr>
<tr>
<td>01/01/2020</td>
<td>$42.06</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$71.06</td>
</tr>
<tr>
<td>07/01/2020</td>
<td>$43.16</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$72.26</td>
</tr>
<tr>
<td>01/01/2021</td>
<td>$44.25</td>
<td>$8.15</td>
<td>$20.85</td>
<td>$0.00</td>
<td>$73.25</td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
<td>Supplemental</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>----------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------------</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>$19.76</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$21.73</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$23.71</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$25.68</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$27.66</td>
<td>$8.15</td>
<td>$17.24</td>
<td>$0.00</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$29.63</td>
<td>$8.15</td>
<td>$17.73</td>
<td>$0.00</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$31.61</td>
<td>$8.15</td>
<td>$18.21</td>
<td>$0.00</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$35.56</td>
<td>$8.15</td>
<td>$19.18</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$19.93</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$28.08</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$21.92</td>
<td>$8.15</td>
<td>$5.64</td>
<td>$0.00</td>
<td>$35.71</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$23.92</td>
<td>$8.15</td>
<td>$6.15</td>
<td>$0.00</td>
<td>$38.22</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$25.91</td>
<td>$8.15</td>
<td>$6.66</td>
<td>$0.00</td>
<td>$40.72</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$27.90</td>
<td>$8.15</td>
<td>$17.78</td>
<td>$0.00</td>
<td>$53.83</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$29.90</td>
<td>$8.15</td>
<td>$18.29</td>
<td>$0.00</td>
<td>$56.34</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$31.89</td>
<td>$8.15</td>
<td>$18.80</td>
<td>$0.00</td>
<td>$58.84</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$35.87</td>
<td>$8.15</td>
<td>$19.83</td>
<td>$0.00</td>
<td>$63.85</td>
</tr>
</tbody>
</table>

Notes: Steps are 750 hrs.

Apprentice to Journeyworker Ratio: 1:1

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 2
### Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

**Effective Date** - 07/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$18.79</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$26.94</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$20.66</td>
<td>$8.15</td>
<td>$5.34</td>
<td>$0.00</td>
<td>$34.15</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$22.54</td>
<td>$8.15</td>
<td>$5.82</td>
<td>$0.00</td>
<td>$36.51</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$24.42</td>
<td>$8.15</td>
<td>$6.31</td>
<td>$0.00</td>
<td>$38.88</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$26.30</td>
<td>$8.15</td>
<td>$17.24</td>
<td>$0.00</td>
<td>$51.69</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$28.18</td>
<td>$8.15</td>
<td>$17.73</td>
<td>$0.00</td>
<td>$54.06</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$30.06</td>
<td>$8.15</td>
<td>$18.21</td>
<td>$0.00</td>
<td>$56.42</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$33.81</td>
<td>$8.15</td>
<td>$19.18</td>
<td>$0.00</td>
<td>$61.14</td>
</tr>
</tbody>
</table>

**Effective Date** - 01/01/2019

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$18.96</td>
<td>$8.15</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$27.11</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$20.86</td>
<td>$8.15</td>
<td>$5.64</td>
<td>$0.00</td>
<td>$34.65</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$22.75</td>
<td>$8.15</td>
<td>$6.15</td>
<td>$0.00</td>
<td>$37.05</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$24.65</td>
<td>$8.15</td>
<td>$6.66</td>
<td>$0.00</td>
<td>$39.46</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$26.54</td>
<td>$8.15</td>
<td>$17.78</td>
<td>$0.00</td>
<td>$52.47</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$28.44</td>
<td>$8.15</td>
<td>$18.29</td>
<td>$0.00</td>
<td>$54.88</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$30.34</td>
<td>$8.15</td>
<td>$18.80</td>
<td>$0.00</td>
<td>$57.29</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
<td>$34.13</td>
<td>$8.15</td>
<td>$19.83</td>
<td>$0.00</td>
<td>$62.11</td>
</tr>
</tbody>
</table>

**Notes:**
- Steps are 750 hrs.
- Apprentice to Journeyworker Ratio: 1:1

---

**PANEL & PICKUP TRUCKS DRIVER**

**TEAMSTERS JOINT COUNCIL NO. 10 ZONE A**

<table>
<thead>
<tr>
<th>Issue Date</th>
<th>Wage Request Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/01/2016</td>
<td>20180723-020</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANEL &amp; PICKUP TRUCKS DRIVER</td>
<td>12/01/2016</td>
<td>$33.08</td>
<td>$10.91</td>
<td>$10.89</td>
<td>$0.00</td>
<td>$54.88</td>
</tr>
</tbody>
</table>

**PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)**

**PILE DRIVER LOCAL 56 (ZONE 1)**

For apprentice rates see "Apprentice- PILE DRIVER"

**PILE DRIVER**

**PILE DRIVER LOCAL 56 (ZONE 1)**
<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>$22.14</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$53.19</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>$26.56</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$57.61</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$30.99</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$62.04</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$33.20</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$64.25</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>$35.42</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$66.47</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$35.42</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$66.47</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>$39.84</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$70.89</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>$39.84</td>
<td>$9.90</td>
<td>$21.15</td>
<td>$0.00</td>
<td>$70.89</td>
</tr>
</tbody>
</table>

**Notes:**

Apprentice to Journeyworker Ratio: 1:5

**PIPEFITTER & STEAMFITTER**

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/01/2017</td>
<td>$51.44</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$80.13</td>
</tr>
<tr>
<td>09/01/2018</td>
<td>$52.94</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$81.63</td>
</tr>
<tr>
<td>09/01/2019</td>
<td>$54.44</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$83.13</td>
</tr>
<tr>
<td>09/01/2020</td>
<td>$55.94</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$84.63</td>
</tr>
</tbody>
</table>
### Classification

**Apprentice - PIPEFITTER - Local 537**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>$20.58</td>
<td>$9.95</td>
<td>$7.75</td>
<td>$0.00</td>
<td>$38.28</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>$23.15</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$51.84</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$30.86</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$59.55</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$36.01</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$64.70</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$41.15</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$69.84</td>
</tr>
</tbody>
</table>

**Effective Date - 09/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>$21.18</td>
<td>$9.95</td>
<td>$7.75</td>
<td>$0.00</td>
<td>$38.88</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>$23.82</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$52.51</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$31.76</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$60.45</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>$37.06</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$65.75</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$42.35</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$71.04</td>
</tr>
</tbody>
</table>

*Notes:*

**1:3; 3:15; 1:10 thereafter / Steps are 1 yr.**


**Apprentice to Journeyworker Ratio:**

---

**PIPELAYER**

**LABORERS - ZONE 1**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Rate Base Wage</th>
<th>Health</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$61.15</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$62.10</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$63.10</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$64.10</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$65.09</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$66.10</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$67.09</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

---

**PLUMBERS & GASFITTERS**

**PLUMBERS & GASFITTERS LOCAL 12**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Rate Base Wage</th>
<th>Health</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/01/2018</td>
<td>$54.69</td>
<td>$11.57</td>
<td>$82.02</td>
</tr>
<tr>
<td>09/01/2018</td>
<td>$56.19</td>
<td>$11.57</td>
<td>$83.52</td>
</tr>
<tr>
<td>03/01/2019</td>
<td>$57.69</td>
<td>$11.57</td>
<td>$85.02</td>
</tr>
<tr>
<td>09/01/2019</td>
<td>$59.19</td>
<td>$11.57</td>
<td>$86.52</td>
</tr>
<tr>
<td>03/01/2020</td>
<td>$60.69</td>
<td>$11.57</td>
<td>$88.02</td>
</tr>
<tr>
<td>09/01/2020</td>
<td>$62.19</td>
<td>$11.57</td>
<td>$89.52</td>
</tr>
<tr>
<td>03/01/2021</td>
<td>$63.69</td>
<td>$11.57</td>
<td>$91.02</td>
</tr>
</tbody>
</table>

---
### Apprentice - PLUMBER/GASFITTER - Local 12

**Effective Date:** 03/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>$19.14</td>
<td>$11.57</td>
<td>$5.72</td>
<td>$0.00</td>
<td>$36.43</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$21.88</td>
<td>$11.57</td>
<td>$6.49</td>
<td>$0.00</td>
<td>$39.94</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>$30.08</td>
<td>$11.57</td>
<td>$8.81</td>
<td>$0.00</td>
<td>$50.46</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$35.55</td>
<td>$11.57</td>
<td>$10.36</td>
<td>$0.00</td>
<td>$57.48</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$41.02</td>
<td>$11.57</td>
<td>$11.90</td>
<td>$0.00</td>
<td>$64.49</td>
</tr>
</tbody>
</table>

**Effective Date:** 09/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>$19.67</td>
<td>$11.57</td>
<td>$5.72</td>
<td>$0.00</td>
<td>$36.96</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$22.48</td>
<td>$11.57</td>
<td>$6.49</td>
<td>$0.00</td>
<td>$40.54</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>$30.90</td>
<td>$11.57</td>
<td>$8.82</td>
<td>$0.00</td>
<td>$51.29</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$36.52</td>
<td>$11.57</td>
<td>$10.36</td>
<td>$0.00</td>
<td>$58.45</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>$42.14</td>
<td>$11.57</td>
<td>$11.90</td>
<td>$0.00</td>
<td>$65.61</td>
</tr>
</tbody>
</table>

**Notes:**
- **1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
- Step4 with lic$61.00, Step5 with lic$67.99

### Apprentice to Journeyworker Ratio:

**PNEUMATIC CONTROLS (TEMP.)**

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>09/01/2017</td>
<td>$51.44</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$80.13</td>
</tr>
<tr>
<td>09/01/2018</td>
<td>$52.94</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$81.63</td>
</tr>
<tr>
<td>09/01/2019</td>
<td>$54.44</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$83.13</td>
</tr>
<tr>
<td>09/01/2020</td>
<td>$55.94</td>
<td>$9.95</td>
<td>$18.74</td>
<td>$0.00</td>
<td>$84.63</td>
</tr>
</tbody>
</table>

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

**PNEUMATIC DRILL/TOOL OPERATOR**

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

*For apprentice rates see "Apprentice- LABORER"*

**POWDERMAN & BLASTER**

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$39.00</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.90</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.85</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.85</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.85</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.84</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.92</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.82</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.94</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.84</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.95</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.85</td>
</tr>
</tbody>
</table>

*For apprentice rates see "Apprentice- LABORER"*
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POWER SHOVEL/DERRICK/TRENCHING MACHINE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPERATING ENGINEERS LOCAL 4</td>
<td>06/01/2018</td>
<td>$47.08</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.58</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$48.23</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.73</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$49.33</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.83</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$50.48</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.98</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$51.58</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.08</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$52.73</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.23</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$53.83</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.33</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$54.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$81.48</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| PUMP OPERATOR (CONCRETE)                            |                |           |        |         |                             |            |
| OPERATING ENGINEERS LOCAL 4                         | 06/01/2018     | $47.08    | $11.00 | $15.50  | $0.00                       | $73.58     |
|                                                    | 12/01/2018     | $48.23    | $11.00 | $15.50  | $0.00                       | $74.73     |
|                                                    | 06/01/2019     | $49.33    | $11.00 | $15.50  | $0.00                       | $75.83     |
|                                                    | 12/01/2019     | $50.48    | $11.00 | $15.50  | $0.00                       | $76.98     |
|                                                    | 06/01/2020     | $51.58    | $11.00 | $15.50  | $0.00                       | $78.08     |
|                                                    | 12/01/2020     | $52.73    | $11.00 | $15.50  | $0.00                       | $79.23     |
|                                                    | 06/01/2021     | $53.83    | $11.00 | $15.50  | $0.00                       | $80.33     |
|                                                    | 12/01/2021     | $54.98    | $11.00 | $15.50  | $0.00                       | $81.48     |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| PUMP OPERATOR (DEWATERING, OTHER)                   |                |           |        |         |                             |            |
| OPERATING ENGINEERS LOCAL 4                         | 06/01/2018     | $31.90    | $11.00 | $15.50  | $0.00                       | $58.40     |
|                                                    | 12/01/2018     | $32.68    | $11.00 | $15.50  | $0.00                       | $59.18     |
|                                                    | 06/01/2019     | $33.43    | $11.00 | $15.50  | $0.00                       | $59.93     |
|                                                    | 12/01/2019     | $34.22    | $11.00 | $15.50  | $0.00                       | $60.72     |
|                                                    | 06/01/2020     | $34.97    | $11.00 | $15.50  | $0.00                       | $61.47     |
|                                                    | 12/01/2020     | $35.75    | $11.00 | $15.50  | $0.00                       | $62.25     |
|                                                    | 06/01/2021     | $36.50    | $11.00 | $15.50  | $0.00                       | $63.00     |
|                                                    | 12/01/2021     | $37.29    | $11.00 | $15.50  | $0.00                       | $63.79     |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| READY MIX CONCRETE DRIVERS after 4/30/10            | 07/01/2017     | $28.18    | $8.48  | $9.72   | $0.00                       | $46.38     |

(Drivers Hired After 4/30/2010) TEAMSTERS LOCAL 25b

| READY-MIX CONCRETE DRIVER                          | 07/01/2017     | $29.48    | $8.48  | $9.72   | $0.00                       | $47.68     |

TEAMSTERS LOCAL 25b

| RECLAIMERS                                          |                |           |        |         |                             |            |
| OPERATING ENGINEERS LOCAL 4                         | 06/01/2018     | $46.61    | $11.00 | $15.50  | $0.00                       | $73.11     |
|                                                    | 12/01/2018     | $47.75    | $11.00 | $15.50  | $0.00                       | $74.25     |
|                                                    | 06/01/2019     | $48.84    | $11.00 | $15.50  | $0.00                       | $75.34     |
|                                                    | 12/01/2019     | $49.98    | $11.00 | $15.50  | $0.00                       | $76.48     |
|                                                    | 06/01/2020     | $51.06    | $11.00 | $15.50  | $0.00                       | $77.56     |
|                                                    | 12/01/2020     | $52.20    | $11.00 | $15.50  | $0.00                       | $78.70     |
|                                                    | 06/01/2021     | $53.29    | $11.00 | $15.50  | $0.00                       | $79.79     |
|                                                    | 12/01/2021     | $54.43    | $11.00 | $15.50  | $0.00                       | $80.93     |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"
### Classification

**RIDE-ON MOTORIZED BUGGY OPERATOR**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$38.25</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$61.15</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$39.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$62.10</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$40.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$63.10</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$41.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$64.10</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$42.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$65.09</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$43.17</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$66.07</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$44.19</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$67.09</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$45.20</td>
<td>$7.70</td>
<td>$15.20</td>
<td>$0.00</td>
<td>$68.10</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

**ROLLER/SPREADER/MULCHING MACHINE OPERATING ENGINEERS LOCAL 4**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/2018</td>
<td>$46.61</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.11</td>
</tr>
<tr>
<td>12/01/2018</td>
<td>$47.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.25</td>
</tr>
<tr>
<td>06/01/2019</td>
<td>$48.84</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.34</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>$49.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.48</td>
</tr>
<tr>
<td>06/01/2020</td>
<td>$51.06</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$77.56</td>
</tr>
<tr>
<td>12/01/2020</td>
<td>$52.20</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.70</td>
</tr>
<tr>
<td>06/01/2021</td>
<td>$53.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.79</td>
</tr>
<tr>
<td>12/01/2021</td>
<td>$54.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.93</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**ROOFER (Inc. Roofer Waterproofing & Roofer Damproofing)**

**ROOFERS LOCAL 33**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/01/2018</td>
<td>$42.36</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$68.51</td>
</tr>
<tr>
<td>08/01/2018</td>
<td>$43.46</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$69.61</td>
</tr>
<tr>
<td>02/01/2019</td>
<td>$44.61</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$70.76</td>
</tr>
</tbody>
</table>

**Apprentice - ROOFER - Local 33**

**Effective Date - 02/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$21.18</td>
<td>$11.35</td>
<td>$3.44</td>
<td>$0.00</td>
<td>$35.97</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$25.42</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$51.57</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$27.53</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$53.68</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>$31.77</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$57.92</td>
</tr>
<tr>
<td>5</td>
<td>85</td>
<td>$36.01</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$62.16</td>
</tr>
</tbody>
</table>

**Effective Date - 08/01/2018**

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$21.73</td>
<td>$11.35</td>
<td>$3.44</td>
<td>$0.00</td>
<td>$36.52</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$26.08</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$52.23</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>$28.25</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$54.40</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>$32.60</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$58.75</td>
</tr>
<tr>
<td>5</td>
<td>85</td>
<td>$36.94</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$63.09</td>
</tr>
</tbody>
</table>

**Notes:**

**1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1**

Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs. (Hot Pitch Mechanics’ receive $1.00 hr. above ROOFER)

**Apprentice to Journeyworker Ratio:**

**ROOFER SLATE / TILE / PRECAST CONCRETE**

**ROOFERS LOCAL 33**

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/01/2018</td>
<td>$42.61</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$68.76</td>
</tr>
<tr>
<td>08/01/2018</td>
<td>$43.71</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$69.86</td>
</tr>
<tr>
<td>02/01/2019</td>
<td>$44.86</td>
<td>$11.35</td>
<td>$14.80</td>
<td>$0.00</td>
<td>$71.01</td>
</tr>
</tbody>
</table>

**Issue Date:** 07/23/2018 **Wage Request Number:** 20180723-020 **Page 33 of 42**
### SHEETMETAL WORKER - Local 17-A

#### Effective Date: 02/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>$17.64</td>
<td>$12.20</td>
<td>$5.61</td>
<td>$0.00</td>
<td>$35.45</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$17.64</td>
<td>$12.20</td>
<td>$5.61</td>
<td>$0.00</td>
<td>$35.45</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>$19.85</td>
<td>$12.20</td>
<td>$10.85</td>
<td>$1.29</td>
<td>$44.19</td>
</tr>
<tr>
<td>4</td>
<td>45</td>
<td>$19.85</td>
<td>$12.20</td>
<td>$10.85</td>
<td>$1.29</td>
<td>$44.19</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>$22.06</td>
<td>$12.20</td>
<td>$11.80</td>
<td>$1.38</td>
<td>$47.44</td>
</tr>
<tr>
<td>6</td>
<td>50</td>
<td>$22.06</td>
<td>$12.20</td>
<td>$12.05</td>
<td>$1.39</td>
<td>$47.70</td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>$26.47</td>
<td>$12.20</td>
<td>$13.70</td>
<td>$1.57</td>
<td>$53.94</td>
</tr>
<tr>
<td>8</td>
<td>65</td>
<td>$28.67</td>
<td>$12.20</td>
<td>$14.65</td>
<td>$1.67</td>
<td>$57.19</td>
</tr>
<tr>
<td>9</td>
<td>75</td>
<td>$33.08</td>
<td>$12.20</td>
<td>$16.56</td>
<td>$1.86</td>
<td>$63.70</td>
</tr>
<tr>
<td>10</td>
<td>85</td>
<td>$37.49</td>
<td>$12.20</td>
<td>$17.96</td>
<td>$2.03</td>
<td>$69.68</td>
</tr>
</tbody>
</table>

**Notes:**
- Steps are 6 mos.
- Apprentice to Journeyworker Ratio: 1:4

### SIGN ERECTOR - Local 35 Zone 2

#### Effective Date: 06/01/2013

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$12.91</td>
<td>$7.07</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$19.98</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>$14.20</td>
<td>$7.07</td>
<td>$2.45</td>
<td>$0.00</td>
<td>$23.72</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>$15.49</td>
<td>$7.07</td>
<td>$2.45</td>
<td>$0.00</td>
<td>$25.01</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>$16.78</td>
<td>$7.07</td>
<td>$2.45</td>
<td>$0.00</td>
<td>$26.30</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>$18.07</td>
<td>$7.07</td>
<td>$7.05</td>
<td>$0.00</td>
<td>$32.19</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>$19.36</td>
<td>$7.07</td>
<td>$7.05</td>
<td>$0.00</td>
<td>$33.48</td>
</tr>
<tr>
<td>7</td>
<td>80</td>
<td>$20.65</td>
<td>$7.07</td>
<td>$7.05</td>
<td>$0.00</td>
<td>$34.77</td>
</tr>
<tr>
<td>8</td>
<td>85</td>
<td>$21.94</td>
<td>$7.07</td>
<td>$7.05</td>
<td>$0.00</td>
<td>$36.06</td>
</tr>
<tr>
<td>9</td>
<td>90</td>
<td>$23.23</td>
<td>$7.07</td>
<td>$7.05</td>
<td>$0.00</td>
<td>$37.35</td>
</tr>
</tbody>
</table>

**Notes:**
- Steps are 4 mos.
- Apprentice to Journeyworker Ratio: 1:1

### SPECIALIZED EARTH MOVING EQUIP < 35 TONS

#### Effective Date: 12/01/2016

| Apprentice to Journeyworker Ratio: 1:1

### SPECIALIZED EARTH MOVING EQUIP > 35 TONS

#### Effective Date: 12/01/2016

| Apprentice to Journeyworker Ratio: 1:1

---

**Issue Date:** 07/23/2018  **Wage Request Number:** 20180723-020  **Page 34 of 42**
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPRINKLER FITTER</td>
<td>03/01/2018</td>
<td>$57.78</td>
<td>$9.12</td>
<td>$18.15</td>
<td>$0.00</td>
<td>$85.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</td>
<td>10/01/2018</td>
<td>$59.28</td>
<td>$9.12</td>
<td>$18.15</td>
<td>$0.00</td>
<td>$86.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>01/01/2019</td>
<td>$59.28</td>
<td>$9.47</td>
<td>$18.35</td>
<td>$0.00</td>
<td>$87.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>03/01/2019</td>
<td>$60.78</td>
<td>$9.47</td>
<td>$18.35</td>
<td>$0.00</td>
<td>$88.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10/01/2019</td>
<td>$62.28</td>
<td>$9.47</td>
<td>$18.35</td>
<td>$0.00</td>
<td>$90.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>03/01/2020</td>
<td>$63.78</td>
<td>$9.47</td>
<td>$18.35</td>
<td>$0.00</td>
<td>$91.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10/01/2020</td>
<td>$65.28</td>
<td>$9.47</td>
<td>$18.35</td>
<td>$0.00</td>
<td>$93.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>03/01/2021</td>
<td>$66.78</td>
<td>$9.47</td>
<td>$18.35</td>
<td>$0.00</td>
<td>$94.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>03/01/2018</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>$20.22</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$38.24</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$23.11</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$41.13</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>$26.00</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$44.02</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>$28.89</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$46.91</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>$31.78</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$49.80</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>$34.67</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$54.19</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>65</td>
<td>$37.56</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$57.08</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>70</td>
<td>$40.45</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$59.97</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>75</td>
<td>$43.34</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$62.86</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>80</td>
<td>$46.22</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$65.74</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>10/01/2018</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>$20.75</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$38.77</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>$23.71</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$41.73</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>$26.68</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$44.70</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>$29.64</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$47.66</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>$32.60</td>
<td>$9.12</td>
<td>$8.90</td>
<td>$0.00</td>
<td>$50.62</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>$35.57</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$55.09</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>65</td>
<td>$38.53</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$58.05</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>70</td>
<td>$41.50</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$61.02</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>75</td>
<td>$44.46</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$63.98</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>80</td>
<td>$47.42</td>
<td>$9.12</td>
<td>$10.40</td>
<td>$0.00</td>
<td>$66.94</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Apprentice entered prior 9/30/10: 40/45/50/55/60/65/70/75/80/85. Steps are 850 hours.

Apprentice to Journeyworker Ratio: 1:3
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEAM BOILER OPERATOR</td>
<td>06/01/2018</td>
<td>$46.61</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.11</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$47.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.25</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$48.84</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.34</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$49.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.48</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$51.06</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$77.66</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$52.20</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.70</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$53.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.79</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$54.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.93</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS",

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAMPER, SELF-PROPELLED OR TRACTOR DRAWN</td>
<td>06/01/2018</td>
<td>$46.61</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$73.11</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$47.75</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$74.25</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$48.84</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$75.34</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$49.98</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$76.48</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$51.06</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$77.66</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$52.20</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$78.70</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$53.29</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$79.79</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$54.43</td>
<td>$11.00</td>
<td>$15.50</td>
<td>$0.00</td>
<td>$80.93</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- OPERATING ENGINEERS",

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELECOMMUNICATION TECHNICIAN</td>
<td>03/01/2018</td>
<td>$37.61</td>
<td>$13.00</td>
<td>$15.93</td>
<td>$0.00</td>
<td>$66.54</td>
</tr>
<tr>
<td></td>
<td>09/01/2018</td>
<td>$38.51</td>
<td>$13.00</td>
<td>$15.96</td>
<td>$0.00</td>
<td>$67.47</td>
</tr>
<tr>
<td></td>
<td>03/01/2019</td>
<td>$39.40</td>
<td>$13.00</td>
<td>$15.98</td>
<td>$0.00</td>
<td>$68.38</td>
</tr>
</tbody>
</table>
### TELECOMMUNICATION TECHNICIAN - Local 103

<table>
<thead>
<tr>
<th>Step</th>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>03/01/2018</td>
<td>$15.04</td>
<td>$13.00</td>
<td>$0.45</td>
<td>$0.00</td>
<td>$28.49</td>
</tr>
<tr>
<td>2</td>
<td>03/01/2018</td>
<td>$15.04</td>
<td>$13.00</td>
<td>$0.45</td>
<td>$0.00</td>
<td>$28.49</td>
</tr>
<tr>
<td>3</td>
<td>03/01/2018</td>
<td>$16.92</td>
<td>$13.00</td>
<td>$12.74</td>
<td>$0.00</td>
<td>$42.66</td>
</tr>
<tr>
<td>4</td>
<td>03/01/2018</td>
<td>$16.92</td>
<td>$13.00</td>
<td>$12.74</td>
<td>$0.00</td>
<td>$42.66</td>
</tr>
<tr>
<td>5</td>
<td>03/01/2018</td>
<td>$18.81</td>
<td>$13.00</td>
<td>$13.03</td>
<td>$0.00</td>
<td>$44.84</td>
</tr>
<tr>
<td>6</td>
<td>03/01/2018</td>
<td>$20.69</td>
<td>$13.00</td>
<td>$13.32</td>
<td>$0.00</td>
<td>$47.01</td>
</tr>
<tr>
<td>7</td>
<td>03/01/2018</td>
<td>$22.57</td>
<td>$13.00</td>
<td>$13.61</td>
<td>$0.00</td>
<td>$49.18</td>
</tr>
<tr>
<td>8</td>
<td>03/01/2018</td>
<td>$24.45</td>
<td>$13.00</td>
<td>$13.90</td>
<td>$0.00</td>
<td>$51.35</td>
</tr>
<tr>
<td>9</td>
<td>03/01/2018</td>
<td>$26.33</td>
<td>$13.00</td>
<td>$14.19</td>
<td>$0.00</td>
<td>$53.52</td>
</tr>
<tr>
<td>10</td>
<td>03/01/2018</td>
<td>$28.21</td>
<td>$13.00</td>
<td>$14.48</td>
<td>$0.00</td>
<td>$55.69</td>
</tr>
</tbody>
</table>

### BRICKLAYERS LOCAL 3 - MARBLE & TILE

<table>
<thead>
<tr>
<th>Step</th>
<th>Effective Date</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>02/01/2018</td>
<td>$51.00</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$81.78</td>
</tr>
<tr>
<td>2</td>
<td>08/01/2018</td>
<td>$51.85</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$83.26</td>
</tr>
<tr>
<td>3</td>
<td>02/01/2019</td>
<td>$52.49</td>
<td>$10.75</td>
<td>$20.66</td>
<td>$0.00</td>
<td>$83.90</td>
</tr>
<tr>
<td>4</td>
<td>08/01/2019</td>
<td>$53.84</td>
<td>$10.75</td>
<td>$20.80</td>
<td>$0.00</td>
<td>$86.39</td>
</tr>
<tr>
<td>5</td>
<td>02/01/2020</td>
<td>$54.48</td>
<td>$10.75</td>
<td>$20.95</td>
<td>$0.00</td>
<td>$87.53</td>
</tr>
<tr>
<td>6</td>
<td>08/01/2020</td>
<td>$55.83</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$0.00</td>
<td>$89.73</td>
</tr>
<tr>
<td>7</td>
<td>02/01/2021</td>
<td>$56.47</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$0.00</td>
<td>$90.32</td>
</tr>
<tr>
<td>8</td>
<td>08/01/2021</td>
<td>$57.87</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$0.00</td>
<td>$90.32</td>
</tr>
<tr>
<td>9</td>
<td>02/01/2022</td>
<td>$58.46</td>
<td>$10.75</td>
<td>$21.11</td>
<td>$0.00</td>
<td>$90.32</td>
</tr>
</tbody>
</table>
## Classification

### TERRAZZO FINISHER - Local 3 Marble & Tile

#### Apprentice - Effective Date: 02/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$25.50</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$56.28</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$30.60</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$61.38</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$35.70</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$66.48</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$40.80</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$71.58</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$45.90</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$76.68</td>
</tr>
</tbody>
</table>

#### Effective Date: 08/01/2018

<table>
<thead>
<tr>
<th>Step</th>
<th>percent</th>
<th>Apprentice Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>$25.93</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$56.71</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>$31.11</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$61.89</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$36.30</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$67.08</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>$41.48</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$72.26</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>$46.67</td>
<td>$10.75</td>
<td>$20.03</td>
<td>$0.00</td>
<td>$77.45</td>
</tr>
</tbody>
</table>

### Notes:

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

TEST BORING DRILLER HELPER

<table>
<thead>
<tr>
<th>Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/18</td>
<td>$38.07</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$61.17</td>
</tr>
<tr>
<td>12/01/18</td>
<td>$39.02</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$62.12</td>
</tr>
<tr>
<td>06/01/19</td>
<td>$40.02</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$63.12</td>
</tr>
<tr>
<td>12/01/19</td>
<td>$41.02</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$64.12</td>
</tr>
<tr>
<td>06/01/20</td>
<td>$42.01</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$65.11</td>
</tr>
<tr>
<td>12/01/20</td>
<td>$42.99</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$66.09</td>
</tr>
<tr>
<td>06/01/21</td>
<td>$44.01</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$67.11</td>
</tr>
<tr>
<td>12/01/21</td>
<td>$45.02</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$68.12</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEST BORING LABORER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LABORERS - FOUNDATION AND MARINE</td>
<td>06/01/2018</td>
<td>$37.95</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$61.05</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$38.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$62.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$39.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$63.00</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$40.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.00</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$41.89</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$64.99</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$42.87</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$65.97</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$43.89</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$66.99</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$44.90</td>
<td>$7.70</td>
<td>$15.40</td>
<td>$0.00</td>
<td>$68.00</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

| TRACTORS/PORTABLE STEAM GENERATORS OPERATING ENGINEERS LOCAL 4 | 06/01/2018 | $46.61 | $11.00 | $15.50 | $0.00 | $73.11 |
|                                                               | 12/01/2018 | $47.64 | $11.00 | $15.50 | $0.00 | $74.25 |
|                                                               | 06/01/2019 | $48.48 | $11.00 | $15.50 | $0.00 | $75.34 |
|                                                               | 12/01/2019 | $49.48 | $11.00 | $15.50 | $0.00 | $76.48 |
|                                                               | 06/01/2020 | $51.06 | $11.00 | $15.50 | $0.00 | $77.56 |
|                                                               | 12/01/2020 | $52.06 | $11.00 | $15.50 | $0.00 | $78.66 |
|                                                               | 06/01/2021 | $53.29 | $11.00 | $15.50 | $0.00 | $79.79 |
|                                                               | 12/01/2021 | $54.32 | $11.00 | $15.50 | $0.00 | $80.93 |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| TRAILERS FOR EARTH MOVING EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE A | 12/01/2016 | $34.12 | $10.91 | $10.89 | $0.00 | $55.92 |

| TUNNEL WORK - COMPRESSED AIR LABORERS (COMPRESSED AIR) | 06/01/2018 | $50.23 | $7.70  | $15.80  | $0.00  | $73.73 |
|                                                        | 12/01/2018 | $51.18 | $7.70  | $15.80  | $0.00  | $74.68 |
|                                                        | 06/01/2019 | $52.18 | $7.70  | $15.80  | $0.00  | $75.68 |
|                                                        | 12/01/2019 | $53.18 | $7.70  | $15.80  | $0.00  | $76.68 |
|                                                        | 06/01/2020 | $54.17 | $7.70  | $15.80  | $0.00  | $77.67 |
|                                                        | 12/01/2020 | $55.15 | $7.70  | $15.80  | $0.00  | $78.65 |
|                                                        | 06/01/2021 | $56.15 | $7.70  | $15.80  | $0.00  | $79.67 |
|                                                        | 12/01/2021 | $57.18 | $7.70  | $15.80  | $0.00  | $80.68 |

For apprentice rates see "Apprentice- LABORER"

| TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) LABORERS (COMPRESSED AIR) | 06/01/2018 | $52.23 | $7.70  | $15.80  | $0.00  | $75.73 |
|                                                                     | 12/01/2018 | $53.18 | $7.70  | $15.80  | $0.00  | $76.68 |
|                                                                     | 06/01/2019 | $54.18 | $7.70  | $15.80  | $0.00  | $77.68 |
|                                                                     | 12/01/2019 | $55.18 | $7.70  | $15.80  | $0.00  | $78.68 |
|                                                                     | 06/01/2020 | $56.17 | $7.70  | $15.80  | $0.00  | $79.67 |
|                                                                     | 12/01/2020 | $57.15 | $7.70  | $15.80  | $0.00  | $80.65 |
|                                                                     | 06/01/2021 | $58.17 | $7.70  | $15.80  | $0.00  | $81.67 |
|                                                                     | 12/01/2021 | $59.18 | $7.70  | $15.80  | $0.00  | $82.68 |

For apprentice rates see "Apprentice- LABORER"

| TUNNEL WORK - FREE AIR LABORERS (FREE AIR TUNNEL) | 06/01/2018 | $42.30 | $7.70  | $15.80  | $0.00  | $65.80 |
|                                                   | 12/01/2018 | $43.25 | $7.70  | $15.80  | $0.00  | $66.75 |
|                                                   | 06/01/2019 | $44.25 | $7.70  | $15.80  | $0.00  | $67.75 |
|                                                   | 12/01/2019 | $45.25 | $7.70  | $15.80  | $0.00  | $68.75 |
|                                                   | 06/01/2020 | $46.24 | $7.70  | $15.80  | $0.00  | $69.74 |
|                                                   | 12/01/2020 | $47.22 | $7.70  | $15.80  | $0.00  | $70.72 |
|                                                   | 06/01/2021 | $48.24 | $7.70  | $15.80  | $0.00  | $71.74 |
|                                                   | 12/01/2021 | $49.25 | $7.70  | $15.80  | $0.00  | $72.75 |

For apprentice rates see "Apprentice- LABORER"
<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUNNEL WORK - FREE AIR (HAZ. WASTE) LABORERS (FREE AIR TUNNEL)</td>
<td>06/01/2018</td>
<td>$44.30</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$67.80</td>
</tr>
<tr>
<td></td>
<td>12/01/2018</td>
<td>$45.25</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$68.75</td>
</tr>
<tr>
<td></td>
<td>06/01/2019</td>
<td>$46.25</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$69.75</td>
</tr>
<tr>
<td></td>
<td>12/01/2019</td>
<td>$47.25</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$70.75</td>
</tr>
<tr>
<td></td>
<td>06/01/2020</td>
<td>$48.24</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$71.74</td>
</tr>
<tr>
<td></td>
<td>12/01/2020</td>
<td>$49.22</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$72.72</td>
</tr>
<tr>
<td></td>
<td>06/01/2021</td>
<td>$50.24</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$73.74</td>
</tr>
<tr>
<td></td>
<td>12/01/2021</td>
<td>$51.25</td>
<td>$7.70</td>
<td>$15.80</td>
<td>$0.00</td>
<td>$74.75</td>
</tr>
</tbody>
</table>

For apprentice rates see "Apprentice- LABORER"

| VAC-HAUL TEAMSTERS JOINT COUNCIL NO. 10 ZONE A | 12/01/2016     | $33.54    | $10.91 | $10.89  | $0.00                      | $55.34     |

| WAGON DRILL OPERATOR LABORERS - ZONE 1         | 06/01/2018     | $38.25    | $7.70  | $15.20  | $0.00                      | $61.15     |
|                                                   | 12/01/2018     | $39.20    | $7.70  | $15.20  | $0.00                      | $62.10     |
|                                                   | 06/01/2019     | $40.20    | $7.70  | $15.20  | $0.00                      | $63.10     |
|                                                   | 12/01/2019     | $41.20    | $7.70  | $15.20  | $0.00                      | $64.10     |
|                                                   | 06/01/2020     | $42.19    | $7.70  | $15.20  | $0.00                      | $65.09     |
|                                                   | 12/01/2020     | $43.17    | $7.70  | $15.20  | $0.00                      | $66.07     |
|                                                   | 06/01/2021     | $44.19    | $7.70  | $15.20  | $0.00                      | $67.09     |
|                                                   | 12/01/2021     | $45.20    | $7.70  | $15.20  | $0.00                      | $68.10     |

For apprentice rates see "Apprentice- LABORER"

| WASTE WATER PUMP OPERATOR OPERATING ENGINEERS LOCAL 4 | 06/01/2018     | $47.08    | $11.00 | $15.50  | $0.00                      | $73.58     |
|                                                   | 12/01/2018     | $48.23    | $11.00 | $15.50  | $0.00                      | $74.73     |
|                                                   | 06/01/2019     | $49.33    | $11.00 | $15.50  | $0.00                      | $75.83     |
|                                                   | 12/01/2019     | $50.48    | $11.00 | $15.50  | $0.00                      | $76.98     |
|                                                   | 06/01/2020     | $51.58    | $11.00 | $15.50  | $0.00                      | $78.08     |
|                                                   | 12/01/2020     | $52.73    | $11.00 | $15.50  | $0.00                      | $79.23     |
|                                                   | 06/01/2021     | $53.83    | $11.00 | $15.50  | $0.00                      | $80.33     |
|                                                   | 12/01/2021     | $54.98    | $11.00 | $15.50  | $0.00                      | $81.48     |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| WATER METER INSTALLER PLUMBERS & GASFITTERS LOCAL 12 | 03/01/2018     | $54.69    | $11.57 | $15.76  | $0.00                      | $82.02     |
|                                                   | 09/01/2018     | $56.19    | $11.57 | $15.76  | $0.00                      | $83.52     |
|                                                   | 03/01/2019     | $57.69    | $11.57 | $15.76  | $0.00                      | $85.02     |
|                                                   | 09/01/2019     | $59.19    | $11.57 | $15.76  | $0.00                      | $86.52     |
|                                                   | 03/01/2020     | $60.69    | $11.57 | $15.76  | $0.00                      | $88.02     |
|                                                   | 09/01/2020     | $62.19    | $11.57 | $15.76  | $0.00                      | $89.52     |
|                                                   | 03/01/2021     | $63.69    | $11.57 | $15.76  | $0.00                      | $91.02     |

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

| Outside Electrical - East                        | 09/03/2017     | $27.14    | $7.75  | $1.81   | $0.00                      | $36.70     |

For apprentice rates see "Apprentice- LINEMAN"

| CABLEMAN (Underground Ducts & Cables) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 09/03/2017     | $38.45    | $7.75  | $9.53   | $0.00                      | $55.73     |

For apprentice rates see "Apprentice- LINEMAN"

| DRIVER / GROUNDMAN CDL OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 09/03/2017     | $31.66    | $7.75  | $9.44   | $0.00                      | $48.85     |

For apprentice rates see "Apprentice- LINEMAN"
### Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRIVER / GROUNDMAN -Inexperienced (&lt;2000 Hrs)</td>
<td>09/03/2017</td>
<td>$24.88</td>
<td>$7.75</td>
<td>$1.75</td>
<td>$0.00</td>
<td>$34.38</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LINEMAN&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQUIPMENT OPERATOR (Class A CDL)</td>
<td>09/03/2017</td>
<td>$38.45</td>
<td>$7.75</td>
<td>$13.61</td>
<td>$0.00</td>
<td>$59.81</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LINEMAN&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQUIPMENT OPERATOR (Class B CDL)</td>
<td>09/03/2017</td>
<td>$33.92</td>
<td>$7.75</td>
<td>$10.21</td>
<td>$0.00</td>
<td>$51.88</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LINEMAN&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUNDMAN</td>
<td>09/03/2017</td>
<td>$24.88</td>
<td>$7.75</td>
<td>$1.75</td>
<td>$0.00</td>
<td>$34.38</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LINEMAN&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUNDMAN -Inexperienced (&lt;2000 Hrs.)</td>
<td>09/03/2017</td>
<td>$20.35</td>
<td>$7.75</td>
<td>$1.61</td>
<td>$0.00</td>
<td>$29.71</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For apprentice rates see &quot;Apprentice- LINEMAN&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOURNEYMAN LINEMAN</td>
<td>09/03/2017</td>
<td>$45.23</td>
<td>$7.75</td>
<td>$16.61</td>
<td>$0.00</td>
<td>$69.59</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apprentice - LINEMAN (Outside Electrical) - East Local 104</td>
<td>09/03/2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective Date -</td>
<td>09/03/2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>percent</td>
<td>Apprentice Base Wage</td>
<td>Health</td>
<td>Pension</td>
<td>Unemployment</td>
<td>Total Rate</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>----------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
<td>$27.14</td>
<td>$7.75</td>
<td>$3.31</td>
<td>$0.00</td>
<td>$38.20</td>
</tr>
<tr>
<td>2</td>
<td>65</td>
<td>$29.40</td>
<td>$7.75</td>
<td>$3.38</td>
<td>$0.00</td>
<td>$40.53</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>$31.66</td>
<td>$7.75</td>
<td>$3.45</td>
<td>$0.00</td>
<td>$42.86</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>$33.92</td>
<td>$7.75</td>
<td>$5.02</td>
<td>$0.00</td>
<td>$46.69</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>$36.18</td>
<td>$7.75</td>
<td>$5.09</td>
<td>$0.00</td>
<td>$49.02</td>
</tr>
<tr>
<td>6</td>
<td>85</td>
<td>$38.45</td>
<td>$7.75</td>
<td>$5.15</td>
<td>$0.00</td>
<td>$51.35</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>$40.71</td>
<td>$7.75</td>
<td>$7.22</td>
<td>$0.00</td>
<td>$55.68</td>
</tr>
</tbody>
</table>

### Notes:

- **Apprentice to Journeyworker Ratio:** 1:2

### Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELEDATA CABLE SPLICER</td>
<td>02/05/2018</td>
<td>$29.98</td>
<td>$4.70</td>
<td>$3.15</td>
<td>$0.00</td>
<td>$37.83</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td>02/04/2019</td>
<td>$30.73</td>
<td>$4.70</td>
<td>$3.17</td>
<td>$0.00</td>
<td>$38.60</td>
</tr>
<tr>
<td>TELEDATA LINEMAN/EQUIPMENT OPERATOR</td>
<td>05/05/2018</td>
<td>$28.22</td>
<td>$4.70</td>
<td>$3.10</td>
<td>$0.00</td>
<td>$36.02</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td>02/04/2019</td>
<td>$28.93</td>
<td>$4.70</td>
<td>$3.14</td>
<td>$0.00</td>
<td>$36.77</td>
</tr>
<tr>
<td>TELEDATA WIREMAN/INSTALLER/TECHNICIAN</td>
<td>02/05/2018</td>
<td>$28.22</td>
<td>$4.70</td>
<td>$3.10</td>
<td>$0.00</td>
<td>$36.02</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td>02/04/2019</td>
<td>$28.93</td>
<td>$4.70</td>
<td>$3.14</td>
<td>$0.00</td>
<td>$36.77</td>
</tr>
<tr>
<td>TREE TRIMMER</td>
<td>01/31/2016</td>
<td>$18.51</td>
<td>$3.55</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$22.06</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company’s equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Unemployment</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREE TRIMMER GROUNDMAN</td>
<td>01/31/2016</td>
<td>$16.32</td>
<td>$3.55</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$19.87</td>
</tr>
<tr>
<td>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company’s equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.
### Additional Apprentice 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. Apprentice 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, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 2:2, 3:4, 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.
A. General Information

1. From: Quincy Conservation Commission

2. This issuance is for (check one):
   a. ☑ Order of Conditions  b. □ Amended Order of Conditions

3. To: Applicant:
   Merrymount Parkway
   a. First Name
   City of Quincy
   c. Organization
   One Merrymount Parkway
   d. Mailing Address
   Quincy
   e. City/Town  g. Zip Code

4. Property Owner (if different from applicant):
   a. First Name  b. Last Name
   c. Organization
   d. Mailing Address
   e. City/Town  f. State

5. Project Location:
   Merrymount Parkway
   a. Street Address
   5076
   c. Assessors Map/Plat Number
   b. City/Town  d. Parcel/Lot Number
   Latitude and Longitude, if known: 42.262130d m 71.007043d m
A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
   Norfolk
   a. County
   b. Certificate Number (if registered land)
   c. Book
   d. Page
   e. Scale

7. Dates:
   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):
   Merrymount Parkway Reconstruction Project
   a. Plan Title
   b. Prepared By
   c. Signed and Stamped by
   April 2018
   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:

   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.
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)

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Proposed Alteration</th>
<th>Permitted Alteration</th>
<th>Proposed Replacement</th>
<th>Permitted Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. □ Bank</td>
<td>a. linear feet</td>
<td>b. linear feet</td>
<td>c. linear feet</td>
<td>d. linear feet</td>
</tr>
<tr>
<td>5. □ Bordering Vegetated Wetland Land Under Waterbodies and Waterways</td>
<td>a. square feet 460</td>
<td>b. square feet 340</td>
<td>c. square feet</td>
<td>d. square feet</td>
</tr>
<tr>
<td></td>
<td>a. square feet 0</td>
<td>b. square feet</td>
<td>c. square feet</td>
<td>d. square feet</td>
</tr>
<tr>
<td></td>
<td>e. c/y dredged</td>
<td>f. c/y dredged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. □ Bordering Land Subject to Flooding Cubic Feet Flood Storage</td>
<td>a. square feet</td>
<td>b. square feet</td>
<td>c. square feet</td>
<td>d. square feet</td>
</tr>
<tr>
<td>7. □ Isolated Land Subject to Flooding Cubic Feet Flood Storage</td>
<td>a. square feet</td>
<td>b. square feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. □ Riverfront Area</td>
<td>a. cubic feet</td>
<td>b. cubic feet</td>
<td>c. cubic feet</td>
<td>d. cubic feet</td>
</tr>
<tr>
<td></td>
<td>c. cubic feet Blacks Creek 66, 120</td>
<td>d. cubic feet 79, 620</td>
<td>e. cubic feet</td>
<td>f. cubic feet</td>
</tr>
<tr>
<td></td>
<td>c. square feet 13,500</td>
<td>d. square feet 13,500</td>
<td>e. square feet</td>
<td>f. square feet</td>
</tr>
<tr>
<td></td>
<td>g. square feet</td>
<td>h. square feet</td>
<td>i. square feet</td>
<td>j. square feet</td>
</tr>
</tbody>
</table>
## B. Findings (cont.)

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

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Proposed</th>
<th>Permitted</th>
<th>Proposed</th>
<th>Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Designated Port Areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Land Under the Ocean</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Barrier Beaches</td>
<td>□</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Coastal Beaches</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>14</td>
<td>Coastal Dunes</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>15</td>
<td>Coastal Banks</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>16</td>
<td>Rocky Intertidal Shores</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>17</td>
<td>Salt Marshes</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>18</td>
<td>Land Under Salt Ponds</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>19</td>
<td>Land Containing Shellfish</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>20</td>
<td>Fish Runs</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>21</td>
<td>Land Subject to Coastal Storm Flowage</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>22</td>
<td>Riverfront Area</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

**Indicate size under Land Under the Ocean, below**

**Indicate size under Coastal Beaches and/or Coastal Dunes below**

**Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above**

**Indicate size under Coastal Storm Flowage**

**Sq ft within 100 ft**

**Sq ft between 100-200 ft**
B. Findings (cont.)

23. ☐ Restoration/Enhancement *:
   a. square feet of BW
   b. square feet of salt marsh

24. ☐ 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.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.

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. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).

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 May 2, 2012 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.
C. General Conditions Under Massachusetts Wetlands Protection Act

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.

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 059-1413"

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

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.

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 if it deems necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the “Project”)
   (1) ☒ is subject to the Massachusetts Stormwater Standards
   (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.

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.
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):


20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.
D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes  ☐ No

2. The ___________________________ 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:

   ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯俪

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:
   Quincy Wetlands Protection Act 401-87
   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):
   1. A copy of the Order of Conditions and Approved Plans shall be on-site during all operations.
   2. Prior to any activity on site, the Applicant shall inform the Commission of the Name and Contact information of the on-site Construction Supervisor as well as the start date of the project.
   3. Erosion and sediment control shall be maintained at all times and not removed until approved by the Commission.
   4. Comply with: comment letters from all City Departments; All DEP & Commission Requests
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.

Signatures:

Maureen C. Glynn

Jeffrey Graeber

John C. Brennan

Thomas Carroll

☐ by certified mail, return receipt requested, on

May 4, 2018

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 for 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.
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:

   Merrymount Parkway Reconstruction Project
   Department of Public Works &
   Park, Forestry, and Cemetery Department
   City of Quincy
   July 2018

   Tighe & Bond, Inc.
   Consulting Engineers
   Westfield, Massachusetts

2. The Work includes the following major items:

   a. 1,100 linear feet of water main. Including a new connection to an existing water main
   b. New drainage piping, structures, infiltration system, stormwater treatment units, and outfalls to Blacks Creek.
   c. Bituminous concrete pavement full depth reconstruction and mill and overlay.
   d. Remove and reset granite curb and supplementing with additional granite curbing as needed.
   e. Double stacked granite curb landscape median island
   f. New street lighting, conduit, and handholes
   g. Coordination with utility companies to provide underground electrical, communications, cable, and fire alarm systems.
   h. Pavement Marking and thermoplastic panel asphalt crosswalk
   i. Retaining wall construction
   j. New landscaping and aesthetic improvements

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 PROJECT/SITE CONDITIONS

A. Permits

1. Obtain the permits and approvals listed below:
   
a. National Pollution Discharge Elimination System (NPDES) Stormwater Permit
   
b. Permits and licenses of a temporary nature necessary to perform the Work.
   
c. Permits for disposal of construction wastes including disposal of cleared and grubbed materials.
   
d. Other permits or licenses required for the Contractor’s operations or required elsewhere in the Contract Documents and not included herein.

2. Comply with the permits and approvals listed below:

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. 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.

b. Obtain permits and written approvals from appropriate jurisdictional agencies for the use of premises not available for use by the Owner, including all off-site staging areas, borrow pits and waste areas. Submit copies of all permits and approvals to the Owner prior to using areas.

c. Provide for the disposal of waste materials off-site in accordance with all applicable laws.
d. Adhere to the limits of Work and traffic control plans 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.

e. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.

f. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.

C. Other Requirements

1. Comply with the Quincy Water and Sewer Department requirements included in Section 00800 for all Work on their existing water mains.

2. Comply with National Grid requirements for working adjacent to or under power lines.

PART 2 PRODUCTS – (NOT USED)

PART 3 EXECUTION – NOT USED

END OF SECTION
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

B.  Related Requirements

1.  Section 01310 - Coordination
2.  Section 01325 - Scheduling of Construction

1.2  SUBMITTALS

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

1.3  WORK SCHEDULE

A.  Conduct the Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 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.

B.  Cutting of paved surfaces, excavation within any paved roadway, or pavement resurfacing activities is not allowed from November 15th to April 1st.

PART 2  PRODUCTS – NOT USED

PART 3  EXECUTION – NOT USED

END OF SECTION
SECTION 01270
MEASUREMENT AND PAYMENT

PART 1  GENERAL

1.1  DIVISION 0 AND DIVISION 1 WORK INCIDENTAL TO THE CONTRACT PRICE

A.  No separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the 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.

1.  All soil and compaction testing
2.  All color audio-video documentation survey of existing surface features

B.  Division 2 Work will be measured and paid for at the Contractor’s unit Bid price or lump sum item cost as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid Item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.


D.  Measurement and payment for Division 2 Work is defined in the Standard Specifications and/or in the Special Provisions.

PART 2  PRODUCTS - NOT USED

PART 3  EXECUTION - NOT USED

END OF SECTION
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 Special Provisions 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. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

1.3 LUMP SUM ITEMS

A. Each lump sum price stated in the Bid form shall be measured and paid for in accordance with the Special Provisions.

1.4 UNIT PRICE ITEMS

A. Each unit price stated in the Bid form shall be measured and paid for in accordance with the Special Provisions.
PART 2  PRODUCTS - NOT USED
PART 3  EXECUTION - NOT USED

END OF SECTION

J:\Q\Q0019 Quincy, MA Consultant Review Services\Q0019-002 Merrymount Park\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 ________________________________ hereunto 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:  __________________

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Supplier/Manufacturer</th>
<th>Quantity Stored and not Incorporated</th>
<th>Unit $</th>
<th>Certified Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signature: ____________________________  Total Amount Due for Stored Materials ______________________________

Contractor’s Principal

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.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION
SECTION 01310
COORDINATION

PART 1 GENERAL

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

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

1.3 PROJECT MANAGEMENT
A. Retain a full-time Superintendent, satisfactory to the Owner and Engineer. The Superintendent shall not be changed except with the consent of the Owner and Engineer. The Superintendent shall be in full charge of the Work.

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

1.4 COORDINATION

A. Do not interfere with the operation of the existing facilities.

B. Perform all coordination necessary to complete work.

C. Coordinate with appropriate utility companies, as well as with the Owner, where the Work crosses or is adjacent to existing utilities. A preliminary list of contacts is provided in the Special Provisions.

D.

1.5 PROJECT MEETINGS

A. Pre-Construction Conference

1. The Contractor shall be prepared to discuss the following subjects at the Pre-Construction Conference. Documentation for these items is required to be submitted within the time frames included in individual specification sections.

   a. Project scheduling
   b. Sequencing of critical path Work items
   c. Shop Drawing procedures
   d. Project changes and clarification procedures
   e. Use of sites, access to Work areas, office and storage areas, security and temporary facilities
   f. Contractor safety plan and representative
   g. Progress payments and procedures
   h. Required documentation
   i. Project personnel contact list

B. Progress Meetings

1. Progress meetings will be held 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. Work on site shall not occur until all required permits are obtained.

B. Notify the Owner and Engineer, in writing, a minimum of 1 week before commencing any work which may affect the Owner’s operations.

C. Perform all construction activities so as to avoid interference with operations of the facility and the work of others.

D. Coordinate the following operations with the Owner and the Engineer:
   1. Operation of existing valves. The opening and closing of existing valves will be performed by the Owner.
   2. The Owner will operate all existing facilities. Do not operate any existing equipment without the Owner’s approval. The Owner will operate existing facilities or equipment that may be required in order for the Contractor to make connections to existing facilities.

E. The Owner has the authority to order the Work stopped which could unreasonably result in stopping the necessary functions of the City infrastructure. Any costs and/or delays associated with these work stoppages due to the Contractor’s operation shall be borne by the Contractor.

3.3 SEQUENCE OF CONSTRUCTION

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

B. The bid quantities for pavement and utility work were created using the following general sequence of work. There will be no compensation for additional quantities created by altering the above sequence of work. The sequence may be altered at the Contractor’s own expense:
   1. Utility installation
   2. Sidewalk construction
   3. Road Construction
   4. Landscaping
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.

1.3 QUALITY ASSURANCE – NOT USED

PART 2 PRODUCTS

2.1 CONSTRUCTION PHOTOGRAPHS
   A. Electronic files shall be in .jpg format.

PART 3 EXECUTION

3.1 PRE-CONSTRUCTION PHOTOGRAPHY
   A. Prior to the commencement of any Work under this Contract, take a minimum of 2 photographs at each location at 100 foot intervals along the entire length of the roadway. The photographs will serve as a record of the original conditions where construction activities will occur.
   B. The area to be photographed shall include, but not be limited to, the area within and adjacent to the proposed construction, including roadways, utilities, driveways, landscaping, trees, structures and buildings.

3.2 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 photographs of all utility abandonments.
   C. Take photographs of all relocated utility connections.

3.3 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
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

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. 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
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 shopwork manufacturing instructions, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certification, as applicable to the Work.
   2. Shop Drawings shall be of standardized sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard size drawings shall be
      a. 24-inches by 36-inches
      b. 22-inches by 34-inches
      c. 11-inches by 17-inches
      d. 8.5-inches by 11-inches
   3. Submit Shop Drawings at the proper time so as to prevent delays in delivery of materials. Coordinate submittals for related or interdependent equipment.
   4. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.
   5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or
otherwise in error shall be returned to the Subcontractors or Suppliers for correction before submission to the Engineer. Drawings that are current shall be marked with the date, name, and approval stamp of the Contractor.

6. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.

7. 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.

8. 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.

9. 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.

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.

2. Submit schedule of stored materials when requesting payment for materials not yet installed.

G. **Construction Photography:** Provide preconstruction, progress, and post-construction photography and videography in accordance with Sections 01320.

H. **Contract Closeout Submittals:** In accordance with Section 01770.

I. **Contractor Design Data**
1. Written and graphic information
2. List of assumptions
3. List of performance and design criteria
4. Summary of loads or load diagram
5. Calculations
6. List of applicable codes and regulations
7. Name and version of software
8. Information requested in individual Specification section

J. Manufacturer’s Instructions: Written or published information that documents manufacturer’s recommendations, guidelines, and procedures in accordance with individual Specification sections.

K. Schedules - Submit construction progress schedules and schedule updates in accordance with Section 01325.

L. Statement of Qualifications: Submit evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty subcontractor, trade, specialist, consultant, installer, and other professionals.

M. Submittals Required by Laws, Regulations, and Governing Agencies
   1. Submit promptly notifications, reports, certifications, payrolls, and other required information as may be required, directly to the applicable federal, state, or local governing agency or their representative.
   2. Transmit to Engineer for Owner’s records, one copy of correspondence and transmittals (including enclosures and attachments) between Contractor and governing agency.

N. Test and Inspection Reports
   1. Submit test and inspection reports as required by individual Specification sections.
   2. Test and inspection reports shall contain signature of person responsible for test or report.
   3. Reports shall include identification of product and Specification, project name, date and time of test, type of test, location, test results, corrective action required if report indicates test is not in compliance with Contract Documents, interpretation of test results, and other information as required in individual Specification sections.

O. Equipment Data: Submit information on equipment to be used in the performance of the Work as required by individual Specification sections.

P. Testing and Start-up Data: Prepare and submit testing procedures proposed to perform testing required by individual Specification sections.
Q. Vendor Training Plan: At least two weeks prior to scheduling training of Owner’s personnel, submit lesson plans for vendor training in accordance with individual Specification section and manufacturer’s Operations and Maintenance Manuals.

R. Health & Safety Plans: When specified in individual Specification sections, prepare and submit a Health and Safety Plan modified or supplemented to include job-specific considerations.

S. Submittals stamped by another Professional Engineer: When specified in individual Specification sections, prepare and submit calculations and/or drawings stamped by a Professional Engineer licensed in the State where the work is being performed.

T. Coordination Drawings: When specified in individual Specification sections, prepare and submit drawings to show how multiple system and interdisciplinary work will be coordinated. Examples are conduit routing diagrams, duct layouts, utility coordination drawings, sprinkler plans etc.

U. Work Plans: When specified in individual Specification sections, prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities.

V. Erosion Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of erosion control plans.

W. Traffic Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of traffic control plans.

X. 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.

Y. 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 sequential letter suffix commencing with "A". (e.g. Submittal number 11330-01A)

E. Provide a copy of the Submittal certification form (copy attached at the end of this section) which shall be attached to every copy of each Submittal as required under Article 7.16 A.2 of Section 00700. Apply the Contractor’s stamp and initials or signature certifying that the submission has been thoroughly reviewed for completeness, compliance with the Contract Documents, coordination with adjacent construction and dimensional compatibility. Items submitted without the stamp or that are incomplete will be returned by the Engineer for rework and resubmission.

F. Provide a copy of the P.E. certification form (copy attached at the end of this section) which shall be attached to every copy of each Submittal stamped by another Professional Engineer. Items submitted without the completed certification form will be returned by the Engineer for resubmission.

G. Distribute copies of reviewed submittals along with the Engineer’s transmittal to concerned parties with instructions to promptly report any inability to comply with the provisions or integrate the requirements with interfacing work.

H. Partial and Incomplete Submittals

1. Shop Drawings shall be submitted as a complete package by Specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials, and samples associated with each Specification section be included as a single submittal for the Engineer’s review.

2. Engineer will return entire submittals if preliminary review deems it incomplete including:

   a. Missing or incomplete Submittal certification form

   b. Insufficient number of copies
c. Missing content

3. Partial submittals may be considered, at Engineer’s option, only when necessary to expedite the Project.

4. Partial submittals shall be clearly identified as such on the transmittal to identify missing components.

I. Submittals not required by the Specification will be returned without review or action code.

J. Resubmission

1. Make corrections and modifications required by the Engineer and resubmit until approved.

2. Clearly identify changes made to submittals and indicate other changes that have been made other than those requested by the Engineer.

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

K. Distribution

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

1.6 ENGINEER’S REVIEW

A. The Engineer will review submittals for design, general methods of construction and detailing. The Engineer’s review and approval of submittals shall not be construed as a complete check nor does it relieve the Contractor from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Engineer’s attention to such deviations at the time of submission. It will not extend to means, methods, technique, sequences, or procedures of construction (except where specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.

B. The Engineer’s review of the submittals shall not relieve the Contractor from the responsibility for proper fitting of the Work, or the responsibility of furnishing any work required by the Contract Documents which may not be indicated on the submittals. The Contractor shall be solely responsible for any quantities shown on the submittals.

C. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall provide written notice to the Engineer at least 7 working days prior to release for manufacture.

D. When the submittals have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
E. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:

1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.

2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.

3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.

4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.

F. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:

1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.

2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION
SUBMITTAL CERTIFICATION FORM

PROJECT:_____________________________________________________________
ENGINEER:_____________________ ENGINEER’S PROJECT NO.:____________________
CONTRACTOR:__________________ CONTRACTOR’S PROJECT NO.:_______________
TRANSMITTAL NO.:_______________ SUBMITTAL NO.:___________________________
SPECIFICATION NO.:______________ DRAWING NO:___________________________
DESCRIPTION:_________________________________________________________
MANUFACTURER:_______________________________________________________

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

☐ NO DEVIATIONS

☐ A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

SUBMITTED BY:___________________________ DATE:_______________________

GENERAL CONTRACTOR’S STAMP
P.E. CERTIFICATION FORM

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

_____________________________________________________________ to design

(Name of Contractor)

_____________________________________________________________

(Insert P.E. Responsibilities)

In accordance with Specification Section ________________________________for the

_____________________________________________________________

(Name of Project)

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

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

_____________________________________________________________

(Insert Name of Owner)

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

P.E. Name

Contractor’s Name

____________________________   ____________________________

Signature                                             Signature

Title

Title

____________________________   ____________________________

Address                                             Address
SECTION 01420

REFERENCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes


1.2 GENERAL

A. Comply with the requirements of standards referenced in the Contract Documents.

1.3 ABBREVIATIONS

A. Abbreviations used in the Specifications are defined as follows:

1. AA – Aluminum Association
2. AABC – Associated Air Balance Council
3. AASHTO – American Association of State Highway and Transportation Officials
4. ACI - American Concrete Institute
5. ACOE - U.S. Army Corps of Engineers
6. ADA – Americans with Disabilities Act
7. ADC – Air Diffusion Council
8. AFBMA – Antifriction Bearing Manufacturers Association
9. AGA – American Gas Association
10. AGC – Associated General Contractors of America
11. AGMA - American Gear Manufacturer Association
12. AI – Asphalt Institute
13. AIA – American Institute of Architects
14. AISC – American Institute of Steel Construction
15. AISI - American Iron and Steel Institute
16. AITC - American Institute of Timber Construction
17. AMCA – Air Movement and Control Association
18. ANSI – American National Standards Institute
19. APA – American Plywood Association
20. API – American Petroleum Institute
21. ARI – Air Conditioning and Refrigeration Institute
22. ASCE – American Society of Civil Engineers
23. ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers
24. ASME – American Society of Mechanical Engineers
25. ASPA – American Sod Producers Association
26. ASTM – American Society for Testing and Materials
27. AWG – American Wire Gauge
28. AWI - Architectural Woodwork Institute
29. AWPA – American Wood Preservers’ Association
30. AWS – American Welding Society
31. AWWA – American Water Works Association
32. BIA – Brick Institute of America
33. CDA – Copper Development Association
34. CLFMI – Chain Link Fence Manufacturer’s Institute
35. CPM - Critical Path Method
36. CPVC – Chlorinated Polyvinyl Chloride
37. CRSI – Concrete Reinforcing Steel Institute
38. CI – Cast Iron
39. DHI – Door and Hardware Institute
40. DI – Ductile Iron
41. EJCDC – Engineers’ Joint Contract Documents Committee
42. EJMA – Expansion Joint Manufacturers Association
43. EPDM – Ethylene Propylene Diene Monomer
44. EPT – Electrical Plastic Tubing
45. EVT – Equiviscous Temperature
46. FGMA - Flat Glass Marketing Association
47. FM – Factory Mutual
48. FS – Federal Specifications
49. GA – Gypsum Association
50. GFCI – Ground Fault Circuit Intempter
51. GPR - Ground Penetrating Radar
52. GPS – Global Positioning System
53. HVAC – Heating, Ventilating and Air Conditioning
54. IBC – International Building Code
55. IBR – Institute of Boiler and Radiator Manufacturers
56. ICBO – International Conference of Building Officials
57. ICS – Industrial Control and Systems
58. IEEE – Institute of Electrical and Electronics Engineers
59. IMI – International Masonry Institute
60. ISA – Instrument Society of America
61. JIC – Joint Industrial Council
62. LCD – Liquid Crystal Display
63. MBMA – Metal Building Manufacturer’s Association
64. MEC – Massachusetts Electric Code
65. MFMA Maple Flooring Manufacturers Association
66. MGL – Massachusetts General Law
67. ML/SFA – Metal Lath/Steel Framing Association
68. MSDS – Material Safety Data Sheets
69. MSS – Manufacturer’s Standardization Society
70. NAAMM – National Association of Architectural Metal Manufacturers
71. NAVD – North American Vertical Datum
72. NCMA – National Concrete Masonry Association
73. NEBB – National Environmental Balancing Bureau
74. NEC – National Electrical Code
75. NECA – National Electrical Contractors Association
76. NEMA – National Electrical Manufacturers Association
77. NFPA – National Fire Protection Association
78. NRCA – National Roofing Contractors Association
79. NRS – Non-rising Stem
80. NSF – National Sanitation Foundation
81. NSWMA – National Solid Waste Management Association
82. NWMA – National Woodwork Manufacturers Association
83. O&M – Operation and Maintenance
84. OSHA – Occupational Safety and Health Administration
85. PCA – Portland Cement Association
86. PCI – Precast/Prestressed Concrete Institute
87. PDOP – Positional Dilution of Precision
88. PLC – Programmable Logic Controller
89. PS – Product Standard
90. PVC – Polyvinyl Chloride
91. QA/QC – Quality Assurance/Quality Control
92. RCP – Reinforced Concrete Pipe
93. RCSHSB – Red Cedar Shingle and Handsplit Shake Bureau
94. RIS – Redwood Inspection Service
95. RTU – Remote Telemetry Unit
96. SCADA – Supervisory Control and Data Acquisition
97. SDI – Steel Deck Institute
98. TCA – Tile Council of America
99. UL – Underwriter’s Laboratories
100. UPS – Uninterruptable Power Supply
101. USCS – Unified Soil Classification System
102. USDA – United States Department of Agriculture
103. WCLIB – West Coast Lumber Inspection Bureau
104. WOG – Water, Oil, Gas
105. WWPA – Western Wood Products Association

END OF SECTION
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. Product test reports
   4. 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. Watermain bacterial disinfection lab tests

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 PRODUCT TEST REPORTS

A. Submit 2 copies of product test reports where required by the Contract Documents.

1.6 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:\Q\Q0019 Quincy, MA Consultant Review Services\Q0019-002 Merrymount Park\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)

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 the Special Provisions.

3.3 CONCRETE TESTING

A. Provide qualified independent field and laboratory testing service to perform the concrete testing required in the Special Provisions 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 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
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
SECTION 01570
TEMPORARY CONTROLS

PART 1   GENERAL

1.1 SUMMARY

A. Section Includes
   1. Dust control
   2. Drainage and erosion control
   3. Compost Filter Tubes
   4. Mulch
   5. Sediment trapping devices

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 COMPOST FILTER TUBES

A. Compost filter tubes shall be in accordance with Item 767.12 as described in the Special provisions.

2.2 SEDIMENT TRAPPING DEVICES

A. Sediment Trapping Devices shall be in accordance with Item 697.1 as described in the Special provisions.

B. 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. Use a mechanical street sweeper daily.

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, haybales, siltation fencing, diversion and control of storm water run-off, ponding areas and similar methods.

B. Provide and maintain sediment trapping systems.

C. 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.

D. 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, reforesting, reseeding, remulching and/or netting to maintain the restored areas until the Work is accepted by the Owner.

G. Seed shall be as specified in the Special Provisions.

3.4 CLEANING

A. Remove any sediment that builds up around the haybales 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
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. Equip drive motors with thermostatically controlled strip heaters. Outdoor storage with plastic, canvas, plywood or other cover will not be allowed except where specific approval for designated items not containing electrical components or bearings is obtained from the Engineer. This approval does not relieve the Contractor of responsibility for proper protection of materials.

D. Familiarize workmen and subcontractors with hazards associated with materials, equipment, and chemicals specified herein and take all necessary safety precautions.

E. Areas available on the construction site for storage of material and equipment shall be as shown on the Drawings or approved by the Owner.

F. Materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier, and Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

G. Protect finished surfaces including floor surfaces, stairs, joints, and soffits of passageways from damage until accepted by the Engineer.

H. Promptly remove materials from the site of the Work which have become damaged or are unfit for the use intended or specified. The Contractor will not be compensated for the damaged materials or their removal costs.

I. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required. 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.

J. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

K. All materials and equipment to be incorporated in the Work shall be placed so as to not damage any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Keep materials and equipment neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to the Owner.

L. No material or equipment will be permitted to be stored in any of the Owner's facilities, unless otherwise approved by the Engineer.

M. Do not store material or equipment in any wetland or environmentally sensitive area. Stockpile sites shall be level, devoid of mature stands of natural vegetation, and removed from drainage facilities and features, wetlands, and stream corridors.

N. Contractor shall be fully responsible for loss or damage to stored materials and equipment.

O. No item judged rusty, corroded or otherwise damaged during storage will be accepted. Any electrical or instrumentation item determined by the Engineer to be damaged shall be removed from the Site and replaced by a completely new item in first class condition. Items not properly stored will not be considered for any partial payment.

P. Provide protective and preventive maintenance during storage consisting of manually exercising equipment where required, inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer as necessary for its protection and other precautions as necessary to assure proper protection of equipment stored.

Q. Treat ferrous surfaces not receiving finish coats of paint with rust preventive coating, and protect non-ferrous metal work and devices with suitable wrappings.

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
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
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.

5. Before starting any site work on any land takings and/or easements, the Contractor’s surveyor shall submit a letter of certification stating that all land takings and/or easements have been laid out in accordance with the recorded land taking and/or easement plans. If any deviations or changes exist, these changes must be fully explained in the letter.

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 misfitting 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.

G. Submit the pre-construction letter of certification as outlined in Part 1 above.

END OF SECTION
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, 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, 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 demolition 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.

E. Replace in-kind any damaged traffic loop detection wiring in a timely fashion. In general, traffic signal wiring damaged by the Contractor shall be replaced and placed in service no later than 24-hours after being taken out of service.

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
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. 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. As-built drawings shall depict the location of all piping and valves installed under this Contract, as well as field changes. 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. Ties to other utility crossings, abandoned pipelines, and sewer service stubs, from two horizontal measurements to permanent surface reference points include depth below permanent grade and spacing between crossing utilities.
4. Invert and rim elevation of all gravity pipelines and structures including manholes, catch basins, below-grade structures, wet wells, septic tanks and distribution boxes as appropriate.

5. Depth of ledge at changes in profile but not more than 25-foot intervals.

6. Changes to pipe size and materials.

B. 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
SPECIAL PROVISIONS

SCOPE OF WORK

The work under this Contract consists of subsurface utility improvements including conduit installation, drainage system improvements, water main, and hydrant replacements, and streetscape improvements including replacement of sidewalk with cement concrete walk featuring ADA compliant curb cuts and wheelchair ramps, pedestrian crossings with high visibility signage and stamped thermoplastic panel asphalt crosswalks, on-street parallel parking, removing and resetting or replacing granite curb, linear landscape features including landscaped median, trees, plantings, and mulch, granite façade retaining wall, granite block gravity wall, micro-mill and overlay and full depth reconstruction of the roadway, application of new pavement markings.


The Bidding and Contract Requirements (Division 0) and General Requirements (Division 1) contained in this project manual supersede the 1988 MassDOT Standard Specifications Division I.

Attached to the Special Provisions are the following sections:

- Attachment A: City of Quincy FY18 Water Main Improvements Project No. 0231074.00
- Attachment B: MassDOT Document 00717 Superpave Requirements
- Attachment C: National Grid Construction Details
- Attachment D: Verizon Conduit & Handhole Specifications
- Attachment E: Comcast Details

WORK SCHEDULE

See Section 01140

PROSECUTION OF WORK; CONTRACTOR'S SCHEDULE OF OPERATIONS

The general sequence of work is presented in Section 01310.

The Contractor shall submit for approval within 10 calendar days after the effective date of the Agreement a project schedule in compliance with the requirements of Section 01325.
NOTICE TO OWNERS OF UTILITIES (Supplementing Section 01310)

Before commencing work on any utility line or service or within the deeded easement of a utility company, the Contractor shall be responsible for contacting the utility company to obtain construction requirements, standards, and to give adequate notice of commencement of work.

The following are the names of owners and representatives of the principal utilities or entities affected, but completeness of this list is not guaranteed:

**CITY OF QUINCY**
Quincy Department of Public Works
55 Sea Street
Quincy, MA 01507
Paul Costello, P.E.
City Engineer
Phone: (617)-376-1959

City of Quincy
Park and Forestry Department
One Merrymount Parkway
Quincy, MA 02169
Donald Martin
Executive Director
Phone: (617)-376-1253

Quincy Water and Sewer Dept.
55 Sea Street
Quincy, MA 02169
Peter Hoyt
Dep. Supt. of Water Supply
Phone: (617)-376-1910

Quincy Fire Department
40 Quincy Avenue
Quincy, MA 02169
Chief Joseph Barron
Phone: (617)-376-1040

Quincy Police Department
1 Sea Street
Quincy, MA 02169
Chief Paul Keenan
Phone: (617)-745-5712

**TRANSMISSION WATER AND SEWER**
MWRA Water
2 Griffin Way
Chelsea, MA 02150
Ralph Francesconi
Phone: (617)-305-5827

MWRA Sewer
2 Griffin Way
Chelsea, MA 02150
Kevin Mckenna
Phone: (617)-305-5956

**ELECTRIC**
National Grid
1250 Brayton Point Road
Somerset, MA 02725
Jack Saraiva
Phone: (508)-962-6298

Q-0019-02/7/26/2018 SP-2 Special Provisions
**GAS**
National Grid Gas
40 Sylvan Road – 3rd Floor
Waltham, MA 02451

Melissa Owens
Phone: (781)-907-2845

**TELEPHONE**
Verizon
385 Myles Standish Boulevard
Taunton, MA 02780

Karen Mealey
Phone: (774) 409-3160

**CABLE**
Comcast Cable Corporation
676 Island Pond Road
Manchester, NH 03109

Wendy Brown
Phone: (978) 848-5109

AT&T/Teleport Communications/Siena Engineering
50 Mall Road – Suite 203
Burlington, MA 01803

Hayleigh Walker
Phone: (781)-221-8400

Crown Castle
80 Central Street
Boxborough, MA 01719

Mark Bonanno
Phone: (508)-616-7818

MCI-Verizon Business
P.O. Box 600
Charlton, MA 01507

Stephen Parretti
Phone: (508)-248-1305

**OTHER AFFECTED PARTIES ARE:**

Tighe & Bond, Inc.
53 Southampton Road
Westfield, MA 01085

Vinod Kalikiri, PTOE, P.E.
Project Manager
Phone: (508)-304-6373
MATERIAL REMOVED AND STACKED

The Contractor shall carefully remove, transport and stack all material that, in the opinion of the Engineer, is salvageable. The material shall be stacked at the DPW facility on Sea Street or as directed by the City of Quincy. The Contractor shall coordinate with the City of Quincy to schedule drop-off time.

DISPOSAL OF SURPLUS MATERIALS

Surplus material obtained from any type of excavation, and not needed for further use as determined by the Engineer shall become the property of the Contractor and shall be removed from the site during the construction period and disposed of legally. The removal and disposal of surplus material shall adhere to the regulations and requirements of local authorities governing the disposal of such materials, at no additional compensation.

DRAINAGE

At no additional cost to the owner, the Contractor shall maintain the existing drainage system in the work areas to provide continual drainage of the site. Any damage caused due to the Contractor’s negligence in regard to maintenance of drainage facilities during construction shall be repaired at the Contractor’s expense.

Where new pipe is shown on the drawings to be connected into an existing drainage structure to remain, the existing structure shall be first cleaned to remove all debris and other material. The existing structure wall shall be carefully and neatly core to provide the minimum size opening required for the insertion of the new pipe. The proposed pipe end shall be set or cut off flush with the inside face of the existing structure wall and the remaining space around the pipe completely filled with cement grout for the full thickness of the structure wall. No separate payment will be made for connecting to existing structures.

Existing shaped inverts shall be reconstructed as necessary to provide a smooth and uniform flow channel from the new pipe through the existing structure.

All pipes and structures installed as part of this Contract shall be left in a clean and operable condition at the completion of the work.

All existing pipes to be abandoned shall be plugged with brick masonry not less than 8 inches in thickness in conformance with the Standard Specifications, Section 201.62 at no additional cost.

ARCHITECTURAL ACCESS BOARD TOLERANCES

The Contractor is hereby notified that they are ultimately responsible for constructing all project elements in compliance with the current AAB/ADA rules, regulations and standards.

All construction elements in this project associated with sidewalks, walkways, wheelchair ramps and curb cuts are controlled by 521CMR – Rules and Regulations of the Architectural Access Board (AAB).
The AAB Rules and Regulations specify maximum slopes and minimum dimensions required for construction acceptance. There is no tolerance allowed for slopes greater than the maximum slope or for dimensions less than the minimum dimensions.

Contractors shall establish grade elevations at all wheelchair ramp locations, and shall set transitions lengths according to the appropriate table in the Construction Standards (or to the details shown on the plans).

All wheelchair ramp joints and transition sections which define grade changes shall be formed, staked and checked prior to placing cement concrete. All grade changes are to be made at joints.

BORROW MATERIAL TESTING

Contractor shall provide 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.

Provide sieve analysis (ASTM C136) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 500 CY of borrow material placed. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.

Contractor shall provide modified proctor analysis (ASTM D1557) and soil classification (ASTM D2487) from certified soils testing laboratory for all borrow or backfill materials at the frequency specified above at no additional cost to the Owner.

COMPACTION TESTING

Contractor shall provide 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. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
ITEM 101. CLEARING & GRUBBING ACRE

Work under this item shall conform to the relevant provisions of Section 101 of the Standard Specifications, the Construction Standard Details, the Drawings and the following:

All trees, regardless of size, specifically called out to be removed on the plans shall be included under this item. Removal of trees shall include removal of stumps and site restoration.

**Method of Measurement**
Clearing and grubbing will be measured for payment per acre, complete in place.

**Basis of Payment**
Clearing and grubbing will be paid for at the Contract unit price per acre, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for removal of individual trees and stumps but all costs in connection therewith shall be included in the Contract unit price bid.
ITEM 120.1  UNCLASSIFIED EXCAVATION  CUBIC YARD

The work under this item shall conform to the relevant provisions of Section 120 of the Standard Specifications and the following:

The work shall include removal and legal disposal of all materials obstructing the execution of scheduled work as shown on the Drawings and/or as directed by the Engineer, except those materials for which payment is made as part of other items of this Contract.

Material shall be disposed of in accordance with all applicable local, state and federal requirements.

Work shall also include the removal and disposal of existing roadway, driveway, and sidewalk pavement, and removal of existing walls, bollards, tree stumps, concrete pads, concrete pavement (reinforced and non-reinforced), foundations or slabs, bricks or masonry and cobblestones as may be required.

In addition, work under this Section may include the removal and discarding of existing features not to be removed and reset or removed and stacked including fences, curbing, berm, curb corners and curb inlets, earth, loam, pipe, Class A rock, ledge, timber, cinders, guard posts and other materials from previous constructions.

Should unsatisfactory subgrade material be encountered, the Engineer may direct that excavation be carried to the depth of satisfactory material and be backfilled with suitable borrow.

Method of Measurement and Basis of Payment
Unclassified excavation will be measured for payment by the cubic yard, as approved. Measurements are assumed to be taken in the horizontal or vertical plane. The actual lengths, widths, and depths shall be measured in the field but shall not exceed the depths shown on the Drawings unless otherwise approved by the Engineer.

Any work done in excess of the depth authorized by the Drawings or the Engineer shall be at the Contractor’s expense and will not be paid for under this Contract.

Volume of pipe removed shall be measured as the cross sectional area multiplied by the length of the pipe, less the voids.

The accepted quantity of unclassified excavation will be paid for at the contract unit price per cubic yard, which price shall include all labor, materials, equipment, and incidental costs required to complete the work. No separate payment will be made for disposal.
ITEM 141.1  TEST PIT FOR EXPLORATION  CUBIC YARD

Test pit locations are shown on the Drawings. Additional test pits may be required by the Engineer due to potential utility conflicts. The Contractor shall not perform any test pit without the approval of the Engineer for size and location. Surface restoration for test pits shall be paid for under this item.

Method of Measurement
Test Pit for Exploration will be measured for payment per cubic yard, complete in place. Measurement will be taken in the horizontal and vertical plane of the actual excavation performed by the Contractor, however the volume may not exceed that authorized by the Engineer prior to commencement of test pitting operations.

Basis of Payment
Test Pit for Exploration will be paid for at the Contract unit price per cubic yard, which price shall include, all labor, materials, equipment, sawcutting, dewatering, disposal and incidental costs required to complete the work. Surface restoration for test pits shall be paid for under this item.
ITEM 151. **GRAVEL BORROW** CUBIC YARD

The work under this item shall conform to the relevant provisions of Section 150 of the Standard Specifications and the following:

**Method of Measurement**
Gravel Borrow will be measured by the cubic yards, compacted in place, with no swell factor adjustment. The project calls for MassDOT Gravel Borrow, Type B. The width of gravel installed for trench repairs will be measured to the actual trench width or a maximum pay line width of 6.5-feet, whichever is less.

**Basis of Payment**
Gravel Borrow will be paid for at the contract unit price per cubic yard, complete in place, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 170. **FINE GRADING AND COMPACTING** SQUARE YARD

The work under this item shall conform to the relevant provisions of Section 170 of the Standard Specifications and the following:

**Method of Measurement and Basis of Payment**
Fine grading and compacting will be measured by the square yard, complete in place. No measurement will be taken in areas of trench repair, planter/landscape strip, or loam and seed restoration.

Fine grading and compacting will be paid for at the contract unit price per square yard, complete in place, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.
ITEM 201.  CATCH BASIN  EACH

The work under these items shall conform to the relevant provisions of Section 201 of the Standard Specifications and the following:

All basins shall be constructed with a minimum sump depth of four feet below the outlet pipe invert and include an outlet hood.

The Engineer may authorize catch basins to be constructed with concrete blocks in vicinity of existing utilities when doing so will prevent a utility relocation.

Where new structures are shown on the drawings to be constructed over existing pipes, the work shall also include the connecting of the pipe to the structure and the necessary cutting and removal of the existing pipe within the structure. The existing pipe shall be neatly cut to provide a smooth uniform face flush with the inside wall surface of the catch basin.

Method of Measurement and Basis of Payment
Catch Basins shall be measured by the each (minus frame and grate). Catch Basins will be paid for at the contract unit price per each regardless of depth, which price shall include all excavation, dewatering, sawcutting, stone bedding, outlet hood, abandoning or connecting existing drainage pipes when required, and the catch basin complete in place.
ITEM 203.1  SPECIAL MANHOLE – TYPE A (SWTU)  EACH
ITEM 203.2  SPECIAL MANHOLE – TYPE B (SWTU)  EACH

The work under this item shall conform to the relevant provisions of Section 201 of the Standard Specifications and the following:

**General**
Special Manhole – Type A (SWTU) is a stormwater treatment unit/system as detailed on the Drawings. Special Manhole – Type B (SWTU) is a stormwater treatment unit/system as detailed on the Drawings.

**Submittals**
The Contractor shall submit:

- Treatment unit indicating compliance with the design flowrate (design flowrate provided on drawing detail)
- Installation schedule for each stormwater treatment unit
- Manufacturer’s certificate of compliance upon successful installation

**Installation**
The SWTU shall be installed in accordance with manufacturer recommendations and as specified in Section 201. Install at the locations and elevations provided on the Drawings, unless otherwise directed by the Engineer.

The floor of the precast base section shall be checked for level after it is set. If the slope between any corners exceeds 0.5%, the unit shall be reset.

All interior and exterior structural components and plumbing shall be made watertight. Any holes made for handling the precast sections shall be filled with a non-shrink grout.

The SWTU shall be cleaned and leak tested prior to final inspection.

Manufacturer representatives shall be scheduled to inspect the final installed unit and certify compliance with their installation specifications.

**Method of Measurement**
Item 203.1 and Item 203.2 will be measured for payment per each, regardless of depth, complete in place, including a certification by the manufacturer’s representative.

**Basis of Payment**
Item 203.1 and Item 203.2 will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for excavation (excluding rock), dewatering, sawcutting, stone bedding, frame and covers, or additional fasteners, fittings, or adapters associated with Item 203.2, but all costs in connection therewith shall be included in the Contract unit price bid.
ITEM 203.3     SPECIAL MANHOLE – TYPE C     EACH

The work under these items shall conform to the relevant provisions of Section 201 of the Standard Specifications and the following:

Special Manhole – Type C

The manhole shall have an inside diameter of 60-inches. The location of the structure is Merrymount Parkway Station 2+50 and 7+30 (DMH 1 and DMH 6 respectively).

Method of Measurement
Item 203.3 will be measured for payment per each, regardless of depth, complete in place.

Basis of Payment
Item 203.3 will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for excavation (excluding rock), dewatering, sawcutting, or stone bedding, associated with the Special Manhole, but all costs in connection therewith shall be included in the Contract unit price bid.
ITEM 220.6  SANITARY STRUCTURE REBUILT  FOOT

The work under these items shall conform to the relevant provisions of Section 220 in conformance to the City of Quincy, and the following:

Work under these items shall include the construction of concrete collars as shown on standard plate E 202.9.0 with the following changes. Class 4,000 psi, 1½ inch, 565 Cement Concrete Masonry (High Early Strength) shall be used for collars. The concrete collar shall be brought up only to a level which will allow leveling, and top courses to be placed, or as directed by the Engineer.

Backfilling around the structures shall consist of suitable material thoroughly compacted with mechanical devices. Any structure that is in the paved roadway, and is not to the point of being backfilled and the collar installed at the end of any work day, shall be steel-plated or backfilled with compacted gravel, level with the roadway. This gravel and the re-excavation of the gravel, to complete the new drainage structure, shall be included in the above items' unit price.

Measurement for Item 220.6 shall be the vertical height in feet to the nearest tenth of a foot increment from the bottom of the rebuilt masonry to the bottom of the casting. The depth of structure rebuilding will be determined in the field by the engineer. When conditions so warrant, it may be required to rebuild a structure completely. If the rebuilding exceeds 3.0 feet from the bottom of the rebuilt masonry to the bottom of the casting, any amount over 3.0 feet, and only said amount, will be measured at 1.3 times the measured depth.

Method of Measurement and Basis of Payment
Payment under Items 220.6 shall include removal and replacement of the frame and grate/cover, concrete collar, and all labor, materials, equipment, and incidentals necessary to complete the work. The payment quantity shall be the vertical height in feet, to the nearest tenth foot increment from the bottom of the rebuilt masonry to the bottom of the casting.
ITEM 222.1 FRAME AND GRATE – MASSDOT CASCADE TYPE EACH

The work performed under these items shall conform to the relevant provisions of Section 220 and the following:

All frames and grates installed in roadway pavement areas shall have hook lock grates.

Hook lock frames and grates shall conform to Standard Construction Drawings 201.6.0 through 201.10.1. The Contractor’s attention is also directed to Engineering Directive E-16-003. The Contractor will be responsible for determining the number of left and right frames and grates according to the direction of flow. The Contractor shall provide a list to the Engineer for approval before ordering the castings.

Method of Measurement
Item 222.1 will be measured for payment per each, complete in place.

Basis of Pavement
Item 222.1 will be paid for at the contract unit price per each, which price shall include all labor, materials, equipment, one adjustment, and incidental costs required to complete the work. No distinction will be made between cascade type frames and grates with flow from the left or right.

ITEM 222.3 FRAME AND GRATE MUNICIPAL STANDARD EACH

The work performed under these items shall conform to the relevant provisions of Section 200, the City of Quincy, and the following:

Frame and grate municipal standard shall be of the same style and shall be installed in locations as shown on the Drawings.

Method of Measurement and Basis of Payment
Frame and Grate will be paid for at the Contract unit price per each, which price shall include the frame, grate, brick and mortar used for adjustment, one adjustment, and all labor, materials, equipment and incidental costs required to complete the work.
ITEM 223.1 FRAME AND GRATE (OR COVER) EACH REMOVED AND STACKED

The work performed under these items shall conform to the relevant provisions of Section 200 and the following:

Frame and Grate (Or Cover) designated by the engineer to be removed and stacked shall be neatly removed and relocated to a designated location at the Quincy DPW yard or other location as directed by the Engineer. If the City decides it does not want the frames and grates or covers, then the removed frames and grates or covers shall become the property of the Contractor and legally disposed of at no additional cost.

Method of Measurement and Basis of Payment
Frame and Grate (Or Cover) Removed and Stacked will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.
ITEM 252.12  12 INCH CORRUGATED PLASTIC (POLYETHYLENE) PIPE FOOT
ITEM 252.18  18 INCH CORRUGATED PLASTIC (POLYETHYLENE) PIPE FOOT
ITEM 252.24  24 INCH CORRUGATED PLASTIC (POLYETHYLENE) PIPE FOOT

Work performed under these items shall conform to the relevant provisions of Section 230 and the following:

The work shall include removing and disposing of any existing pipe to be replaced. Where existing pipe is to be abandoned is encountered in the trench, work shall include removal and disposal of the section of pipe impeding the work and plugging of the open ends of the abandoned pipe.

Where new pipe is shown on the drawings to be installed, the work shall also include the connecting of the pipe to the structure and the necessary cutting and removal of the existing pipe and the breaking and connection into drainage structures. Work associated with sealing voids as a result of connecting corrugated plastic pipe to a larger diameter pipe hole shall be incidental to the cost of the pipe.

Pipe materials shall meet the requirements of M.5.03.10. Pipe shall be firmly joined with an approved coupling.

Corrugated Plastic Pipe to be smooth wall interior/corrugated exterior (Type S) high density polyethylene conforming to AASHTO Designation M-294. Installation shall conform to manufacturer’s specifications and ASTM Recommended Practice D-2321.

Pipe and fittings shall be made of virgin PE compounds which conform to the requirements of Type III Category 4 or 5, Grade P33, Class C; or Grade P34, Class C as defined and described in ASTM D 1248. Only fittings supplied or recommended by the pipe manufacturer should be used.

All plastic storm drain pipe shall be encased in 1/4–inch crushed stone conforming to M2.01.6 placed 6-inches below and above the outside of the pipe. The stone shall extend to both trench walls.

**Method of Measurement**
Item 252.12, Item 252.18, and Item 252.24 will be measured for payment per Foot, complete in place. All measurements shall be taken in the horizontal plane.

**Basis of Payment**
Item 252.12, 252.18, and Item 252.24 will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Sawcutting, excavation (excluding rock), dewatering, sawcutting, connection to existing structures, stone bedding, testing, replacing existing pipe damaged during construction, removal and disposal of existing pipe, or plugging abandoned pipe ends shall be incidental to the relevant item.
ITEM 258.1 UNDERGROUND INFILTRATION SYSTEM LUMP SUM

The work performed under this item shall conform to the relevant provisions of Section 230 and the following:

General
The Contractor shall construct a complete stormwater underground infiltration system as shown on the Drawings and to the manufacturer’s specifications. When requested by the Engineer, the Contractor shall ensure that a qualified manufacturer’s representative be present to observe and certify the work.

Polypropylene components (including recharge chambers) shall be protected from exposure to sunlight prior to installation. Protection can be achieved with a canvas covering or any protective material recommended or approved by the manufacturer.

Materials
Chamber and end cap shall be manufactured from virgin polypropylene resin to be inherently resistant to environmental stress cracking and to maintain adequate stiffness when exposed to higher temperatures during installation and service.

Materials and dimensions shall generally comply with the information presented on the Drawings. The units shall have a continuously curved section profile and be open-bottomed.

The chamber units shall have at least forty-eight orifices penetrating the sidewalls to allow for lateral conveyance of water. The units shall also have two orifices near the top to allow for equalization of air pressure between the interior and exterior of the chamber.

No wall, barrier, or other obstruction shall be present within a row of chamber units to allow for unimpeded hydraulic flows and the ability to conduct visual inspections down an entire row. Each chamber shall have a flat circular surface at the top to allow for installation of a 4-inch minimum inspection port.

End caps shall be capable of fitting into any corrugation of a chamber unit and be sufficiently strong to support and orifice of any size at any elevation.

The system shall be ADS StormTech, Cultec Recharger, Contech ChamberMaxx, or approved equal. The recharge system shall be manufactured in an ISO 9001:2000 certified facility and designed to accommodate AASHTO H-20 vehicle loading.

Subgrade, bedding and trench conditions shall be carefully prepared as specified by the manufacturer and inspected by the Engineer prior to installing chamber units. Manufacturer’s specifications shall be followed for installation.

Method of Measurement and Basis of Payment
Stormwater underground infiltration system will be measured and paid for at the contract price per lump sum in accordance with an approved schedule of values. This price shall include all labor, materials, equipment and incidental costs required to complete the work.
No separate payment will be made for header pipes, observation ports, excavation, dewatering, sawcutting, backfill, crushed stone or geotextile fabric for separation, but all costs in connection therewith shall be included in the contract unit price bid.
ITEM 302.06  6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) FOOT
ITEM 302.08  8 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) FOOT
ITEM 309.  DUCTILE IRON FITTINGS FOR WATER PIPE POUND
ITEM 350.06  6 INCH GATE AND GATE BOX EACH
ITEM 350.08  8 INCH GATE AND GATE BOX EACH
ITEM 358.  GATE BOX ADJUSTED EACH
ITEM 358.1  GATE BOX OR SERVICE BOX REMOVED AND STACKED EACH
ITEM 376.  HYDRANT EACH
ITEM 376.3  HYDRANT – REMOVED & RESET EACH

The work under these items shall conform to the relevant provisions of Section 300 of the Standard Specifications, the “FY18 Water Main Improvements” Project No. 0231074.00, City of Quincy Specifications (Attachment A) and the following:

Relevant material and product sections from the “FY18 Water Main Improvements” Project No. 0231074.00, City of Quincy Specifications (Attachment A) include the following:

- Section 33 01 10.58 – Disinfection of Water Utility Piping Systems
- Section 33 01 10.73 – Line Stops
- Section 33 14 11.01 – Water Utility Piping – Ductile Iron
- Section 33 14 19 – Valves and Hydrants for Water Utility Service
- Section 33 14 21 – Water Service Connections – Copper

The above specifications provide water main materials approved by the City of Quincy and shall not serve to replace any Division 00 and Division 01 documents. Measurement and Payment for all items shall refer to the Special Provisions.

**Method of Measurement and Basis of Payment**

The unit bid price for all water related items (Section 300) shall constitute full compensation for furnishing and installing pipe, hydrant, fittings, restrained joints, thrust blocks, cutting, pipe, excavation to full depth, dewatering, sawcutting, disposal, pipe bedding, warning tape, backfill, common fill, testing, and disinfection and associated work. No additional payment shall be made for excavation over five (5) feet. All mains to be installed to a minimum five foot cover.

Test connections, blow off, hydrants, and air release valves shall be installed in the piping for pressure testing and disinfection at locations ordered by the Engineer (there shall be no separate payment for this work).

Water pipe will be measured in place along the axis of the pipe without deduction for the space occupied by valves or fittings. All fittings shown on the drawings shall be included with the ductile iron pipe. If fittings are required which are NOT shown on the plans or cannot be anticipated by the required work of the plans, they shall be paid for under Item 309.
Ductile iron fittings, which are ordered by the Engineer and not indicated on the plans, or part of other work of this contract, will be paid for at the contract unit price per pound. The fittings (excluding accessories comprising of rings, gaskets, bolts, nuts, washers and clamps) will be measured by the pound and the quantity to be paid for shall be the weight stated on the invoice of the supplier or the manufacturer’s rated weight as listed in the catalog, whichever is lesser.

No Ductile Iron Fittings beyond those shown on the plans are anticipated in the prosecution of the work; however, this item is included in the Contract to establish a unit bid cost in the event that unanticipated fittings are required for a complete job. If no Ductile Iron Fittings are required in the prosecution of the work, the Contractor shall, in this case, have no redress against the City for any loss in anticipated profit. Payment under this item shall include the furnishing and proper installation of concrete thrust blocks.

Gate valves and boxes for new valves will be measured as one unit each, complete in place and will be paid for at the contract unit each for the appropriate size of gate valve and box required.

Valve & Box will be measured as one unit each, 6” gate valve, 6” gate valve box, 8” gate valve, 8” gate valve box, fittings, all labor, materials, equipment, and incidental costs required to complete the work complete in place. No separate payment shall be made for excavation, dewatering, backfilling, or compaction.

Hydrants and relocated hydrants shall be paid for at the Contract unit price per each, which price shall include hydrant, hydrant extensions and appurtenances, proper installation of thrust blocks, restrained joints excavation, backfill, disinfection, and testing required to complete the installation. Gate valves and 6-inch ductile iron water pipe required to complete the hydrant installations will be paid for separately under Items 302.06 and 350.06. All other costs required to complete the hydrant installations shall be inclusive.

No separate payment will be made for the removal, transporting and stacking of existing salvaged materials, but all costs in connection therewith shall be included in the unit prices bid for the respective items.

No separate payment will be made for final adjustment of new gate boxes or service boxes, but all costs in connection therewith shall be included in the Contract unit price bid for the respective new boxes.
ITEM 415.  PAVEMENT MICROMILLING  SQUARE YARD

All references to Section 130 Pavement Milling within Section 450 Hot Mix Asphalt Pavement shall be replaced by Item 415 Pavement Micromilling.

Description

415.20 General
This work shall consist of micromilling and removal of existing Hot Mix Asphalt (HMA) pavement courses from the project by the Contractor. Micromilling shall be performed in conformity with the approved QC Plan. The Contractor shall present and discuss in sufficient detail the Quality Control information and activities related to milling at the Construction Quality Meeting required under Section 450. Unless otherwise specified, the milled material shall become the property of the Contractor.

Construction Procedures

415.60 General
All construction procedures under Pavement Micromilling shall also conform to any of the following relevant provisions of Pavement Milling:

Milling Equipment Requirements
The milling equipment shall be self-propelled with sufficient power, traction, and stability to remove the existing HMA pavement to the specified depth and cross-slope. The milling machine shall be capable of operating at a minimum speed of 10 feet per minute, designed so that the operator can at all times observe the milling operation without leaving the control area of the machine, and equipped with the following:

(a) A built in automatic grade control system that can control the longitudinal profile and the transverse cross-slope to produce the specified results.

(b) Longitudinal controls capable of operating from any longitudinal grade reference, including string line, 30-foot ski minimum, 30-foot mobile string line minimum, or a matching shoe.

(c) The transverse controls shall have an automatic system for controlling cross-slope at a given rate.

(d) Cutting heads able to provide a minimum 6-foot cutting width and a 0 to 4-inch-deep cut in one pass. The teeth on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture.

(e) An integral pickup and conveying device to immediately remove milled material from the roadway and discharge the millings into a truck, all in one operation.

(f) All necessary safety devices such as reflectors, headlights, taillights, flashing lights and back up signals so as to operate safely in both day and night.
(g) A means of effectively limiting the amount of dust escaping from the milling and removal operation in accordance with local, State, and Federal air pollution control laws and regulations.

When milling smaller areas or areas where it is impractical to use the above described equipment, the use of a smaller or lesser-equipped milling machine may be permitted when approved by the Engineer.

**Sweeper Equipment Requirements**

The Contractor shall provide a sufficient number of mechanical sweepers to ensure that the milled surface is free of millings and debris at the end of each day’s milling operations. Each sweeper shall be equipped with a water tank, spray assembly to control dust, a pick-up broom, a dual gutter broom, and a dirt hopper. The sweepers shall be capable of removing millings and loose debris from the textured pavement.

**Milling Operations**

The milling operations shall be scheduled to minimize the duration and placement of traffic on the milled surface. The milling operations shall not proceed more than 3 miles ahead of the paving operations. Under no circumstances shall the milled surface be left exposed to traffic for a period exceeding seven days. The Engineer may allow the Contractor to adjust the above limitations on milling production when necessary.

The Contractor shall coordinate milling and paving operations to minimize the exposure of milled surfaces to traffic. The Contractor shall ensure that milled surfaces are overlaid in a timely manner to avoid damage to the pavement structure. Any damage to the pavement structure resulting from extended exposure of the milled surface to traffic shall be repaired as directed by the Engineer at the Contractor’s expense.

The existing pavement shall be removed to the average depth shown on the plans, in a manner that will restore the pavement surface to a uniform cross-section and longitudinal profile. The longitudinal profile of the milled surface shall be established using a 30-foot mobile ski, mobile string line, or stationary string line. The cross-slope of the milled surface shall be established by a second sensing device or by an automatic cross-slope control mechanism. The Contractor will be responsible for providing all grades necessary to remove the material to the proper line, grade, cross section, superelevation, and transitions shown on the plans or as directed by the Engineer. The requirement for automatic grade or slope controls may be waived by the Engineer in locations warranted by the situation, including intersections and closely confined areas.

The Engineer may adjust the average milling depth specified on the plans by ± 3/4” (± 20mm) during each milling pass at no additional payment to minimize delamination of the underlying pavement course or to otherwise provide a more stable surface. If delamination or exposure of concrete occurs when milling a HMA pavement course from an underlying Portland Cement Concrete (PCC) pavement, the Contractor shall cease milling operations and consult the Engineer to determine whether to reduce the milling depth or make other adjustments to the operation.
**Protection of Inlets and Utilities**
Throughout the milling operation, protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor’s responsibility and shall be repaired at the Contractor’s expense. To prevent the infiltration of milled material into the storm sewer system the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that falls into inlet openings or inlet grates shall be removed at the Contractor’s expense.

**Vertical Faces**
All permanent limits of the milled area shall be sawcut or otherwise neatly cut by mechanical means to provide a clean and sound vertical face. No vertical faces, transverse or longitudinal, shall be left exposed to traffic. If any vertical face is formed in an area exposed to traffic a temporary paved transition with a maximum 12:1 slope shall be established. If the milling machine is used to temporarily transition the milled pavement surface to the existing pavement surface, the temporary transition shall be constructed at a maximum 12:1 slope.

**Opening to Traffic**
Prior to opening a milled area to traffic, the milled surface shall be thoroughly swept with a mechanical sweeper to remove all remaining millings and dust. This operation shall be conducted in a manner so as to minimize the potential for creation of a traffic hazard and to comply with local, State, and Federal air pollution control laws and regulations. Any damage to vehicular traffic as a result of milled material becoming airborne is the responsibility of the Contractor and shall be repaired at the Contractor’s expense. Temporary pavement markings shall be placed in accordance with the provisions of Subsection 850.64.

**Milled Surface Inspection**
The milled surface shall provide a satisfactory riding surface with a uniform textured appearance. The milled surface shall be free from gouges, excessive longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, non-uniform milling teeth, improper use of equipment, or otherwise poor workmanship. Any unsatisfactory surfaces produced shall be corrected by re-milling at the Contractor’s expense and to the satisfaction of the Engineer.

The Contractor shall perform Quality Control inspection of all work items addressed as specified in the table below. Inspection activities during milling of HMA pavement may be performed by qualified Production personnel (e.g. Skilled Laborers, Foremen, Superintendents). However, the Contractor’s QC personnel shall have overall responsibility for QC inspection. The Contractor shall not rely on the results of Engineer Acceptance inspection for Quality Control purposes. The Engineer shall be provided the opportunity to monitor and witness all QC inspection.

The milled surface of each travel lane shall be divided into longitudinal sublots of no more than 500 feet. The Contractor shall perform a minimum of one random QC measurement within each sublot with a 10-foot straightedge in the transverse direction across the milled surface. Additional selective QC measurements within each sublot will be performed as
deemed necessary by the QC personnel. All QC inspection results shall be recorded on NETTCP Inspection Report Forms. The Engineer will also randomly inspect a minimum of 25% of the Sublots. The Contractor shall perform surface texture measurements with a 10-foot straightedge in the transverse direction across the milled surface. The milled surface shall have a texture such that the variation from the edge of the straightedge to the top of ridges between any two ridge contact points shall not exceed 1/8 inch. The difference in height from the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed 1/16”. Any point in the surface not meeting these requirements shall be corrected as directed by the Engineer at the Contractor’s expense.

In isolated areas where surface delamination between existing HMA layers or a surface delamination of HMA on Portland Cement Concrete causes a non-uniform texture to occur, the straightedge surface measurement requirements stated in the preceding paragraph may be waived, subject to the approval of the Engineer.

**Minimum QC Inspection of Milling Operations**

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>As specified in QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
</tr>
<tr>
<td>Environmental Conditions</td>
<td>Protection of Inlets &amp; Utilities</td>
<td>Per QC Plan</td>
<td>Existing Surface</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Removal of Millings &amp; Dust</td>
<td>Per QC Plan</td>
<td>Milled Surface</td>
<td>Visual Check</td>
</tr>
<tr>
<td>Workmanship</td>
<td>Milling Depth</td>
<td>Per QC Plan</td>
<td>Milled Surface</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Cross-Slope &amp; Profile</td>
<td>Per QC Plan</td>
<td>Milled Surface</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Milled Surface Texture</td>
<td>Per QC Plan</td>
<td>Milled Surface</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Milled Surface Roughness</td>
<td>100% of 500 feet per milled lane</td>
<td>Milled Surface per Subsection 410.67</td>
<td>10-foot standard straightedge</td>
</tr>
<tr>
<td></td>
<td>Sawcut Limit Vertical Face</td>
<td>Per QC Plan</td>
<td>Sawcut Limits</td>
<td>Visual Check</td>
</tr>
</tbody>
</table>
415.61  Micromilling Equipment Requirements
The micromilling machine shall be equipped with a drum specifically designed to provide the surface specified below.

415.62  Control Strip
The Contractor shall micromill a control strip. The control strip shall be 100 feet minimum in length with a uniformly textured surface and cross slope, as approved by the Engineer.

The micromilled surface of the control strip shall provide a satisfactory riding surface with a uniform textured appearance. The micromilled surface shall be free from gouges, excessive longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, non-uniform milling teeth, improper use of equipment, or otherwise poor workmanship. Any unsatisfactory surfaces produced in the control strip shall be corrected by additional micromilling at the Contractor’s expense and to the satisfaction of the Engineer.

The micromilled pavement surface shall have a transverse pattern of 0.2 to 0.3-inch center to center of each strike area. The Contractor shall perform surface texture measurements with a 10-foot straightedge in the transverse direction across the milled surface. The milled surface shall have a texture such that the variation from the edge of the straightedge to the top of ridges between any two ridge contact points shall not exceed 1/8 inch. The difference in height from the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed 1/16-inch. Any point in the surface not meeting these requirements shall be corrected as directed by the Engineer at the Contractor’s expense.

415.67  Micromilled Surface Inspection
The Contractor shall perform Quality Control inspection of all work items addressed under Section 415. The Contractor shall not rely on the results of Engineer Acceptance inspection for Quality Control purposes.

The micromilled surface shall meet the requirements of 415.62.

415.80  Method of Measurement
Micromilling - Micromilling will be measured for payment by the number of square yards of area from which the milling of existing HMA pavement has been completed and the work accepted. No area deductions will be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar utility structures.

415.81  Basis of Payment
Micromilling - Micromilling, removal and disposal of existing HMA pavement will be paid for at the contract unit price per square yard. This price shall include all equipment, tools, labor, and materials incidental thereto. No additional payments will be made for multiple passes with the milling machine to remove the existing HMA surface to the grade specified.

No separate payments will be made for: performing handwork removal of existing pavement and providing protection around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractor’s negligence; providing protection to underground utilities from the vibration of the milling operation;
sawcutting micromilled limits; installing and removing any temporary transition; removing and disposing of millings; furnishing a sweeper and sweeping after milling. The costs for these items shall be included in the contract unit price for Pay Item 415. Pavement Micromilling.

415.82 Payment Items

415. Pavement Micromilling Square Yard
ITEM 450.50  HMA LEVELING COURSE  TON
ITEM 450.90  CONTRACTOR QUALITY CONTROL (PAVING)  TON
ITEM 452.  ASPHALT EMULSION FOR TACK COAT  GAL
ITEM 455.22  SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)  TON
ITEM 455.31  SUPERPAVE INTERMEDIATE COURSE – 12.5 (SBC – 12.5)  TON
ITEM 455.32  SUPERPAVE BASE COURSE – 19.0 (SBC - 19.0)  TON

Work under these Items shall conform to the relevant provisions of Document 00717 SUPERPAVE REQUIREMENTS contained herein as Attachment B, and the following:

The Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is <0.3 Million 18-kip (80-kn) ESALs.

The emulsion under this specification shall be Grade RS-1H and shall meet the requirements of AASHTO M 140.

All required sawcutting in the existing pavement in accordance with Sections 450 and 455 (Document 00717) will be included in the contract unit price for each HMA pavement course.

Note: The hot mix asphalt (HMA) Walks and Drives with Superpave HMA mixtures shall be paved in accordance with Section 701 of the Standard Specification which shall be the basis for the work and paid for under Hot Mix Asphalt Driveways, Item 703.
ITEM 472.  HOT MIX ASPHALT FOR MISCELLANEOUS WORK  TON

The work performed under these items shall conform to the relevant provisions of Section 400 and the following:

Hot mix asphalt for miscellaneous work includes hot mix asphalt for trench repairs, driveway repairs, and at locations directed by the Engineer.

Method of Measurement
The width installed for trench repairs will be measured to the actual trench width or a maximum pay line width of 6.5-feet, whichever is less. Depths of asphalt for trench and driveway repairs will be limited to the depth shown on the drawings unless greater depths are approved by the Engineer. The calculated tonnage to be paid for will be based on a conversion of 0.056 tons per square yard per inch.

Basis of Payment
HMA for miscellaneous work will be paid for at the Contract unit price per ton, which price shall include all labor, connections, materials, equipment and incidental costs required to complete the work.
ITEM 473. THERMOPLASTIC PANEL SQUARE YARD ASPHALT CROSSWALK

The work performed under this item shall conform to the relevant provisions of Sections 460 and 860 and the following:

**General**
A durable imprinted aggregate reinforced preformed thermoplastic pavement marking system that provides a textured durable topical treatment to the surface of asphalt pavement. Typically the system replicates, in relief, the grout lines common to brick or other types of unit pavers, but may also be used to create other patterns. It is intended for use on asphalt pavements to create traffic calming solutions and decorative crosswalks, medians, intersections and through areas in parking lots.

The aggregate reinforced preformed thermoplastic is typically supplied in panels.

The System must be able to be applied to asphalt surfaces without preheating the application surface to a specific temperature.

The System must be able to be applied in temperatures down to 45ºF (7ºC) without any special storage, preheating or treatment of the material before application.

The System is applied to asphalt pavement using reciprocating infrared heating equipment. A two-part epoxy sealer specified by the manufacturer must be applied to the substrate prior to preformed thermoplastic application to ensure proper adhesion, and to provide reinforcement for larger volumes of material. Immediately following sealer application, preformed thermoplastic panels are positioned properly on the asphalt substrate. The preformed thermoplastic is then heated to the required melting temperature. Additional aggregate may be applied to the preformed thermoplastic surface as needed following the melting process, to achieve added friction properties and a uniform surface appearance. As the material is cooling, it is imprinted with a vibratory plate compactor and a template made from 3/8 in. flexible wire rope in the required design to create crisp, clean lines which define the pattern.

The system shall be brick red. Color samples and photos of actual installations shall be submitted to the Owner for approval.

The System shall utilize a resilient, aggregate reinforced preformed thermoplastic product which contains a minimum of thirty percent (30%) intermixed anti-skid/anti-slip elements and where the top surface contains anti-skid/anti-slip elements. These anti-skid/anti-slip elements must have a minimum hardness of 6 (Mohs scale).

The System must be resistant to the detrimental effects of motor fuels, antifreeze, lubricants, hydraulic fluids, etc.

Where applicable, the material shall meet state specifications and be approved for use by the appropriate state agency.
Materials
Performed Thermoplastic Material: Must be composed of an ester modified rosin impervious to degradation by motor fuels, lubricants, etc. in conjunction with aggregates, pigments, binders, and anti-skid/anti-slip elements. Pigments and anti-skid/anti-slip elements must be uniformly distributed throughout the material. The material conforms to AASHTO designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state, being non-reflective, and potentially being of a color different from white or yellow.

PIGMENTS:

- White: The material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.
- Other Colors: The pigment system must not contain heavy metals nor any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

Skid Resistance: The surface of the material shall contain factory applied anti-skid/anti-slip elements with a minimum hardness of 6 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303.

Slip Resistance: The surface of the material shall contain factory applied anti-skid/anti-slip elements with a minimum hardness of 6 (Mohs scale). Upon application the material shall provide a minimum static friction of coefficient of 0.6 when tested according to ASTM C 1028 (wet and dry), and a minimum static coefficient of friction of 0.6 when tested according to ASTM D 2047.

Thickness: The material must be supplied at a minimum thickness of 150 mil.

Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

Storage Life: The material may be stored for 12 months, if stored indoors and protected from the elements.

Equipment
Stamping Templates: A wire rope template is required in the execution of the System. The template is used for imprinting the pattern once the preformed thermoplastic has been applied. The wire rope diameter for the imprinting template used for the specified pattern is 3/8 in. The stamping templates are distributed by the System manufacturer.

Heating Equipment: The System manufacturer shall distribute reciprocating infrared heating equipment designed specifically to elevate the temperature of the preformed thermoplastic material and asphalt pavement without adversely affecting it. The primary heating unit must employ a bank of propane-fired infrared heaters, mounted on a track device that allows the heater bank to reciprocate back and forth over a designated area, thereby
allowing the operator to monitor the temperature of the preformed thermoplastic at all times during the pavement heating process.

- A smaller, mobile infrared heater distributed by the System manufacturer is designed specifically to heat areas such as borders and narrow areas that are inaccessible to the primary heaters. This secondary heater also allows the operator to monitor the temperature of the preformed thermoplastic at all times during the heating process.

- An approved hand-held propane heat torch distributed by the System manufacturer shall be used to heat isolated areas of the preformed thermoplastic.

Sealer: A two-part epoxy sealer specified by the System manufacturer must be applied to the substrate prior to material application to ensure proper adhesion, and to provide reinforcement for larger volumes of material.

Hand Held Finishing Tool: Enables the applicator to complete the imprinting of the thermoplastic in areas around permanent structures, such as curbs and manholes covers, which may be inaccessible to the stamping template. The hand held finishing tools are distributed by the System manufacturer.

Aggregate: Supplemental anti-skid/anti-slip elements to be applied to the surface of the molten thermoplastic as needed, if the factory applied anti-skid/anti-slip elements embed too deeply into the surface of the molten thermoplastic material during the heating process. (Embedded aggregate is exposed upon wear for extended skid resistance.) The aggregate is distributed by the System manufacturer.

Air Powered Spray Hopper: Used to spray supplemental anti-skid/anti-slip elements (aggregate) on the surface of the molten preformed thermoplastic in a uniform manner. The air powered spray hoppers are distributed by the System manufacturer.

Vibratory Plate Compactor (700-900 lb.): Shall be used for pressing the 3/8” wire rope stamping templates into the thermoplastic to create the specified pattern in both the thermoplastic and asphalt substrate. The System manufacturer does not supply vibratory plate compactors.

Construction Methods

Manufacturer Certified Applicator Requirement: The System shall be supplied and applied only by an applicator certified by the System manufacturer. The applicator shall provide proof of current certification before commencing work. The Certified Applicator shall follow the System manufacturer’s current published application procedures.

Substrate Condition: The System must only be applied to a stable, high quality asphalt pavement substrate over a stable base that is free of defects or debris, including but not limited to dirt, dust, de-icing materials, and chemical residue.

Procedure: Installation shall comply with manufacturer’s guidelines and recommendations.

The System shall not be applied to Portland Cement Concrete.
Method of Measurement and Basis of Payment
Thermoplastic panel asphalt crosswalk will be measured for payment by the square yard of pavement that has received the Aggregate Reinforced Preformed Thermoplastic and (where applicable) transverse white lines, measured in place.

No deduction will be made for the area(s) occupied by manholes, inlets, drainage structures, bollards or by any public utility apparatus within the area.

Thermoplastic panel asphalt crosswalk will be paid for at the Contract unit price per square yard, which price shall include all labor, materials, equipment and incidental costs required to complete work.

| ITEM 482.3 | SAWING ASPHALT PAVEMENT | FOOT |
| ITEM 482.4 | SAWING CEMENT CONCRETE | FOOT |

Work under this item shall include sawing of hot mix asphalt and concrete at locations along the edge of proposed limits of work including, walkways, limit of work locations, proposed curb lines, handicap ramps, or crosswalks to provide a smooth and uniform transition between existing pavement to remain and new pavement proposed, and as required by the engineer.

Method of Measurement
Sawing Asphalt Pavement and Sawing Cement Concrete will be measured for payment by the foot, for actual locations saw cut, complete in place.

Basis of Payment
Sawing Asphalt Pavement and Sawing Cement Concrete will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. Sawing asphalt pavement or cement concrete shall include the cost of sawing through any base materials such as cobbles or granite required to complete the work.

Sawcutting for utility structure, pipe, or conduit installation shall be paid for under the respective structure, pipe, or conduit item.
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>FOOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>503</td>
<td>GRANITE CURB TYPE VA3 – STRAIGHT</td>
<td></td>
</tr>
<tr>
<td>503.1</td>
<td>GRANITE CURB TYPE VA3 – CURVED</td>
<td></td>
</tr>
<tr>
<td>506.2</td>
<td>DOUBLE STACK GRANITE CURB</td>
<td></td>
</tr>
<tr>
<td>509</td>
<td>GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS - STRAIGHT</td>
<td></td>
</tr>
<tr>
<td>509.1</td>
<td>GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS – CURVED</td>
<td></td>
</tr>
<tr>
<td>580</td>
<td>GRANITE CURB REMOVED AND RESET</td>
<td></td>
</tr>
<tr>
<td>590</td>
<td>GRANITE CURB REMOVED AND STACKED</td>
<td></td>
</tr>
</tbody>
</table>

The work under this item shall conform to the applicable requirements of Section 500 of the Standard Specifications and the following:

Granite curb removed and reset includes transport of the curbing within the work limits. Granite curb removed and stacked includes transport of the curbing to the Quincy DPW yard. If the curbing is rejected by the Owner, it shall become the property of the Contractor at no additional cost.

Granite curb removed and/or installed includes all excavation required to complete the work. If the excavation required to complete curb work overlaps with excavation that would otherwise be required to complete the work, payment for the excavation shall be considered inclusive to the curb regardless of material.

Granite Set Paver for Double Stack Granite Curb

**Mock up**

Prior to proceeding with the remainder of the stone work, erect in place on the job site at intended location 10 square feet of cobble pavement. The mock up shall be located as directed by the Engineer. Do not proceed with remainder of the work until this in place mockup has been inspected by the Engineer for workmanship, jointing and relevant features. Make modifications as directed, including replacement of entire mock up if judged necessary by the Engineer.

**Reference Standards**

3. AASHTO: American Association of State Highway and Transportation Officials.
6. OSHA: Occupational Safety and Health Administration.
Examination of Existing Conditions
The Contractor shall fully inform himself of existing conditions of the site before submitting his bid, and shall be fully responsible for carrying out all site 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.

Shop Drawings
Sieve Analyses: For aggregate materials, according to ASTM C 136.
Samples:

1. Edge restraints.
2. Granite Setts.
3. Stone Dust setting bed and joints.

Delivery, Storage and Handling
Store stone on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
**Materials**

**General**

Obtain stone and setting materials from one source or quarry having sufficient quantity to meet the requirements of this project.

Granite Setts – 3 3/4”w x 3 3/4”l x 4” d.

Stone Dust - Stone dust shall consist of inert materials that are hard, durable stone, free from surface coatings and deleterious materials. Submit samples for Landscape Architect's approval. Gradation requirements shall be as follows:

<table>
<thead>
<tr>
<th>U.S. Sieve No.</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td># 4</td>
<td>100</td>
</tr>
<tr>
<td># 8</td>
<td>96</td>
</tr>
<tr>
<td># 16</td>
<td>68</td>
</tr>
<tr>
<td># 30</td>
<td>43</td>
</tr>
<tr>
<td># 50</td>
<td>29</td>
</tr>
<tr>
<td># 100</td>
<td>17</td>
</tr>
<tr>
<td># 200</td>
<td>11</td>
</tr>
</tbody>
</table>

Concrete Base Slab: Refer to Section 430.

**Construction Methods**

**General**

The work of this Section shall be coordinated with that of associated Trades.

The Contractor shall be fully responsible for the proper execution and performances of the work described herein.

The Contractor shall inspect all surfaces, areas and other contingent construction in or to which his work is to be installed and insure himself that they are in proper condition to receive the work to be performed under this Section. Contractor shall notify the Engineer in writing, before any work is installed or of any existing requiring correction. Failure to make such a report shall be construed as acceptance of the existing conditions and it shall be the responsibility of the Contractor to provide an acceptable installation.

Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance to the attention of the Engineer. Obtain decision regarding corrective measures before the start of fabrication and/or installation of items affected.
Excavation, filling, grading, sub base preparation and backfill are in accordance with Section120.010 “Excavation and Backfill”.

Preparation

Proof-roll prepared subgrade to identify soft pockets and areas of excess yielding. Proceed with paving installation only after deficient subgrades have been corrected and are ready to receive subbase and base course for paving.

Clean the surfaces of each stone before setting, removing foreign matter that might impair the bedding, bonding or appearance of the work. During setting operations dirt or setting materials in contact with exposed surfaces of the stone work shall be immediately removed.

Do not set patched, chipped, cracked, broken or other defective pieces of stone work. Stains which cannot be removed with clean water and fiber brushes shall be considered a defect and such pieces shall not be used.

Surfaces to which this work is to be secured and the stone surfaces them shall be free from frost, wetness, grease, visible rust and foreign materials which will be detrimental to the proper execution of the work.

Setting Bed Installation

Install stone dust setting bed to compacted depth as shown on the Drawings. Stone dust shall be compacted to not less than 95 per cent of the maximum dry density as determined by the Standard AASHO Test Designation T99 compaction test method C.

Place leveling course and screed to a thickness of 2 to 2-1/2 inches, taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.

Installation of Stone

Install stonework using skilled workmen under adequate supervision in accordance with the recommendations of the stone supplier, the details and approved shop and setting Drawings. Stone work shall be installed by a single contractor or subcontractor.

Before being set, clean stone so it is free of ice and frost. Remove dirt and other foreign materials which will cause hindrance during the erection and installation operations.

Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

See details and layout, drainage and electrical plans for location of utilities plans for lines and components that penetrate or pass under the stone: all cuts in granite shall be saw cut. If openings are round, then circular openings will be made core drilling with a diamond tip drill. Round openings will be symmetrical circles.
Exercise care to protect work already in place. Repair work damaged as a result of these stone operations at no additional cost to the satisfaction of the Engineer.

Set stones to the lines and grades shown.

Compact stones into leveling course with a low-amplitude plate vibrator capable of a 3500-to 5000-lbf (16- to 22-kN) compaction force at 80 to 90 Hz. Use vibrator with neoprene mat on face of plate or other means as needed to prevent cracking and chipping of pavers. Perform at least three passes across paving with vibrator.

Place graded aggregate fill immediately after vibrating pavers into leveling course. Spread and screed aggregate fill level with tops of pavers.

Cover and protect all unfinished work when not being worked on by means of waterproof paper, tarps or other means.

**Adjustments and Cleaning**

Repair or replace broken or defective stone work as directed by the Engineer at no additional cost or time.

After completion of other work, and after removal of protective materials, clean the stonework of foreign matter and carefully wash and scrub down using approved and recommended means and methods. Contractor shall provide to the Engineer a detailed written procedure for the cleaning of the stone work and the protection of all plant material. The Contractor shall be responsible for the replacement of any plant material damaged or killed as a result of the cleaning process. Exercise care during these cleaning methods to protect work already in place.

Remove and replace stones which have become damaged or stained during or after installation with acceptable material at no additional cost and as directed by the Engineer.

Provide final protection and maintain conditions which ensure stonework being without damage, discolorations or deterioration during subsequent construction and until time of substantial completion.

**Method Of Measurement and Basis of Payment**

Granite curb type VA3 (straight and curved), granite transition curb for wheelchair ramps (straight and curved), granite curb removed and reset, and granite curb removed and stacked will be measured for payment by the foot, complete in place. Measurements are assumed to be taken in a horizontal plane unless otherwise noted in the measurement clause. Payment will be made at the contract unit price per foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

Double stack granite curb will be measured for payment by the foot, complete in place. Payment will be made at the contract unit price per foot, which price shall include type VA3
granite curb, granite set pavers, stone dust, mortar, cement concrete, all labor, materials, equipment, and incidental costs required to complete the work.

Removing and stacking curb corners shall be paid for under item 590.

No separate payment shall be made for relocating granite curbing to a different location within the work limits as part of the remove and reset pay item, but all costs in connection therewith shall be included in the unit price for the item.
**ITEM 655**  
**ORNAMENTAL FENCE**  
**FEET**

**General**

The work of this Section consists of the provision of all materials, labor and equipment and the like necessary and/or required for the complete execution of the decorative fence fabrication and installation for this Project and as required by the Drawings.

**Materials**

Decorative Steel Fences: Fences made from steel tubing and shapes, hot-dip galvanized.

Posts: Square steel tubing. Line, End and Corner Posts: 4 by 4 inches (102 by 102 mm).

Pickets: 3/4-inch- (19-mm-) square steel bars of pattern and size indicated.

1. Terminate tops of pickets at top rail for flush top appearance.
2. Picket Spacing: 4 inches (101.6 mm) o.c. maximum.
3. Provide iron castings of pattern indicated between each pair of pickets.

Fasteners: Stainless-steel carriage bolts and tamperproof nuts.

Fabrication: Assemble fences into sections by welding pickets to rails.

1. Fabricate sections with clips welded to rails for field fastening to posts.
2. Drill posts and clips for fasteners before finishing to maximum extent possible.

Finish exposed welds to comply with NOMMA Guideline 1, Finish #2 - completely sanded joint, some undercutting and pinholes okay.

Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A 123/A 123M. For hardware items, hot-dip galvanize to comply with ASTM A 153/A 153M.

1. Hot-dip galvanize rail and picket assemblies after fabrication.

Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

Surface Preparation: Clean surfaces according to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

1. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it

Powder Coating: Immediately after cleaning, apply two-coat finish consisting of epoxy primer and TGIC polyester topcoat, with a minimum total dry film thickness of not less than 8 mils (0.20 mm). Comply with coating manufacturer's written instructions.

Q-0019-02/7/26/2018  SP-39  Special Provisions

Construction method

Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

Do not begin installation before wall is completed unless otherwise permitted by Architect.

Proceed with installation only after unsatisfactory conditions have been corrected.

Install fences by setting posts as indicated and fastening rails and infill panels to posts. Peen threads of bolts after assembly to prevent removal.

Post Setting: Set posts with mechanical anchors at indicated.

1. Verify that posts are set plumb, aligned, and at correct height and spacing.

Method Of Measurement and Basis of Payment

Ornamental fence will be measured for payment by the linear foot, measured along the top of the granite cap, complete in place.

Payment will be made at the contract unit price per foot, which price shall decorative steel fence, posts, pickets, fasteners, surface preparation, setting material, coring and preparation for posts in concrete cap, all labor, materials, equipment, and incidental costs required to complete the work.
ITEM 685.3  GRANITE BLOCK RETAINING WALL  CUBIC YARD

The work under this item shall conform to the applicable requirements of Section 685 of the Standard Specifications, Construction Standard Details, October 2017 E 302.2.0 and the following:

Granite stone required to construct the granite block retaining wall are stockpiled at the City of Quincy DPW and shall be removed only after coordination with the City has occurred.

Chink spaces using small pieces (less than 12” in any dimension). Small stone is to be sourced from the City’s stockpile, using crushed large stone as necessary. Use the largest stones at bottom courses of the wall and smaller, flatter stones at top courses of the wall. Colors shall be mixed and sizes shall be evenly distributed throughout the horizontal length of the wall.

Provide a minimum of four representative mockups to show the following:

- Wall constructed using only stone from City stockpile
- Wall constructed using a blend of stone from all three available piles
- Power washing of wall after construction
- Sandblasting of wall after construction

No concrete coping is required for the granite block retaining wall. Provide flat, even surface for the top course of stone.

Method Of Measurement and Basis of Payment
Granite block retaining wall will be measured for payment by the cubic yard, complete in place. Measurements of stone shall be in accordance with MassDOT Construction Standard E 302.2.0.

Payment will be made at the contract unit price per foot, which price shall include coordination, granite stone, loading and hauling of stone from stockpile to the project site, temporary stockpiling, loading, and hauling required to move the stone on-site as necessary, excavation, dewatering, backfill, grading, compaction, crushed stone, gravel backfill, pvc pipe for weepholes, cement concrete foundation, powerwashing and sandblasting after construction, dewatering, all labor, materials, equipment, and incidental costs required to complete the work.
ITEM 685.4  CONCRETE RETAINING WALL WITH GRANITE FAÇADE  FOOT

The work under this item shall conform to the applicable requirements of Section 905, 910 of the Standard Specifications, Construction Standard Details, October 2017 E 305.1.0, E 305.5.0 and the following:

Granite veneer, granite cap, and fence (Alternate 1) shall be installed as shown on the Drawings (Sheet L-201). Granite shall match the color and finish of granite obtained from the City of Quincy.

Stone Veneer

Stone Veneer Mock up

Prior to proceeding with the stone work, erect in place on the job site at intended location 6 linear feet of granite wall. The mock up shall be located as directed by the Engineer. Do not proceed with remainder of the work until this in place mockup has been inspected by the Engineer for workmanship, jointing and relevant features. Make modifications as directed, including replacement of entire mock up if judged necessary by the Engineer.

Reference Standards
3. AASHTO: American Association of State Highway and Transportation Officials.
6. OSHA: Occupational Safety and Health Administration.

Shop Drawings

Samples:
1. Granite Cap and Veneer Stone samples – match existing. Samples shall illustrate the full color range.
2. Colored mortar and other items involving color selection.
The Contractor shall not order materials until Engineer’s review of applicable samples, certifications and test results has been obtained. Delivered materials shall closely match the samples.

Submit shop and installation drawings for all items specified in this Section.

Submit manufacturer’s material descriptions and installation instructions for all manufactured items and materials.

Quality Standards

Contractor shall check dimensions show on Contract Drawings at the site by accurate field measurements before submittal of shop drawings and before final fabrication of stone work. Coordinate installation tolerances to ensure proper fit of final stone work.

Contractor shall ensure proper coordination with other subcontractors and suppliers whose work is affected by the delivery schedule and installation of stone work.

Construction tolerances for stonework: This will apply to exposed surfaces of work that is installed.

1. Variation from plumb: Do not exceed ¼ inch in 10 feet.
2. Variation from Level: Do not exceed 1/8 inch for individual grades or 1/8 inch in 10 feet for level line.
3. Backs or bottoms of all pieces to be set in mortar shall be sawn to approximately true planes. Maximum variation from dimension on the Drawings shall not exceed ½ inch on piece less than 3 inches thick or 1 inch on thicker pieces. Mortar contact surfaces shall be cleaned of all rust and iron particles.

Job Conditions for granite work:

1. Protect mortar materials and stonework accessories from weather, moisture and contamination with earth and other foreign materials.
2. Protect stonework against freezing when ambient temperature is 40 degrees and falling. Heat materials and provide temporary protection.
3. Do not use frozen material or materials mixed or coated with ice or frost. Do not lower the freezing point of mortar by the use of admixtures or anti-freeze agents. Do not use calcium chloride in mortar and grout.
4. Do not build on frozen work. Remove and replace stonework damaged by frost or freezing.
5. During all seasons, protect partially completed stonework against weather when work is not in progress. Cover top of walls with strong waterproof, non-staining membrane extending down both sides of walls and anchored securely in place.
Delivery, storage and handling of granite work:

1. Protect stone during storage and construction against moisture, soiling, staining and physical damage.

2. Handle stone to prevent chipping, breakage, soiling and other damage. Do not use pinch or wrecking bars without protecting edges of stone with wood or other rigid materials.

3. Store stone on wood skids or pallets. Protect stored stone from weather with waterproof, non-staining covers or enclosures, but allow air to circulate around stones.

Materials

Granite Cap and Veneer

Granite shall match existing color ranges, sizes and finish.

Mortar for granite wall joints shall conform to the requirements of M4.02.15 of the Standard Specifications.

Stainless Steel Cap Anchors – ½” diameter x 9”, 18” o.c.

Construction Methods

General

The work of this Section shall be coordinated with that of associated Trades.

The Contractor shall be fully responsible for the proper execution and performances of the work described herein.

The Contractor shall inspect all surfaces, areas and other contingent construction in or to which his work is to be installed and insure himself that they are in proper condition to receive the work to be performed under this Section. Contractor shall notify the Engineer in writing, before any work is installed or of any existing requiring correction. Failure to make such a report shall be construed as acceptance of the existing conditions and it shall be the responsibility of the Contractor to provide an acceptable installation.

Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance to the attention of the Engineer. Obtain decision regarding corrective measures before the start of fabrication and/or installation of items affected.

Preparation

Clean the surfaces of each stone before setting, removing foreign matter that might impair the bedding, bonding or appearance of the work. During setting operations dirt or setting materials in contact with exposed surfaces of the stone work shall be immediately removed.
Do not set patched, chipped, cracked, broken or other defective pieces of stone work. Stains which cannot be removed with clean water and fiber brushes shall be considered a defect and such pieces shall not be used.

Surfaces to which this work is to be secured and the stone surfaces them shall be free from frost, wetness, grease, visible rust and foreign materials which will be detrimental to the proper execution of the work.

**Installation of Stone**

Install stonework using skilled workmen under adequate supervision in accordance with the recommendations of the stone supplier, the details and approved shop and setting Drawings. Stone work shall be installed by a single contractor or subcontractor.

Before being set, clean stone so it is free of ice and frost. Remove dirt and other foreign materials which will cause hindrance during the erection and installation operations.

Mix stone from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

Exercise care to protect work already in place. Repair work damaged as a result of these stone operations at no additional cost to the satisfaction of the Engineer.

Fit stone pieces as closely together as possible and fill the joints between the pieces with mortar. Neatly point the mortar joint finish and clean excess mortar off granite pieces.

Cover and protect all unfinished work when not being worked on by means of waterproof paper, tarps or other means.

**Adjustments and Cleaning**

Repair or replace broken or defective stone work as directed by the Engineer at no additional cost or time.

After completion of other work, and after removal of protective materials, clean the stonework of foreign matter and carefully wash and scrub down using approved and recommended means and methods. Contractor shall provide to the Engineer a detailed written procedure for the cleaning of the stone work and the protection of all plant material. The Contractor shall be responsible for the replacement of any plant material damaged or killed as a result of the cleaning process. Exercise care during these cleaning methods to protect work already in place.

Remove and replace stones which have become damaged or stained during or after installation with acceptable material at no additional cost and as directed by the Engineer.
Provide final protection and maintain conditions which ensure stonework being without
damage, discolorations or deterioration during subsequent construction and until time of
substantial completion.

Method Of Measurement and Basis of Payment
Concrete retaining wall with granite façade will be measured for payment by the linear foot,
measured along the top of the granite cap, complete in place.

Payment will be made at the contract unit price per foot, which price shall include granite
veneer and cap, mortar, expansion joint, excavation, dewatering, backfill, grading,
compaction, crushed stone, gravel backfill, pvc pipe for weepholes, cement concrete,
reinforcing steel, dewatering, all labor, materials, equipment, and incidental costs required
to complete the work.
The work under this item shall conform to the relevant provisions of the Standard Specifications and the following:

Silt sacks shall be installed in existing and proposed catch basins and drop inlets within the project limits, and as required by the Resident Engineer. All curb inlets shall be blocked to prevent stormwater from bypassing the silt sack.

The silt sack shall be manufactured to fit the opening of the drainage structure under regular flow conditions, and shall be mounted under the grate. The insert shall be designed such that the grate can be removed without the insert discharging or dropping into the structure.

Devices shall be:

- ACF Environmental Siltsack
- Mirafi Dandy Sack
- UltraTech Drain Guards
- Terrafix SiltSack
- Dandy Products Dandy Bag
- ADS FlexStorm
- Fabco StormSack
- or approved equal.

The Contractor shall inspect all silt sacks after each rainstorm and during major rainfall events. If debris within the silt sack prevents or reduces flow into the drainage structure the Contractor shall remove all debris and reinstall the silt sack.

When emptying the silt sack, the Contractor shall take all due care to prevent sediment from entering the drainage structure. Any silt, sediment, or debris observed within drainage structures at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the silt sack be deposited on site and used in construction.

**Method of Measurement**

Silt sacks will be measured for payment by the each, complete in place.

**Basis of Payment**

Silt sacks will be paid for at the Contract unit price per each, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for cleaning or maintenance, legal disposal of debris and/or sack, or replacement of silt sack, but all costs in connection therewith shall be included in the Contract unit price bid.
ITEM 701.       CEMENT CONCRETE SIDEWALK       SQUARE YARD
ITEM 701.1      CEMENT CONCRETE SIDEWALK       SQUARE YARD
ITEM 701.2      CONCRETE WHEELCHAIR RAMP       SQUARE YARD

Work under these items shall conform to the relevant provisions of Section 701. and shall include construction of concrete sidewalks, concrete walkways, concrete wheelchair ramps with detectable warning panels, and concrete sidewalk ramps to buildings.

Detectable warning panels shall be yellow.

**Method of Measurement and Basis of Payment**
Compensation for work done under these Items shall be at the contract unit price per square yard complete in place, and shall constitute full payment for all labor, materials, and equipment required.

Cement concrete driveway aprons will be measured under Item 701.1 and shall be paid for at the contract unit price under Item 701.1.

Detectable warning panels will be considered part of the work under Item 701.2 and no specific compensation will be made.

**ITEM 707.81       STEEL SWING GATE       EACH**

Work under these items shall conform to the relevant provisions of Sections 700 and 901 of the standard specifications and the following:

**General**
Steel swing gate shall comply with the details shown on the Drawings.

**Submittals**
Contractor shall submit all shop drawings, material sheets, and samples necessary for the swing gate and paint coating. Color samples shall be provided to the Owner for review.

**Method of Measurement and Basis of Payment**
Steel swing gate will be measured for payment by the each, complete in place.

Steel swing gate will be paid for at the Contract unit price per each, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment shall be made for hasp, lock, other hardware, or paint, but all costs in connection therewith shall be included in the unit price bid.
ITEM 767.12  COMPOST FILTER TUBES  FOOT

The work under this item shall conform to the relevant provisions of Section 751 and 767 of the Standard Specifications and the following:

This work shall include the furnishing and placement of a linear, compost-filled tube for the purpose of slowing the velocity of and filtering suspended sediments from storm water flow.

Materials
Material for the filter tubes shall be compost meeting M1.06.0, except that no manure or biosolids shall be used. In addition, no kiln-dried wood or construction debris shall be allowed. Particle size analysis: 98% shall pass through a 3-inch sieve; 30-50% shall pass 3/8-inch sieve.

Tubes for compost filters shall be a minimum of 12 inches and a maximum of 18 inches in diameter. Tube material shall be a knitted mesh with 1/8” - 3/8” openings and made of 100% biodegradable (cotton, hemp or jute) materials. Additional tubes shall be used at the direction of the Engineer.

Stakes for anchors, if required, shall be nominal 2 x 2 stakes.

Construction Methods
 Tubes of compost may be filled on site or shipped. Tubes shall be placed, filled and staked in place as required to ensure stability against water flows. All tubes shall be tamped to ensure continuous contact with the soil. Stakes shall not puncture compost tube fabric.

The Contractor shall ensure that the filter tubes function as intended at all times. Tubes shall be inspected after each rainfall and at least daily during prolonged rainfall. The Contractor shall immediately correct all deficiencies, including, but not limited to, washout, overtopping, clogging due to sediment, and erosion. The contractor shall review location of tubes in areas where construction activity causes drainage runoff to ensure that the tubes are properly located for effectiveness. Where deficiencies exist, such as overtopping or washout, additional staking or compost material shall be installed as directed by the Engineer.

Contractor shall remove sediment deposits as necessary to maintain the filters in working condition. The functional integrity of filter tubes shall be maintained in sound condition at all times. Filter tubes that are decomposing, cut, or otherwise compromised shall be repaired or replaced as directed by the Engineer and be incidental to this item. At specific locations, such as at gully points, steep slopes, or identified failure points in the sediment capture line, compost filter tube may be reinforced by either staked hay bales and/or silt fence at the direction of the Engineer. Such reinforcing shall be incidental to the cost of this item and shall not exceed 10 percent of the overall length of compost filter tube required for the project.

Stakes shall be removed by the Contractor when site conditions are sufficiently stable to prevent surface erosion, and after receiving permission to do so from the Engineer. The Contractor shall cut the tube longitudinally and empty the compost. The tube fabric shall be removed and properly disposed of and the Contractor shall rake out compost so that it blends
evenly and is no greater than 1-2 inches in depth on soil substrate. Raked compost shall then be seeded with a mix appropriate to the surrounding vegetation.

**Method of Measurement and Basis of Payment**

Compost Filter Tubes will be measured for payment by the foot, installed, approved and maintained in place for the duration of the contract. Compost Filter Tubes will be paid for at the Contract unit price per foot which price shall include all labor equipment, materials and incidental costs required to complete the work.

No separate payment will be made for repair or replacement of tubes over the duration of the Contract, but all costs in connection therewith shall be included in the Contract unit price bid.
ITEM 772. TREES, SHRUBS AND GROUNDCOVER
EACH

Description

The work under this item shall conform to the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the Standard Specifications, except as amended and supplemented as indicated on the drawings and as specified below.

For the above items the Contractor shall provide and install plant material of genus, species, variety, size and quantities in locations as directed by the Engineer. The work of this section includes, but is not limited to, the following:

A. Purchasing and transporting plant material to construction sites
B. Installation of plant material
C. Plant care during 60-day Maintenance Period and one-year Warranty Period
D. Replacement of defective or dead plants at End of Maintenance Period
E. Replacement of defective or dead plants at End of Warranty Period

Cooperation By Contractor (Supplementing Subsection 5.05)

The Landscape Contractor shall have five years continuous experience and expertise in management, handling and installation of ornamental plant material in large scale landscape construction projects. Site foreman shall have at least five years experience and shall be on-site during all times of plant installation.

Samples and Submittals

Plant Material: At least 180 days prior to anticipated planting, the Contractor shall submit a confirmation of availability for all plants on the list, accompanied by nursery sources. When the specified types and sizes of plants are not available, substitutions may be made upon request by the Contractor, if approved in writing by the Engineer. Substitutions proposed by the Contractor shall have equivalent overall form, height, and horticultural characteristics and must be approved in writing by the Engineer prior to tagging. At least 30 days prior to planting, the Contractor shall submit a schedule for tagging material to the Engineer.

For all other materials, at least 30 days prior to ordering, the Contractor shall submit to the Engineer material specifications and (where applicable) installation instructions attesting that the following materials meet the requirements specified. No materials shall be ordered until submittals have been approved by the Engineer. Delivered materials shall match the samples.

All material samples shall include supplier’s literature and certification that material meets specifications. Submittals, including samples, material specifications, and installation specifications are as follows
Fungal mychorrhizae: Submit sample with supplier specifications and certification.

Loam: The Contractor shall submit two 4-kilogram samples of loam to be used as backfill per the requirements of Section 751 of the Standard Specifications, accompanied by laboratory certified test results per the requirements of Section 751.

Backfill Mix: The contractor shall submit a 4 kilogram representative sample of existing soil, which shall then be mixed with loam and tested according to the requirements specified herein. Mixing shall be done in the presence of the Engineer.

Water: Submit a watering schedule, including sources of water, methods of irrigation, and any incidental work required to provide water for the plants.

Testing Methods: The Contractor shall submit to the Engineer for his inspection and approval, equipment and methods for testing soil moisture and soil pH.

The Contractor shall provide to the Engineer two new functioning moisture gauges, including instructions for use and batteries if required, for his use during the duration of the Contract. The meters shall be hand held, and shall be capable of measuring moisture at a depth of 150 millimeters. Meter scale shall be sufficient to determine moist, dry, or wet soil. The meters shall be regularly checked for calibration against watered loam, and shall be replaced if found faulty at no additional cost.

In addition, the Contractor shall provide to the Engineer one copy of the "American Standard for Nursery Stock," ANSI Z-60.1, latest edition, published by American Association of Nurserymen (AAN) for the duration of this Contract.

References and Standards

The following standards shall apply to the Work of this Section.


Examination of Conditions

The Contractor shall be responsible for judging the full extent of work requirements involved. This responsibility includes, but is not limited to, the following: transportation, purchase, temporary storage and maintenance of plants; plant rehandling prior to final installation; removal and off-site disposal of existing loam determined by the Engineer to be unacceptable; purchase, transport, and supply of loam.

Materials
Plant Materials

The Contractor shall furnish all plants as shown on the plans, unless otherwise directed in writing by the Engineer. All plants shall be nursery grown.

All plants shall be legibly tagged with the botanical name. Only plant stock grown within hardiness Zones 1 through 6a, as established by the USDA Plant Hardiness Zone Map, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 6a or harder conditions. Plants not so certified will not be accepted.

All plants shall be typical of their species or variety in growth habit. Plant sizes, habit, rootballs, and containers shall be in accordance with the American Standard for Nursery Stock (ASNS), Standards of the American Association of Nurserymen (AAN) as a minimum requirement for acceptance.

Loam Borrow

Loam borrow, sometimes referred to as loam, for planting soil mix shall be in accordance with the requirements of Standard 751 of the Standard Specifications.

Soil Amendments

Soil amendments, including ground limestone, sulfur, gypsum, and organic materials, shall meet the requirement of Loam Borrow, as described herein.

Planting Soil Mix

Planting soil for backfill shall be a mixture of equal parts approved loam and excavated material. Mixed material shall be pH tested by the Contractor in the presence of the Engineer, and adjusted according to particular planting applications, using lime or sulfur as required. For plants that require an acid soil, such as ericaceous plants and broad-leaved evergreens, planting soil shall have a true pH of 4.5 to 5.5. Planting soil for all other plants shall have a true pH value of 6.0 to 6.5. Proposed soil amendments shall be submitted to the Engineer for approval prior to application.

Bark Mulch

Bark mulch shall be shredded pine bark aged a minimum of six (6) months. The mulch shall be dark brown in color, free of chunks and pieces of wood thicker than 6 millimeters and shall not contain, in the judgement of the Engineer, an excess of fine particles. Unless otherwise specified in these special provisions, bark mulch shall be incidental to the cost of the planting items. Do not use wood chips.

Water

The Contractor shall be responsible for furnishing his own supply of water to the site at no extra cost. All plants injured or damaged due to the lack of water, or due to the use of too
much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

Fungal Mycorrhizae

Each plant shall be planted with fungal mycorrhizae. Mycorrhizae shall include at least three species of vesicular arbuscular (endomycorrhizal) fungi as well as ectomycorrhizal fungi. Mycorrhizae shall be shipped in individual dosage packets.

Construction methods

Furnishing and planting of plant material shall include, but is not limited to, the following: digging of the pits and plant beds; amendment of loam as required to produce planting soil mix; provision of soil additives for pH requirements of specific plants; provision of mycorrhizal fungi; furnishing the plants as specified; plant installation; watering and maintenance.

Seasons for Planting

Spring: Deciduous materials - March 21 through May 1

Evergreen materials - April 15 through June 1

Fall: Deciduous materials - Oct. 1 through Dec. 1

Evergreen materials - Aug. 15 through October 15

Requests for exceptions to this schedule shall be submitted in writing to the Engineer for his approval.

Plant Tagging and Approval

The Contractor shall locate, secure, tag, and ship plant material in a sufficiently timely manner to ensure minimal substitution and storage of plants.

Plants shall be tagged at least one month prior to the expected planting date. The Contractor shall be responsible for tagging the material at the nursery and providing a representative. The Contractor shall request that the Engineer provide a representative to approve tagged stock to be planted under this Section. Contractor shall tag or allow the nursery to tag material for approval of the Engineer’s representative. In the event that satisfactory material cannot be located, the Contractor shall be responsible for any necessary travel and overnight accommodations for the Engineer’s representative during the period of time required to locate, select, and approve plant material.

All trees and a representative sample of each shrub species on the Plant List shall be tagged by the Contractor at the nursery and approved by the Engineer or his representative, prior to digging, for conformity to specification requirements as to quality, size, and variety. Cost
of replacement of materials rejected by the Engineer at the site shall be borne by the Contractor.

Approval of tagged material at the nursery shall not prevent the right of inspection and rejection upon delivery at the site or during the progress of the work.

Tree trunks shall be protected during shipping by a heavy walled cardboard sleeve or other suitable material. Plants shall either be shipped in enclosed trucks or all surfaces, leaves and branches shall be wrapped to prevent damage and dessication.

**Plant Delivery and Installation**

Locations for all plants shall be approved by the Engineer before any plant pits or plant beds are dug.

The Contractor shall locate all underground utilities within 4 meters of the proposed planting pits and notify the Engineer of any conflicts prior to digging plant pits.

The Contractor shall notify the Engineer 3 working days prior to the proposed arrival of plant material on the site. All plants shall be planted within 5 days of arrival on site or shall be rejected by the Engineer. Plants stored on site shall be shaded from direct sunlight at all times and shall not be stored on paved surfaces. Plants stored on site shall be watered daily.

**Planting**

Prior to the installation of any plant material, the Contractor shall dig test pits to determine percolation rates. Percolation of less than 25 millimeters per hour shall require corrective measures as recommended by the Contractor and approved by the Engineer.

Plant pits shall be excavated as shown on plans and the sides scarified to prevent glazed soils.

Trees and shrubs shall be placed as shown on the plans, with the root crown exposed above finished grade. After placement of balled and burlapped plants and prior to backfilling, remove all rope, wire baskets and burlap from the root balls. For container material, remove pots just before planting, and loosen the perimeter roots and soil before placement. Handle plants carefully to prevent damaging roots or stems.

Add mycorrhizal fungi per manufacturer specifications. After planting, the Contractor shall submit fungi dose packets to the Engineer to certify installation of material.

Prepare planting soil mix as specified above to depths as shown on the drawings. Place backfill mix in layers of not more than 150 millimeters, and water each layer sufficiently to settle soil before the next layer is put in place. Backfill mix shall meet finished grade after settlement. Shape edge of planting pit to form a saucer for holding water and place mulch as shown in the plans. Do not cover the stem flare of the plants with mulch.
Water plants immediately following planting as necessary to thoroughly moisten rootball/roots and planting soil.

Plants shall not be wrapped after installation. Wounds shall not be painted. Trees shall not be staked unless wind or other local conditions require the additional protection. Staking and guying shall be incidental to tree installation. Use cloth tape rather than wire. The Contractor shall be responsible for removing all staking and guying materials at the end of the Maintenance Period.

Plant Care

Contractor shall provide plant care for the duration of the Maintenance and Establishment periods.

Adequate watering is essential to plant care. During the 60 day Maintenance Period, plants shall be inspected for watering needs at least twice each week using moisture meters supplied by the Contractor. In addition, during the portion of the Establishment period occurring between May 1 and October 1, the plants shall be inspected weekly using moisture meters.

Plant care shall consist of keeping the plants in a healthy growing condition. Plant care shall include watering, weeding, pruning, re-mulching, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.

Trees and shrubs shall be pruned, if necessary, following planting and in accordance with the American Nurserymen's Association Standards for Class I, fine pruning, to preserve the natural character of the plant. All dead wood or suckers and all broken or badly bruised branches shall be removed. Do not cut leaders.

Any decline in the condition of new plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturists to inspect plant materials and to identify problems and recommend corrective procedures. The Engineer shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the Engineer.

Absolutely no debris may be left on the site. The Contractor shall repair any damage to site as directed by the Engineer, at no additional cost.

Maintenance Period: 60 Days

The Maintenance Period shall begin immediately after each plant is planted and shall continue for a minimum of 60 days following the completion of all planting installations, or until the Conditional Acceptance of all planting work, whichever is a longer period of time.

At the end of the Maintenance Period, the Contractor will request inspection by the Engineer at least 10 days before the anticipated date of inspection.
At the time of inspection, if the plant materials and workmanship are acceptable to the Engineer, the Engineer shall issue a written Certificate of Conditional Acceptance to the Contractor. The date of the inspection shall establish the end of the Maintenance Period and the commencement of the required one year establishment period for planting work.

If in the Engineer's opinion, plant materials and/or workmanship is deficient, acceptance will not be granted, and the Maintenance Period for all the plants shall be extended until plant replacements are made or other deficiencies are corrected. All dead and unsatisfactory plants shall be removed promptly from the project. Replacement plants shall conform in all respects to the Specifications for the original plants and shall be planted in the same manner.

**Warranty Period: One Year**

The purpose of the Warranty Period is to nurture plants through at least one full growing season and one full winter. All plants shall be inspected by the Engineer one year after Conditional Acceptance and shall be alive and in satisfactory growth at the end of that time. The Contractor is responsible for arranging inspection early enough in the season to allow adequate time to procure and install replacement material.

At the end of the Warranty Period, each plant shall show healthy growth on at least 75 percent of its terminal stems, as determined by the Engineer. Determination of healthy growth shall include, but is not necessarily limited to, viable leaves (in season) and terminal buds, as well as live cambium. Plants found to be unacceptable shall be removed promptly from the site and replaced immediately or during the next normal planting season, as permitted by the specifications.

Planted areas shall be free of weeds and debris, and plantings shall be remulched as necessary.

The Engineer will inspect the replacement planting work upon the request of the Contractor. Request for inspection shall be received by the Engineer at least ten days before the anticipated date of inspection.

Stakes and guying, if any, shall be removed from all plants before Final Acceptance.

Upon acceptance of the work of replacement planting, the Engineer shall issue a written Certificate of Final Acceptance for all plants installed under this Section to the Contractor.

**Method of Measurement and Basis of Payment**

ITEMS listed BELOW will be measured PER EACH. Payment will not be approved until satisfactory completion of the Maintenance Period. The Contract unit prices paid shall be full compensation for providing materials, equipment, labor, and incidentals to provide plant pit excavation, soil preparation, soil amendments, planting mix preparation, loam for planting mix, mycorrhizal fungi planting, plant protection, bark mulch (including placement), watering, maintenance, disposal of unsuitable soils, and all other incidentals.
required for furnishing and installing the plantings in accordance with the drawings, and as directed by the Engineer.

**PAYMENT ITEMS DESCRIBED IN ITEM 772.**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>773.436</td>
<td><strong>PINE – WHITE 5-6 FEET</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Pinus strobus</td>
<td></td>
</tr>
<tr>
<td>775.027</td>
<td><strong>ELM – ‘VALLEY FORGE’ – 4-4.5 INCH CALIPER</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Taxodium distichum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bare root – fall transplant recommended)</td>
<td></td>
</tr>
<tr>
<td>777.263</td>
<td><strong>OAK – SWAMP WHITE 2 – 2/12 INCH CAL.</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Quercus bicolor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bare root)</td>
<td></td>
</tr>
<tr>
<td>777.265</td>
<td><strong>OAK – SWAMP WHITE 4 – 4/12 INCH CAL.</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Quercus bicolor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Balled &amp; Burlapped)</td>
<td></td>
</tr>
<tr>
<td>777.673</td>
<td><strong>SWEETGUM 2-2.5 INCH CALIPER</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Liquidambar styraciflua</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bare root)</td>
<td></td>
</tr>
<tr>
<td>777.675</td>
<td><strong>SWEETGUM 4-4.5 INCH CALIPER</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Liquidambar styraciflua</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Balled and Burlapped)</td>
<td></td>
</tr>
<tr>
<td>778.255</td>
<td><strong>BIRCH - GRAY – MULTISTEM 6-8 FEET</strong></td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Betula populifolia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Balled and Burlapped)</td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>778.255</td>
<td>BIRCH - GRAY – MULTISTEM 6-8 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Betula populifolia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Balled and Burlapped)</td>
<td></td>
</tr>
<tr>
<td>782.735</td>
<td>BALDCYPRESS 2-2.5 INCH CALIPER</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Taxodium distichum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bare root – fall transplant recommended)</td>
<td></td>
</tr>
<tr>
<td>782.735</td>
<td>BALDCYPRESS 2-2.5 INCH CALIPER</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Taxodium distichum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bare root – fall transplant recommended)</td>
<td></td>
</tr>
<tr>
<td>783.467</td>
<td>TUPELO 2-2.5 INCH CALIPER</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Nyssa sylvatica</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bare root – fall transplant recommended)</td>
<td></td>
</tr>
<tr>
<td>785.633</td>
<td>INKBERERRY 2-3 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Ilex glabra</td>
<td></td>
</tr>
<tr>
<td>786.110</td>
<td>JUNIPER – ‘BROADMOOR’ 15-18 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Juniperus sabina ‘Broadmoor’</td>
<td></td>
</tr>
<tr>
<td>786.400</td>
<td>JUNIPER – SHORE – 15-18 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Juniperus conferta ‘Pacific Shore’</td>
<td></td>
</tr>
<tr>
<td>786.477</td>
<td>RUSSIAN CYPRESS – 12-15 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Microbiota decussata</td>
<td></td>
</tr>
<tr>
<td>787.033</td>
<td>PINE SHRUB – ‘SPAAN’S DWARF’ 2.5-3 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Pinus contorta ‘Spaan’s Dwarf’</td>
<td></td>
</tr>
<tr>
<td>788.217</td>
<td>AZALEA – ‘DELAWARE VALLEY WHITE’ 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td></td>
<td>Azalea ‘Delaware Valley White’</td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>788.231</td>
<td>AZALEA – ‘KAREN’ 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>788.251</td>
<td>AZALEA – ‘ROSY LIGHTS’ 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>788.262</td>
<td>AZALEA – ‘WESTON’S PINK AND SWEET’ 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>788.271</td>
<td>MOUNTAIN-LAUREL ‘PRISTINE’ 3-4 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td>788.273</td>
<td>MOUNTAIN-LAUREL ‘SARAH’ 3-4 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td>792.019</td>
<td>HYDRANGEA – OAKLEAF ‘SNOW QUEEN’ 2.5-3 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td>794.322</td>
<td>SUMAC SHRUB – FRAGRANT ‘GRO-LOW’ 15-18 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>794.733</td>
<td>SUMMERSWEET SHRUB ‘RUBY SPICE’ 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>794.735</td>
<td>SUMMERSWEET SHRUB ‘HUMMINGBIRD’ 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>794.739</td>
<td>FOTHERGILLA 18-24 INCH</td>
<td>EACH</td>
</tr>
<tr>
<td>795.187</td>
<td>WITCH HAZEL – AUTUMN BLOOMING 3-4 FEET</td>
<td>EACH</td>
</tr>
<tr>
<td>796.419</td>
<td>COMMON RUSH 1 GALLON</td>
<td>EACH</td>
</tr>
</tbody>
</table>
796.421 SWEETGALE 5 GALLON EACH
Myrica gale

796.714 BLACK EYED SUSAN ‘VIETTE’S LITTLE SUZIE’ 1 GALLON EACH
Rudbeckia fulgida ‘Blovi’

796.805 NEW YORK ASTER ‘WOOD’S BLUE’ 3 GALLON EACH
Symphiotrichum novi-belgii ‘Wood’s Blue’

796.819 PURPLE CONEFLOWER ‘BRAVADO’ 1 GALLON EACH
Echinacea purpurea ‘Bravado’

796.829 MARGINAL WOOD FERN 1 GALLON EACH
Dryopteris marginalis ‘Marginal Wood Fern’

796.835 RUSSIAN SAGE ‘CRAZYBLUE’ 3 GALLON EACH
Perovskia atriplicifolia ‘CrazyBlue’

796.869 CATMINT ‘SIX HILLS GIANT’ 5 GALLON EACH
Nepeta ‘Six Hills Giant’

796.871 GOLDEN LEAVED HYSSOP 3 GALLON EACH
Agastache ‘Golden Jubilee’

796.873 BLUESTAR 3 GALLON EACH
Amsonia hubrichtii

796.875 BLUE FALSE INDIGO 3 GALLON EACH
Baptisia australis
<table>
<thead>
<tr>
<th>ITEM</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>804</td>
<td>TRENCHING FOR CONDUIT INSTALLATION FOOT</td>
</tr>
<tr>
<td>804.010</td>
<td>CONDUIT CEMENT CONCRETE ENCASEMENT FOOT</td>
</tr>
<tr>
<td>804.11</td>
<td>1 INCH ELECTRICAL CONDUIT FOOT</td>
</tr>
<tr>
<td>TYPE NM – PLASTIC IN OPEN TRENCH</td>
<td></td>
</tr>
<tr>
<td>804.151</td>
<td>1 ½ INCH ELECTRICAL CONDUIT FOOT</td>
</tr>
<tr>
<td>TYPE NM – PLASTIC IN OPEN TRENCH</td>
<td></td>
</tr>
<tr>
<td>804.41</td>
<td>4 INCH ELECTRICAL CONDUIT FOOT</td>
</tr>
<tr>
<td>TYPE NM – PLASTIC IN OPEN TRENCH</td>
<td></td>
</tr>
<tr>
<td>811.20</td>
<td>24 INCH x 24 INCH ELECTRIC HANDHOLE EACH</td>
</tr>
<tr>
<td>811.21</td>
<td>12 INCH x 12 INCH ELECTRIC HANDHOLE EACH</td>
</tr>
<tr>
<td>811.36</td>
<td>ELECTRIC MANHOLE ADJUSTED EACH</td>
</tr>
<tr>
<td>811.952</td>
<td>NATIONAL GRID 2-WAY MANHOLE EACH</td>
</tr>
<tr>
<td>811.953</td>
<td>NATIONAL GRID 3-WAY MANHOLE EACH</td>
</tr>
<tr>
<td>811.954</td>
<td>NATIONAL GRID 4-WAY MANHOLE EACH</td>
</tr>
<tr>
<td>811.955</td>
<td>NATIONAL GRID 1 PHASE JUNCTION BOX EACH</td>
</tr>
<tr>
<td>811.961</td>
<td>VERIZON PRECAST VAULT EACH</td>
</tr>
<tr>
<td>811.971</td>
<td>COMCAST VAULT EACH</td>
</tr>
</tbody>
</table>

Electrical conduit shall conform to the relevant provisions of Section 801, “Conduits, Manholes, Handholes, Pullboxes and Foundations” of the MassDOT Standard Specifications for Highways and Bridges, Attachment C: National Grid Specifications; Attachment D: Verizon Specifications, Attachment E: Comcast Details, and the following:

The work to be done under Item 804. shall consist of excavating trenches for conduit installation and backfilling the trenches after the conduit is installed, at locations indicated on the Drawings.

The work under Item 804.151 thru Item 804.51 shall include furnishing and installing permanent and as-needed temporary conduit systems during construction, unless otherwise noted.

Riser sections (including weather heads) will be installed under these items, regardless of material. Material to be specified by the respective utility.

Multiple conduits for the same utility shall be spaced as specified by the respective utility company (see utility details attached to these specifications). Conduits for different utilities shall generally be spaced one (1) foot on center (of the outer most individual conduit) as shown on the Drawings.

All conduit shown on the Drawings, or additional conduits placed in locations as directed by the Engineer, shall be new. Trench backfill for conduit under grass areas shall be as per Section 801.60 of the Standard Specifications.

All conduit shall be at least three (3) feet in depth, unless specified otherwise on the plans or by the Engineer.

Existing grass areas disturbed by conduit installation shall be restored to equal or better
condition. A paved traveled way or roadway disturbed by conduit installation shall be replaced as follows: Existing pavement shall be cut in neat true lines by mechanical means along the length of trench equally spaced from the centerline of trench and not more than 18 inches apart. Conduit shall be placed and the trench backfilled as detailed on the plans. After approval of the Engineer, the Contractor shall place the final pavement layers.

Trenches shall be maintained at all times from commencement to final acceptance of the Contract.

**Method of Measurement and Basis of Payment**

ITEM 804. Trenching for Conduit Installation will be measured for payment per foot, regardless of depth and width of trench, complete in place. Grouped conduit runs, which are shown adjacent to each other, shall be measured once (per foot) for payment. No separate payment shall be made for temporary relocation and resetting of dumpsters, trailers, or vehicles, but all costs in connection therewith shall be included in the unit cost.

ITEM 804.010 Conduit Cement Concrete Encasement and will be measured for payment per foot, regardless of depth and width, complete in place. Grouped conduit runs, which are shown adjacent to each other, shall be measured once (per foot) for payment.

ITEMS 804.11 to 804.41 Electrical Conduit Type NM Plastic in open trench will be paid for at the Contract unit price per foot, which price shall include conduit installation and connection to existing conduit in an open trench, all labor, materials, warning tape, equipment and incidental costs required to complete the work. Payment for trench excavation, dewatering, and backfill will be under the item in which the trenching, dewatering, and backfill operations were conducted. Excavation, dewatering, and backfill for individual trenching operations will only be eligible for payment once for the duration of the Contract. Riser sections, regardless of required material, shall be measured and paid under these items.

Items 811.20, 811.21, 811.36, 811.952, 811.953, 811.954, 811.955, 811.961, and 811.971 shall be measured for payment per each, complete in place. The price shall include all labor, materials, equipment and incidental costs required to complete the work.
The work under these items shall conform to the Standard Specifications Section 801, 813, and 820 and the following:

Submit Shop Drawings for
- Luminaires, including all components of reflector, refractor, diffuser, lantern, ballast, fuse holder, etc.
- Light Posts and appurtenances
- Concrete foundation design and bolt pattern for light posts
- Panelboard and circuit breakers
- Wire
- Conduit, bushings, couplings, etc.
- Handholes
- Lighting contactors
- Grounding rod and hardware

Quality Assurance
Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

All work shall comply with the relevant portions of the Massachusetts State Electrical Code.

All electrical components shall be UL listed for wet outdoor locations except Items 1.5 and 1.9.

All electric work shall be performed by a duly Licensed Electrician.

Contractor is responsible for obtaining all necessary electrical permits and licenses for this work.

Materials
Pole

The 18ft tall roadway assembly shall be cast 356 aluminum alloy base and shaft. The base shall be a one-piece structural base with a 1” thick floor casted as an integral part of the base. The shaft shall be circumferentially welded internally and externally for added strength. It shall have a 6” to 4” taper with a .188 wall thickness to withstand 90mph windspeeds and a gust factor of 1.14. The one-piece base shall be 20” in diameter. The shaft shall use either a single or double 32” ornamental, straight aluminum arm to position the luminaire downward. In the base of each pole behind the handhole cover will be a device wired to the 0-10v dimming driver housed in the fixture. The device will allow for individual step dimming of each assembly. The shaft shall have a hand-hole, which shall be within about .45M from the base plate. The hand-hole shall be adequately sized to provide easy access.
to the wiring connections, and a grounding lug. Basis of design is the Sternberg Barrington pole: 5218ETFP6/4/.188-PCC-678HPM-EZ-BKT-FDRB or approved equal.

Shaft and Base Assemblies: The Shaft Sub-assembly shall be fabricated from heavy-duty cast aluminum. Shaft shall be secured to the concrete foundation by a structural base plate slotted to accept anchor bolts. Exterior surfaces of the post shall be free of protuberances, dents, and other imperfections.

Four (4) galvanized steel anchor bolts of size recommended by manufacturer conforming to ASTM A-307 complete with two (2) galvanized hex-head nuts and washers shall be provided with each pole. One (1) plywood template complete with bolt holes drilled on bolt centers shall be furnished with each pole.

Pole Finish and Warranty

Finish to be black textured powder coated. For all mechanical components, prior to coating, each component is chemically cleaned and etched in a 5-stage washing system which includes alkaline cleaning, rinsing, phosphoric etching, reverse osmosis water rinsing, and non-chrome sealing to ensure corrosion resistance and excellent adhesion for the finish coating. The finish coating is electrostatically applied semi-gloss, super durable polyester powder baked at 400 degrees for a durable and color retentive finish.

Ornamental Fixture / Luminaire

The luminaire must be 20.5” in diameter, 19-5/8” height and have a decorative cast aluminum fitter, a spun aluminum shade and flat lens. Active cooling mechanisms (ie fans) will not be allowed. Vented shades for heat dissipation will not be permitted. The luminaire housing will be wet listed and UL approved. The luminaire shall be supplied with an aluminum door frame for tool-less access to the LEDs and drivers. The driver must be accessible from below and removable. A hang straight must be used so the fixture is oriented to the ground correctly at all times and properly distributes light to the roadway. The power factor must be greater than .90 with a 10kV surge suppressor and UL/ETL listed. Basis of design is the Sternberg Glenview LED fixture. Single arm assembly: 1A-1940LEDGV1-678HPM-5218ETFP6/4/.188-PCC-8ARC35T3-MDL03-EZ-BKT-FDRB. Double arm assembly: 2A-1940LEDGV1-678HPM-5218ETFP6/4/.188-PCC-8ARC35T3-MDL03-EZ-BKT-FDRB. Represented by Omnilite @ 263 Winn Street, Burlington, MA 01803.

The lamp source of the luminaire must be LED and have a maximum wattage consumption of 130 watts and deliver a minimum lumen output of 10,000 lumens. The performance of the luminaire must take into account a glare reduction lens (SV1) that will produce a BUG rating of B3-U0-G3 and a light distribution with 0% up light. The optical performance must be tested in a certified laboratory and be tested as absolute photometry (LED source and fixture combined). Lamp life (L70 > 100,000hrs) supported by TM-21, LM79, and LM80 standards/guidelines. Optical distribution, taking into account the soft view lens, must be Type 3 per the IESNA classification.
Field Adjustable Wattage Selector (FAWS)
Each light fixture shall be factory installed with a FAWS unit, compatible with the lighting assembly. The FAWS unit will be capable of overriding other built-in level controls. The photocell will still switch the fixtures on and off.

Controls
Each fixture shall be controlled by a central photocell and associated contactor designed to automatically turn the lights on and off. The photocell shall be vandal proof and be installed on top of the Load Center.

Lighting Load Center
Panelboard to be 100amp, 240 volt, 1 phase, 3 wire with a minimum of 30 slots for breakers.

Method of Construction
Verify field measurements and circuiting arrangements as shown on the Drawings. Commencement of lighting installation activities means installer accepts existing and proposed conditions.

Furnish and install all conduits, handholes, wiring, conductors, connectors, and appurtenance necessary for the street lighting system under the applicable sections of these specifications.

Installation of Light Poles
Install ornamental poles on concrete light base with integral electrical conduits. Cast in anchor bolts to conform to bolt circle pattern of pole.

Install pole securely, safely and plumb in accordance with manufacturer’s instructions.

All light poles which are indicated as being in straight alignment shall be installed in the field to line up. Locations shall be staked out for review by the Engineer, and locations shall be adjusted until the design intent is achieved. Tolerance for alignment is one inch.

Protect finish of pole throughout construction. Repair or replace any damaged components as required.

Installation of Luminaires
Install all luminaires in accordance with manufacturer’s instructions.

Field adjust and aim luminaires for proper positioning and to achieve the desired lighting levels.

Installation of Load Center
Load center shall comply with the requirements of the Standard Specifications and the details shown on the Drawings.

National Grid to furnish and install new electrical service at lighting control cabinet as shown on the Drawings. Service shall be 240 volt, 1 phase, 3 wire, 100 amp.
Furnish and install new electrical panelboard to receive service from National Grid. Panelboard to be 100 amp, 240 volt, 1 phase, 3 wire with a minimum of 30 slots for breakers.

Furnish and install one GFCI duplex-receptacle (20 amp, 120v) in the Load Center enclosure.

Furnish and install one lighting contactor (8 pole, 30 amp rated) in the Load Center enclosure.

**Field Quality Control**
Contractor and his electrician shall inspect the work as it is installed to verify compliance with the contract documents. Correct any defects.

All electric work shall be inspected by the City’s Wiring Inspector, as required.

All electric work shall be tested in presence of Engineer. Lights shall be tested in the dark, and any necessary adjustments in the orientation of the luminaires shall be made to provide the required lighting levels.

The Contractor shall provide up to three additional lighting level adjustments at each fixture (using the FAWS) to modify illumination.

**Method of Measurement and Basis of Payment**
Item 812.17 Period Lighting – Single will be measured for payment by fixture, complete in place. The item will be paid for at the Contract unit price per fixture, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Item 812.18 Period Lighting – Double will be measured for payment by fixture, complete in place. The item will be paid for at the Contract unit price per fixture, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No additional payment will be made for concrete light base foundations (included design costs), but all costs in connection therewith shall be incidental to Items 812.17 and 812.18. The design of the foundations shall be prepared by a structural engineer and submitted by the contractor. No separate payment shall be made for the foundation design.

Item 823.60 Highway Lighting Load Center will be measured for payment by the each, complete in place. Payment will be made at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment shall be made for the service connection or meter, receptacle, and incidental internal wiring/connections.
ITEM 813.561  TRANSFORMER PAD – SINGLE PHASE  EACH
ITEM 813.801  SERVICE CONNECTION – 1 PHASE  EACH
ITEM 813.805  SERVICE METER – 1 PHASE  EACH

All work shall conform to the relevant provisions of Section 801, “Conduits, Manholes, Handholes, Pullboxes and Foundations” of the MassDOT Standard Specifications for Highways and Bridges and relevant National Grid standards including the attached standard details (Attachment C).

All electric work under this section shall be coordinated with property owners, the City of Quincy, and National Grid. Service interruptions at individual properties, as made necessary by the switch over from the existing overhead to the new underground electrical system, shall occur on an appointment-only basis with all possible consideration granted to the property owner and their operations. 48-hour notice to both building owner and current tenant(s) is required. Scheduled service interruptions shall be kept to a two-hour maximum length. Only one service interruption per property, during normal business hours, shall be allowed under this contract.

Service meter 1 phase socket replacement includes service connection and all necessary labor and materials in conformance with National Grid, the City of Quincy requirements, and the Massachusetts Electrical Code.

All electric work shall be inspected by the City’s Wiring Inspector, as required.

**Method of Measurement and Basis of Payment**

Items 813.561, 813.801, 813.805 will be measured for payment by the each, complete in place. Payment will be made at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.
ITEM 826.52   FIRE ALARM BOX REMOVED AND STACKED   EACH

The work under these items shall conform to the Standard Specifications Section 820 and the following:

Coordinate removal of existing fire alarm box with the City of Quincy DPW and Fire Department. Stack the fire alarm box at the Quincy DPW yard.

Method of Measurement and Basis of Payment
Fire alarm box removed and stacked shall be paid for by each. Payment will be made at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.
ITEM 833. RECTANGULAR RAPID FLASHING BEACON (RRFB) EACH

The work under this item shall conform to the relevant provisions of Sections 824 and 828 of the Standard Specifications and the following:

General
The work shall consist of furnishing and installing solar powered rectangular rapid flashing beacons (RRFBs) for the locations indicated on the plans or where directed by the Engineer.

The front and back of each RRFB shall consist of two rapidly and alternately flashing rectangular yellow indications having light emitting diode (LED) array based pulsing light sources, and shall be designed, located, and operated in accordance with the detailed requirements specified on the drawings.

Each RRFB shall be a complete assembly, consisting of supporting structure (e.g., pole, breakaway transformer base, sign supports, etc.), indications, signage, pedestrian push button, battery, solar panel, and electrical components (e.g., wiring, solid-state circuit boards, etc.).

RRFB system shall come with a manufacturer warranty valid for three (3) years from the date of delivery.

RRFB shall be approved by the Traffic and Safety Engineering Section and be listed on the current Qualified Traffic Control Equipment list found on the Massachusetts Department of Transportation website.

Massachusetts Department of Transportation is in the process of obtaining permission from FHWA for use of RRFB’s in Massachusetts under Interim Approval IA-21 at the time of issuance of these Special Provisions. These Special Provisions shall be modified to match any new provisions of MassDOT’s approval of the use of RRFB’s in Massachusetts.

Materials
The RRFB shall have the following components and/or properties:

- Shall be a self-powered unit using solar power.
- Shall be activated by push button.
- Shall be Americans with Disabilities Act (ADA) compliant.
- Shall be wirelessly synchronized with companion units to have all indications flashing when push button is activated.
- Shall be dark until pedestrian actuation, shall flash for a predetermined amount of time (based on MUTCD procedures), and shall return to dark after the full time period.
- A small light directed at, and visible to, pedestrians in the crosswalk shall be installed integral to the RRFB to give confirmation that the RRFB is in operation.
- When activated, the RRFB indications shall flash in a rapidly alternating “wig-wag” flashing sequence (left light on, then right light on).
• Each of the RRFB’s indications shall have 70 to 80 periods of flashing per minute that are alternating but have approximately equal periods of rapid pulsing light and dark operations.
• The flash rate of the RRFB’s indication shall not be between 5 and 30 flashes per second.
• A sign shall be located at each pushbutton with the legend “Push Button To Turn On Warning Lights.”
• The RRFB shall have a Pedestrian crossing warning sign (W11-2) with a diagonal downward arrow plaque (W16-7P; Left and Right, as required) on the front and back of each unit.
• Each RRFB LED indication shall be a minimum size of approximately 5 inches wide by 2 inches high.
• The two RRFB LED indications shall be aligned horizontally, with the longer dimension of the indication horizontal, and a minimum space between the two indications of approximately 7 inches measured from the inside edge of one indication to the inside edge of the second indication.
• Each RRFB structure shall have a four-way indication flasher (flashing in four directions)
• The outside edges of the two indications, including any housing, shall not protrude beyond the outside edges of the integral signage of the RRFB (i.e., W11-2 sign).
• The light intensity of the RRFB’s indications shall meet the minimum specifications of the Society of Automotive Engineers (SAE) standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January 2005.
• The supporting structure of the RRFB (e.g., post, sign holders, etc.) shall be constructed of manufactured aluminum embodiments and powder coated.
• Each RRFB to be supplied with all required hardware to install assembly.
• Each RRFB shall be located between the bottom of the pedestrian crossing warning sign (W11-2) and the top of the supplemental downward diagonal arrow plaque (W16-7P).
• The pushbutton shall be capable of continuous operation over a temperature range of -30 degrees F to 165 degrees F (-34 degrees C to 74 degrees C).

The sign post and base shall be as recommended by the manufacturer. The base shall be a MassDOT type signal pedestal foundation.

Method of Measurement
Rectangular Rapid Flashing Beacon (RRFB) will be measured for payment by the each, complete in place. “Each” shall be defined as the complete assembly required per pole location.

Basis of Payment
Rectangular Rapid Flashing Beacon (RRFB) will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.
No separate payment will be made for solar power kit, sign post, post foundation, technical support, wireless synchronizing, or warranty but all costs in connection therewith shall be included in the contract unit price bid.
ITEM 850. TRAFFIC CONTROLS FOR CONSTRUCTION OPERATIONS

Work under this item shall conform to the relevant provisions of Section 850 of the Standard Specifications, the MUTCD, the Temporary Traffic Control Plan, and the following:

**General**
The intent of work performed under this item is to ensure public safety and convenience for the duration of the Work. Nothing contained herein shall be construed as relieving the Contractor of any of his responsibilities for protection of persons and property under the terms of the Contract.

**Temporary Traffic Control Devices**
All devices used for temporary traffic control shall be in accordance with the latest MassDOT, FHWA, and MUTCD standards and be deployed in accordance with the Temporary Traffic Control Plan included with the Contract Drawings.

Positioning, adjusting and re-positioning of all devices such as traffic cones, high level warning devices, etc., not otherwise classified and paid for under other items in this contract, is considered incidental and no separate payment will be made.

Sign supports shall be furnished by the Contractor and shall be capable of supporting the warning signs in a proper position.

Signs shall be removed immediately at the conclusion of work operations.

**Basis of Payment**
Traffic Controls for Construction Operations will be paid for at the Contract lump sum price, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for signage, barricades, or any other apparatus used for traffic control, but all costs in connection therewith shall be included in the Contract unit bid price.
ITEM 874.4 TRAFFIC SIGN REMOVED AND STACKED EACH

The work under this item shall conform to the relevant provisions of Sections 828 and 840 of the Standard Specifications and the following:

The work shall include the careful removal and stacking of signs, attached hardware and supports from locations shown on the plans and as directed by the Engineer. The Contractor shall coordinate the removal of signs with the Engineer. Existing signs shall remain in place until removal is approved by the Engineer. Any sign damaged or lost either directly or indirectly as a result of the Contractor’s operations shall be replaced by the Contractor at his own expense. Signs shall be stacked at the Quincy DPW.

Method of Measurement
Traffic sign removed and stacked will be measured for payment by each, complete in place.

Basis of Payment
Traffic sign removed and stacked will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for sign mounting hardware or any components of the sign or support damaged by the Contractor’s operations, but all costs in connection therewith shall be included in the Contract unit price bid.
ITEM 874.7 MISCELLANEOUS PLAQUE REMOVED AND RESET EACH

The work under these items shall conform to the provisions of Sections 828 and 840 of the Standard Specifications and the following:

Work shall include removal and resetting of the memorial plaque and foundation as indicated on the Drawings. Provide a 12-inch thick crushed stone bedding to reset the foundations on. If the plaque is damaged by the Contractor’s operations, the Contractor shall repair the damage at no additional cost to the City. The Contractor shall notify the owner at least 48-hours prior to removal.

Method of Measurement and Basis of Payment
The work under this item shall be paid for at the contract unit price per each. The contract price under this item shall constitute full payment for all materials, labor and equipment required or incidental to the satisfactory completion of the work including the above amendments and supplements.

ITEM 900. POLICE DETAIL FOR TRAFFIC CONTROL HOUR

The work under these items shall conform to the provisions of Section 850 of the Standard Specifications, the Traffic Control Plans, and this Special Provision.

Police coverage provided for the Contractor's convenience, and not at the direction of the Owner or local jurisdiction, will be paid for at the Contractor's expense and is not included under this item. The Contractor shall coordinate with the City and the Engineer to schedule police services on an as-needed basis.

Method of Measurement and Basis of Payment
The work under these items shall be paid for at the contract unit price per hour. The contract price under this item shall constitute full payment for all materials, labor and equipment required or incidental to the satisfactory completion of the work. The Contractor shall submit the Police Detail log book with the payment requisition. No unsubstantiated hours shall be paid.
ITEM 999.1 MONTHLY PRICE ADJUSTMENT ALLOWANCE FOR LIQUID ASPHALT

The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

The Period Price of liquid asphalt for each monthly period will be determined by MassDOT using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer’s terminal, as listed under the “East Coast Market – New England, Boston Massachusetts area” section of the Poten & Partners, Inc. Asphalt Weekly Monitor. This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. MassDOT will post the period price on its website within two (2) business days following its receipt of the current issue of the Asphalt Weekly Monitor. This method of period price determination was formerly called the New Asphalt Period Price Method.


The Contract Price of the hot mix asphalt mixture will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be a separate payment item and will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

The Price Adjustment will be determined by multiplying the number of tons of hot mix asphalt mixtures placed during each monthly period with the liquid asphalt content percentage and with the RAP Factor and with the variance in price between Base Price and Period Price of liquid asphalt.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is an Owner approved extension of time.
ITEM 999.2  MONTHLY PRICE ADJUSTMENT ALLOWANCE FOR DIESEL FUEL

ITEM 999.3  MONTHLY PRICE ADJUSTMENT ALLOWANCE FOR GASOLINE

The Price Adjustment will be based on the variance in price for the fuel component of various excavation, borrow, and paving items of work (see table below) only from the Base Price to the Period Price. This Price Adjustment will occur on a monthly basis.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

The Base Price for diesel fuel for this project shall be the Period Price for the month of July 2018 (per gallon) as provided on the MassDOT Price Adjustments webpage: (https://www.massdot.state.ma.us/highway/DoingBusinessWithUs/Construction/PriceAdjustments.aspx).

The Base Price for gasoline for this project shall be the Period Price for the month of July 2018 (per gallon) as provided on the MassDOT Price Adjustments webpage: (https://www.massdot.state.ma.us/highway/DoingBusinessWithUs/Construction/PriceAdjustments.aspx).

The Contract Price of the various excavation, borrow, and paving items will be paid under the respective items in the Contract. The Price Adjustment, as herein provided, upwards or downwards, will be a separate payment item and will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The Price Adjustment applies only to the actual fuel component of various excavation, borrow, and paving items of work.

The Price adjustment will be determined by multiplying the number of cubic yards of various excavation, borrow, and paving items of work completed during each monthly period with fuel usage factors developed by the Highway Research Board in Circular 158, dated July 1974. The quantity of fuel used will then be multiplied by the variance in price from the Base Price to the Period Price for diesel and gasoline fuel.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is an Owner approved extension of time.

<table>
<thead>
<tr>
<th>ITEMS COVERED</th>
<th>FUEL FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diesel</td>
</tr>
<tr>
<td>Excavation and Borrow Work:</td>
<td>0.29</td>
</tr>
<tr>
<td>Items 120.1, 141.1., 151., 156., 402., 751. (Both Factors used)</td>
<td>Gallons / CY</td>
</tr>
</tbody>
</table>
ITEM 999.4 MONTHLY PRICE ADJUSTMENT ALLOWANCE FOR PORTLAND CEMENT IN CONCRETE

This provision applies to all projects using greater than 100 cubic yards of Portland cement concrete containing Portland cement.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

The Period Price of Portland cement for each monthly period will be determined by MassDOT using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the “Construction Economics” section of ENR Engineering News-Record magazine or at the ENR website http://www.enr.com under “Construction Economics.” The Period Price will be posted on the MassDOT website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Base Price for Portland cement for this project shall be the Period Price for the month of July 2018 (per ton) as provided on the MassDOT Price Adjustments webpage: (https://www.massdot.state.ma.us/highway/DoingBusinessWithUs/Construction/PriceAdjustments.aspx).

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be a separate payment item and will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The Price Adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is an Owner approved extension of time.
ITEM 999.5  MONTHLY PRICE ADJUSTMENT FOR ALLOWANCE
STRUCTURAL AND REINFORCING STEEL

This provision applies to projects containing a price adjustment for structural steel and reinforcing steel as stipulated in the Advertisement for Bid. It applies to all structural steel as defined below and all reinforcing steel on the project. Compliance with this provision is mandatory, i.e., there are no “opt-in” or “opt-out” clauses. 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.

Price adjustments will be variances between Base Prices and Period Prices. Base Prices and Period Prices are defined below.

Price adjustments will only be made if the variances between Base Prices and Period Prices are 5% or more. A variance can result in the Period Price being either higher or lower than the Base Price. Once the 5% threshold has been achieved, the adjustment will apply to the full variance between the Base Price and the Period Price.

Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or fabricated reinforcing steel bars subject to a price adjustment by the index factor calculated as shown below under Example of a Period Price Calculation.

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.

The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

Base Prices and Period Prices are defined as follows:

Base Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are fixed prices determined by the Engineer and found in the Advertisement for Bid. The Base Price Date is the month and year in which the Owner opened bids for the project. This date is used to select the Base Price Index.

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 (July 2018) using an index of steel prices to adjust the Base Price.

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 Engineer 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.

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 (4) 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)”.

**Period Prices are determined as follows:**

Period Price = Base Price X Index Factor  
Index Factor = Period Price Index / Base Price Index  

**Example of a Period Price Calculation:**

Calculate the Period Price for December 2009 using a Base Price from March 2009 of $0.82/Pound for 1,000 Pounds of ASTM A709 (AASHTO M270) Grade A36 Structural Steel Plate.  
The Period Price Date is December 2009. From the PPI website*, the Period Price Index = 218.0.  
The Base Price Date is March 2009. From the PPI website*, the Base Price Index = 229.4.  
Index Factor = Period Price Index / Base Price Index = 218.0 / 229.4 = 0.950  
Period Price = Base Price X Index Factor = $0.82/Pound X 0.950 = $0.78/Pound  
Since $0.82 - $0.78 = $0.04 is less than 5% of $0.82, no price adjustment is required.  
If the $0.04 difference shown above was greater than 5% of the Base Price, then the price adjustment would be 1,000 Pounds X $0.04/Pound = $40.00. Since the Period Price of $0.78/Pound is less than the Base Price of $0.82/Pound, indicating a drop in the price of steel between the bid and the delivery of material, a credit of $40.00 would be owed to the Owner. When the Period Price is higher than the Base Price, the price adjustment is owed to the Contractor.  

* To access the PPI website and obtain a Base Price Index or a Period Price Index, go to http://data.bls.gov/cgi-bin/srgate  

END OF EXAMPLE

The Contractor will be paid for unfabricated structural steel and unfabricated reinforcing steel under the respective contract pay items for all components constructed of either structural steel or reinforced Portland cement concrete under their respective Contract Pay Items.  

No price adjustment will be made for price changes after the Contract Completion Date, unless the Owner has approved an extension of Contract Time for the Contract.  

END OF SECTION
SPECIAL PROVISIONS – ATTACHMENT A

CITY OF QUINCY
FY18 WATER MAIN IMPROVEMENTS
PROJECT NO. 0231074.00
SECTION 33 01 10.58

DISINFECTION OF WATER UTILITY PIPING SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes
   1. Provide disinfection of water utility piping systems by a certified independent third party in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements
   1. Section 01 51 38 – Temporary Water Bypass
   2. Section 33 14 11.01 – Water Utility Piping – Ductile Iron
   3. Section 33 14 19 – Valves and Hydrants for Water Utility Service

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards
   1. American Water Works Association (AWWA)
      a. AWWA B300 Hypochlorites
      b. AWWA C651 Disinfecting Water Mains
      c. AWWA C655 Field Dechlorination
   2. NSF International (NSF)
      a. NSF/ANSI 60 Drinking Water Treatment Chemicals – Health Effects
      b. NSF/ANSI 61 Drinking Water System Components – Health Effects

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

B. Perform disinfection after completing preliminary flushing of water utility piping systems, and after pressure and leakage testing of water utility piping systems are complete and approved by Engineer.

C. Coordinate final flushing with Owner.
1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product data: Safety Data Sheets (SDS).

C. Certificates

1. Certificate of compliance verifying independent commercial laboratory performing bacteriological sampling analyses is certified with the state Department of Environmental Protection for analyzing public drinking water supplies.

2. Certified bacteriological test results

D. Source and field quality control submittals

1. Disinfection procedures, including flushing locations, rates of flushing, discharge locations, chlorine form, method of chlorination, procedures for measuring potable water supply, procedures for measuring free chlorine residual, sampling locations and number and frequency of samples for bacteriological tests.

2. Dechlorination plan

3. Free chlorine residual test results

E. Qualification statements: names and qualifications of firm performing disinfection and dechlorination work.

F. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Qualifications: per Division 01 General Requirements and as follows.

1. Certified, independent, third party firm with minimum 5 years’ experience with disinfection and dechlorination of water utility piping systems.

C. Regulatory approvals

1. Chemicals in contact with raw or drinking water meet NSF 60 Drinking Water Treatment Chemicals – Health Effects.

2. Products in contact with raw or drinking water meet NSF 61 Drinking Water System Components – Health Effects.

D. Independent testing: bacteriological analyses by an independent commercial laboratory certified by the State Department of Environmental Protection for analyzing public drinking water supplies.

DISINFECTION OF WATER UTILITY PIPING SYSTEMS

WOODARD & CURRAN
1.07 DELIVERY, STORAGE, AND HANDLING
   A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS
   A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 MATERIALS
   A. Chlorine: liquid sodium hypochlorite or granular calcium hypochlorite conforming to AWWA B300.

2.02 SOURCE QUALITY CONTROL
   A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 DISINFECTION
   A. Disinfect new water utility piping systems utilizing continuous-feed method in accordance with AWWA C651 before being placed into service.
   
   B. Utilize potable water from existing distribution system or other sources of supply approved by Owner.
   
   C. Prevent contaminated or highly chlorinated water from entering existing, new or previously disinfected water utility piping systems.
   
   D. Provide chemical feed pumps for chlorine solutions to provide accurate measurement of chlorine being introduced.
   
   E. Provide sampling taps to allow for sampling in accordance with AWWA C651. At a minimum, sampling taps shall be provided at each end of the new main, at 1,200 linear foot intervals, and disinfected branch line greater than 18 feet, unless otherwise shown on the Drawings or required by Owner. Hoses and fire hydrants shall not be considered acceptable sampling locations.
   
   F. Disinfect final connections to existing mains in accordance with AWWA C651.

3.02 FINAL FLUSHING
   A. Flush new water utility piping systems in accordance with AWWA C651 following a minimum 24-hour disinfection retention period with a free chlorine residual of not less than 10 mg/l. Prevent contaminated or highly chlorinated water from
entering existing, new or previously disinfected piping systems and the environment.

B. After the retention period described above, flush the heavily chlorinated water using water from the existing main. Coordinate flushing with Owner and take necessary measures to prevent damage or flooding. Continuously flush heavily chlorinated water until background conditions are restored.

C. Neutralize chlorine residual of disposed flushing water by chemical dechlorination in accordance with AWWA C655. Provide equipment to dechlorinate at flushing rates indicated.

D. Comply with Federal, State and local regulations for disposal of flushing water.

3.03 BACTERIOLOGICAL TESTS

A. Collect samples at each sampling location in accordance with AWWA C651 after final flushing and before water utility piping systems are placed into service.

B. Perform sampling in accordance with Option A of AWWA C651, Section 5.1.1.1.

C. Passing laboratory results: absence of any coliform bacteria and heterotrophic plate count (HPC) less than 500/ml in both sets of samples.

A. Re-flush and re-sample water utility piping systems if either set of samples fails to produce passing results in accordance with AWWA C651. If resampling results fail, re-chlorinate, re-flush and re-sample in accordance with AWWA C651 until passing results are obtained.

3.04 REPAIR/RESTORATION

A. Remove temporary blow-off and sample lines down to corporation stop once water utility piping system has been accepted and placed into service.

3.05 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

B. Provide certified, independent third-party firm to perform field testing of free chlorine residuals to ensure appropriate concentrations are being achieved during disinfection in accordance with AWWAC651, and during flushing water disposal in accordance with AWWA C655.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION
SECTION 33 01 10.73

LINE STOPS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Provide line stops, fittings and associated installation, including excavation in accordance with this Section and applicable reference standards listed in Article 1.03.

2. Excavation, shoring, bracing, backfill, compaction, preparation of pipe, tapping of pipe, stopping flow and thrust restraint.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
3. Section 31 00 00 – Earthwork
4. Section 31 10 00 – Site Clearing
5. Section 31 50 00 – Excavation Support and Protection
6. Section 32 12 16 – Asphalt Paving
7. Section 32 16 14- Granite Curbs
8. Section 32 92 19 – Seeding
9. Section 33 14 11.01 - Water Utility Piping – Ductile Iron

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Society for Testing and Materials (ASTM)
   b. ASTM A193 – Standard Specification for Alloy-Steel and Stainless-Steel Bolting for High Temperature or High-Pressure Service and Other Special Purpose Applications.
c. ASTM A194 – Standard Specification for Carbon Steel, Alloy Steel, and Stainless-Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
f. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs 60,000 PSI Tensile Strength.
h. ASTM D2000 – Standard Classification System for Rubber Products in Automotive Applications.

2. American WaterWorks Association (AWWA)
a. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pressure Pipe and Fittings.
c. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
d. AWWA C115 - Standard for Flanged Ductile-Iron Pipe with Threaded Flanges
e. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
g. AWWA C213 – Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings
h. AWWA C223 – Fabricated Steel and Stainless-Steel Tapping Sleeves.
i. AWWA C228 – Stainless-Steel Pipe Flange Joints for Water Service – Sizes 2 In. Through 72 In. (50 mm Through 1,800 mm)
j. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
k. AWWA C651 - Disinfecting Water Mains
3. American National Standards Institute (ANSI)
   b. ANSI B16.42 – Ductile Iron Pipe Flanges and Flanged Fittings
   a. MSS-SP-60 – Connecting Flange Joints between Tapping Sleeves and Tapping Valves.

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, Sequencing and Scheduling: per Division 01 of the General Requirements.

B. Unless otherwise stated or directed by Owner, the Contractor shall not operate valves required to isolate the Work.

C. Obtain necessary dewatering permits at no additional cost to the Owner. Dewater access pits and existing water mains in accordance with permit requirements and local Conservation Commission bylaws.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product Data: manufacturer’s product data and installation instructions for each product specified.

C. Shop Drawings.

D. Sample and Mockups: as specified in Article 1.06.

E. Certificates: notarized manufacturer's certificate of conformance with the standards and specification requirements.

F. Design Data/Submittals

1. Provide concrete thrust restraint designed by a Professional Engineer registered in the Commonwealth of Massachusetts and designed to counteract thrust forces encountered at each line stop location. Submit thrust restraint calculations and dimensions for review with materials submittals.

2. Schedule for pre-excavation of access pit locations and method of
supporting and covering access excavations during non-working hours.

G. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.
   1. Record depth and take ties for Conformed to Construction Records.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Comply with Owner requirements

C. Comply with state and local plumbing codes. Where there is conflict in the codes, the more stringent code shall apply.

D. Comply with AWWA C223, AWWA C600, AWWA C651 including Section 4.3, “for cleanliness, NSF 61 and NSF 372.

E. Provide services of a licensed subcontractor specializing in installation of line stops. Licensed subcontractor shall have successfully completed at least three (3) line-stop installations of the size(s) proposed on the Drawings in the past ten (10) years. Submit line stop subcontractor qualifications with materials submittal for review.

1.07 DELIVERY, STORAGE AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Packing, Shipping, Handling, and Unloading
   1. Each shipment to include manufacturer’s certificate of conformance.

C. Acceptance at Site
   1. Inspect upon delivery and reject materials that do not conform to the specified requirements or show signs of damage during shipping. Mark and immediately remove damaged or rejected materials from the Site and dispose of legally.

1.08 SITE CONDITIONS

A. Existing Conditions: per Division 01 General Requirements.
PART 2 - PRODUCTS

2.01 GENERAL

A. Products in contact with drinking water must meet NSF/ANSI 61 and NSF/ANSI 372.

B. Materials shall comply with the requirements of the Safe Drinking Water Act and U.S. Environmental Protection Agency

2.02 TAPPING SLEEVE

A. Body: ASTM A536 ductile iron or Type 304 stainless steel in conformance with AWWA C223; full circumferential seal; sized appropriately for the point of installation. Measure outside diameter of pipe at installation location prior to ordering materials.

B. Outlet Flange: ductile iron or Type 304 stainless steel meeting or exceeding the requirements of AWWA C228; compatible with ANSI B16.1, class 125 and B16.42, class 150; recessed for tapping valve in accordance with MSS-SP-60.

C. Completion Plug: ductile iron conforming to ASTM A536; fusion bonded epoxy finish meeting AWWA C213; designed for use with tapping and stopping equipment.

D. Cover Plate: carbon steel conforming to ASTM A283C; compatible with ANSI B16.1, class 125 and B16.42, class 150; designed for pressure sealing application.

E. Test Plug: ¾-inch NTP Type 304 stainless steel; hex head; threads coated to prevent galling.

F. Gaskets:

1. O-ring; Nitrile (Buna-N) per ASTM D2000, compounded to resists water, oil, acids, alkalies and other chemicals.

2. Cover: Styrene-Butadiene (SBR) “Red Rubber”; full face ANSI B16.1, class 125 and B16.42, class 150; compounded to resist water, oil, acids, alkalies and other chemicals.

G. Welds and Hardware:

1. Welds: accomplished by qualified welders utilizing GMAW weld process.

2. Set screw: carbon steel; socket head cup point; designed to engage and retain completion plug.
3. Flange Plug: Carbon steel; ¾-inch NPT socket head, designed to seal flange pressure.
4. Bolts Nuts, Washers: Type 304 stainless steel; rolled threads; coated to prevent galling.

H. Working Pressure: 200 psi.

PART 3 - EXECUTION

3.01 GENERAL

A. Coordinate Work with Owner.

B. Perform excavation and backfill in accordance with Section 31 00 00. Support trenches in accordance with Section 31 50 00.

C. Coordinate and schedule Work required to be performed outside of normal business hours per Contract Drawings or per direction of Owner with Owner and Engineer.

3.02 INSTALLATION:

A. Field verify line stop location with Owner and Engineer.

B. Confirm outside pipe diameter, inside pipe diameter, design pressure and operating pressure prior to ordering line stop materials.

C. Confirm range marked on line stop sleeve with pipe diameter prior to installation to ensure installation of appropriately sized sleeve.

D. Excavate trench to size and dimensions required by line stop sub-contractor for access and installation of Work. Thoroughly clean pipe surface to remove all dirt, rock, scale and foreign material in area where line stop sleeve is to be installed.

E. Provide timbers and cribbing required for temporary support of pipe and materials.

F. Install line stop sleeve in accordance with manufacturer’s installation instructions and pressure test to minimum 1.5 times pipeline pressure.

G. Pour concrete support and thrust restraint. Provide 5,000 psi high early concrete unless otherwise required by line stop sub-contractor and approved by Engineer. Allow concrete to cure 24-hours before installing line stop equipment.

H. Schedule line stop insertion with Owner. Line stop insertion shall be scheduled as noted on the Contract Drawings or required by Owner.
I. Mount temporary tapping valve to line stop fitting. Mount tapping machine, open temporary valve and pressure tap pipe. Retract cutter, close temporary valve and remove tapping machine. Provide coupon to Owner being careful to keep coupon intact.

J. Mount line stop machine, open temporary valve and insert line stop head into main. Test for shutdown at drain nozzle, hydrant or other blow-off point. Provide blow-off point as necessary at no additional cost to Owner.

K. Cut downstream main and install valves and fittings as proposed.

L. Retract line stop head, close temporary valve and remove line stop machine.

M. Install completion machine, open valve and insert completion plug. Remove completion machine and temporary valve open insertion of completion plug.

N. Install blind flange in accordance with manufacturer’s specifications and backfill in accordance with Contract documents.

3.03 THRUST AND SUPPORT BLOCKING:

A. Submit thrust restraint design calculations for line stops to Owner for review at least five (5) working days in advance of mounting temporary valve and pressure tapping machinery. Thrust restraints shall be designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Concrete thrust and support blocking shall be installed in accordance with reviewed submittal. Blocking shall reach a minimum cure strength specified by submittal before any valves or machinery shall be mounted onto the line stop fitting.

3.04 CUTTING OPERATION:

A. Drilling equipment shall be in good condition, and equipped with power drive to insure smooth cutting and to minimize shock and vibration. Cutting equipment shall be carbide tipped and capable of being renewed without removal from jobsite.

3.05 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION
SECTION 33 14 11.01

WATER UTILITY PIPING - DUCTILE IRON

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide ductile iron water utility piping, fittings, couplings and joint restraints in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 01 51 38 – Temporary Water Bypass
3. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
4. Section 31 00 00 – Earthwork
5. Section 32 12 16 - Asphalt Paving
6. Section 32 16 14 - Granite Curbs
7. Section 32 92 19 - Seeding
8. Section 33 01 10.58 – Disinfection of Water Utility Piping Systems
9. Section 33 14 19 – Valves and Hydrants for Water Utility Service
10. Section 33 13 21 – Water Service Connections - Copper

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. ASTM International (ASTM)
   a. ASTM A536 Standard Specification for Ductile Iron Castings

2. American Water Works Association (AWWA)
   a. AWWA C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
   b. AWWA C110 Ductile-Iron and Gray-Iron Fittings
   c. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
d. AWWA C151 Ductile-Iron Pipe, Centrifugally Cast

e. AWWA C153 Ductile-Iron Compact Fittings

f. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances

g. AWWA C651 Disinfecting Water Mains

h. AWWA M41 Ductile-Iron Pipe and Fittings

3. NSF International (NSF)
a. NSF/ANSI 61 Drinking Water System Components-Health Effects

4. Underwriters Laboratories (UL)

5. Factory Mutual (FM)

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product data: manufacturer’s data including dimensions, coatings, and installation instructions for each product.

C. Manufacturers’ certificates verifying conformance

D. Source and field quality control submittals: inspection and testing logs, and test results.

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

   1. Record depth and take ties as directed by Engineer for construction records.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Regulatory approvals

   1. Comply with state and local plumbing codes. If there are conflicts, apply the more stringent code.

C. Comply with the requirements of AWWA C600, and Section 4.8 of AWWA C651 for cleanliness.

D. Comply with requirements of NSF/ANSI 61 and 372.

E. Comply with manufacturer’s recommendations for loading, unloading and storage.
1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Handle according to AWWA C600.

C. Packing, shipping, handling, and unloading
   1. Protect flanges and fittings from moisture and dirt by storing inside or package with durable, waterproof wrapping.
   2. Unload and string pipe. Lift pipe off truck and place on ground according to manufacturer’s recommendations. Do not roll pipe off the truck or drop. Stack pipe maximum 3 layers high with proper blocking between layers.

D. Acceptance at Site
   1. Confirm each shipment of pipe, fittings, and appurtenances includes manufacturers’ Certificate of Conformance.
   2. Inspect upon delivery and reject pipe not in conformance with specified requirements, or damaged beyond repair. Mark and immediately remove damaged pipe from Site and dispose of legally.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. Pipe, fittings and joint restraints: in accordance with NSF 61.

B. Furnish products manufactured in the United States.

2.02 DUCTILE IRON PIPE

A. Performance/Design Criteria
   1. Conform to AWWA C151.
   2. Thickness: Class 52.
   3. Diameter: as shown on Drawings.
   4. Joint type: rubber gasketed, push-on conforming to AWWA C111.
   5. Pipe lubricant: suitable for use in potable water supply.
   6. Interior lining: double thickness cement mortar lining and asphaltic seal coat conforming to AWWA C104.
7. Exterior: Factory applied bituminous coating in accordance with AWWA C151.

B. Manufacturers
1. U.S. Pipe
2. American Cast Iron Pipe Company
3. McWane Ductile
4. Or equal

2.03 FITTINGS

A. Performance/Design Criteria
1. Ductile iron fittings: in accordance with AWWA C110 or AWWA C153.
2. Rated working pressure: 350 psi for 3-inch through 24-inch diameter and 250 psi working pressure for 30-inch through 48-inch diameter.
4. Interior lining: double thickness cement mortar lining and asphaltic seal coat conforming to AWWA C104.
5. Exterior: Factory applied bituminous coated in accordance with AWWA C151.

B. Manufacturers
1. U.S. Pipe
2. American Cast Iron Pipe Company
3. Tyler Union
4. Or equal

2.04 SOLID SLEEVE COUPLINGS

A. Performance/Design Criteria
1. Type: restrained solid sleeve.
2. Conform to AWWA C153.
3. Rated working pressure: 350 psi for 3-inch through 24-inch diameter and 250 psi working pressure for 30-inch through 48-inch diameter.

B. Manufacturers
1. U.S. Pipe
2. American Cast Iron Pipe Company
3. Tyler Union
2.05 JOINT RESTRAINT

A. Concrete thrust blocks: 3,000 psi concrete minimum and sized according to thrust block schedule shown on Drawings.

B. Mechanical Joint Restraint
1. Type: mechanical joint restraint gland with multiple gripping wedges and torque limiting twist off nuts.
2. Materials: grade 65-45-12 ductile iron conforming to ASTM A536 for gland body, wedge and wedge actuating components.
3. Wedges: heat treated to hardness range of 370 to 470 BHN.
4. Rated working pressure: 350 psi for 3-inch to 16-inch diameter and 250 psi for 18-inch to 48-inch diameter.
5. Coating: fusion bonded epoxy.
6. Manufacturers
   a. EBAA Iron Inc
   b. Ford Meter Box Company
   c. Tyler Union
   d. Smith-Blair
   e. Or equal

C. Push-on joint restraint
1. Type: rubber gasket with stainless steel locking segments compatible with pipe.
2. Conform to AWWA C111.
3. Rated working pressure: 350 psi up to 24-inch diameter.
4. Manufacturers
   a. U.S. Pipe
   b. American Cast Iron Pipe Company
   c. McWane Ductile
   d. Or equal

2.06 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.
PART 3 – EXECUTION

3.01 GENERAL

A. Coordinate Work with Owner.

B. Perform excavation and backfill according to Section 31 00 00. Support trenches in accordance with Section 31 50 00.

C. Install according to manufacturer’s installation instructions, AWWA C600, AWWA C651, as shown on Drawings and as specified.

3.02 INSTALLATION

A. Make joints in dry trench according to manufacturer’s recommendations and best practices for class of exterior pipe laid. Wipe ends of pipe clean with dry cloth before making joint.

B. Lay pipe to line and grades shown on Drawings and to the satisfaction of the Owner. Line and grade may be adjusted by Engineer to meet field conditions.

C. Install pipe with minimum 5 feet of cover, measured from pipe crown to finished grade, as shown on Drawings or approved by Engineer.

D. Use off-sets or joint deflection according to allowances specified to transition from existing pipe elevation to new pipe elevation with less than 5 feet of cover.

1. Insulate pipe within 3 feet of culvert or with less than 5 feet of cover with minimum 4-inch, 40-pound density Styrofoam material. Extend insulation the width of the trench, minimum 4 feet above pipe envelope and on vertical sides of trench bottom from bottom to above pipe envelope.

2. Joint deflection: according to AWWA C600 or maximum allowable deflection permitted by manufacturer.

3. Install pipe beginning at stub end unless otherwise approved by Engineer. Clean interior of pipe length before laying next length. Cover pipe end with construction cap when Work is stopped temporarily or for extended period. Keep trench free from water. Do not lay or test pipe in a wet trench. Do not cover or backfill trench until approved by Engineer.

E. Pipe Cutting

1. Pipe may be cut to provide shorter sections for construction using a saw or milling process recommended by pipe manufacturer.

2. Cut end of pipe square to the axis of the pipe, grind any rough edges smooth, and bevel where being used for push-on joints.

F. Thrust Restraint
1. Provide for water utility piping where bends, tees, plugs, reducers, couplings, hydrants, or valves are installed.

2. Utilize both concrete thrust blocks and restrained joints.

3. Cast concrete against undisturbed earth and place support to not interfere with making joints. Protect bolts with #15 roofing felt.

4. Length of restrained joints: according to AWWA M41. Anticipate and install restraints prior to bend or valve.

G. Repair clamps are not considered permanent repairs. Cut out defective sections and replace using solid sleeve couplings.

H. Lay pipe to point directed where connecting pipe or structures have not yet been installed. Plug or cap end. Identify terminal point with stake extending above ground, marked to indicate size and service. Provide temporary thrust restraint as required.

I. Vertical Separation from Sanitary Sewer at Crossings

1. Where possible, install water main a minimum of 18 inches above the top of the sewer main or services at crossings. Align a 20-linear foot pipe section with the center of the sewer crossing so water main joints will be equidistant and as far from the sewer as possible. Where conditions prevent 18-inch vertical separation, install the water main in accordance with the following requirements:

   a. Align a 20 linear foot section of water main with the center of the sewer crossing so water main joints will be equidistant and as far from the sewer as possible, and

      1) Encase the water main in concrete as shown on the details, minimum 6-inch thickness, extending ten feet on either side, measured perpendicular to the sewer, or

      2) Install a carrier pipe around water main, constructed of an AWWA-approved water main material with a minimum pressure rating of 150 psi extending ten feet on either side, measured perpendicular to the sewer. Carrier pipe joints, if present, shall also be rated for 150 psi. Install pipe support spacers in annular space in accordance with manufacturer requirements. Seal ends of carrier pipe with non-shrink grout or approved material to prevent settling.

J. Vertical Separation from Storm Drain at Crossings

1. Install water main a minimum of 18 inches above or below storm drain.
K.  Horizontal Separation from Sanitary Sewers and Drains for Parallel Installation
    1.  Where possible, install water main a minimum ten feet horizontally, edge
to edge, from sewers, drains, sewer services or sewer/drain manholes. Where
conditions prevent ten-foot horizontal separation, install water main
in accordance with the following requirements:
       a.  Install water main a minimum of 18 inches above crown of sewer or
    drain, in a separate trench or on an undisturbed earth shelf located
    on one side of the sewer or drain; or
       b.  Encase the water main in concrete as shown on the details, minimum
    6-inch thickness, or
       c.  Install a carrier pipe around water main, constructed of an AWWA-
    approved water main material with a minimum pressure rating of
    150 psi. Carrier pipe joints, if present, shall also be rated for 150 psi.
    Install pipe support spacers in annular space in accordance with
    manufacturer requirements. Seal ends of carrier pipe with concrete
to prevent soil intrusion.

L.  Separation from Natural Gas, Cable TV, Telecommunication, and Electrical
     Underground Utility Lines
    1.  Parallel installations: provide a minimum five-foot horizontal separation
    from outside of edge of water main to outside edge of utility line or duct
    bank.
    2.  Crossings: install water main above or below utility line or duct bank. Comply
    with bury depth requirements for water main. Provide a minimum
    of 12 inches vertical separation from outside edge of water main to outside
    edge of utility line or duct bank.

3.03 FILLING AND PRELIMINARY FLUSHING

A.  Fill and flush new water utility piping system according to AWWA C600 and
    AWWA C651 prior to performing water main testing. Prevent contaminated water
    from entering existing, new or previously disinfected piping systems.

B.  Preliminary flushing: Prior to disinfecting the new main, flush using water from
    existing main in accordance with AWWA C651. Fill the main in a manner that will
    remove air pockets and flush with velocities sufficient to remove particulates.
    Refer to Section 33 01 10.58 and AWWA C651 for disinfection requirements.

C.  Coordinate flushing with Owner and take necessary measures to prevent damage
    or flooding.
3.04 WATER MAIN TESTING

A. Perform pressure and leakage tests according to AWWA C600 and requirements below after preliminary flushing, witnessed by Engineer. Pressure and leakage testing shall be completed by a certified, independent, third party testing firm.

1. Hydrostatic testing: minimum of 2 hours. Test pressure: 1.5 times working pressure at lowest point, not less than 150 psi. Do not allow test pressure to exceed rated working pressure for any joint, restraint, valve, fitting, or connected appurtenance.

2. Determine allowable leakage for ductile iron pipe as follows.

   \[ L = \frac{SDP^{1/2}}{148,000} \]

   Where \( L \) is allowable leakage in gallons per hour, \( S \) is length of pipe in feet, \( D \) is nominal diameter in inches, and \( P \) is average test pressure in psi.

   a. Recommended Allowable Leakage Per 1,000-Feet of Pipeline in Gallons per Hour

   b. Allowable leakage will be the sum of computed leakage for each size if pipeline under test contains sections of various diameters.

<table>
<thead>
<tr>
<th>Average Test Pressure (psi)</th>
<th>NOMINAL PIPE DIAMETER - INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>450</td>
<td>0.57</td>
</tr>
<tr>
<td>400</td>
<td>0.54</td>
</tr>
<tr>
<td>350</td>
<td>0.51</td>
</tr>
<tr>
<td>300</td>
<td>0.47</td>
</tr>
<tr>
<td>275</td>
<td>0.45</td>
</tr>
<tr>
<td>250</td>
<td>0.43</td>
</tr>
<tr>
<td>225</td>
<td>0.41</td>
</tr>
<tr>
<td>200</td>
<td>0.38</td>
</tr>
<tr>
<td>175</td>
<td>0.36</td>
</tr>
<tr>
<td>150</td>
<td>0.33</td>
</tr>
<tr>
<td>125</td>
<td>0.30</td>
</tr>
<tr>
<td>100</td>
<td>0.27</td>
</tr>
</tbody>
</table>

3.05 ABANDONED UTILITIES

A. Close open ends of abandoned underground utilities not designated for removal. Provide closure to withstand hydrostatic or earth pressure which may result after ends of abandoned utilities have been closed acceptable to Engineer.
3.06 FIELD QUALITY CONTROL
   A. Provide in accordance with Division 01 General Requirements.

3.07 REPAIR/RESTORATION
   A. Repair leaks and defective Work and retest until installation is accepted.
   B. Restore disturbed surface areas as follows.
      1. Paved areas, including bituminous curbing and bituminous sidewalks: per Section 32 12 16.
      2. Sidewalks: per Section 32 12 16.
      4. Lawn areas: per Section 32 92 19.
   C. Replace materials and items removed for performance of Work and restore disturbed areas to original conditions.

3.08 CLOSEOUT ACTIVITIES
   A. Provide in accordance with Division 01 General Requirements.

END OF SECTION
SECTION 33 14 19

VALVES AND HYDRANTS FOR WATER UTILITY SERVICE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes

1. Provide valves, hydrants, and appurtenances in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 01 51 38 – Temporary Water Bypass
3. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
4. Section 31 00 00 – Earthwork
5. Section 32 12 16 – Asphalt Paving
6. Section 31 16 14 – Granite Curbs
7. Section 32 92 19 – Seeding
8. Section 33 14 11.01 – Water Utility Piping – Ductile Iron

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Society of Mechanical Engineers (ASME)
   a. ASME B16.1 Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250

2. ASTM International (ASTM)
   b. ASTM A276 Standard Specification for Stainless Steel Bars and Shapes
   c. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
   d. ASTM A536 Standard Specification for Ductile Iron Castings
e. ASTM B98 Standard Specification for Copper-Silicon Alloy Rod, Bar and Shapes
f. ASTM B584 Standard Specification for Copper Alloy Sand Castings for General Applications
g. ASTM D2000 Standard Classification System for Rubber Products in Automotive Applications
h. ASTM F593 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
i. ASTM F594 Standard Specification for Stainless Steel Nuts

3. American Water Works Association (AWWA)
a. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
b. AWWA C153 Ductile-Iron Compact Fittings
c. AWWA C502 Dry-Barrel Fire Hydrants
d. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service
e. AWWA C515 Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
f. AWWA C550 Protective Interior Coatings for Valves and Hydrants
g. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances
h. AWWA C651 Disinfecting Water Mains

4. Manufacturers Standardization Society (MSS)
a. MSS SP-60 Connecting Flange Joints Between Tapping Sleeves and Tapping Valves

5. NSF International (NSF)
a. NSF/ANSI 61 Drinking Water System Components - Health Effects
b. NSF/ANSI 372 Drinking Water System Components – Lead Content

6. Underwriters Laboratories (UL)
7. Factory Mutual (FM)

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.
1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.
B. Product data: manufacturer’s product data and installation instructions for each product specified.
C. Shop Drawings
D. Certificates: manufacturer’s notarized certificate, certifying conformance with specified standards and requirements to accompany shipments.
E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.
B. Comply with requirements of AWWA C600, and Section 4.8 of AWWA C651 for cleanliness.
C. Comply with requirements of NSF/ANSI 61 and 372.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.
B. Packing, shipping, handling and unloading
   1. Each shipment to include manufacturer’s certificate of conformance.
   2. Comply with manufacturer’s recommendations for loading, unloading and storage.
   3. Inspect upon delivery and reject pipe not in conformance with specified requirements, or damaged beyond repair. Mark and immediately remove damaged pipe from Site and dispose of legally.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. Products in contact with raw or drinking water must meet NSF/ANSI 61 and NSF/ANSI 372.
B. Materials provided shall be new, approved for use and purchased specifically for the Project.

2.02 GATE VALVES

A. Resilient wedge of non-rising stem (NSR) type meeting AWWA C515, with a 2-inch square AWWA operating nut opening RIGHT (CLOCKWISE), Underwriters Laboratories (UL) listed and Factory Mutual (FM) approved and with smooth, round, unobstructed flow way.

B. Ductile iron valve body, bonnet, disc, stuffing box and operating nut.

C. Wedge: ductile iron, fully encapsulated EPDM Rubber.

D. Stem and stem nut: silicon bronze stem and ductile iron nut.

E. Stem seals: triple O-rings, 2 above thrust collar, 1 below.

F. Stuffing box and bonnet sealing: nitrile O-rings.

G. Exterior nuts and bolts: Type 304 or 316 stainless steel.

H. Maximum working pressure: 350 psi.

I. Standard mechanical joint ends in accordance with AWWA C111.

J. Interior and exterior surfaces coated with fusion bonded epoxy coating in accordance with AWWA C550, and certified per NSF/ANSI 61.

K. Manufacturers
   1. Mueller Corporation
   2. U.S. Pipe Valve & Hydrant, LLC
   3. American Cast Iron Pipe Company
   4. Or equal

2.03 VALVE BOXES

A. Heavy duty cast iron, two-piece slide type in accordance with ASTM A48. Telescoping, adjustable heavy-pattern type, inside diameter minimum 5-1/4 inches, designed to prevent transmission of traffic loads, adjustable through minimum 6 inches vertically without reduction of lap between sections to less than 4 inches, and length necessary to suit ground elevation. Covers: close fitting, dirt-tight, with WATER cast-in. Top of cover: flush with top of box rim.
2.04 HYDRANTS

A. For standardization, hydrants shall be Mueller “Super Centurion”, Model 250 (with or without AquaGrip System) as manufactured by Mueller Co., Decatur, IL or Darling B-62-B as manufactured by American Valve & Hydrant, Beaumont, TX or approved equal.

B. Dry barrel type meeting or exceeding requirements of AWWA C502 with full flow openings, compression type main valve capable of opening and closing against inlet pressure and draining system.

C. Hydrant shall have a bronze operating nut and shall open RIGHT (CLOCKWISE) with an arrow and the word OPEN cast into body or bonnet of hydrant to indicate turn direction.

D. Working pressure: 200 psi.

E. Ductile iron upper barrel, lower barrel, base and housing.

F. Below grade nuts and bolts: non-metric, Type 304 stainless steel.

G. Provide with the following.
   1. Traffic type at ground line
   2. 5-1/2 foot bury
   3. 6-inch mechanical joint shoe with fusion bonded epoxy coating
   4. 5-1/4-inch valve opening
   5. Two, 2-1/2-inch NST hose nozzles
   6. One, 4-1/2-inch NST steamer nozzle
   7. One operating nut - pentagon shape
   8. 6-inch minimum inside barrel diameter
   9. Paint: Factory coated epoxy primer and two coats epoxy top coating per Article 2.05.
   10. At the Owner’s option, provide permanently mounted hydrant flag approved by Owner.

H. Manufacturers
   1. Mueller Corporation
   2. American Flow Control
   3. Or equal
2.05 HYDRANT PAINT

A. Thoroughly clean hydrants and apply two (2) coats of epoxy paint for top coating, either shop applied, or field applied, in accordance with AWWA C502 and the paint manufacturer’s installation instructions. Paint colors below shall be verified with the Owner and Water Department Superintendent prior to paint application:

1. Barrel: OSHA yellow
2. Bonnet:
   a. 16-inch Water Main: Blue
   b. 12-inch Water Main: Green
   c. 8-inch Water Main: Grey
   d. 6-inch Water Main: Orange

B. Hydrants delivered with Owner’s standard color shall receive one (1) field applied coat of matching alkyd gloss enamel. Hydrants not delivered with the Owner’s standard color shall receive two (2) field applied coats of matching alkyd gloss enamel. Colors shall be as indicated above.

C. Hydrant paint shall be manufactured by Sherwin Williams, Cleveland, OH; Tnemec Company, Inc., Kansas City, MO or Minnesota Mining and Manufacturing Co. (3M), St. Paul, MN; or approved equal.

D. Alkyd gloss enamel shall be 801 DTM by Sherwin-Williams, 2H-Tneme by Tnemec; or approved equal. Reflective paint shall be Scotchlite #7211 by 3M.

2.06 PIPE BOLLARDS

A. Pipe bollards shown on the Drawings or directed by the Owner to be installed, shall be concrete filled, 4-inch diameter ductile iron pipe. The concrete shall be minimum 3,000 psi and trowel rounded at the top.

B. Provide a minimum two (2) coats of field applied safety yellow epoxy paint.

2.07 THRUST RESTRAINT

A. Provide thrust restraint at valves and hydrants in accordance with Section 33 14 11.01.
2.08 TAPPING SLEEVES AND VALVES

A. Tapping Sleeve
   1. ASTM A536 Grade 65-45-12 ductile iron rated for 250 psig maximum working pressure with end joint accessories and split glands to assemble sleeve to pipe.
   2. Asphalctic varnish coating in accordance with NSF/ANSI 61.
   3. Side flange seals: O-ring type, round, oval or rectangular in cross-sectional shape.
   4. 12-inch and smaller: capable of working on Class ABCD pipe diameters without changing either half of sleeve.
   5. Greater than 12-inch: field measured to determine class required.
   6. Outlet flange dimensions and drilling in compliance with ASME B16.1, class 125 and MSS SP-60.
   7. Provide 3/4-inch national pipe thread (NPT) test plug.

B. Tapping Valve
   1. Conform to Gate Valves requirements specified.
   2. Provide with inlet flange conforming to ASME B16.1 Class 125 and MSS SP-60, and mechanical joint outlet end with dimensions complying with AWWA C111.
   3. Designed to connect directly to flanged end of tapping sleeve.

2.09 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Perform excavation and backfill in accordance with Section 31 00 00. Support trenches in accordance with Section 31 50 00.

B. Install in accordance with manufacturer’s installation instructions, AWWA C509, AWWA C515, AWWA C600, as shown on Drawings, and as specified.

3.02 INSTALLATION

A. Valve and Valve Box
   1. Provide that valves bear no stresses due to loads from adjacent pipe.
   2. Inspect valves before installation, clean and lubricate prior to installation.
3. Install valve with stem in vertical position.
4. Secure valves to water main with retainer glands.
5. Set valve box centered directly over operating nut in true vertical alignment. Brace valve box to ensure it remains in true vertical alignment and centered on operating nut during and after backfilling.
6. Maintain proper alignment and height of valve box until final acceptance and adjust to finish grade as required.
7. Prior to issuing request for Substantial Completion, remove any dirt or debris from each valve box installed and operate valve in the presence of the Owner and Engineer.

B. Hydrant
1. Provide hydrants have drains.
2. Restrain joints in hydrant lateral from main to hydrant.
3. Install hydrant gate on hydrant tee.
4. Set hydrant in true vertical alignment with solid concrete block support.
5. Embed hydrant within crushed stone material from bottom of excavation to 12 inches above hydrant drains. Cover crushed stone with plastic polyethylene sheet barrier, minimum 6 Mil.
6. Engineer to inspect hydrant installation prior to backfilling.
7. Paint hydrant with rust inhibiting paint in color scheme selected by Owner.
8. Prior to issuing request for Substantial Completion, operate each hydrant installed in the presence of the Owner and Engineer.

C. Tapping Sleeve and Valve
1. After installation, pressure test joints before tapping.
2. Verify actual pipe size and material to be tapped.
3. Remove dirt and scale on exterior of water main to be tapped.
4. Clean and disinfect pipe exterior tapping saddle and valve, drilling and cutting tools.

3.03 THRUST RESTRAINT
A. Provide thrust restraint at valves, tees and hydrants in accordance with Section 33 14 11.01.

3.04 REPAIR/RESTORATION
A. Repair defective work and retest until installation is accepted.
B. Repair leaks.

C. Restore disturbed surface areas as follows.
   1. Paved areas, including bituminous curbing and bituminous sidewalks: in accordance with Section 32 12 16.
   2. Curbing: in accordance with Section 32 16 14.
   3. Concrete sidewalks: in accordance with Section 32 12 16.
   4. Lawn areas: in accordance with Section 32 92 19.

D. Replace other materials and items removed, restore disturbed areas to original conditions and Owner’s satisfaction.

3.05 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION
SECTION 33 14 21

WATER SERVICE CONNECTIONS – COPPER

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes
   1. Provide copper water service connections in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements
   1. Section 01 50 00 – Temporary Facilities and Controls
   2. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
   3. Section 31 00 00 – Earthwork
   4. Section 32 12 16 – Asphalt Paving
   5. Section 32 16 14 – Granite Curbs
   6. Section 32 92 19 – Seeding
   7. Section 33 14 11.01 – Water Utility Piping – Ductile Iron

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards
   1. ASTM International (ASTM)
      b. ASTM A240 Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
      c. ASTM A536 Standard Specification for Ductile Iron Castings
      d. ASTM B62 Standard Specification for Composition Bronze or Ounce Metal Castings
      e. ASTM B88 Standard Specification for Seamless Copper Water Tube
      f. ASTM B584 Standard Specification for Copper Alloy Sand Castings for General Applications
2. American Water Works Association (AWWA)
   a. AWWA C230 Stainless-Steel Full-Encirclement Repair and Service Connection Clamps for 2 in. Through 12 in. Pipe
   b. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances
   c. AWWA C800 Underground Service Line Valves and Fittings
3. NSF International (NSF)
   a. NSF/ANSI 61 Drinking Water System Components – Health Effects
   b. NSF/ANSI 372 Drinking Water System Components – Lead Content
4. Uni-Bell PVC Pipe Association
   a. Uni-Bell Tapping Guide for PVC Pressure Pipe
5. Unified Number System (UNS) for Copper and Copper Alloys
   a. UNS C89520
   b. UNS C89833

1.04 ADMINISTRATIVE REQUIREMENTS

   A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

   A. Submit in accordance with Division 01 General Requirements.
   B. Product data: manufacturer's product data and installation instructions for each product specified.
   C. Shop Drawings
   D. Certificates: notarized manufacturer's certificate of conformance with the standards and specification requirements.
   E. Closeout and maintenance material submittals: per Division 01 General Requirements.

       1. Record depth and take ties as directed by Engineer for conformed to construction records.

1.06 QUALITY ASSURANCE

   A. Provide in accordance with Division 01 General Requirements.
   B. Comply with Owner requirements.
C. Comply with the United States of America Safe Drinking Water Act and the U.S. Environmental Protection Agency.

D. Comply with state and local plumbing codes. Apply more stringent code for any conflicts.

E. Comply with AWWA C651 including Section 4.3 for cleanliness, AWWA C800, NSF 61 and NSF 372.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Packing, shipping, handling, and unloading
   1. Each shipment to include manufacturers’ certificate of conformance.

C. Acceptance at Site
   1. Inspect upon delivery and reject pipe not in conformance with specified requirements, or damaged beyond repair. Mark and immediately remove damaged materials from Site and dispose of legally.

1.08 SITE CONDITIONS

A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. Products in contact with drinking water must meet NSF/ANSI 61 and NSF/ANSI 372.

B. Comply with the United States of America Safe Drinking Water Act and the U.S. Environmental Protection Agency.

2.02 SERVICE TUBING

A. Copper tubing: Type K, soft copper tubing in accordance with ASTM B88 and AWWA C800.

2.03 CORPORATION STOPS

A. Materials:
   1. Conform to AWWA C800, NSF/ANSI 61 and NSF/ANSI 372.
   2. The letter “NL” cast into the main body for lead free identification.
3. Brass in contact with potable water shall be “No-Lead Brass” conforming to UNS Copper Alloy No. C89520 or C89833 in accordance with ASTM B584 and AWWA C-800.

4. Brass not in contact with potable water shall be 85-5-5-5 brass per UNS Copper Alloy C83600 in accordance with ASTM B62, ASTM B584 and AWWA C-800.

B. Type: ball type; 360° turning radius; solid, one-piece body; solid one-piece stem and operating head; 300 psig working pressure; straight through/full port design, blow-out proof, double O-ring stem seals, brass ball coated with fluorocarbon coating; installed using standard tapping machine.

C. Inlet threads: AWWA CC threads in accordance with AWWA C800.

D. Outlet connection: compression outlet for copper tube size (CTS) outside diameter (OD) tubing.

E. Capable of being installed using a standard tapping machine.

F. Conform to AWWA C800.

G. Manufacturers
   1. Mueller Corporation
   2. A.Y. McDonald
   3. Ford Meter Box
   4. Or equal

2.04 CURB STOPS

A. Materials:
   1. Conform to AWWA C800, NSF/ANSI 61 and NSF/ANSI 372.
   2. The letter “NL” cast into the main body for lead free identification.
   3. Brass in contact with potable water shall be “No-Lead Brass” conforming to UNS Copper Alloy No. C89520 or C89833 in accordance with ASTM B584 and AWWA C-800.
   4. Brass not in contact with potable water shall be 85-5-5-5 brass per UNS Copper Alloy C83600 in accordance with ASTM B62, ASTM B584 and AWWA C-800.

B. Type: ball, open right, quarter turn check with no drain; brass ball with fluorocarbon coating, blow-out proof, double O-ring type stem seals, straight-through/full port design.

C. Positive shut-off in either direction.
D. Pressure rating: 300 psig for ball type or 100 psig for ground key plug type.

E. Inlet connection: compression connection.

F. Outlet connection: compression connection.

G. Conform to AWWA C800.

H. Manufacturers
   1. Mueller Corporation
   2. A.Y. McDonald
   3. Ford Meter Box
   4. Or equal

2.05 SERVICE BOXES

A. Materials: Heavy cast iron in accordance with ASTM A48; asphaltic bituminous coating.

B. Style: 2-1/2-inch Buffalo style.

C. Type: two-piece, slide type.

D. Cover: heavy duty, flush fit, locking type, brass pentagon head bolt, with word WATER cast-in.

E. Base: arch style, enlarged base for 1-1/2 inch and 2-inch diameter water services.

2.06 SERVICE SADDLES

A. Materials: Ductile iron body meeting or exceeding ASTM A536 with Type 304 stainless steel double strap; 300 psi working pressure.
   1. Wraparound design with wide skirt, heavy tapping boss; fusion bonded epoxy coating in accordance with AWWA C213 or Nylon coated.
   2. Studs, nuts and washers: Studs: Type 304 stainless steel per ASTM A276; rolled threads. Nuts: Type 304 stainless steel per ASTM A194 and coated to prevent galling. Washers: Type 304 stainless steel per ASTM A240.
   3. Straps: Type 204 Stainless Steel per ASTM A240 or ASTM A276 as applicable.
   4. Gasket: Nitrile or EPDM O-ring per ASTM D2000; compounded to resist water, oil, natural gas, alkalies and other chemicals.

B. Comply with AWWA C800, NSF/ANSI 61 and NFS/ANSI 372.
C. Polyvinyl chloride (PVC) and molecularly oriented polyvinyl chloride (PVCO) service saddles for PVC/PVCO pipe.

D. Manufacturers
1. Ford Meter Box
2. Smith-Blair, Inc.
3. Mueller Corporation
4. Or equal

2.07 REPAIR CLAMPS

A. Materials:
1. Band ASTM A240 Type 304 stainless steel
2. Gaskets: gridded Nitrile (Buna-N) or Styrene Butadiene Rubber (SBR) face gasket with tapered ends.
3. Lugs: ductile iron per ASTM A536; finish epoxy applied.
4. Armor: ASTM A240 Type 304 heavy gauge stainless steel, mold bonded into the gasket to insure uniform compression against the pipe.
5. Nuts and Bolts: Type 304 stainless steel per ASTM A193 and ASTM A194; CC (AWWA) threads.

B. Comply with AWWA C230, NSF/ANSI 61 and NSF/ANSI 372.

C. Pressure rating: maximum 150 psi working pressure.

D. Manufacturers
1. Romac Industries, Inc.
2. Smith-Blair, Inc.
3. Mueller Corporation
4. Or equal

2.08 ACCESSORIES

A. Service Fittings
1. Materials: cast, no-lead UNS Copper Alloy No. C89520 or C89833 brass in accordance with ASTM B584 and AWWA C800.
2. Pressure rating: minimum 300 psig.
3. Inlet connection: compression type.
5. Manufacturers
2.09 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Coordinate Work with Owner.

B. Perform excavation and backfill in accordance with Section 31 00 00. Support trenches in accordance with Section 31 50 00.

C. Install utility service connections in accordance with manufacturer’s installation instructions, as shown on Drawings, and as specified. Provide after disinfection, flushing and bacteriological testing of water utility piping systems are complete and accepted by Engineer.

3.02 INSTALLATION

A. Corporation Stops

1. Install 1-inch corporation stops for 1-inch and smaller services. Install 2-inch corporations for greater than 1-inch through 2-inch services.

2. Install direct tapped connections with tapping machine for services 1-inch in diameter and smaller in accordance with AWWA C600, manufacturer’s instructions, and as shown on Drawings.

3. Install service saddles for services larger than 1-inch in diameter, and for connections to PVC/PVCO water mains. Install service saddles for PVC/PVCO pipe in accordance with Uni-Bell Tapping Guide for PVC Pressure Pipe.

4. Install wet tap connections with tapping machine.

5. Install taps on customer side of water main.

6. Cut through water main wall completely when drilling. Clean tapped threads and remove any remnants of water main materials.

7. Wrap threaded end with Teflon tape prior to installation.

8. Ensure service taps are water tight.
B. Water Service Tubing

1. Provide 1-inch tubing for services 1-inch and smaller. Provide 2-inch tubing for services greater than 1-inch through 2-inch.
2. Extend as indicated on Drawings or directed by Owner.
3. Install in a single piece without joints between corporation and curb stop.
4. Install in accordance with AWWA C600 and in a straight path from corporation stop to curb stop.
5. Avoid kinks, joints, gouges or crimps.
6. Install with a goose neck at the corporation stop.
7. Connect to corporation stop, curb stop, and existing water service tubing.
8. Connect to existing water service with service fitting.
9. Install with minimum 5-feet of cover measured from top of service tubing to finished grade, as shown on Drawings, or approved in writing by Owner.
10. Insulate service tubing with less than 5 feet of cover with minimum 4-inch, 40-pound density styrofoam material. Extend insulation the width of the trench, minimum 4-feet above pipe envelope and on vertical sides of trench bottom, from bottom to above pipe envelope.
11. Remove and legally dispose of existing water service tubing.

C. Curb Stop and Box

1. Install 1-inch curb stop for services 1-inch and smaller. Install 2-inch curb stop for services greater than 1-inch through 2-inch.
2. Install in trench on precast solid concrete block support at elevation to provide minimum cover of 5-feet.
3. Perform operational testing of curb stops by opening and closing under water pressure to insure proper operation and release any air in the water service tubing.
4. Pressure test utility service connections under active line pressure prior to backfilling.
5. Provide a service box for each curb stop.
6. Set and brace curb box to ensure it remains in a vertical position centered on the curb stop during and after backfilling. Maintain proper alignment and height of curb box until completion of Project.
7. Install curb box so cover is flush with existing grade.
8. Remove and legally dispose of existing curb stop and box.

3.03 REPAIR/RESTORATION

A. Repair defective service taps with stainless steel split sleeve repair clamps.
B. Install repair clamps in accordance with AWWA C230. Do not re-tap water main within 12 inches of repair clamp.

C. Replace defective water service tubing with a single piece of tubing extending from corporation stop to curb stop.

D. Repair defective Work and retest until installation is accepted.

E. Repair leaks.

F. Repair customer indoor plumbing problems that occur as a result of Work performed.

G. Restore disturbed surface areas as follows.
   1. Paved areas, including bituminous curbing and bituminous sidewalks in accordance with Section 32 12 16.
   2. Granite curbing in accordance with Section 32 16 14
   3. Concrete sidewalks in accordance with Section 32 12 16
   4. Lawn areas in accordance with Section 32 92 19.

H. Replace other materials and items removed, restore disturbed areas to original conditions.

3.04 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.05 CLEANING

A. Clean and flush piping after Work is completed, before final acceptance.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION
This page intentionally left blank
SPECIAL PROVISIONS – ATTACHMENT B

SUPERPAVE REQUIREMENTS
SUPERPAVE REQUIREMENTS
SECTION 450
HOT MIX ASPHALT PAVEMENT

Section 450 - Hot Mix Asphalt Pavement entirely replaces the following Sections and Subsections of the Standard Specifications for Highways and Bridges:

- Section 420 - Class I Bituminous Concrete Base Course Type I-1
- Section 460 - Class I Bituminous Concrete Pavement Type I-1
- Subsection M3.01.0 - Asphalt Cement
- Subsection M3.11.06 - Bituminous Materials
- Subsection M3.11.08 - Inspection
- Subsection M3.11.09 - Composition and Compaction Acceptance Tests

The Contractor shall adhere to all of the requirements herein of Section 450, Hot Mix Asphalt Pavement. All QC Inspection Report Forms and Test Report Forms must be submitted to the Department by the Contractor at the completion of each Lot. Material produced and placed must conform to the Quality Limits specified in Subsection 450.77. Contractor QC data and Department Acceptance data for each Lot falling under HMA Lot Category A (Large Lot) or Category B (Small Lot) will be evaluated using Quality Level Analysis and must meet the minimum Percent Within Limits specified in Subsection 450.77.

NOTE: The Pay Adjustment provisions included in Subsection 450.92 will be applied to items under this contract.
SECTION 450
HOT MIX ASPHALT PAVEMENT

DESCRIPTION

450.20 General.

This work shall consist of producing and placing Hot Mix Asphalt (HMA) pavement. HMA mixtures shall be composed of the following: Mineral aggregate, mineral filler (if required), Performance Graded Asphalt Binder (PGAB), and as permitted, reclaimed materials (limited to Reclaimed Asphalt Pavement (RAP), Manufactured Asphalt Shingles (MAS), and Processed Glass Aggregate (PGA)). The HMA pavement shall be constructed as shown on the plans and as directed on the prepared or existing base in accordance with these specifications and in close conformity with the lines, grades, compacted thickness and typical cross section as shown on the plans. Unless specified otherwise, each HMA pavement course placed shall be comprised of one of the mixture types listed in Table 450.1.

Table 450.1 - HMA Pavement Courses & Mixture Types

<table>
<thead>
<tr>
<th>Pavement Course</th>
<th>Mixture Type</th>
<th>Mixture Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction Course</td>
<td>• Open-Graded Friction Course - Polymer Modified</td>
<td>OGFC-P</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 4.75</td>
<td>SSC - 4.75</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 9.5</td>
<td>SSC - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 12.5</td>
<td>SSC - 12.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 19.0</td>
<td>SSC - 19.0</td>
</tr>
<tr>
<td>Surface Course</td>
<td>• SUPERPAVE Intermediate Course - 12.5</td>
<td>SIC - 12.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Intermediate Course - 19.0</td>
<td>SIC - 19.0</td>
</tr>
<tr>
<td>Intermediate Course</td>
<td>• SUPERPAVE Base Course - 25.0</td>
<td>SBC - 25.0</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Base Course - 37.5</td>
<td>SBC - 37.5</td>
</tr>
<tr>
<td>Base Course</td>
<td>• SUPERPAVE Leveling Course - 4.75</td>
<td>SLC - 4.75</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Leveling Course - 9.5</td>
<td>SLC - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Leveling Course - 12.5</td>
<td>SLC - 12.5</td>
</tr>
<tr>
<td>Leveling Course</td>
<td>• SUPERPAVE Bridge Surface Course - 9.5</td>
<td>SSC-B - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Bridge Surface Course - 12.5</td>
<td>SSC-B - 12.5</td>
</tr>
<tr>
<td>Bridge Surface Course</td>
<td>• SUPERPAVE Bridge Protective Course - 9.5</td>
<td>SPC-B - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Bridge Protective Course - 12.5</td>
<td>SPC-B - 12.5</td>
</tr>
<tr>
<td>Bridge Protective Course</td>
<td>• SUPERPAVE Bridge Protective Course - 9.5</td>
<td>SPC-B - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Bridge Protective Course - 12.5</td>
<td>SPC-B - 12.5</td>
</tr>
</tbody>
</table>
450.30 Quality Assurance.

A. Quality Assurance Responsibilities.

This is a Quality Assurance Specification wherein the Contractor is responsible for controlling the quality of materials and workmanship and the Department is responsible for accepting the completed work based on the measured quality. Quality Assurance is simply defined as “making sure the Quality of a product is what it should be”.

The core elements of Quality Assurance include: Contractor Quality Control (QC), Department Acceptance, Department Independent Assurance (IA), Dispute Resolution, Qualified Laboratories, and Qualified Personnel. Although Quality Assurance utilizes test results to control production and determine acceptance of the HMA, inspection remains as an important element in controlling the process and accepting the product.

The Contractor is responsible for providing an appropriate Quality Control system to ensure that all materials and workmanship meet the required quality levels for each specified Quality Characteristic. The Contractor will perform all required Quality Control inspection, sampling, and testing in accordance with these specifications and the Contractor’s Quality Control Plan.

The Department will monitor the adequacy of the Contractor’s QC activities and will perform Acceptance inspection, sampling, and testing. The Department’s Acceptance information will be utilized in the acceptance determination for each Lot of material produced and placed.

Independent Assurance is the responsibility of the Department’s Central Materials Laboratory. The function of IA testing is to periodically provide an unbiased and independent evaluation of the sampling and testing procedures used in the acceptance decision. Contractor QC and Department Acceptance testing procedures and equipment will be evaluated by IA personnel using one or more of the following: observation, calibration checks, split sample comparison, or proficiency samples (homogeneous samples distributed and tested by two or more laboratories). QC and Acceptance testing personnel are evaluated by observation and split samples or proficiency samples.

B. Hot Mix Asphalt Lots & Sublots.

The quality of each HMA pavement course of the same mixture type produced and placed will be inspected, tested, and evaluated on the basis of Lots and Sublots. A Lot is defined as “an isolated quantity of material from a single source which is assumed to be produced or placed by the same controlled process”.

The Lot size and corresponding unit of measure is a function of the individual Quality Characteristic evaluated. Lot sizes for Quality Characteristics subject to Department Acceptance are as shown in Table 450.2.

Changes in the target values, material sources, or JMF for an HMA mixture type will constitute a change in Lot, requiring the establishment of a new Lot. All Lots will be properly identified for accurate evaluation and reporting of HMA quality.
Table 450.2 - HMA Lot Sizes

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Lot Size &amp; Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG Asphalt Binder Grading</td>
<td>Total Tons of HMA from all JMFs using the same PGAB Grade (from same PGAB Supplier), produced by a single plant and placed within same construction season.</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>Total quantity of an HMA mixture type with same JMF for same individual pavement course, produced by a single plant using the same source of materials and placed at a uniform plan thickness within the same construction season, not to exceed 18,000 tons. (See Table 450.3).</td>
</tr>
<tr>
<td>Volumetrics - Air Voids</td>
<td></td>
</tr>
<tr>
<td>In-place Density</td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td></td>
</tr>
<tr>
<td>Ride Quality (IRI)</td>
<td>Total length (miles) of individual wheel paths (in all travel lanes and ramps) of in-place HMA with same JMF for same individual pavement course, produced by a single plant and placed within same construction season, and which is located within the same posted speed limit range as defined in Table 450.19</td>
</tr>
<tr>
<td>Wheel Path Deviations</td>
<td></td>
</tr>
</tbody>
</table>

C. HMA Quality Assurance Requirements.

These Specifications establish three categories under which Hot Mix Asphalt Lots will be produced, placed, evaluated and accepted. Table 450.3 below defines each of the Lot categories and outlines the required Quality Assurance activities of the Contractor and the Department. The division of the Lot categories is based on the total estimated contract quantity of each individual HMA mixture type per each project location. For contracts containing multiple Hot Mix Asphalt items, it is possible to have work performed under more than one HMA Lot category.

(1) Determination of Lot Size and Lot Category

When the total contract quantity of an HMA mixture type is < 2,100 tons (1,925 Mg), it shall be classified as a Minor Lot (Category C Lot).

When the total contract quantity of an HMA mixture type is ≥ 2,100 tons (1,925 Mg), but < 7,500 tons (6,875 Mg), it shall be classified as a Small Lot (Category B Lot).

When the total contract quantity of an HMA mixture type is ≥ 7,500 tons (6,875 Mg), but ≤ 15,000 tons (13,750 Mg), it shall be classified as a Large Lot (Category A Lot).

When the total contract quantity of an HMA mixture type is > 15,000 tons (13,750 Mg), each 15,000 tons (13,750 Mg) will represent a Category A Lot. If the quantity remaining after all 15,000 ton (13,750 Mg) Category A Lots is ≤ 3,000 tons (2,750 Mg), it shall be added to the final Lot providing a final Lot quantity not to exceed 18,000 tons (16,500 Mg). If the quantity remaining after all 15,000 ton (13,750 Mg) Category A Lots is > 3,000 tons (2,750 Mg), it shall constitute a separate Category A Lot.

(2) Determination of Sublot Size

Each HMA Lot will be divided into Sublots of uniform size. The size of each HMA Sublot shall be as listed in Table 450.10 and Table 450.17. If the HMA quantity at the end of a Lot is equal to or greater than one half of a full Sublot, then such quantity shall be identified and evaluated as a separate Sublot. If the HMA quantity at the end of a Lot is less than one half of a full Sublot, then such quantity shall be combined with the previous full Sublot quantity and shall be identified and evaluated as the final Sublot.
Table 450.3 - HMA Lot Categories & Quality Assurance Requirements

<table>
<thead>
<tr>
<th>Quality Assurance Requirements</th>
<th>Category A (Large Lot)</th>
<th>Category B (Small Lot)</th>
<th>Category C (Minor Lot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Quantity for individual Lot of HMA:</td>
<td>≥ 7,500 tons (6,875 Mg), but ≤ 15,000 tons (13,750 Mg)</td>
<td>≥ 2,100 tons (1,925 Mg), but &lt; 7,500 tons (6,875 Mg)</td>
<td>&lt; 2100 tons (1,925 Mg)</td>
</tr>
<tr>
<td>QC Plan Required:</td>
<td>YES</td>
<td>YES</td>
<td>(See Note 2)</td>
</tr>
<tr>
<td>Contractor QC Inspection Required:</td>
<td>YES (Subsection 450.64)</td>
<td>YES (Subsection 450.64)</td>
<td>YES (Subsection 450.64)</td>
</tr>
<tr>
<td>Contractor QC Testing Required:</td>
<td>YES (Subsection 450.65)</td>
<td>YES (Subsection 450.65)</td>
<td>YES (Subsection 450.65)</td>
</tr>
<tr>
<td>Control Strip Required:</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Control Charts Required:</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Quality Level Analysis Required:</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>MassDOT Acceptance Inspection &amp; Testing Performed:</td>
<td>Minimum 25% of Sublots (Subsection 450.74)</td>
<td>Minimum 50% of Sublots, but Minimum 3 Sublots (Subsection 450.74)</td>
<td>100% of Sublots (Subsection 450.74)</td>
</tr>
<tr>
<td>QC Test Results included in MassDOT Acceptance Determination:</td>
<td>YES (If Validated)</td>
<td>YES (If Validated)</td>
<td>NO</td>
</tr>
<tr>
<td>Pay Adjustment Applied:</td>
<td>YES (Subsection 450.92)</td>
<td>YES (Subsection 450.92)</td>
<td>NO</td>
</tr>
</tbody>
</table>

Note 1: Category A Lots shall not exceed 18,000 tons (16,500 Mg) as specified in Subsection 450.30C(1)
Note 2: If all HMA Lots fall under Category C then a QC Plan is not required. However, if any Lots on the project fall under Category A or Category B, then any Category C Lots must be addressed in the QC Plan.
MATERIALS

450.40 General.

Materials shall meet the requirements in the following Subsections of Division III, Materials and as otherwise specified herein:

Asphalt Emulsion M3.03.0
Hot Poured Joint Sealer M3.05.0
Asphalt Anti-Stripping Additive M3.10.0
Job-Mix Formula M3.11.03
Mineral Aggregate M3.11.04
Mineral Filler M3.11.05
Plant Requirements M3.11.07

450.42 Hot Mix Asphalt Mix Design.

The Contractor shall be responsible for development of all HMA Laboratory Trial Mix Formulas (LTMF). The aggregate gradation structure and target PG Asphalt Binder content of each LTMF for HMA base courses, HMA intermediate courses, and HMA surface courses shall conform to the Control Points in Section 455. The aggregate gradation structure and target PG Asphalt Binder content for Open-Graded Friction Course (OGFC-P) shall conform to the master ranges in M3.11.03 – Table B. All LTMFs for HMA pavement courses shall be supported by volumetric mix designs. Volumetric mix designs are not required for OGFC-P.

All HMA LTMF’s will be submitted to the Engineer with adequate samples of individual ingredients for verification of each proposed mixture. Upon the Engineer’s laboratory verification of the LTMF for Category A Lots, a Control Strip will be necessary. Once each LTMF for Category B Lots or Category C Lots is laboratory verified and accepted by the Engineer, the LTMF will become the approved job mix formula (JMF).

Two or more job-mix formulas per HMA mixture type may be approved for a particular plant, however, only HMA conforming to one job-mix formula is permitted to be produced and placed on any given day.

450.44 Reclaimed Asphalt Pavement (RAP).

Reclaimed Asphalt Pavement (RAP) shall consist of the material obtained from the highways or streets by crushing or milling existing HMA pavements. This material shall be transported to the HMA production facility yard and processed through an appropriate crusher so that the resulting material will contain no particles larger than the maximum aggregate size of the HMA mixture in which it will be used. The material shall be stockpiled on a free draining base, covered and kept separate from the virgin aggregates. The material contained in the RAP stockpiles shall have a reasonably uniform gradation from fine to coarse and shall be protected from accumulation of excessive moisture and shall not be contaminated by foreign materials.
The use of RAP will be permitted at the option of the Contractor provided that the end product is in conformance with the approved job-mix formula. The proportion of RAP to virgin aggregate for base course mixtures and intermediate course mixtures shall be limited to a maximum of 40% for drum mix plants and 20% for modified batch plants. The maximum amount of RAP for all surface course mixtures listed in Table 450.1 shall be 15%. No RAP will be allowed in OGFC-P mixtures.

450.46 Manufactured Asphalt Shingles (MAS)

Manufactured Asphalt Shingles (MAS), as defined in M3.11.04, may be used in HMA leveling courses, HMA base courses, and HMA intermediate courses at a maximum rate of 5% by weight only when RAP is not included in the job mix formula. When MAS is used in HMA mixtures containing RAP or other reclaimed materials, the MAS will be considered as part of the overall allowable mass of reclaimed materials in the mixture, as defined in M3.11.06. HMA mixtures containing MAS shall be designed, produced, and placed in accordance with the requirements contained in Section M3.

450.48 Performance Graded Asphalt Binder.

A. Standard Asphalt Binder Grade.

The Asphalt Binder shall be a Performance Graded Asphalt Binder (PGAB) which meets the specification requirements of AASHTO Standard M320. PGAB shall be provided by an Approved Supplier (AS) in accordance with the Approved Supplier Certification (ASC) system outlined in AASHTO R26, “Standard Practice for Certifying Suppliers of Performance Graded Asphalt Binders”.

The standard PGAB grade for Massachusetts has been determined based upon the expected minimum and maximum pavement in-service temperature using the LTPPBind software with a High Reliability (96-98%). Unless indicated otherwise on the Plans or in the Special Provisions, the standard PGAB Grade of PG64-28 shall be used.

B. Asphalt Binder Modifiers for Reclaimed Materials.

For any HMA containing reclaimed materials, an asphalt binder modifier shall be added to the mixture to restore the asphalt binder properties of the reclaimed materials to a level that is consistent with the specified virgin PGAB. If greater than 25% RAP is used in an HMA mixture, the PGAB modifier grade used shall be in accordance with Table 450.4. The type and amount of asphalt binder modifier to be used shall be included as part of the LTMF. Only Performance Graded Asphalt Binders will be used as modifiers and shall meet the requirements of AASHTO M 320. However, the resulting final PGAB grade shall be in accordance with Table 450.4 (or the specified PGAB grade per the contract).

For HMA Category A Lots and Category B Lots incorporating greater than 25% RAP in the LTMF, the Contractor shall perform, as part of the mix design, full binder testing per AASHTO M 320 on samples of asphalt binder recovered from the RAP (by Abson recovery) blended in the appropriate proportion with samples of the virgin PGAB.

For HMA Category A Lots containing greater than 25% RAP, the Contractor shall also perform full binder testing (on asphalt binder recovered from the RAP blended with the virgin PGAB) for the Control Strip and for Quality Control during HMA production and placement as specified in Subsection 450.65.
### Table 450.4 - PGAB Grades for HMA Mixtures Containing RAP

<table>
<thead>
<tr>
<th>Amount of RAP in Mixture</th>
<th>PGAB Modifier Grade</th>
<th>Resulting PGAB Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 25% RAP by Weight of Mixture</td>
<td>None</td>
<td>64-28</td>
</tr>
<tr>
<td>&gt; 25% to 40% RAP by Weight of Mixture</td>
<td>52-34</td>
<td>64-28 ± 2°C</td>
</tr>
</tbody>
</table>
CONSTRUCTION PROCEDURES

450.50 General.

Prior to the start of any work activity addressed in Subsections 450.53 thru 450.59 below, a Construction Quality Meeting shall be held to review the Contractor’s Quality Control system. The Contractor shall present and discuss with the Engineer in sufficient detail the specific Quality Control information and activities contained in each section of their QC Plan as outlined in Subsection 450.61 below. The meeting is intended to ensure that the Contractor has an adequate Quality Control system in place and that the Contractor’s personnel are fully knowledgeable of the roles and activities for which they are responsible to achieve the specified level of quality. Contractor personnel required to attend the Construction Quality Meeting include; the Project QC Manager, all other QC personnel (production facility and field operations), all Superintendents, and the Foremen for field operations. The Contractor shall provide a copy of the approved QC Plan for each Contractor and Department attendee of the meeting.

450.51 Control of Grade and Cross-Section.

The Contractor will provide a longitudinal and transverse reference system, with a maximum spacing of 100 ft (30 meters), for the purpose of locating and documenting sampling and testing locations and related uses. It is the Contractor’s responsibility to clearly mark this reference system in the field. Work related to this reference system is incidental and will be included as part of the Contractor’s Quality Control system. The Department shall provide information tying in the Contractor’s reference system to the State Mile Marker System.

The Contractor shall furnish, set and maintain all line and grade stakes necessary to guide the automated grade control equipment. Where required these control stakes shall be maintained by the Contractor and used throughout the operations, from the grading of the subbase material up to and including the final course of the pavement.

Under normal conditions, where more than one course of HMA is to be constructed, the use of the string line for grade control may be eliminated or discontinued after the construction of the initial course of HMA. For resurfacing projects, where only one course of HMA is to be constructed, the use of the string line for grade control may be eliminated. The use of approved automation may then be substituted for the string line where lines and grades are found to be satisfactory by the Engineer.

450.52 Weather Limitations.

HMA shall only be placed on dry, unfrozen surfaces and only when the temperature requirements contained in Table 450.5 below are met.

The Contractor may continue HMA placement when overtaken by sudden rain, but only with material which is in transit from the HMA production facility at the time, and then only when the temperature of the HMA mixture is within the temperature limits specified and when the existing surface on the roadway is free of standing moisture.

The construction of HMA pavement shall terminate November 15 and shall not be resumed prior to April 1 except as determined and directed in writing by the Engineer depending upon the necessity and emergency of attendant conditions, weather conditions, and location of the project. Only in extreme cases will the placement of surface courses be permitted between November 15 and April 1. Regardless of any temperature requirements, OGFC-P mixtures shall not be placed after October 31 or before May 1 without the written permission of the Engineer.
Table 450.5 - Temperature Limitations for HMA Placement

<table>
<thead>
<tr>
<th>HMA Pavement Course</th>
<th>Lift Thickness Inches (mm)</th>
<th>Minimum Air Temperature °F (°C)</th>
<th>Minimum Surface Temperature °F (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction Course</td>
<td>1 (25)</td>
<td>50 (10)</td>
<td>55 (13)</td>
</tr>
<tr>
<td>Surface Course &lt; 1¼ (45)</td>
<td>45 (7)</td>
<td></td>
<td>50 (10)</td>
</tr>
<tr>
<td>Surface Course ≥ 1¼ (45)</td>
<td>40 (4)*</td>
<td></td>
<td>45 (7)</td>
</tr>
<tr>
<td>Intermediate Course</td>
<td>All</td>
<td>40 (4)*</td>
<td>45 (7)</td>
</tr>
<tr>
<td>Base Course</td>
<td>All</td>
<td>40 (4)*</td>
<td>45 (7)</td>
</tr>
<tr>
<td>Leveling Course</td>
<td>As Specified</td>
<td>45 (7)</td>
<td>50 (10)</td>
</tr>
</tbody>
</table>

*When the air temperature falls below 50° F (10° C), extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials, and in placing and compacting the mixtures.

The Contractor shall supply the Engineer with an approved dial type thermometer with a temperature range of -50° to 500° F (-18° to 260° C) and an infrared pistol thermometer for each paving machine in operation on the project. The infrared pistol thermometer shall be Fahrenheit or Celsius selectable and conform to the following requirements:

- Portable and battery operated
- LCD Display to nearest 1° F (1° C)
- Temperature operating range of 0° to 750° F (-18° to 400° C)
- Accuracy of ± 2%
- Repeatability of ± 5° F (± 3° C)
- Emissivity preset at 0.95

The thermometers will remain the property of the Contractor upon completion of the project.

450.53 Preparation of Underlying Surface.

HMA mixtures shall be placed only upon properly prepared surfaces that are clean from foreign materials. The underlying surface shall be prepared in accordance with the requirements below, prior to the placement of HMA pavement courses.

A. Subbase or Reclaimed Base.

Prior to the placement of HMA base course mixtures, the Contractor shall inspect the prepared subbase or reclaimed base material to ensure that it is in conformance with the required grade, cross-section, and in-place density. Subbase or reclaimed base material that is not in accordance with the plans or specifications shall be reworked or replaced to meet the applicable requirements of Sections 401, 402, or 403 before the start of HMA placement. The subbase or reclaimed base shall not be frozen or have standing water when placing HMA.
B. Milling Existing HMA Pavement.

When specified on the plans, existing HMA pavement courses shall be milled and removed from the project by the Contractor. Milling shall be performed in conformity with the limits, line, grade, and typical cross-section shown on the plans and in accordance with Section 130, Milling Existing HMA Pavement. All Quality Control activities for milling shall be addressed in the Contractor’s HMA QC Plan.

C. Patching Existing Pavement Courses.

Areas of existing HMA pavement courses that are significantly distressed or unsound shall be removed and replaced with patches using new Hot Mix Asphalt. The location and limits of patching will be as identified in the plans or as directed by the Engineer.

Each existing pavement course determined to be unsound shall be removed to the full depth of the pavement course within a rectangular area. For each patch location equal to or greater than 50 square feet (4.6 square meters) in area (and having a minimum dimension of 4 feet (1.2 meters)) where the existing pavement courses are removed down to subbase, the subbase shall be compacted by mechanical means to not less than 95% of the maximum dry density of the subbase material as determined by AASHTO T 99 method C at optimum moisture content. Each edge of the patch area shall be sawcut or otherwise neatly cut by mechanical means to provide a clean and sound vertical face. The vertical face of each edge shall be thoroughly coated with a hot poured rubberized asphalt sealant meeting the requirements of ASTM D3405 immediately prior to placing the HMA patching mixture.

Delaminated areas of existing pavement courses resulting from pavement milling shall be cut back neatly by mechanical means to the limits of any unsound material. After removing all unsound material, the underlying pavement surface within the patch limits shall receive a thorough tack coat at a rate of application of 1/10 gal/s.y. (0.40 liters/square meter) immediately prior to placing the HMA patching mixture.

HMA patching mixture shall be the same mixture type as the existing pavement course being patched or as specified on the plans or as directed by the Engineer. The lift thickness of the patching mixture shall not exceed four times the nominal maximum aggregate size of the mixture. The patching mixture will be placed by hand or by mechanical means and shall match the thickness, grade, and cross-slope of the surrounding pavement. The HMA patching mixture shall be compacted using a steel wheel roller. For patch areas not large enough to permit use of a roller, compaction shall be accomplished using a mechanical tamper capable of achieving the required in-place density. The Contractor shall test the in-place density of each patched area using a calibrated density gauge and record the test data for each patched area on NETTCP Test Report Forms. The in-place density of the HMA patching mixture shall be not less than 92% of the maximum theoretical density of the mixture as determined by AASHTO T 209.

D. Leveling Courses.

HMA Leveling Courses shall only be used when specified in the Plans or Special Provisions. The HMA mixture used for a Leveling Course shall be as specified in the Plans or Special Provisions and shall conform to the relevant Materials requirements of Section 450.

E. Preparation of Curbs, Edging, and Utilities.

All curbs or edging shall be installed or reset to the line and grade established on the plans. The surface elevation of all catch basin frames and grates, manholes, utility valve boxes, or other utility structures located in the pavement shall uniformly match the grade and cross-slope of the final pavement riding surface. Adjustment of all curbs, edging, and utilities shall be completed prior to the placement of the HMA surface course. When OGFC-P is specified to be placed over the HMA surface course, all curbs, edging, and utilities shall be adjusted prior to
placement of the surface course mixture. Hand placement of HMA along curbs and edging or around utilities after placement and compaction of the surface course shall not be permitted.

F. Sweeping Underlying Surface.
   The Contractor shall provide a mechanical sweeper equipped with a water tank, spray assembly to control dust, a pick-up broom, a dual gutter broom, and a dirt hopper. The sweeper shall be capable of removing millings and loose debris from the underlying surface.
   All milled pavement surfaces shall be thoroughly swept in accordance with Section 130, prior to opening a milled area to traffic, to remove all remaining millings and dust. All other existing pavement surfaces shall be swept immediately prior to application of the tack coat. Any new HMA pavement course that has been open to traffic, or that was placed 30 days prior to placement of the subsequent pavement course, shall also be swept immediately prior to application of the tack coat.

G. Tack Coat.
   A tack coat of asphalt emulsion, grade RS-1 shall be uniformly applied to existing or new pavement surfaces prior to placing pavement courses as specified below. The existing surface shall be swept clean of all foreign matter and loose material using a mechanical sweeper and shall be dry before the tack coat is applied.

(1) Tack Distributor System.
   A pressure distributor shall be used to apply the tack coat. The tack distributor system shall be equipped with the following to control and monitor the application:
   (a) System for heating the asphalt emulsion uniformly to specified temperature.
   (b) Thermometer for measuring the asphalt emulsion temperature.
   (c) Adjustable full circulation spray bar.
   (d) Positive controls including tachometer, pressure gauge, and volume measuring device.

(2) Tack Application Requirements.
   The tack coat material shall be applied by a pressure distributor. All nozzles on the distributor shall be open and functioning. All nozzles shall be turned at the same angle to the spray bar. Proper nozzle angle shall be as determined by the manufacturer of the distributor spray bar. The spray bar shall be adjusted so that it is at the proper height above the pavement surface to provide a double overlap spray for a uniform coverage of the pavement surface. A double lap application requires that the nozzle spray patterns overlap one another such that every portion of the pavement receives spray from exactly two nozzles.
   When an HMA pavement course is placed on an existing tight smooth pavement surface, a tack coat shall be applied at the rate of 1/20 gal/s.y. (0.20 liters/square meter). All existing surfaces subjected to milling shall receive a tack coat at the rate of 1/15 gal/s.y. (0.28 liters/square meter). Tack coat shall be applied to cover approximately 90% of the pavement surface.
   Any new HMA pavement course that has been open to traffic, or that was placed 30 days prior to placement of the subsequent pavement course, shall receive a tack coat at an application rate of 1/20 gal/s.y. (0.20 liters/square meter).
   When the surface of a new HMA pavement course is in a condition which in the Engineer's judgment is unsatisfactory for the direct placement of the subsequent pavement course, a tack coat shall be applied at the applicable rate specified above for the particular pavement surface condition.
   In addition to the requirements above, all vertical surfaces of curbs, edging, utilities, and drainage structures shall receive a thorough tack coat application immediately prior to placing each HMA pavement course.
(3) Tack Inspection.
The asphalt emulsion temperature and application rate shall be periodically measured and properly recorded by the Contractor on NETTCP Inspection Report Forms. If the temperature or application rate is determined to not be in conformance with the specification requirements above, the Contractor shall make appropriate adjustments to the tack application operations.

450.54 Hot Mix Asphalt Transportation and Delivery.

A. Haul Unit Equipment.
The trucks used to transport HMA to the field placement site shall have tight, clean, smooth metal beds. When necessary to maintain the required HMA temperature, trucks shall be equipped with insulated beds. The truck beds shall be evenly and lightly coated with an approved release agent to prevent HMA mixture adherence. Release agents may consist of soapy water or commercial oil emulsions (also known as soluble oils) in the proportions recommended by the manufacturer. Truck beds shall be kept free of kerosene, gasoline, fuel oil, solvents, or other materials that could adversely affect the HMA mixture. Excess lubricant shall not be allowed to accumulate in low spots in the body. The Contractor shall employ sufficient procedures and QC inspection to ensure that all truck beds are free of contaminants, residual HMA, or excess release agent.

B. HMA Protection During Transport.
The HMA shall be transported from the plant to the field placement site in trucks previously cleaned of all foreign materials. During transportation of the HMA from the plant to the placement equipment at the site, each load shall be fully covered at all times, without exception, with canvas or other suitable material of sufficient size and thickness, which is tightly secured to furnish complete protection. The HMA shall not be transported such a distance that segregation of the mixture takes place or that a crust is formed on the surface, bottom or sides of the HMA.

C. Coordination and Inspection of HMA Delivery.
The dispatching of trucks from the plant shall be continuously coordinated to ensure that all HMA mixture planned to be delivered to the field placement site may be placed and compacted before the end of the scheduled work day. During paving operations, the Contractor shall provide for ongoing two-way radio or cellular phone communication between the field placement site and the HMA plant.
The target temperature and allowable range of the HMA when delivered at the field placement site will be established in the Contractor’s Quality Control Plan. The Contractor shall measure the temperature of the HMA, either from the trucks prior to discharge or from the paver hopper, using a metal stemmed dial type thermometer at the minimum frequency indicated in the approved QC Plan. All QC temperature measurement results of the delivered HMA mixture shall be recorded on NETTCP Inspection Report Forms. The Contractor shall also visually inspect the delivered HMA for crusting or material (physical) segregation. The Contractor shall reject any loads of HMA with material which is crusted, segregated, or which is not within the delivery temperature range established in the Contractor’s Quality Control Plan.

450.55 Hot Mix Asphalt Placement.

A. Material Transfer Vehicles
For projects on all controlled access highways with HMA Category A Lots, a Material Transfer Vehicle (MTV) will be required. The MTV shall be used to place each pavement...
course, with the exception of leveling courses, on the mainline of the traveled way including all travel lanes, auxiliary lanes, and collector/distributor (C/D) lanes.

**1. MTV Equipment Requirements.**

The MTV shall be self-propelled and capable of remixing and transferring the HMA mixture to the paver so that the HMA mat behind the paver has a uniform homogeneous temperature and appearance. The MTV shall be equipped with the following:

(a) A truck unloading system, capable of 600 tons per hour (550 Mg per hour), which shall receive HMA from the trucks and independently deliver the mixture from the trucks to the paver.

(b) A paver hopper insert with a minimum capacity of 14 tons (12.7 Mg) shall be installed in the hopper of conventional paving equipment. The paver hopper insert shall be marked to identify the point at which the insert is 50% full.

(c) An internal storage bin with a minimum capacity of 25 tons (22.7 Mg) of mixture and a remixing system in the bottom of the storage bin to continuously blend the mixture as it discharges to a conveyor system; or a dual pugmill system located in the paver hopper insert with two full length longitudinally mounted counter-rotating screw augers to continuously blend and feed the mixture through the paver to the screed.

**2. MTV Operations.**

The Contractor shall ensure that the MTV is loaded continuously to keep the paver moving. The volume of HMA in the paver hopper insert shall remain above the 25% capacity mark during all paving operations. In the event the MTV malfunctions during HMA placement operations, the Contractor shall continue placement of material until such time there is sufficient HMA placed to maintain traffic in a safe manner. The Contractor may continue placement of HMA until any additional mixture in transit has been placed. Paving Operations may resume only after the MTV has been repaired and is fully operational.

**3. Bridge Loading Restrictions.**

The MTV shall be subject to all bridge load restrictions. The Contractor shall verify the sufficiency of the current bridge ratings with the Engineer. In the event that the MTV exceeds the maximum allowable bridge load, the MTV shall be empty when crossing the bridge and shall be moved across without any other Contractor vehicles or equipment being on the bridge. The MTV shall be moved across the bridge in a travel lane and shall not be moved across the bridge on the shoulder. The MTV shall be moved at a speed no greater than five miles per hour (8 kph) without any acceleration or deceleration.

**B. Pavers.**

Each HMA pavement course shall be placed with one or more pavers at the specified grade, cross-slope, and lift thicknesses.

**1. Paver Equipment Requirements.**

Each paver shall be a self-contained, power propelled unit and shall produce a finished surface of smooth and uniform texture without segregating, tearing, shoving or gouging the HMA. The pavers shall be equipped with the following:

(a) A receiving hopper having sufficient capacity to ensure a uniform and continuous placement operation.

(b) Automatic feed controls, which are properly adjusted to maintain a uniform depth of material ahead of the screed.

(c) Automatic screed controls with sensors capable of sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.
(d) An adjustable vibratory screed with full-width screw augers and heated for the full width of the screed.

(e) Capable of spreading and finishing HMA pavement courses in widths at least 12 inches (300mm) more than the width of one travel lane.

(f) Capable of being operated at forward speeds to satisfactorily place the HMA.

(2) Paver Operations.

The Contractor shall ensure that the paver is loaded continuously to keep the placement operation moving. The volume of HMA in the paver receiving hopper shall remain above the paver tunnel during all paving operations. Proper practices shall be utilized to ensure that HMA is not dumped or spilled onto the prepared underlying surface in front of the paver by trucks unloading into the receiving hopper.

C. HMA Placement Inspection.

The HMA shall be free of identifiable material (physical) segregation or temperature related segregation. The HMA placed shall be a homogeneous mixture that is of uniform temperature. The Contractor shall inspect the HMA in the paver receiving hopper for material (physical) segregation. The Contractor will also inspect the uncompacted HMA mat behind the paver for longitudinal streaks, end-of-load segregation or other irregularities.

The Contractor shall also measure the temperature differential in the uncompacted mat behind the paver. Each HMA pavement course behind the paver shall be divided into longitudinal Sublots of 500 feet (150 meters). The mat temperature differential of the uncompacted HMA shall be measured at a minimum of one location in each Sublot along a straight transverse line behind the paver at a minimum frequency of once per Sublot. The transverse line for mat temperature measurement shall be established at a distance within 10 feet (3 meters) behind the paver screed. Temperature measurements shall be obtained by the Contractor using an infrared pistol thermometer at two (2) foot intervals along the transverse line across the width of the mat and recorded on NETTCP Inspection Report Forms. The difference between the highest and lowest temperature measurement shall not exceed 20°F (10°C).

If the maximum mat temperature differential is exceeded, or if material segregation or irregularities in the HMA mat behind the paver are noted, the Contractor shall review the production, transportation, and placement operations and take corrective action. The Contractor shall make every effort to prevent or correct any irregularities in the HMA, such as changing pavers or using different and additional equipment. The Contractor’s Quality Control Plan shall fully outline procedures for inspecting the HMA mat during placement, identifying and troubleshooting material segregation or temperature related segregation, and implementing corrective action.

450.56 Hot Mix Asphalt Compaction.

A. Compaction Equipment Requirements.

The Contractor shall employ compaction equipment as outlined in the approved Quality Control Plan. Equipment used for compaction of HMA Base Courses, Intermediate Courses and Surface Courses may include steel wheeled rollers, vibratory rollers, oscillation rollers, or pneumatic-tired (rubber tired) rollers as determined appropriate by the Contractor for the particular mixture type being placed. The number and type of rollers used for breakdown, intermediate, and finish rolling shall be sufficient to achieve the target in-place density and specified course thickness.
B. Compaction Operations.

The rollers shall not crush the aggregate in the HMA mixture and shall be capable of reversing without shoving or tearing the mixture. The Contractor shall outline in the Quality Control Plan the proposed rolling sequence for each HMA pavement course to be placed. For HMA Category A Lots, the initial rolling pattern for each pavement course will be confirmed or adjusted during placement of the Control Strip in accordance with the requirements of Subsection 450.66B. As Lot placement progresses during the construction season, the rolling pattern shall be adjusted as necessary to achieve the specified HMA in-place density.

C. Compaction of Open-Graded Friction Course.

Vibratory rollers, oscillation rollers, or rubber tire rollers will not be permitted on Open Graded Friction Course (OGFC-P) mixtures. Initial rolling of OGFC-P should be accomplished with the breakdown roller within a short distance of the paver. Any subsequent rolling shall be accomplished without over-rolling the mixture. Breakdown and intermediate rolling of OGFC-P shall be completed before the material has cooled to 195°F (90°C).

D. Inspection & Testing of Compacted HMA.

The compacted HMA pavement course shall be free of material (physical) segregation and shall meet the requirements for in-place density, thickness, and ride quality specified in Subsection 450.65F. The Contractor shall inspect each Sublot of HMA throughout the compaction operation and shall further inspect the in-place HMA after Sublot completion and identify any areas of visible material (physical) segregation. The Contractor shall reject any in-place Sublot of HMA which is determined to be segregated through procedures established in the Quality Control Plan. The Contractor will also test each Sublot for in-place density, thickness, and ride quality as specified in Subsection 450.65F.

450.57 Hot Mix Asphalt Joints.

The Contractor shall plan the sequence of HMA placement to minimize transverse and longitudinal joints in each pavement course. Paving operations should employ long pulls or tandem pavers, whenever practicable, to reduce the number and length of joints.

A. Transverse Joints.

Where the start or end of a new HMA pavement course meets existing HMA pavement, the existing pavement shall be sawcut to form a transverse butt joint for the full depth of all new pavement courses. The sawcut shall follow a straight line and provide a clean and sound vertical face. Material at any intermediate transverse joint resulting from suspension of placement of a new HMA pavement course shall also be sawcut and removed to provide a clean vertical face before continuing placement of the pavement course.

When traffic is to be carried over any transverse joint before completion of an HMA pavement course, the Contractor shall provide a temporary tapered joint with a maximum 12:1 slope. The HMA mixture forming the taper shall be placed on heavy wrapping paper or other suitable material to serve as a bond breaker. The temporary tapered joint shall be sawcut to reveal the full depth of the pavement course and form a transverse butt joint with a clean vertical face. The temporary tapered joint material shall be completely removed before resuming placement of the HMA pavement course.

Prior to the start of HMA placement at each transverse joint, the vertical joint face shall be thoroughly coated with a hot poured rubberized asphalt sealant meeting the requirements of ASTM D3405, with a minimum of 15% ground reclaimed tire rubber. The asphalt sealant temperature and application rate for each pavement course shall be established in the
Contractor’s Quality Control Plan. No reheating of the joint face shall be permitted. Equipment used to apply the hot poured rubberized asphalt sealant shall be capable of maintaining the sealant at the established temperature and application rate sufficient to uniformly coat the vertical joint face without runoff or accumulation of the asphalt sealant.

B. Longitudinal Joints.

All longitudinal joints in HMA surface courses shall be located on the roadway centerline or on a lane line or edge line of the traveled way. The longitudinal joints in each pavement course below the surface course shall be successively offset from the joint in the surface course by no more than 12 inches (300 mm) and no less than six inches (150 mm).

(1) Vertical Joints.

When an HMA pavement course is placed using single paver pulls, the Contractor shall employ suitable equipment to confine the longitudinal edge of the HMA mixture to establish an edge that is near vertical. For all HMA surface course mixtures placed, when the Contractor’s placement operations do not provide a confined and near vertical edge, the longitudinal edge of the surface course shall be sawcut full depth and removed to provide a clean vertical face before placement of the adjacent course of HMA.

All longitudinal joint edges of HMA surface courses, regardless of whether the joint edge is required to be sawcut, shall be treated prior to placing the adjacent pull of HMA. The vertical joint shall be coated with a hot poured rubberized asphalt sealant meeting the requirements of ASTM D3405, with a minimum of 15% ground reclaimed tire rubber. The asphalt sealant shall be applied at a sufficient temperature and application rate sufficient to uniformly coat the vertical joint face without runoff or accumulation of the sealant. The asphalt sealant temperature and application rate shall be established in the Contractor’s Quality Control Plan. No reheating of the joint shall be permitted.

When placing an HMA surface course with pavers in tandem, the use of the hot poured rubberized asphalt sealant will be omitted, provided the temperature of the mixture at the longitudinal joint does not fall below 200°F (95°C) prior to the placement of the adjacent mat.

When the longitudinal edge of any HMA pavement course is placed against an adjoining edge such as existing pavement, curb, gutter, drainage or utility structure, or any metal surface, a tack coat shall be uniformly applied to the entire vertical joint surface in accordance with Subsection 450.53 prior to placement of the HMA.

(2) Wedge Joints.

The Contractor may use a longitudinal wedge joint when placing HMA pavement courses at a thickness of 1.75 inches (45 mm) or greater.

When a wedge joint is proposed for use, the joint detail shall be included in the Contractor’s QC Plan. The wedge joint shall include a notched vertical edge with a minimum depth of 0.5 inches (12.5 mm). The sloped surface of the wedge joint shall not exceed a 6:1 slope. The Contractor shall use a commercially manufactured wedge joint attachment to the paver, or other attachment approved by the Engineer, to form the wedge joint.

Hot poured rubberized asphalt sealant shall not be applied to wedge joints. A tack coat shall be applied to the entire surface of the wedge joint in accordance with Subsection 450.53 prior to placement of the adjacent pull of HMA.

C. Inspection & Testing of HMA Joints.

The hot poured rubberized asphalt sealant temperature and application rate shall be measured and properly recorded by the Contractor on NETTCP Inspection Report Forms a minimum of once per transverse joint and once per 1,000 feet (300 meters) of longitudinal joint. If the temperature or application rate is determined to not be in conformance with the
requirements established in the Contractor’s Quality Control Plan, the Contractor shall make appropriate adjustments to the asphalt sealant application operations.

The placement and compaction of HMA at each transverse joint or longitudinal joint shall provide a tight bond between the existing pavement and the new pavement course. The Contractor shall visually inspect each transverse joint and longitudinal joint throughout the placement and compaction operations and shall further inspect the joints after Sublot completion and identify any bumps, depressions, openings, or other visible defects. The Contractor shall reject any in-place Sublot of HMA which is determined to have defective joints through procedures established in the Quality Control Plan.

Finished joint surfaces shall be smooth and true to the required grade and cross-slope without deviations exceeding 0.25 inches (6 mm), both transversely and parallel to the joint, when measured with a 10 foot (3 meter) standard straightedge. The in-place density of the completed HMA pavement course, within 1 foot (300 mm) of either side of the finished joint, shall be not less than 90% of the maximum theoretical density of the mixture as determined by AASHTO T 209. The Contractor will measure the surface smoothness and test the in-place density of each transverse joint and longitudinal joint of each Sublot of HMA as specified in Subsection 450.65F. All joint inspection and testing data shall be recorded on NETTCP Inspection Report Forms and Test Report Forms.

450.58 HMA Pavement on Bridges.

A. Bridge Course Mixture Requirements.

HMA pavement courses for bridge decks shall consist of a bridge protective course, placed first, followed by a bridge surface course. Unless specified otherwise on the plans, the bridge protective course mixture shall consist of Dense Binder treated with an approved anti-stripping compound as specified under M3.10.0.

The bridge protective course and bridge surface course shall be placed only after all curbing and edging, when included in the work, are in place. The bridge protective course shall be placed within 24 hours after the membrane waterproofing has been placed, unless an exception is granted by the Engineer. No vehicular traffic shall be permitted over any bare membrane waterproofing except as provided for under Subsection 965.62. Equipment used for placement and compaction of the bridge protective course and bridge surface course shall be sufficient to place the HMA mixture at the required grade, cross-slope, thickness, and in-place density without damaging the underlying membrane waterproofing.

B. Inspection & Testing of Bridge Course Mixtures.

The Contractor shall inspect and test each Sublot of bridge protective course HMA mixture and bridge surface course HMA mixture in accordance with the requirements for mixture temperature, mat temperature, segregation, and joint quality as specified in Subsections 450.54 through 450.57. QC sampling and testing of each Sublot shall be performed for all HMA loose mix Quality Characteristics specified in Subsection 450.65F. The in-place density of the bridge protective course and bridge surface course shall be randomly tested using a calibrated density gauge and the test data recorded on NETTCP Test Report Forms. The in-place density of the bridge protective course and bridge surface course shall be not less than 90% of the maximum theoretical density of the mixture as determined by AASHTO T 209 and tested per AASHTO TP-68 or ASTM D2950. Cores shall only be allowed for Dispute Resolution. When the HMA bridge surface course is placed in conjunction with mainline pavement, QC testing for ride quality shall be performed as specified in Subsection 450.65F(11).
450.59 Opening to Traffic.

No vehicular traffic or loads shall be permitted on the newly completed HMA pavement until adequate stability has been attained and the material has cooled sufficiently to a temperature of 140°F (60°C) or less as indicated by a surface type thermometer. The Contractor shall clearly outline, in the Quality Control Plan, the specific criteria related to opening new pavement to traffic. HMA cores shall be obtained by the Contractor for all Sublots placed each day in accordance with the approved Quality Control Plan prior to opening to traffic. At the discretion of the Engineer, based on climactic or other conditions, obtaining of cores may be delayed for a period up to, but not to exceed, 48 hours. In the event of force majeure resulting from direction by Traffic Police or the Engineer, the Contractor shall document the event and may submit a claim in accordance with current Department procedures. In such event, the affected Sublots will be isolated from the relevant HMA Lot and the HMA quality will be evaluated as a separate Lot.
450.60 General.

The Contractor shall provide a Quality Control (QC) system, as outlined in their Quality Control Plan, adequate to ensure that all materials and workmanship meet the required quality levels for each specified Quality Characteristic. The Contractor shall provide qualified QC personnel and QC laboratory facilities and perform Quality Control inspection, sampling, testing, data analysis, corrective action (when necessary), and documentation as outlined further below.

450.61 Contractor Quality Control Plan.

For projects with HMA Category A Lots (Large Lot) or Category B Lots (Small Lot), the Contractor shall provide and maintain a detailed Quality Control Plan, hereinafter referred to as the “QC Plan”. If all HMA Lots fall under Lot Category C (Minor Lot) then a QC Plan is not required. However, if any Lots on the project fall under Lot Category A or Category B, then any Category C Lots must be addressed in the QC Plan. The QC Plan should sufficiently document the QC processes of all Contractor parties (i.e. Prime Contractor, Subcontractors, Producers) performing work required under Section 450. The QC Plan is not intended to be a generic document, but rather must be project specific.

A. QC Plan Submittal Requirements.

At the pre-construction conference, the Contractor shall be prepared to discuss the Quality Control Plan. Information to be discussed shall include the proposed QC Plan submittal date, QC organization, and sources of materials. The Contractor shall submit one (1) hard copy and one (1) electronic copy of the QC Plan to the Engineer for approval not less than forty-five (45) days prior to the start of any work activities related to HMA pavement construction (including preparation of underlying surface) addressed in Subsections 450.53 thru 450.59. The Contractor shall not start work on the subject work items without an approved QC Plan.

B. QC Plan Format and Contents.

The QC Plan shall be structured to follow the format and section headings outlined below, and as outlined in further detail in the New England Transportation Technician Certification Program (NETTCP) “Model QC Plan” for HMA. In the event of discrepancies between the section headings below and the NETTCP Model QC Plan, the current version of the Model QC Plan shall take precedence. The pages of the QC Plan shall be sequentially numbered. The QC Plan shall address, in sufficient detail, the specific information requested under each section and subsection contained in the NETTCP Model QC Plan.

C. QC Plan Approval and Modifications.

Approval of the QC Plan will be based on the inclusion of the required information. Revisions to the QC Plan may be required prior to approval for any part of the QC Plan that is determined by the Department to be insufficient. Approval of the QC Plan does not imply any warranty by the Engineer that the QC Plan will result in completed work that complies with the specifications. It remains the responsibility of the Contractor to demonstrate such compliance. The Contractor may modify the QC Plan as work progresses when circumstances necessitate changes in Quality Control personnel, laboratories, or procedures. In such case, the Contractor shall submit an amended QC Plan to the Department for approval a minimum of three calendar days prior to the proposed changes being implemented.
Cover Page

Table of Contents

Section 0: Terms and Definitions (Optional)

Section 1: Scope and Applicable Specifications

Section 2: Quality Control Organization
  2.1 QC Organizational Chart
  2.2 QC Personnel
  2.3 Production Personnel

Section 3: Quality Control Laboratories
  3.1 Primary QC Laboratory
  3.2 First Alternate QC Laboratory
  3.3 Second Alternate QC Laboratory

Section 4: Materials Control
  4.1 Material Types and Source of Supply
  4.2 Material Properties & Mix Designs
  4.3 Processing of Materials at the Production Site
  4.4 Material Storage and Handling

Section 5: Quality Control Sampling and Testing
  5.1 Definition of Lot and Sublots
  5.2 Define Random Sampling Plan
  5.3 Sample Identification System
  5.4 Quality Control Sampling & Testing
  5.5 Split Sample Correlation Testing
  5.6 Quality Control Sampling & Testing Reports
  5.7 Quality Control Sample Storage and Retention

Section 6: Production Facilities
  6.1 Preliminary Schedule of Production Operations
  6.2 Production Facilities & Equipment
  6.3 Production Facility QC Activities
  6.4 Production Facility Control Chart
  6.5 Evaluation of QC Data (from the production facility)
  6.6 Production QC Inspection Reporting

Section 7: Field Operations
  7.1 Preliminary Schedule of Field Operations
  7.2 Placement Equipment and Procedures
  7.3 Placement QC Activities
  7.4 Placement Control Charts
  7.5 Evaluation of QC Data (from the placement operations)
  7.7 Placement QC Inspection Reporting
450.62 Quality Control Personnel Requirements.
The Contractor’s Quality Control organization shall, at a minimum, consist of the personnel outlined below that meet the described minimum qualifications. Every effort should be made to maintain consistency in the Quality Control organization, however substitution of qualified personnel shall be allowed. When circumstances necessitate substitution of QC personnel not originally listed in the approved QC Plan, the Contractor shall submit an amended QC Plan for approval in accordance with Subsection 450.61C.

A. Quality Control Manager.
The Contractor’s Quality Control system and QC Plan shall be administered by a qualified project assigned Quality Control Manager (QC Manager). The QC Manager must be a full-time employee of the Contractor or a Quality Control consultant engaged by the Contractor. The QC Manager shall have full authority to institute any and all actions necessary for the successful implementation of the QC Plan. The QC Manager (or their assistant in the QC Manager’s absence) shall be available to communicate with the Engineer at all times.

Principal responsibilities of the QC Manager shall include preparation and submittal of the Contractor’s QC Plan, managing the activities of all QC personnel, communicating on quality issues within the Contractor’s organization, and ensuring that all requirements outlined in the approved QC Plan are met.

For all projects with HMA Category A Lots (Large Lot), the QC Manager shall be certified by the NETTCP as a Quality Assurance Technologist. For projects having only HMA Category B Lots or Category C Lots, the Contractor may submit alternate qualifications for the QC Manager acceptable to the Department.

B. Production Facility Quality Control Technician(s).
All Contractor Quality control sampling, testing, and inspection conducted at the HMA production facility shall be performed by qualified Production Facility Quality Control Technicians (Plant QCTs). The Contractor shall provide a sufficient number of Plant QCTs to adequately implement the minimum Quality Control requirements contained in Section 450 and as outlined in the approved QC Plan. A minimum of one (1) qualified Plant QCT shall be present at each production facility location. HMA will not be accepted by the Department unless the Plant QCT is physically present at the plant during production and correctly performs the required Quality Control inspection, testing and documentation.

All Plant QCTs shall be certified as a HMA Plant Technician by the NETTCP.

C. Laboratory Quality Control Technician(s).
Any QC testing that is performed at off site laboratories (i.e. other than at the production facility or field site) shall be performed by qualified Laboratory Quality Control Technicians (Laboratory QCTs). The Contractor shall provide a sufficient number of Laboratory QCTs to adequately implement the minimum Quality Control requirements contained in Section 450 and as outlined in the approved QC Plan. All Laboratory QCTs shall be certified as a HMA Plant Technician by the NETTCP.

D. Field Quality Control Technician(s).
All Contractor Quality Control sampling, testing, and inspection conducted at the HMA field placement site shall be performed by qualified Field Quality Control Technicians (Field QCTs). The Contractor shall provide a sufficient number of Field QCTs to adequately implement the minimum Quality Control requirements contained in Section 450 and as outlined in the approved QC Plan. A minimum of one (1) qualified Field QCT will be present at each field placement site. HMA will not be accepted by the Department unless the Field QCTs is physically
present at the site during pre-placement and placement operations and correctly performs the required Quality Control inspection, testing and documentation.

All Field QCTs shall be certified as a HMA Paving Inspector as certified by the NETTCP.

450.63 Quality Control Laboratory Facility Requirements.

All Contractor Quality Control testing shall be performed in laboratories qualified through the NETTCP Laboratory Certification Program (LCP) or accredited through the AASHTO Accreditation Program (AAP). Laboratory facilities shall be kept clean and all equipment shall be maintained in proper working condition. The QC Manager shall have overall responsibility for ensuring that all laboratories utilized for Quality Control are in compliance with the requirements of the NETTCP LCP. This includes providing required AASHTO, ASTM, and NETTCP reference documents and ensuring that all required equipment and tools are properly functioning and calibrated.

The Engineer shall be permitted unrestricted access to inspect and review the Contractor’s laboratory facility. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. Deficiencies shall be grounds for the Engineer to order an immediate stop to incorporating materials into the work until deficiencies are corrected. The Engineer shall be provided with laboratory space and the availability of laboratory testing equipment to conduct Acceptance testing at the HMA plant.

450.64 Quality Control Inspection.

The Contractor shall perform Quality Control inspection of all work items addressed under Section 450. Inspection activities during HMA production and placement may be performed by qualified Production personnel (e.g. Skilled Laborers, Foremen, and Superintendents). However, the Contractor’s QC personnel shall have overall responsibility for QC inspection. The Contractor shall not rely on the results of Department Acceptance inspection for Quality Control purposes. The Engineer shall be provided the opportunity to monitor and witness all QC inspection.

Quality Control inspection activities must address the following four primary components:

- Equipment
- Materials
- Environmental Conditions
- Workmanship

The minimum frequency of Quality Control inspection activity shall be in accordance with the requirements below and as outlined in the approved QC Plan. The results and findings of QC inspection shall be documented on NETTCP Inspection Report Forms (IRFs).
A. QC Inspection for Preparation of Underlying Surface.

The Contractor’s personnel will perform Quality Control inspection during preparation of the underlying surface in accordance with the requirements of Subsection 450.53. The minimum items to be inspected shall be as outlined in Table 450.6 and Table 450.7. The Contractor shall identify in the QC Plan the specific inspection activities necessary to ensure the quality of the work, including any additional inspection activities not specifically listed in Table 450.6 and Table 450.7.

Table 450.6 - Minimum QC Inspection of HMA Patching Operations

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>As specified in QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
</tr>
<tr>
<td></td>
<td>Aggregates &amp; PG Binder (Correct Type)</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check + Manufacturer COC</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant (Correct Type)</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Check Manufacturer COC</td>
</tr>
<tr>
<td></td>
<td>Temperature of HMA Mix</td>
<td>4 per Day(1)</td>
<td>From Haul Vehicle at Patching Site</td>
<td>Check Measurement</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aggregates &amp; PG Binder (Correct Type)</td>
<td>Per QC Plan</td>
<td>Underlying Surface</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant (Correct Type)</td>
<td>Per QC Plan</td>
<td>At Patching Site</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Temperature of HMA Mix</td>
<td>1 per Day(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Conditions</td>
<td>Underlying Surface Soundness &amp; Moisture</td>
<td>Per QC Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temperature of Air &amp; Underlying Surface</td>
<td>1 per Day(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workmanship</td>
<td>Sawcut Limit Vertical Face</td>
<td>Per QC Plan</td>
<td>Sawcut Limits</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant Application Rate</td>
<td>Per QC Plan</td>
<td>Sawcut Limits</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>HMA Lift Thickness</td>
<td>Per QC Plan</td>
<td>HMA Lift</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Cross-Slope &amp; Profile</td>
<td>Per QC Plan</td>
<td>Compacted HMA</td>
<td>Check Measurement</td>
</tr>
</tbody>
</table>

(1) The initial temperature measurements will be taken from haul vehicles on the first or second load.

(2) As a minimum, the temperature measurements of the air and underlying surface shall be obtained prior to starting the HMA patching placement.
### Table 450.7 - Minimum QC Inspection of Tack Coat Operations

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>As specified in QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
</tr>
<tr>
<td>Materials</td>
<td>Asphalt Emulsion (Correct Type)</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Check Manufacturer COC</td>
</tr>
<tr>
<td></td>
<td>Asphalt Emulsion Temperature</td>
<td>(See Note 1)</td>
<td>From Tack Distributor System</td>
<td>Check Measurement</td>
</tr>
<tr>
<td>Environmental</td>
<td>Underlying Surface Cleanliness &amp; Moisture</td>
<td>Per QC Plan</td>
<td>Underlying Surface</td>
<td>Visual Check</td>
</tr>
<tr>
<td>Conditions</td>
<td>Temperature of Air &amp; Underlying Surface</td>
<td>1 per Day (2)</td>
<td>At Paving Site</td>
<td>Check Measurement</td>
</tr>
<tr>
<td>Workmanship</td>
<td>Asphalt Emulsion Application Rate</td>
<td>(See Note 1)</td>
<td>From Tack Distributor System</td>
<td>Check Measurement</td>
</tr>
</tbody>
</table>

(1) The Asphalt Emulsion Temperature and Application Rate shall be checked as follows:
- After application of the first 1,000 lane-feet (300 lane-meters) per HMA pavement course.
- After application of the next 1,500 lane-feet (450 lane-meters) per HMA pavement course.
- After application of the next 2,500 lane-feet (750 lane-meters) per HMA pavement course.
- Thereafter, a minimum of once per 5,000 lane-feet (1500 lane-meters) each day.

(2) As a minimum, the temperature measurements of the air and underlying surface shall be obtained prior to starting the tack coat placement.

### B. QC Inspection for Production & Placement of HMA Lots.

The Contractor’s QC personnel will perform Quality Control inspection at both the HMA production facility and at the site of HMA field placement to ensure that the production and placement processes are providing work conforming to the contract requirements. The minimum items to be inspected for each HMA Lot shall be in accordance with the requirements of Subsection 450.54 thru Subsection 450.59 and as outlined in Table 450.8a and Table 450.8b. The Contractor shall identify in the QC Plan the specific inspection activities necessary to ensure the quality of the work, including any additional inspection activities not specifically listed in Table 450.8a and Table 450.8b.

### (1) Wheel Path Deviations.

A wheel path is defined as 3 feet (1 meter) from and parallel to each longitudinal edge of a travel lane. Each wheel path for all HMA pavement course Lots shall be inspected for Wheel Path Deviations (high points or low points). Inspection shall be performed using a 10-foot (3 meter) standard straightedge in the longitudinal direction on each wheel path. The Sublot size and minimum frequency of QC inspection for Wheel Path Deviations shall be as specified in Table 450.8b, and in the approved Contractor Quality Control Plan. Each random inspection location shall be established by determining a randomly selected distance along the wheel path in accordance with ASTM D3665. Additional selective QC inspection for Wheel Path Deviations within each Sublot of compacted HMA pavement courses shall be as determined necessary by the Field QCT and as specified in the Contractor’s approved QC Plan.

The variation from the edge of the 10-foot (3 meter) straightedge to the top of the wheel path surface between any two contact points in the wheel path shall not exceed 0.25 inches (6 mm). The Contractor shall correct any location in a pavement course wheel path not meeting...
this requirement. The corrective method(s) proposed by the Contractor shall be subject to the approval of the Department and shall be performed at the Contractor's expense. The Contractor shall re-inspect any Sublots where corrections are made and provide the Department with a copy of the inspection data for the corrected Sublots.

Table 450.8a - Minimum QC Inspection at HMA Production Facility

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>As specified in QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG Binder (Correct Type)</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check + Manufacturer COC</td>
<td></td>
</tr>
<tr>
<td>Aggregates (Correct Type)</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
<td></td>
</tr>
<tr>
<td>RAP</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check + Manufacturer COC</td>
<td></td>
</tr>
<tr>
<td>Release Agent</td>
<td>Per QC Plan</td>
<td>Haul Vehicle Bed at Plant</td>
<td>Check QPL + Visual Check + Manufacturer COC</td>
<td></td>
</tr>
<tr>
<td>Temperature of HMA Mix at Plant</td>
<td>4 per Day(1)</td>
<td>From Haul Vehicle at Plant</td>
<td>Check Measurement</td>
<td></td>
</tr>
<tr>
<td>Environmental Conditions</td>
<td>Stockpile Moisture</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Air Temperature &amp; Precipitation Forecast</td>
<td>1 per Day(2)</td>
<td>HMA Production Facility</td>
<td>Check Measurement</td>
</tr>
<tr>
<td>Workmanship</td>
<td>Uncoated Mixture</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Excess Blue Smoke or Moisture</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Burnt Mix</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Physical Segregation</td>
<td>Per QC Plan</td>
<td>HMA Production Facility</td>
<td>Visual Check</td>
</tr>
</tbody>
</table>

(1) The initial temperature measurements shall be taken from the first or second load.

(2) As a minimum, the air temperature measurements and precipitation forecast shall obtained prior to starting the HMA Plant operation.
### Table 450.8b - Minimum QC Inspection at HMA Placement Location

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>As specified in QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
</tr>
<tr>
<td>Materials</td>
<td>Rubberized Asphalt Sealant (Correct Type)</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Check Manufacturer COC</td>
</tr>
<tr>
<td></td>
<td>Temperature of Delivered HMA Mix</td>
<td>4 per Day&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>From Haul Vehicle or Paver Hopper</td>
<td>Check Measurement</td>
</tr>
<tr>
<td>Environmental Conditions</td>
<td>Underlying Surface Soundness &amp; Moisture</td>
<td>Per QC Plan</td>
<td>Underlying Surface</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Temperature of Air &amp; Underlying Surface</td>
<td>1 per Day&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>At Paving Site</td>
<td>Check Measurement</td>
</tr>
<tr>
<td>Workmanship</td>
<td>Joint Location &amp; Alignment</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Sawcut Joint Vertical Face</td>
<td>Per QC Plan</td>
<td>Joint Vertical Face</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant Application Rate</td>
<td>Once per 1,000 ft (300 meters) per joint</td>
<td>Joint Vertical Face</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Temperature Differential in HMA Mat</td>
<td>Once per 500 feet (150 meters) per pavement course</td>
<td>HMA Mat Behind Paver</td>
<td>Per Subsection 450.55C</td>
</tr>
<tr>
<td></td>
<td>Physical Segregation</td>
<td>Per QC Plan</td>
<td>HMA Mat Behind Paver &amp; Compacted HMA</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>HMA Lift Thickness</td>
<td>Per QC Plan</td>
<td>HMA Lift</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Cross-Slope</td>
<td>Per QC Plan</td>
<td>Compacted HMA</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Joint Tightness</td>
<td>Per QC Plan</td>
<td>Compacted HMA</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Joint Surface Deviations</td>
<td>Once per 500 feet (150 meters) per joint</td>
<td>At Finished Joint</td>
<td>10 foot (3 meter) standard straightedge</td>
</tr>
<tr>
<td></td>
<td>Wheel Path Deviations</td>
<td>Once per 2,000 ft (600 meters) per Wheel Path</td>
<td>Wheel Path</td>
<td>10 foot (3 meter) standard straightedge</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> The initial temperature measurements will be taken from the first or second load.

<sup>(2)</sup> As a minimum, the temperature measurements of the air and underlying surface shall be obtained prior to starting the HMA placement.
450.65 Quality Control Sampling and Testing Requirements.

The Contractor’s QC personnel will perform Quality Control sampling and testing at both the HMA production facility and at the site of HMA field placement to ensure that the production and placement processes are providing work conforming to the contract requirements. The Engineer will not sample or test for Quality Control or assist in controlling the Contractor’s operations. All QC sampling and testing shall be in accordance with the AASHTO, ASTM, NETTCP, or Department procedures specified in Table 450.9 and Table 450.10. The Contractor shall furnish approved containers for all material samples. The Engineer shall be provided the opportunity to monitor and witness all QC sampling and testing.

A. Random Sampling.

The Contractor’s Quality Control system shall utilize stratified random sampling of each Lot produced and placed to assure that all material within the Lot has an equal probability of being selected for testing. The Contractor’s qualified QC personnel shall obtain random QC samples at the minimum frequencies specified in Table 450.9 and Table 450.10. In all cases, application of the specified QC sampling frequencies shall result in a minimum one random sample per Sublot.

Random sample locations shall be determined using the random number tables and procedures contained in ASTM D 3665 or an electronic random number generator, as presented by the NETTCP. The determination of all random sample locations shall be documented on NETTCP Standard Test Report Form D3665. The Contractor will provide the Engineer with the random QC sampling locations selected and documented for each Sublot prior to production and placement of the relevant Sublots.

B. Selective Sampling.

The Contractor’s Quality Control system will also utilize selective sampling (i.e. non-random samples) as needed to provide supplemental information to assist in maintaining all production and placement processes in control. The Contractor’s qualified QC personnel shall obtain selective QC samples from any Sublot as determined necessary and in accordance with the guidelines established in the approved QC Plan.

C. QC Sample Identification System.

The Contractor shall establish a reliable system for the identification of all QC samples obtained. All PG Asphalt Binder samples, HMA loose mixture samples, and core samples shall be correctly labeled with the following minimum information:

(a) Contract No.
(b) Date of Sample.
(c) Mixture Type.
(d) Lot & Sublot No.
(e) Sample No.
(f) Sample Type (i.e. Random or Selective).
(g) Sample Location (e.g. Station & Offset).

All QC sampling data for Ride Quality and Wheel Path Deviations will be identified by the Contractor as directed by the Engineer. The Contractor’s system and procedures for identification of QC samples shall be outlined in the approved QC Plan.
D. Retention of Split Samples.

The Contractor’s qualified QC personnel shall obtain all material samples (PGAB samples, HMA loose mix samples, and cores) for QC testing. The Contractor will retain split samples from each PGAB sample and HMA loose mix sample and provide a split sample to the Engineer if requested. The Contractor shall retain the original core samples after testing to serve as “split samples” and protect them from damage. All split samples shall be properly labeled and stored for a period of (30) days, or until tested. These split samples (PGAB samples, HMA loose mix samples, and cores) will be utilized if necessary, in the Dispute Resolution process. If mutually agreed upon by the Contractor and the Department, the retained split samples may be discarded prior to the required thirty (30) days.

E. Quality Control Testing of Prepared Underlying Surface.

The Contractor’s QC personnel will perform Quality Control testing during preparation of the underlying surface. All QC testing shall be in accordance with the AASHTO, ASTM, NETTCP, or Department procedures specified in Table 450.9. The Engineer shall be provided the opportunity to monitor and witness all QC testing.

Table 450.9 - Minimum QC Sampling & Testing of Prepared Underlying Surface

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method(s)</th>
<th>Sublot Size</th>
<th>Minimum Test Frequency</th>
<th>Point of Sampling</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA Patching Mixture:</td>
<td>AASHTO T164 or</td>
<td>150 tons</td>
<td>1 per Sublot</td>
<td>From Haul Vehicle</td>
<td>Random AASHTO</td>
</tr>
<tr>
<td>PG Asphalt Binder</td>
<td>AASHTO T308</td>
<td>(140 Mg)</td>
<td></td>
<td>at Plant</td>
<td>T168</td>
</tr>
<tr>
<td>Mixture:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined Agg. Gradation</td>
<td>AASHTO T30</td>
<td>150 tons</td>
<td>1 per Sublot</td>
<td>From Haul Vehicle</td>
<td>Random AASHTO</td>
</tr>
<tr>
<td>Mixture:</td>
<td></td>
<td>(140 Mg)</td>
<td></td>
<td>at Plant</td>
<td>T168</td>
</tr>
<tr>
<td>Maximum Theo. Specific</td>
<td>AASHTO T209</td>
<td>150 tons</td>
<td>1 per Sublot</td>
<td>From Haul Vehicle</td>
<td>Random AASHTO</td>
</tr>
<tr>
<td>Gravity</td>
<td></td>
<td>(140 Mg)</td>
<td></td>
<td>at Plant</td>
<td>T168</td>
</tr>
<tr>
<td>In-place Density</td>
<td>ASTM D2950 or</td>
<td>100 sq. ft.</td>
<td>1 per Sublot</td>
<td>From Compacted</td>
<td>Random ASTM D2950,</td>
</tr>
<tr>
<td></td>
<td>AASHTO TP68</td>
<td>(10 sq. meter)</td>
<td></td>
<td>HMA Patch</td>
<td>AASHTO TP68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>per each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patch Area</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F. Quality Control Testing of HMA Lots.

The Contractor’s QC personnel will perform Quality Control testing at both the HMA production facility and at the site of HMA field placement to ensure that the production and placement processes are providing work conforming to the contract requirements. The Engineer shall be provided the opportunity to monitor and witness all QC testing of HMA. All QC testing of HMA Lots shall be in accordance with the AASHTO, ASTM, NETTCP, or Department test methods specified in Table 450.10 and the procedures outlined below.
<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method(s)</th>
<th>Sublot Size</th>
<th>Minimum Test Frequency</th>
<th>Point of Sampling</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG Asphalt Binder Grading</td>
<td>AASHTO M320</td>
<td>Per Supplier QC Plan or 24,000 tons (22,000 Mg) of HMA per Subsection 450.65F(1)</td>
<td>See Subsection 450.65F(1)</td>
<td>See Subsection 450.65F(1)</td>
<td>Random AASHTO T40</td>
</tr>
<tr>
<td>Aggregate Gradation</td>
<td>AASHTO T27</td>
<td>Per QC Plan</td>
<td>Per QC Plan</td>
<td>At HMA Plant Per QC Plan</td>
<td>Random AASHTO T2</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>AASHTO T164 or AASHTO T308</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Haul Vehicle at Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>Combined Aggregate Gradation</td>
<td>AASHTO T30</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Haul Vehicle at Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>Maximum Theo. Specific Gravity</td>
<td>AASHTO T209</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Haul Vehicle at Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>Bulk Specific Gravity</td>
<td>AASHTO T166 (SSD Method)</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Haul Vehicle at Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>Volumetrics: Air Voids, VMA, VFA</td>
<td>AASHTO T245</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Haul Vehicle at Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>In-place HMA Mat Density (Density Gauge)</td>
<td>ASTM D2950 or AASHTO TP68</td>
<td>150 tons (140 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Compacted HMA Course</td>
<td>Selective &amp; Random ASTM D2950, AASHTO TP68</td>
</tr>
<tr>
<td>In-place HMA Mat Density (Cores)</td>
<td>AASHTO T230 AASHTO T166 AASHTO T269</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Compacted HMA Course</td>
<td>Random AASHTO T269</td>
</tr>
<tr>
<td>Thickness</td>
<td>AASHTO T269</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot(1)</td>
<td>From Compacted HMA</td>
<td>Random AASHTO T269</td>
</tr>
<tr>
<td>Transverse Joint Density</td>
<td>ASTM D2950 or AASHTO TP68</td>
<td>Each Joint</td>
<td>1 per Sublot(1)</td>
<td>At Finished Joint</td>
<td>Random ASTM D2950, AASHTO TP68</td>
</tr>
<tr>
<td>Longitudinal Joint Density</td>
<td>ASTM D2950 or AASHTO TP68</td>
<td>500 feet (150 meters) per Joint</td>
<td>1 per Sublot(1)</td>
<td>At Finished Joint</td>
<td>Random ASTM D2950, AASHTO TP68</td>
</tr>
<tr>
<td>Ride Quality (IRI)</td>
<td>AASHTO PP52 Per Subsection 450.65F(11)</td>
<td>0.1 miles (160 meters) per each Wheel Path</td>
<td>3 Runs per Sublot</td>
<td>Each Pavement Course Per Subsection 450.65F(11)</td>
<td>Random Per Subsection 450.65F(11)</td>
</tr>
<tr>
<td>Wheel Path Deviations</td>
<td>10 foot (3 meter) standard straightedge</td>
<td>500 feet (150 meters) per each Wheel Path</td>
<td>1 per Sublot(1)</td>
<td>Each Pavement Course Per Subsection 450.65F(12)</td>
<td>Random Per QC Plan</td>
</tr>
</tbody>
</table>

(1) In the event that the total daily HMA production is less than one Sublot, a minimum of one random QC sample shall be obtained for the day’s production.
(1) PG Asphalt Binder Grading.
QC testing of PG Asphalt Binder shall be performed by the PGAB Supplier in accordance with AASHTO R26 and the Supplier’s approved PGAB Quality Control Plan. The Contractor shall submit to the Engineer a Supplier’s Certificate of Compliance (COC) along with copies of the certified AASHTO M320 test results for each Supplier Lot of PGAB from which the HMA Producer’s PGAB was obtained.

If the Contractor modifies the PGAB at the HMA production facility through blending or introduction of an asphalt binder modifier, the Contractor (i.e. HMA Producer) shall assume responsibility as the PGAB Supplier per AASHTO R26. In such case, the Contractor shall obtain and test a minimum of one random sample of the modified PGAB for each 24,000 ton (22,000 Mg) HMA Sublot, as defined in Table 450.10, to determine conformance with AASHTO M320. A minimum of two 1-quart (1 Liter) containers of PGAB shall be obtained for each PGAB sample in accordance with AASHTO T40. All QC samples shall be split prior to testing and the un-tested portion of the sample shall be retained for a minimum of 30 days.

For HMA Category A Lots incorporating greater than 25% RAP or greater in the job-mix formula, the Contractor shall perform full asphalt binder grade testing on a minimum of one random sample from the Control Strip and from each Sublot as specified in Table 450.10 during HMA Lot production. The QC testing shall be performed on samples of asphalt binder recovered from the RAP (by Abson recovery) blended in the appropriate proportion with samples of the virgin PGAB to determine conformance with AASHTO M320. The PG Asphalt Binder Grade testing results shall be within ± 2°C of the specified PGAB grade for the HMA pavement course mixture.

(2) Aggregate Gradation.
The virgin aggregates utilized in each HMA Lot shall be tested for Gradation in accordance with AASHTO T27. The Sublot size and minimum frequency of QC testing for Aggregate Gradation shall be as specified in the Contractor’s approved QC Plan. Aggregate samples shall be obtained at the HMA plant from aggregate bins or stockpiles in accordance with AASHTO T2.

(3) PG Asphalt Binder Content.
Each HMA Lot produced and placed shall be tested for PG Asphalt Binder Content in accordance with either AASHTO T164 or T308. When AASHTO T164 is used, the test results shall be reported prior to ash correction. The Sublot size and minimum frequency of QC testing for PG Asphalt Binder Content shall be as specified in Table 450.10. Each material sample for PG Asphalt Binder Content shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(4) Combined Aggregate Gradation.
Each HMA Lot produced and placed shall be tested for Combined Aggregate Gradation in accordance with AASHTO T30. The Sublot size and minimum frequency of QC testing for Combined Aggregate Gradation shall be as specified in Table 450.10. Each material sample for Combined Aggregate Gradation shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

The QC test results of Combined Aggregate Gradation must be plotted on Control Charts with Action Limits. Recommended Action Limits are provided in Table 450.11, however, the Action Limits to be used for each HMA Lot shall be as specified in the Contractor’s approved QC Plan. If the QC test results for an individual Sublot fall outside of the established Action Limits, the Contractor shall evaluate the HMA production process and determine any adjustments necessary to bring the Combined Aggregate Gradation back within the Action Limits. If the subsequent Sublot test result falls outside of the Action Limits, the Contractor shall suspend Lot production until it can be demonstrated that the HMA mixture can be produced within the Action Limits. The Contractor’s QC personnel shall document all action(s) taken to bring the HMA production process into control.
Table 450.11 - Recommended Action limits for Combined Aggregate Gradation

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Action Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing No. 4 Sieve (4.75mm) and larger sieve sizes</td>
<td>JMF Target +/-6 percent</td>
</tr>
<tr>
<td>Passing No. 8 sieves (2.36mm)</td>
<td>JMF Target +/-5 percent</td>
</tr>
<tr>
<td>Passing No. 16 (1.18mm) to No. 50 (300µm) sieves (inclusive)</td>
<td>JMF Target +/-3 percent</td>
</tr>
<tr>
<td>Passing No. 100(150µm) sieve</td>
<td>JMF Target +/-2 percent</td>
</tr>
<tr>
<td>Passing No. 200(75µm) sieve</td>
<td>JMF Target +/-1 percent</td>
</tr>
</tbody>
</table>

(5) Maximum Theoretical Specific Gravity.
Each HMA Lot produced and placed shall be tested for Maximum Theoretical Specific Gravity in accordance with AASHTO T209. The Sublot size and minimum frequency of QC testing for Maximum Theoretical Specific Gravity shall be as specified in Table 450.10. Each material sample for Maximum Theoretical Specific Gravity shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(6) Bulk Specific Gravity.
Each HMA Lot produced and placed shall be tested for Bulk Specific Gravity in accordance with AASHTO T166 (SSD Method). The Sublot size and minimum frequency of QC testing for Bulk Specific Gravity shall be as specified in Table 450.10. Each material sample for Bulk Specific Gravity shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(7) Volumetrics (Air Voids, VMA, VFA).
Each HMA Lot produced and placed shall be tested for Volumetrics (Air Voids, VMA, VFA) in accordance with AASHTO T245. The requirement for Volumetric testing of laboratory compacted specimens applies to HMA mixtures for all pavement courses, with the exception of Open Graded Friction Courses and Base Courses. The Sublot size and minimum frequency of QC testing for Volumetrics shall be as specified in Table 450.10. Each material sample for Volumetrics shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(8) In-place HMA Mat Density.
Each HMA Lot produced and placed shall be tested for In-place Density using a density gauge or cores as specified below. The requirement for In-Place Density testing applies to all pavement courses, with the exception of Open Graded Friction Courses and Leveling Courses. The Sublot size and minimum frequency of random QC testing for In-place Density by either density gauge or core shall be as specified in Table 450.10.

(a) Testing In-Place Density by Density Gauge. Initial QC testing of In-Place Density during compaction of HMA pavement courses shall be performed selectively (or randomly when determined appropriate by QC personnel) using a density gauge in accordance with ASTM D2950 or AASHTO TP 68. QC testing of In-Place Density for all HMA bridge protective courses and bridge surface courses shall be performed randomly using a density gauge. Each random sampling and testing location for HMA bridge courses shall be established by determining a randomly selected tonnage and corresponding approximate longitudinal distance within the Sublot, along with a randomly selected offset distance in accordance with ASTM D3665. Additional selective QC sampling and testing within each Sublot of compacted HMA bridge.
protective courses or bridge surface courses shall be as determined necessary by the Contractor’s QC personnel and as specified in the Contractor’s approved QC Plan.

(b) **Testing In-Place Density by Cores.** Final QC testing of In-Place Density of all applicable HMA pavement courses shall be performed using 6-inch (150 mm) diameter cores in accordance with AASHTO T230, T166, and T269. Cores shall not be obtained from bridge protective surface courses. In-Place Density shall be determined from each core by comparing the Bulk Specific Gravity of the core to the average Maximum Theoretical Specific Gravity for all HMA mixture Sublots produced for the pavement course on the same day’s production. Each core location shall be established by determining a randomly selected tonnage and corresponding approximate longitudinal distance within the Sublot, along with a randomly selected offset distance in accordance with ASTM D3665. If the randomly determined sampling location coincides with one of the following conditions, the sampling location shall be relocated immediately beyond the boundary distance as indicated below for the specific condition:

1. Within 1 foot (300mm) from an edge of pavement course to be left unconfined upon project completion
2. Within 1 foot (300mm) of any longitudinal joint or transverse joint.
3. Within 3 feet (1 meter) of any drainage structure.

Core samples shall be obtained in accordance with AASHTO T230 prior to opening the pavement course to traffic. At the discretion of the Engineer, based on climactic or other conditions, obtaining of cores may be delayed for a period up to, but not to exceed, 48 hours. All cores shall be protected against damage and tested within 24 hours after they have been obtained. The Contractor shall fill all core holes, whether from QC sampling or Department Acceptance sampling, with fresh HMA mixture from the same Lot. The filled core holes shall be thoroughly compacted as outlined in the Contractor’s approved QC Plan.

(9) **Thickness.**
Each HMA pavement course specified to be placed at a compacted thickness of 1 inch (25mm) or greater shall be tested for Thickness using cores, with the exception of the following courses:

1. Open Graded Friction Course.
2. Bridge Surface Course.
3. Bridge Protective Course.
4. Leveling Course.
5. In the absence of a Leveling Course, the first pavement course placed over existing pavement.

The aforementioned pavement courses are exempt only from determination of Thickness using cores and the corresponding statistical evaluation of Lot quality. The Contractor is still responsible for ensuring the minimum required thickness of these pavement courses using an appropriate sampling and testing protocol as outlined in the Contractor’s approved QC Plan.

All sampling and testing for Thickness of the applicable pavement courses using cores shall be in accordance with AASHTO T269. The Sublot size and minimum frequency of random QC testing for Thickness shall be as specified in Table 450.10.

(10) **Joint Density.**
Each transverse joint and longitudinal joint formed during placement of a pavement course shall be tested for Joint Density using a density gauge in accordance with ASTM D2950. The requirement for Joint Density testing applies to all pavement courses, with the exception of Open Graded Friction Courses and Leveling Courses. The Sublot size and minimum frequency of random QC testing for Joint Density shall be as specified in Table 450.10.
Each random sampling and testing location shall be established by determining a randomly selected distance along the joint, along with a randomly selected offset distance within 1 foot (300 mm) of either side of the finished joint, in accordance with ASTM D3665. Additional selective QC sampling and testing of Joint Density within each Sublot of compacted HMA pavement courses or bridge protective surface courses shall be as determined necessary by the Field QCT and as specified in the Contractor’s approved QC Plan.

(11) Ride Quality.

The finished surface of the pavement shall be uniform in appearance, free from irregularities in contour and texture and shall present a smooth riding surface. Ride Quality testing shall be performed for Quality Control on a periodic basis during construction of the HMA pavement courses specified below. QC testing shall be performed for HMA Category A Lots, at a minimum, within 24 hours after each 8 lane-miles (13 lane-kilometers) of an individual pavement course have been placed. QC testing of HMA Category B Lots shall be performed, at a minimum, every other paving day. In addition, the Contractor shall perform QC testing of the entire final pavement course placed upon completion.

(a) Pavement Courses Subject to Ride Quality Testing. For projects having a posted speed equal to or greater than 40 mph with HMA Lots falling under Lot Category A (Large Lots) or Category B (Small Lots), QC testing shall be performed with an inertial profiler to determine the Ride Quality of the following pavement courses:

- Friction Course (OGFC-P)
- Surface Course
- Intermediate Course (lift immediately beneath Surface Course only)
- Leveling Course (when placed immediately beneath Surface Course)
- Bridge Surface Course (when asphaltic bridge joints are used and when placed on the same contract with the mainline Surface Course)

At a minimum, the finished surface of these pavement courses will be tested for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes. The Contractor may also elect to perform Ride Quality testing of the pavement courses beneath the courses indicated above in order to provide adequate Quality Control.

(b) Pavement Courses Excluded from Ride Quality Testing

The following pavement courses and surfaces are specifically excluded from Ride Quality testing:

1. All exposed concrete bridge decks and any Bridge Surface Course without asphaltic bridge joints (including 15 feet (5 meters) before the approach joint and 15 feet (5 meters) after the departure joint).
2. Mainline pavement courses less than one half mile (800 meters) in total length (excluding bridge lengths).
3. Side road pavement courses less than one Sublot (0.1 mile (160 meters)) in total length.
4. Single resurfacing pavement courses placed in one lift at a total plan (compacted) thickness less than 1.50 inches (40 millimeters).
5. Pavement courses on horizontal curves having a centerline radius of curvature of 500 feet (150 meters) or less, including the length of pavement within the super-elevation transition of such curves.
6. Pavement courses for shoulders.
7. Pavement segments with manholes or catch basins in the travel lane (the Ride Quality testing data for such pavement segments shall be excluded, including 15 feet (5 meters) before and after these manholes or catch basins).
(c) **Inertial Profiler Equipment Requirements.** All inertial profilers used for Contractor QC testing shall conform to the equipment specifications contained in AASHTO PP50 and ASTM E950. The inertial profiler shall be equipped with a system of transducers (height sensor, accelerometer, distance sensor) to measure the longitudinal pavement profile. An automated triggering system shall be provided that detects a reference mark to start, stop, and event mark the data collection process. The profiler equipment shall include an onboard computer system capable of storing all profile measurement data, calculating the real time International Roughness Index (IRI) per ASTM E1926 (independent of speed), and displaying profile plots.

(d) **Certification and Correlation of Inertial Profilers.** All inertial profilers used for Contractor QC testing must be certified for precision and accuracy in accordance with the requirements of AASHTO PP51. In addition, all Contractor QC profilers must be correlated against the Department’s reference profiling device in accordance with the Department’s correlation procedures. The certification and correlation of all profilers shall be conducted at the Profiler Correlation Center in New Bedford, MA established by the University of Massachusetts at Dartmouth. The certification and initial correlation of the Contractor’s inertial profiler shall be completed prior to the start of Ride Quality testing on the project. After the initial correlation is successfully completed, the same inertial profiler can be used on any Department project without re-correlation for the remainder of the construction season. Equipment that does not pass the Department’s correlation procedure shall not be used. The Contractor’s use of inertial profiler equipment that has not been successfully correlated is sufficient grounds for withholding payment for QC testing of Ride Quality. The Contractor’s inertial profiler equipment may be required to undergo re-correlation at any time during the construction season if significant variations are found within the Contractor’s QC test data or between the QC test data and the Department’s Acceptance test data.

(e) **Ride Quality Testing Procedures.** Ride Quality testing shall be performed in accordance with the procedures outlined in AASHTO PP52, as clarified or amended herein.

The Ride Quality will be measured for each wheel path [a wheel path is defined as 3 feet (1 meter) from and parallel to each longitudinal edge of the lane to be measured]. Each wheel path will be divided into 0.1 mile (160 meters) Sublots starting at the project limits in the direction of traffic. Partial Sublots may result at either end of the project or as a result of interruptions of the continuous pavement surface (i.e. bridge approaches, railroad crossing, cessation of daily paving operations, etc.).

Just prior to testing, the Contractor shall sweep the pavement and remove all foreign objects or materials on the pavement course surface. Testing will begin 15 feet (5 meters) after the transverse approach joint and end 15 feet (5 meters) before the transverse departure joint. A minimum of three and up to a maximum of five test runs will be performed on each wheel path. The final test result for each Sublot will be the average of the three best test runs.

(f) **Data Format and Reporting Requirements.** All Ride Quality QC testing data shall be collected and saved in electronic format in an ASCII data file. A copy of the raw data file shall be provided to the Engineer on site immediately following testing of completed Sublots. A longitudinal profile shall be determined for all Sublots tested and an average IRI value shall be determined and reported for each Sublot (i.e. each 0.1 mile (160 meters) segment of each wheel path). The Contractor shall summarize the results for all Sublots, by corresponding Ride Quality Lot, in an electronic spreadsheet file (MS Excel) consistent with the format of the Department’s QA Spreadsheets. The summary spreadsheet of QC testing data shall be submitted to the Department, electronically and in hardcopy, within two days after the testing is completed.
Ride Quality Monitoring & Corrective Action. The Contractor shall evaluate and monitor the test data for each pavement course requiring Ride Quality testing for conformance with the applicable Quality Limits specified in Table 450.19. If the running Quality Level for all Sublots placed and tested falls below the Suspension Quality Level (70 PWL), the Contractor shall suspend further placement of the corresponding pavement course and evaluate the Sublots placed for appropriate corrective action. If the running Mean IRI of all Sublots placed and tested for the pavement course immediately below the final course is greater than the Action Limits specified in Table 450.12, corrective action will be required prior to placement of the final pavement course.

When Ride Quality correction is required, the Contractor shall use one or more of the following corrective methods:

1. Removal and replacement of the entire pavement course.
2. Partial depth removal of the pavement course by milling and placement of new pavement course(s) of the same mixture type.
3. Overlaying (not patching) with the specified pavement course.
4. Diamond grinding or use of other surface profiling devices.

The corrective method(s) chosen by the Contractor shall be subject to the approval of the Department and shall be performed at the Contractor's expense. The Contractor shall retest any Sublots where corrections are made and provide the Department with a copy of the raw data file, the profile plot, and the IRI summary spreadsheet data for the corrected Sublots.

Table 450.12 - Action Limits for Pavement Course Below Final Pavement Course

<table>
<thead>
<tr>
<th>Posted Speed Limit (1)</th>
<th>Target IRI</th>
<th>Maximum Mean IRI of All Sublots Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than or equal to 55 mph (90 km/hr)</td>
<td>60 in/mile (0.95 m/km)</td>
<td>≤ 85 in/mile (1.34 m/km)</td>
</tr>
<tr>
<td>40 mph (65 km/hr) to 55 mph (90 km/hr)</td>
<td>80 in/mile (1.26 m/km)</td>
<td>≤ 105 in/mile (1.66 m/km)</td>
</tr>
<tr>
<td>Less than 40 mph (65km/hr)</td>
<td>Not subject to Ride Quality testing</td>
<td>N/A</td>
</tr>
</tbody>
</table>

(1) Note that projects with posted speed limits that fall into more than one of the Posted Speed Limit ranges above will be divided into multiple Lots and evaluated separately.

450.66 HMA Mix Design Verification and Control Strip Requirements.

For all pavement courses with HMA Lots falling under Lot Category A (Large Lots), the HMA mix design Verification and Control Strip procedures outlined below shall apply.

A. Laboratory Verification of HMA Mix Design.

The Contractor shall develop and submit a Laboratory Trial Mix Formula (LTMF) for each HMA mixture type, which is to be proposed as a Job Mix Formula, a minimum of forty-five (45) days prior to the start of HMA production. The Contractor shall not proceed to HMA production for the Control Strip as outlined below until the LTMF is verified by the Department.
B. HMA Control Strip.

The Contractor shall produce and place a Control Strip Lot for all HMA pavement courses, with the exception of Leveling Courses, on the first day of HMA production. The Control Strip will be used to verify that the HMA can be produced per the LTMF, to establish compaction patterns, and to verify that the equipment and processes for lay-down and compaction are capable of providing the HMA pavement course in conformance with these specifications. The Control Strip Lot shall consist of a minimum of 600 tons (550 Mg) of HMA, but not more than 1,800 tons (1,650 Mg). Each Control Strip will be divided into three (3) equal Sublots. The Contractor and the Department will both perform inspection, sampling, and testing on the Control Strip and evaluate the corresponding data as outlined below.

(1) Control Strip Inspection.

The Contractor’s QC personnel shall perform inspection of each Control Strip Sublot at both the HMA production facility and at the site of HMA field placement. The specific items to be inspected for the Control Strip shall include the four primary inspection components (Equipment, Materials, Environmental Conditions, Workmanship) in accordance with the requirements of Table 450.8a, Table 450.8b and as specified in the Contractor’s approved QC Plan. The Department will also inspect each Control Strip Sublot for the inspection components of Materials and Workmanship.

(2) Control Strip Sampling and Testing.

The Contractor and the Department shall independently sample and test the Control Strip Lot for the Quality Characteristics identified in Table 450.13. The Contractor and the Department shall each sample and test each Sublot produced and placed. Each Contractor QC sample and each Agency Acceptance sample shall be randomly obtained from each Sublot in accordance with ASTM D3665 and the prescribed sampling protocols for each Quality Characteristic as outlined in Subsection 450.65F. Split samples shall be retained for each Sublot by both the Contractor and the Department in accordance with Subsection 450.65D.

(3) Evaluation of Control Strip Inspection Data.

The Contractor and the Department shall each evaluate their respective Control Strip inspection data against the requirements for Materials and Workmanship specified in Subsection 450.53 thru Subsection 450.58.

(4) Evaluation of Control Strip Sampling and Testing Data.

The Contractor and the Department shall each evaluate their respective individual Sublot test results against the Control Strip Quality Limits in Table 450.13. The Contractor and the Department shall also evaluate the Control Strip Lot Quality Level (PWL) using the Specification Limits in Table 450.13 for those Quality Characteristics subject to Quality Level Analysis. The Contractor’s QC test data shall be combined with the Agency’s Acceptance test data to determine the Lot Quality Level, provided that the QC data is Validated against the Acceptance data in accordance with Subsection 450.77. The Control Strip Lot Quality Level must be 70 PWL or greater.
### Table 450.13 - Control Strip Quality Limits

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Target</th>
<th>Specification Limits</th>
<th>Engineering Limits</th>
<th>Acceptance Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LSL</td>
<td>USL</td>
<td>LEL</td>
</tr>
<tr>
<td>PG Asphalt Binder Grade specified</td>
<td>Per Binder</td>
<td>N/A</td>
<td>N/A</td>
<td>Per AASHTO M320</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>Per LTMF</td>
<td>Target - 0.3 %</td>
<td>Target + 0.3 %</td>
<td>Target - 0.4 %</td>
</tr>
<tr>
<td>Volumetrics: Air Voids</td>
<td>4 %</td>
<td>2.7 %</td>
<td>5.3 %</td>
<td>2 %</td>
</tr>
<tr>
<td>Combined Gradation: Passing #4 (4.75mm) and Larger Sieves</td>
<td>Per LTMF</td>
<td>N/A</td>
<td>N/A</td>
<td>Target - 7%</td>
</tr>
<tr>
<td>Combined Gradation: Passing #8 (2.36mm) Sieve</td>
<td>Per LTMF</td>
<td>N/A</td>
<td>N/A</td>
<td>Target - 5%</td>
</tr>
<tr>
<td>Combined Gradation: Passing #16 (1.18mm) to #50 (300um) Sieve</td>
<td>Per LTMF</td>
<td>N/A</td>
<td>N/A</td>
<td>Target - 4%</td>
</tr>
<tr>
<td>Combined Gradation: Passing #100 (150um) Sieve</td>
<td>Per LTMF</td>
<td>N/A</td>
<td>N/A</td>
<td>Target - 3%</td>
</tr>
<tr>
<td>Combined Gradation: Passing #200 (75um) Sieve</td>
<td>Per LTMF</td>
<td>N/A</td>
<td>N/A</td>
<td>Target - 1.5%</td>
</tr>
<tr>
<td>In-Place HMA Mat Density (Cores)</td>
<td>95 % of G&lt;sub&gt;mm&lt;/sub&gt;</td>
<td>92.5 % of G&lt;sub&gt;mm&lt;/sub&gt;</td>
<td>97.5 % of G&lt;sub&gt;mm&lt;/sub&gt;</td>
<td>92 % of G&lt;sub&gt;mm&lt;/sub&gt;</td>
</tr>
<tr>
<td>Thickness*: (All Courses 1 inch (25mm) or greater)</td>
<td>Per Plans</td>
<td>- 20 % of Target Thickness</td>
<td>+ 20 % of Target Thickness</td>
<td>- 30 % of Target Thickness</td>
</tr>
<tr>
<td>Ride Quality*: Greater than or equal to 55 mph (90 km/hr)</td>
<td>50 in/mile (0.79 m/km)</td>
<td>N/A</td>
<td>70 in/mile (1.10 m/km)</td>
<td>N/A</td>
</tr>
<tr>
<td>Ride Quality*: 40mph (65 km/hr) to 55 mph (90 km/hr)</td>
<td>70 in/mile (1.10 m/km)</td>
<td>N/A</td>
<td>100 in/mile (1.58 m/km)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*To be evaluated for applicable pavement courses subject to testing per Subsection 450.65F. The Quality Limits for Ride in Table 450.13 shall only apply to Control Strips for the final pavement course (HMA Surface Course or Friction Course). For pavement courses below the final pavement course that are subject to Ride Quality testing, the Mean IRI for the Control Strip Sublots shall be less than or equal to the Maximum Mean IRI values in Table 450.12.
(5) Verification of Control Strip Lot and LTMF.
In order for a Control Strip Lot and corresponding LTMF to be Verified, the following criteria must be met:

a) All Attributes inspected for each Sublot must meet the specification requirements in Table 450.16.
b) All individual Sublot test results for the Quality Characteristics tested on the Control Strip must be within the Engineering Limits in Table 450.13.
c) If the evaluation of all inspection data and testing data for the Control Strip indicates that the individual Sublots are in conformance with the requirements outlined in Subsection 450.66B paragraphs (3) and (4) above and the Lot Quality for each applicable Quality Characteristic in Table 450.13 is ≥ 70 PWL, the Control Strip Lot and LTMF shall be declared “Verified”. In such event, the LTMF shall become the Job Mix Formula (JMF) for the Lot and the Contractor may proceed with production and placement of the first HMA Lot.
d) If the Control Strip is not Verified, the Contractor shall reassess the LTMF, the production process, and the placement process to determine the apparent cause(s) of nonconformance. The Contractor must submit proposed adjustment(s) to the LTMF and/or the production process and/or placement process. If adjustments to the LTMF are “major” (as defined in Table 1 of AASHTO R 42), the Contractor will be required to submit a new LTMF for laboratory verification by the Engineer per the requirements of Section 450.66A. If proposed adjustment(s) are accepted by the Engineer, the Contractor may proceed with a subsequent Control Strip.
e) If a 2nd or any subsequent Control Strip does not pass all of the inspection and testing requirements, the Contractor must submit proposed adjustment(s) to the LTMF and/or the production process and/or placement process,
f) If the computed PWL for any Quality Characteristic, with the exception of thickness, is < 60 PWL, the Control Strip Lot will be determined rejected and shall be removed. If the mean thickness of the Lot is determined to be greater than the target, it may remain in place, but payment will be based upon the HMA tonnage calculated at the target thickness.
g) For any Control Strip that is not Verified, the Contractor shall prepare a Corrective Action Plan for the nonconforming Control Strip Lot. The corrective method(s) proposed by the Contractor shall be subject to the approval of the Department and shall be performed at the Contractor’s expense.

(6) Acceptance and Payment of Control Strips
(a) 1st and 2nd Control Strip
For each Control Strip Lot that has been Verified, payment shall be determined for each individual Quality Characteristic in accordance with the pay adjustment provisions of Subsection 450.92. If the Lot Quality Level for an individual Quality Characteristic is 90 PWL, payment for the Quality Characteristic shall be 100% of the Contractor’s bid price for the pay item quantity placed on the Control Strip. If the Lot Quality Level for an individual Quality Characteristic is > 90 PWL, payment for the Quality Characteristic shall be an incentive amount determined in accordance with Subsection 450.92. If the Lot Quality Level for an individual Quality Characteristic is ≥ 60 PWL, but < 90 PWL, payment for the Quality Characteristic shall be a disincentive amount determined in accordance with Subsection 450.92. If the computed Quality Level for an individual Quality Characteristic is < 60 PWL, the Control Strip Lot will be determined rejected and removed in accordance with Subsection 450.66B(5) and shall receive no payment.
(b) **3rd Control Strip**
If a 3rd Control Strip Lot is placed and is Verified, payment shall be limited to a maximum of 85% of the Contractor’s bid price for the entire pay item quantity placed on the Control Strip, regardless of the actual calculated Quality Level for the Lot. If a 3rd Control Strip Lot is placed and is not Verified, payment shall be limited to a maximum of 80% of the Contractor’s bid price for the entire pay item quantity placed on the Control Strip, regardless of the actual calculated Quality Level for the Lot. If the computed Quality Level for an individual Quality Characteristic is < 60 PWL, the Control Strip Lot will be determined rejected and removed in accordance with Subsection 450.66B(5) and shall receive no payment.

(c) **4th or Subsequent Control Strip**
If a 4th or subsequent Control Strip Lot is placed and is Verified, payment shall be limited to a maximum of 75% of the Contractor’s bid price for the entire pay item quantity placed on the Control Strip, regardless of the actual calculated Quality Level for the Lot. If a 4th or subsequent Control Strip Lot is placed and is not Verified, payment shall be limited to a maximum of 70% of the Contractor’s bid price for the entire pay item quantity placed on the Control Strip, regardless of the actual calculated Quality Level for the Lot. If the computed Quality Level for an individual Quality Characteristic is < 60 PWL, the Control Strip Lot will be determined rejected and removed in accordance with Subsection 450.66B(5) and shall receive no payment.

450.67 **Quality Control Documentation and Data Evaluation.**

A. **QC Inspection Documentation & Evaluation.**

The Contractor shall document all QC inspection activity for each HMA Lot Category (Category A, B, or C) produced and placed. All inspection results shall be recorded within 24 hours of inspection on current NETTCP standard Inspection Report Forms (IRFs). The QC Manager shall evaluate inspection results in a timely manner to confirm that production and placement processes are in control. The Contractor shall submit hard copies of all IRFs to the Engineer at the completion of each Lot.

B. **QC Sampling and Testing Documentation & Data Analysis.**

The Contractor shall document all QC sampling and testing data for each HMA Lot Category (Category A, B, or C) produced and placed. All sampling and testing data shall be recorded within 24 hours of sampling and testing on current NETTCP standard Test Report Forms (TRFs). The QC Manager shall evaluate sampling and testing results in a timely manner, as further outlined below, to confirm that production and placement processes are in control. All QC testing data shall be entered into the Department’s MS-Excel QA Data Spreadsheets via the internet (mhdqa.com) within two (2) days after completion of testing. The Contractor shall submit hard copies of all TRFs to the Engineer at the completion of each Lot.

1. **Control Charts.**

For each HMA Category A Lot produced and placed, the Contractor shall use Control Charts as part of the QC system to assist in identifying assignable causes affecting the HMA production and placement processes. Control Charts shall be prepared for the Quality Characteristics subject to QC sampling and testing listed in Table 450.10. As a minimum, the Contractor shall plot all QC test results of each Lot on Control Charts for individual Sublot measurements or test values (Run Charts). It is also recommended practice for the Contractor to use Control Charts that plot Subgroups of data (e.g. X-Bar Charts, R Charts). The Contractor shall submit examples of the Control Charts to be used in the QC Plan. As a minimum, the Control Charts shall identify the Contract number, the Payment Item number, the Lot number, the Quality Characteristic, the Control Chart Target, the Upper and Lower Control Chart Limits, and Sublot or Subgroup numbers.
All Control Charts should be updated within 24 hours after the corresponding testing is completed and documented. Quality Control personnel should use the Control Chart data to monitor and adjust the production and placement processes or suspend operations as determined necessary. Control Charts for Quality Characteristics related to HMA production should be maintained at the HMA production facility. Control Charts for Quality Characteristics related to HMA field placement should be maintained at the project field site. Current Control Charts shall be posted in an accessible location. The Engineer shall be provided access to all Control Charts as part of the Department’s monitoring of Contractor QC activity.

(2) Evaluation of Individual Sublot QC Test Results.

The Contractor shall evaluate the individual QC test results for each HMA Lot Category (Category A, B, or C) produced and placed. Each random QC test result shall be evaluated against the applicable Quality Limits within 24 hours of testing. For HMA Category A Lots and Category B Lots, each Sublot test value shall be within the Engineering Limits specified in Table 450.19. For HMA Category C Lots, each Sublot test value shall be within the Specifications Limits indicated in Table 450.19.

If the evaluation of the QC testing data indicates that an individual Sublot is not in conformance with the applicable Quality Limits for the particular HMA Lot Category, the Contractor shall isolate the Sublot and perform selective sampling followed by additional random sampling of the Sublot to quantify the actual quality of the Sublot.

(3) Evaluation of Lot Quality Level.

For HMA Category A Lots and Category B Lots, the Contractor shall use all random QC test results to continuously evaluate the running quality level and determine the percent within limits (PWL) for each Lot during production and placement. The PWL shall be determined through Quality Level Analysis (QLA) for each of the applicable Quality Characteristics listed in Table 450.19 using the corresponding Specification Limits therein. The Contractor shall perform a running QLA using random QC data only at a minimum after each 5 Sublots have been tested and shall plot the cumulative PWL after each 5 Sublot interval. The Engineer shall be provided access to all records documenting the running QLA for each Lot as part of the Department’s monitoring of Contractor QC activity.

If the running QLA shows the PWL falling below the Acceptable Quality Level (AQL) of 90 PWL, the Contractor shall initiate appropriate adjustments to the production or placement process or initiate corrective action in accordance with procedures outlined in the approved QC Plan. If the PWL falls below the Suspension Quality Level (SQL) of 70 PWL, the Contractor shall suspend production and placement of the Lot. The Contractor shall prepare a plan of corrective action for any nonconforming Lot, as further outlined below. If significant adjustment to the JMF or the production or placement process is required, a new Lot will be established. After resuming production and placement, the PWL for the Lot must be back at or above the AQL of 90 PWL.

450.68 Corrective Action.

As part of the Contractor’s Quality Control system, the Contractor shall implement corrective action for any part of a Lot that is determined by inspection or testing to not be in conformance with the quality requirements specified in Section 450. If the results of QC inspection identify nonconforming material or workmanship within one or more Sublots, or if the evaluation of the QC testing data indicates that any Sublot is not in conformance with the applicable Quality Limits for the particular HMA Lot Category, the Contractor shall isolate the Sublot(s) and perform additional inspection or testing to further assess the quality of the Sublot. Selective inspection or testing should be used to determine the limits of nonconformance, followed by random inspection or testing to quantify the actual quality of the nonconforming area.
Based on the results of additional inspection or testing, the Contractor shall prepare a plan of corrective action for the nonconforming Sublot(s). The Corrective action plan shall be submitted to and approved by the Engineer prior to initiating corrective action. All corrective action shall be performed at the Contractor’s expense.

450.69 Quality Control Records System.

A. Quality Control Daily Diary.

The QC Manager should maintain a Quality Control Daily Diary (QC Daily Diary) to document all major activities or actions related to the Contractor’s QC system. The QC Daily Diary serves as a summary record of key actions taken by QC personnel each day. Recommended Information which should be recorded in the QC Daily Diary includes:

- The day’s weather or environmental conditions.
- A summary of production or placement activities completed.
- Any non-conforming material or workmanship identified.
- Any corrective actions recommended or taken by QC personnel.
- Discussions held with other Contractor personnel or Department personnel.
- Visitors to the production facility or field placement operation.

B. Quality Control Record Books.

The Contractor shall maintain one or more ringed binders referred to as “Quality Control Record Books” (QC Record Books) to store all required QC documents. Separate QC Record Books shall be kept at each HMA production facility and at the project field site. Either a separate QC Record Book shall be established for each HMA pavement course or the data for each pavement course may be included in a single QC Record Book provided the data is separated according to pavement course. QC data for each pavement course shall be organized into separate sections by Quality Characteristic and by Lot number.

QC documents to be stored in the QC Record Book(s) include:

- A signed copy of the current approved QC Plan.
- The original signed copies of all completed Inspection Report Forms.
- The original signed copies of all completed Random Sampling location forms.
- The original signed copies of all completed Test Report Forms.
- A current copy or printout of all Control Charts.
- A current copy or printout of all running QLA performed.
- Current summaries of all individual QC test results to date (by Lot & Sublot).
- Summary sheets of material quantities produced or placed (by Lot & Sublot).

Each required record shall be inserted into the corresponding QC Record Book within 24 hours after the document has been completed. All QC Record Books shall be maintained in a suitable location. The Engineer shall be provided access to all QC Record Books as part of the Department’s monitoring of Contractor QC activity.

C. Quality Control Records Retention.

All Contractor QC records identified above shall be retained for a minimum of seven (7) years. The records shall be protected from damage or alteration. When requested by any State or Federal Agency for audit or similar purposes, the Contractor shall provide complete access to all QC records.
DEPARTMENT ACCEPTANCE

450.70 General.

The Department is responsible for performing all Acceptance activities and making the final acceptance determination for each HMA Lot produced and placed. The Department’s Acceptance system will include monitoring the Contractor’s QC activity, performing Acceptance inspection, sampling & testing, and determining the Quality and corresponding payment for each Lot. These activities will be performed for each HMA Lot Category (Lot Category A, B, and C) as outlined further below.

450.71 Acceptance System Approach.

A. Acceptance of Category A Lots.

The Engineer’s acceptance determination for each HMA Category A Lot will be based on an evaluation of the Department’s Acceptance inspection information and Acceptance testing data. The Engineer will perform Acceptance sampling and testing on a minimum of 25% of the Sublots produced and placed. Contractor QC test data will be included in the Department’s acceptance determination for each Category A Lot provided the following requirements are met:

• Split Sample Correlation testing requirements are satisfied.
• The Contractor provides adequate Quality Control per the approved QC Plan.
• All QC test results included are from random samples.
• The QC test results are Validated against the Department’s Acceptance test results.

B. Acceptance of Category B Lots.

The Engineer’s acceptance determination for each HMA Category B Lot will also be based on an evaluation of the Department’s Acceptance inspection information and Acceptance testing data. The Engineer will perform Acceptance sampling and testing on a minimum of 50% of the Sublots produced and placed, but not less than three (3) Sublots. Contractor QC test data will be included in the Department’s acceptance determination for each Category B Lot provided the requirements outlined in paragraph A above are satisfied.

C. Acceptance of Category C Lots.

For all HMA Category C Lots, the Engineer’s acceptance determination will be based only on the Department’s Acceptance inspection information and Acceptance testing data. The Engineer will perform Acceptance sampling and testing on 100% of the Sublots produced and placed. Contractor QC test data will not be included in the Department’s acceptance determination for Category C Lots.

450.72 Department Monitoring of Contractor Quality Control.

For projects with HMA Category A Lots or Category B Lots, the Department will monitor the Contractor’s Quality Control system to confirm that QC activities are being performed for each Lot in reasonable compliance with the approved QC Plan. Department monitoring of the Contractor’s QC system is not intended to evaluate the Quality of the Work. The Engineer will not perform the QC responsibilities of the Contractor or provide constant direction to the Contractor on how to perform Quality Control. The Engineer’s monitoring of QC activity will include the following:

• Periodic visual observation of QC inspection, sampling, and testing.
• Reviewing QC documentation and records.
• Providing feedback based on monitoring findings.
The Engineer will document all findings (positive or negative) from any monitoring of the Contractor’s QC system on standard Monitoring Report Forms (MRFs). Copies of all MRFs will be provided to the Contractor on a timely basis. When deficiencies in the Contractor’s QC system are identified and documented by the Engineer, the Contractor shall take immediate action to address the deficiencies. If the Contractor fails to take appropriate action, the Contractor shall suspend production and placement of the corresponding Lot(s). The Department will withhold payment for the Contractor Quality Control Payment Item (Item No. 450.70) until the Contractor implements satisfactory corrective measures.

450.73 Acceptance Inspection.

The Engineer will perform Acceptance inspection of all work items addressed under Section 450 to ensure that all materials and completed work are in conformance with the contract requirements. Acceptance inspection is intended to visually assess the quality of each HMA Lot produced and placed and will address only the inspection components of Materials and Workmanship in support of the Department’s final acceptance determination.

All Acceptance inspection activity by the Department will be performed independent of the Contractor’s QC inspection at both the HMA production facility and at the site of HMA field placement. The Engineer will document the results and findings of Acceptance inspection on NETTCP Inspection Report Forms (IRFs). The Engineer will furnish a copy of all Department Acceptance inspection results to the Contractor within five (5) days following the inspection.

A. Acceptance Inspection of Prepared Underlying Surface.

The Department will perform Acceptance inspection of the prepared underlying surface prior to placement of HMA. The items to be inspected and minimum frequency of inspection will be in accordance with the requirements outlined in Table 450.14 and Table 450.15.

Table 450.14 - Department Acceptance Inspection of HMA Patching

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>Mixture Type + PG Binder Grade (Correct Type)</td>
<td>1 per Day</td>
<td>HMA Production Facility</td>
<td>Visual Check + Manufacturer COC</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant (Correct Type)</td>
<td>1 per Day</td>
<td>At Paving Site</td>
<td>Check Manufacturer COC</td>
</tr>
<tr>
<td>Workmanship</td>
<td>Sawcut Limit Vertical Face</td>
<td>25% of Patched Areas</td>
<td>Sawcut Limits</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant Application Rate</td>
<td>25% of Patched Areas</td>
<td>Sawcut Limits</td>
<td>Visual Check + Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Cross-Slope &amp; Profile</td>
<td>25% of Patched Areas</td>
<td>Compacted HMA</td>
<td>Check Measurement</td>
</tr>
</tbody>
</table>
Table 450.15 - Department Acceptance Inspection of Tack Coat

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>Asphalt Emulsion (Correct Type)</td>
<td>1 per Day</td>
<td>At Paving Site</td>
<td>Check</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Manufacturer COC</td>
</tr>
<tr>
<td>Workmanship</td>
<td>Asphalt Emulsion Application Rate</td>
<td>Once per 5,000 lane-ft</td>
<td>Tacked Surface + Tack Distributor System</td>
<td>Visual Check + Check Measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1,500 lane-m)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Acceptance Inspection of HMA Lots.

The Department will perform Acceptance inspection at both the HMA production facility and at the site of HMA field placement. For purposes of Acceptance inspection, the total quantity of each HMA pavement course produced and placed during the same construction season will constitute a Lot. Each inplace HMA Lot will be divided into 500 lane-feet (150 lane-meters) Sublots. The items to be inspected and minimum frequency of inspection will be in accordance with the requirements outlined in Table 450.16.

(1) Wheel Path Deviations.

Each HMA Lot produced and placed will be inspected by the Engineer for Wheel Path Deviations (high points or low points) using a 10 foot (3 meter) standard straightedge in accordance with the procedures outlined in Subsection 450.64B. Acceptance inspection for Wheel Path Deviations applies to all pavement courses (including bridge protective courses and bridge surface courses). The finished surface of each required pavement course will be inspected for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes. The Sublot size and minimum frequency of Acceptance inspection for Wheel Path Deviations will be as specified in Table 450.16.
## Table 450.16 - Department Acceptance Inspection of HMA Lots

<table>
<thead>
<tr>
<th>Inspection Component</th>
<th>Items Inspected</th>
<th>Minimum Inspection Frequency</th>
<th>Point of Inspection</th>
<th>Inspection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td>HMA Mixture Type, Aggregates &amp; PG Binder (Correct Type)</td>
<td>1 per Day</td>
<td>HMA Production Facility</td>
<td>Visual Check + Manufacturer COC</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant (Correct Type)</td>
<td>1 per Day</td>
<td>At Paving Site</td>
<td>Check Manufacturer COC</td>
</tr>
<tr>
<td><strong>Workmanship</strong></td>
<td>Joint Location &amp; Alignment</td>
<td>50% of Sublots, Once per Joint</td>
<td>At Finished Joint</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Sawcut Joint Vertical Face</td>
<td>50% of Sublots, Once per Joint</td>
<td>Joint Vertical Face</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Rubberized Asphalt Sealant Application Rate</td>
<td>50% of Sublots, Once per Joint</td>
<td>Joint Vertical Face</td>
<td>Visual Check + Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Physical Segregation</td>
<td>50% of Sublots, Once per Lane</td>
<td>Compacted HMA</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Cross-Slope</td>
<td>50% of Sublots, Once per Lane</td>
<td>Compacted HMA</td>
<td>Check Measurement</td>
</tr>
<tr>
<td></td>
<td>Joint Tightness</td>
<td>50% of Sublots, Once per Joint</td>
<td>Compacted HMA</td>
<td>Visual Check</td>
</tr>
<tr>
<td></td>
<td>Joint Surface Deviations</td>
<td>50% of Sublots, Once per Joint</td>
<td>At Finished Joint</td>
<td>10 foot (3 meter) standard straightedge</td>
</tr>
<tr>
<td></td>
<td>Wheel Path Deviations</td>
<td>50% of Sublots, per Wheel Path</td>
<td>Wheel Path</td>
<td>10 foot (3 meter) standard straightedge</td>
</tr>
</tbody>
</table>
A. Random Sampling.

The Department will utilize stratified random sampling to determine the overall quality of each HMA Lot produced and placed. Random Acceptance sample locations will be determined by the Engineer in accordance with ASTM D 3665 or by electronic random number generator, as presented by the NETTCP. All random Acceptance sample locations will be documented on NETTCP Standard Test Report Form D3665.

The Contractor shall furnish the Engineer with approved containers for all Acceptance samples. The Engineer will obtain all random Acceptance samples independent of the Contractor’s QC samples at the frequencies outlined below.

1) Sampling HMA Category A Lots.

The Engineer will obtain Acceptance samples from a minimum of 25% of all Sublots in each HMA Category A Lot for all Quality Characteristics specified in Table 450.17, other than PG Asphalt Binder Grading and Ride Quality. Acceptance samples for PG Asphalt Binder Grading and Ride Quality will be obtained from each Sublot as defined in Table 450.17.

2) Sampling HMA Category B Lots.

The Engineer will obtain Acceptance samples from a minimum of 50% of all Sublots, but not less than three (3) Sublots, in each HMA Category B Lot for all Quality Characteristics specified in Table 450.17, other than PG Asphalt Binder Grading and Ride Quality. Acceptance samples for PG Asphalt Binder Grading and Ride Quality will be obtained from each Sublot as defined in Table 450.17.

3) Sampling HMA Category C Lots.

The Engineer will obtain Acceptance samples from 100% of all Sublots in each HMA Category C Lot for all Quality Characteristics specified in Table 450.17, other than Ride Quality. Acceptance sampling and testing for Ride Quality will not be performed on Category C Lots.

B. Selective Sampling.

The Department will utilize selective sampling (i.e. non-random samples) as needed to provide supplemental information to assist in quantifying the quality of apparent nonconforming material. When the results of acceptance inspection or random sampling and testing identify material which is not in conformance with the applicable Quality Limits for the particular HMA Lot Category, the Engineer will isolate the corresponding Sublot(s) and perform selective sampling to further assess the quality of the Sublot. Selective inspection or testing will be used to determine the limits of nonconformance, followed by random inspection or testing to quantify the actual quality of the nonconforming area. The test results of selective Acceptance samples will not be combined with random Acceptance sample data in the determination of Lot acceptance using Quality Level Analysis as outlined in Subsection 450.78.

C. Contractor Assistance in Obtaining Acceptance Samples.

The Engineer will obtain all material samples for Acceptance testing by the Department. When requested by the Department, the Contractor shall assist the Engineer in obtaining Acceptance samples in accordance with the following requirements:

- The Acceptance sample location and time will be randomly selected by the Engineer and provided to the Contractor immediately prior to sampling.
- The Contractor’s qualified QC personnel will only provide the physical labor to assist the Engineer in obtaining the Acceptance sample.
- The Engineer will be present to direct and monitor the taking of the sample.
- The Engineer will take immediate possession of the Acceptance sample.
Contractor assistance may be requested in obtaining Acceptance samples for PG Asphalt Binder Grading and for In-Place Density and Thickness (HMA cores). The Contractor shall provide adequate traffic control for the Department to obtain cores, regardless of whether the Contractor assists the Engineer in obtaining the Acceptance core samples.

D. Acceptance Sample Identification System.

The Department will use a standard system for the identification of all Acceptance samples. All PG Asphalt Binder samples, HMA loose mixture samples, and core samples will be labeled by the Engineer with the minimum information indicated under Subsection 450.65C. Acceptance sampling data for Ride Quality and Wheel Path Deviations will be identified by the Engineer in accordance with the Department’s Standard Operating Procedures (SOPs).

E. Retention of Split Samples.

Qualified Department personnel will obtain all material samples (PGAB samples, HMA loose mix samples, and cores) for Acceptance testing. The Department will retain split samples from each PGAB sample and HMA loose mix sample and provide a split sample to the Contractor if requested. The Department will retain the original core samples after testing to serve as “split samples” and protect them from damage. All split samples will be stored for a period of (30) days, or until tested. These split samples will be utilized if necessary, in the Dispute Resolution process. If mutually agreed upon by the Department and the Contractor, the retained split samples may be discarded prior to the required thirty (30) days.

F. Acceptance Testing of HMA Lots.

The Department will perform Acceptance testing using the random samples obtained in accordance with Subsection 450.74A from the HMA production facility and at the site of HMA field placement. The specific Quality Characteristics subject to Department Acceptance testing are identified in Table 450.17. All Acceptance testing of HMA Lots will be performed by the Engineer in accordance with the AASHTO, ASTM, NETTCP, or Department test methods specified in Table 450.17 and the procedures outlined below. The Engineer will furnish a copy of all Department Acceptance test results/data to the Contractor within five (5) days following completion of testing.

(1) PG Asphalt Binder Grading.

The Department will review the Supplier’s Certificate of Compliance (COC) and corresponding certified AASHTO M320 test results submitted by the Contractor for each Supplier Lot of PGAB from which the HMA Producer’s PGAB was obtained. The Engineer will also obtain and test a minimum of one random Acceptance sample of PGAB for each 12,000 ton (11,000 Mg) HMA Sublot, as defined in Table 450.17, to determine conformance with AASHTO M320. A minimum of two 1-quart (1-Liter) containers of PGAB will be obtained for each Acceptance sample from the HMA Producer’s tanks in accordance with AASHTO T40. All PGAB Acceptance samples will be split prior to testing and the untested portion of the sample will be retained for a minimum of 30 days.

(2) PG Asphalt Binder Content.

The Engineer will test each HMA Lot produced and placed for PG Asphalt Binder Content in accordance with either AASHTO T164 or T308. When AASHTO T164 is used, the test results will be reported prior to ash correction. The Sublot size and minimum frequency of Acceptance testing for PG Asphalt Binder Content will be as specified in Table 450.17. Each material sample for PG Asphalt Binder Content will be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.
### Table 450.17 - Department Acceptance Sampling and Testing of HMA Lots

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method(s)</th>
<th>Sublot Size</th>
<th>Minimum Test Frequency</th>
<th>Point of Sampling</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG Asphalt Binder Grading</td>
<td>AASHTO M320</td>
<td>12,000 tons (11,000 Mg) of HMA using same PG Grade</td>
<td>1 per Sublot</td>
<td>From Tank Valve at HMA Plant</td>
<td>Random AASHTO T40</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>AASHTO T164, or AASHTO T308</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot sampled per Subsection 450.74A(1)</td>
<td>From Haul Vehicle at HMA Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>Volumetrics: Air Voids</td>
<td>AASHTO T245</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot sampled per Subsection 450.74A(1)</td>
<td>From Haul Vehicle at HMA Plant</td>
<td>Random AASHTO T168</td>
</tr>
<tr>
<td>In-place HMA Mat Density (Cores)</td>
<td>AASHTO T269, AASHTO T230, AASHTO T209, AASHTO T166</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot sampled per Subsection 450.74A(1)</td>
<td>From Compacted HMA Course</td>
<td>Random AASHTO T269</td>
</tr>
<tr>
<td>In-place HMA Mat Density (Bridge Courses)</td>
<td>ASTM D2950, or AASHTO TP68</td>
<td>150 tons (140 Mg)</td>
<td>1 per Sublot sampled per Subsection 450.74A</td>
<td>From Compacted HMA Course</td>
<td>Random ASTM D2950 or AASHTO TP68</td>
</tr>
<tr>
<td>Thickness</td>
<td>AASHTO T269</td>
<td>600 tons (550 Mg)</td>
<td>1 per Sublot sampled per Subsection 450.74A(1)</td>
<td>From Compacted HMA Course</td>
<td>Random AASHTO T269</td>
</tr>
<tr>
<td>Ride Quality (IRI)</td>
<td>AASHTO PP52 per Subsection 450.65F(11)</td>
<td>0.1 miles (160 meters) per each Wheel Path</td>
<td>1 Per Sublot Each Pavement Course per Subsection 450.65F(11)</td>
<td>Random per Subsection 450.65F(11)</td>
<td></td>
</tr>
</tbody>
</table>

(1) In the event that the total daily HMA production is less than one Sublot but greater than 150 tons (140 Mg), a minimum of one random Acceptance sample shall be obtained for the day’s production.
(3) Volumetrics (Air Voids).

The Engineer will test each HMA Lot produced and placed for Volumetrics (Air Voids) in accordance with AASHTO T245. The requirement for Volumetric testing of laboratory compacted specimens applies to HMA mixtures for all pavement courses, with the exception of Open Graded Friction Courses and Base Courses. The Sublot size and minimum frequency of Acceptance testing for Volumetrics will be as specified in Table 450.17. Each material sample for Volumetrics will be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(4) In-Place HMA Mat Density.

The Engineer will test each HMA Lot produced and placed for In-place HMA Mat Density. The requirement for In-Place Density testing applies to all pavement courses, with the exception of Open Graded Friction Courses and Leveling Courses, as outlined below.

(a) Testing In-Place Density by Cores. Acceptance testing of HMA pavement courses (other than bridge courses) for In-place Density will be performed using cores in accordance with the procedures outlined in Subsection 450.65F(8)(b). The Sublot size and minimum frequency of Acceptance testing for In-place Density of HMA pavement courses by core will be as specified in Table 450.17.

(b) Testing In-Place Density by Density Gauge. Acceptance testing of all HMA Bridge Protective Courses and Bridge Surface Courses for In-place Density will be performed using a density gauge in accordance with the procedures outlined in Subsection 450.65F(8)(a). The Sublot size and minimum frequency of Acceptance testing for In-place Density of HMA bridge courses by density gauge will be as specified in Table 450.17.

(5) Thickness.

Each HMA pavement course specified to be placed at a compacted thickness of 1 inch (25mm) or greater, with the exception of the HMA pavement courses identified in Subsection 450.65F(9), will be tested by the Engineer for Thickness using cores. Acceptance sampling and testing for Thickness of the applicable pavement courses shall be in accordance with AASHTO T269. The Sublot size and minimum frequency of Acceptance testing for Thickness will be as specified in Table 450.17.

(6) Ride Quality.

Department Acceptance testing for Ride Quality will be required for all projects having a posted speed equal to or greater than 40 mph (65 km/hr) with HMA Lots falling under Lot Category A or Category B. The Engineer will perform Ride Quality testing on the final HMA pavement course placed (either Surface Course or OGFC-P, when specified) for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes using an inertial profiler in accordance with the procedures outlined in Subsection 450.65F(11). Pavement courses and surfaces that are specifically excluded from Acceptance testing for Ride Quality are as specified in Subsection 450.65F(11)(b). The Sublot size and minimum frequency of Acceptance testing for Ride Quality will be as specified in Table 450.17.

The inertial profiler equipment used to perform Acceptance testing will be certified and correlated by the Department in accordance with the requirements and procedures outlined in Subsection 450.65F(11). The Department Acceptance data and Contractor QC data will be correlated and normalized using statistical procedures. The normalization of data will be based on the measurement difference/bias from the Department Reference Profiling Device determined during the device correlation conducted at the Profiling Center by UMass Dartmouth. The Department will provide software and procedures to perform the data normalization. The normalized Acceptance Ride Quality data and QC Ride Quality data will be used to determine the quality level (PWL) and corresponding pay for each Lot.
450.75 Split Sample Correlation.

Split Sample Correlation is an important part of the Department acceptance system for HMA Category A Lots and Category B Lots. Split Sample Correlation shall be performed when Validated Contractor QC test data is to be included in the acceptance determination. The purpose of Split Sample Correlation testing is to identify and eliminate any discrepancies in testing procedures or equipment that could result in significant differences between the Contractor’s QC testing results and the Engineer's Acceptance testing results.

Either prior to or on the first day of production and placement of any HMA Category A Lot or Category B Lot, the Contractor and the Department will conduct Split Sample Correlation. The Engineer or the Contractor may also request that Split Sample Correlation be performed at any time during HMA Lot production and placement. Department IA personnel may also test a split of the Correlation samples.

Split Sample Correlation will be performed on split material samples for those Quality Characteristics identified in Table 450.18. Correlation samples for HMA mixture testing shall be either laboratory prepared specimens or plant produced HMA specimens. Samples for HMA Category A Lots may be obtained from the Control Strip Lot. Correlation testing of the Contractor’s QC ride quality testing equipment and the Department’s Acceptance ride quality testing equipment will be performed in accordance with Subsection 450.65F(11)(c).

Table 450.18 Split Sample Correlation Allowable Differences

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Allowable Difference Between Contractor and Department Split Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Theoretical Specific Gravity (Gmm)</td>
<td>+/- 0.020</td>
</tr>
<tr>
<td>Bulk Specific Gravity (Gmb)</td>
<td>+/- 0.030</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>+/- 0.4%</td>
</tr>
<tr>
<td>Volumetrics - Air Voids</td>
<td>+/- 1.4%</td>
</tr>
<tr>
<td>In-Place HMA Mat Density</td>
<td>+/- 1.4%</td>
</tr>
<tr>
<td>Thickness</td>
<td>+/- 10 %</td>
</tr>
<tr>
<td>Ride Quality (IRI)</td>
<td>Per Subsection 450.65F(11)(c)</td>
</tr>
</tbody>
</table>

If the Contractor’s Split Sample Correlation results differ from the Department’s results by more than the allowable differences specified in Table 450.18, then the Contractor and the Department shall determine and resolve the reasons for the differences prior to the start or continuation of HMA Lot production and placement.
450.76  Lot Acceptance Determination Based on Inspection Results.

The Department’s Acceptance Inspection results will be used in the final acceptance determination for all HMA Lots (Lot Category A, B, and C). Prior to final acceptance of each HMA Lot produced and placed, the Department will periodically evaluate all Acceptance inspection information for the prepared underlying surface and the Lot. The materials and product workmanship for the completed Work will be evaluated for conformance with the plans and the requirements specified in Subsections 450.53 thru 450.58.

When the Acceptance information identifies deficiencies in either material quality or product workmanship for any underlying surface location or HMA Sublot(s), the location or Sublot(s) will be isolated and further evaluated by the Engineer through additional Acceptance inspection (or sampling and testing, if relevant or possible). Depending upon the findings of the additional Acceptance inspection activity, the Engineer will determine the disposition of the nonconforming Work in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

After each HMA Lot (and corresponding prepared underlying surface) is complete, including any corrective action, the Engineer will evaluate all Acceptance inspection information for the Work. The Department will accept the subject Work if the Engineer’s evaluation of all inspection information for the completed Lot (and underlying surface) indicates that the corresponding materials and product workmanship meet the specified requirements (provided the evaluation of all Acceptance testing data for the subject Work per Subsection 450.77 also finds the Work to be acceptable).

450.77  Lot Acceptance Determination Based on Testing Data.


Prior to final acceptance of each HMA Category A Lot produced and placed, the Engineer will periodically evaluate all available Department Acceptance testing data for the Lot.

The Contractor’s random QC testing data for each Lot will be included with the Department’s random Acceptance testing data in the acceptance determination, provided that the QC data has been Validated in accordance with paragraph (1) below. The Department’s Acceptance data and all Validated Contractor QC data will be evaluated using the Quality Limits specified in Table 450.19 and as further outlined below.

(1) Validation of Contractor QC Test Results.

Validation is defined as the mathematical comparison of two independently obtained sets of data to determine whether it can be assumed they came from the same Population. The Validation of each HMA Lot will be performed through a statistical comparison of the Engineer’s random Acceptance testing data and the Contractor’s random QC testing data for the Lot.

The statistical comparison of testing data will be made using the test result Variances ($F$-test) and the test result Means ($t$-test) at a significance level of 0.01 and in accordance with the procedures contained in Appendix F of the AASHTO Implementation Manual For Quality Assurance (February 1996). The Validation worksheet in the Department’s MS-Excel QA Data Spreadsheets will be used to perform the Validation of each Lot.

If the Validation results indicate that the Contractor’s QC test results and the Department’s Acceptance test results can be assumed to be from the same Population, then the Contractor’s QC test results will be included with the Department’s Acceptance test results in the final acceptance determination for each Lot.
If the Validation results indicate that the Contractor’s QC test results and the Department’s Acceptance test results cannot be assumed to be from the same Population, then the Department will endeavor to determine the reason for the difference between the two data sets. If a reason for the difference cannot be determined, then only the Department’s Acceptance test results will be used in the final acceptance determination for each Lot.

(2) Conformance with Engineering Limits.

The Engineer will evaluate all Department Acceptance testing data and Validated Contractor QC testing data for each Category A Lot to determine conformance with the Engineering Limits in Table 450.19. Each Sublot test value for the Acceptance Quality Characteristics identified in Table 450.19 shall be within the Engineering Limits.

If a Sublot test result is outside of the Engineering Limits, the Engineer will further assess the Sublot quality to determine whether the material in the Sublot can remain in place. The Engineer will isolate the Sublot and perform selective sampling followed by additional random sampling (if possible) within the Sublot to quantify the actual quality of the Sublot. The Engineer will determine the disposition of the Sublot in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications. If the Engineer’s assessment determines that the material quality is sufficient to permit the Sublot to remain in place without corrective action, all random testing data for the Sublot (including the original out of Engineering Limit test result) will be included in the Quality Level Analysis for the Lot in accordance with paragraph (3) below.

When a nonconforming Sublot is corrected or replaced, the Engineer will perform Acceptance testing of the Sublot and evaluate the test results for conformance with the Engineering Limits. The Acceptance test data for the corrected Sublot will replace the original Acceptance test result and will be included in the Quality Level Analysis for the Lot in accordance with paragraph (3) below. Once the above requirements have been met, the Department will accept all completed Sublots, provided that the overall Lot quality is above the Acceptance Limit as further outlined below.

(3) Analysis of Lot Quality Level.

For each HMA Category A Lot, the Engineer will determine the Lot Quality Level, for the applicable Quality Characteristics in Table 450.19, using the Quality Level Analysis (QLA) procedures outlined in Subsection 450.78. The QLA procedure will evaluate all Department Acceptance testing data and Validated Contractor QC testing data using the Specification Limits in Table 450.19. The Department’s MS-Excel QA Data Spreadsheets will be used to perform the QLA for each Lot.

All random test results that are within the Engineering Limits will be included in the Quality Level Analysis. Individual Sublot test results that are beyond the Engineering Limits, but for which the corresponding Sublot is permitted to remain in place per paragraph (2) above, will also be included in the Quality Level Analysis.

The QLA procedure will determine the Percent Within Limits (PWL) for each Lot. The Acceptance Limit (Rejectable Quality Level) for each completed Lot is 60 PWL. Each Lot must achieve a final Quality Level of at least 60 PWL in order to be accepted by the Department.

If the final computed Lot Quality Level is at 90 PWL, the Contractor will receive full payment at the unit bid price for the Lot. If the Lot Quality Level is greater than 90 PWL, the Contractor will receive an incentive pay adjustment for the Lot in accordance with Subsection 450.92. If the Lot Quality Level is less than 90 PWL but greater than or equal to 60 PWL, the Contractor will receive a disincentive pay adjustment for the Lot. If the final computed Lot Quality Level is below 60 PWL, the Lot will not be accepted. Payment for the Lot will be withheld and the Contractor shall submit a corrective action plan within 14 days following determination of the Lot PWL. The Engineer will review the corrective action plan and render a decision within 14 days of receipt of the corrective action plan. If the Engineer determines that the Lot or some of the Sublots cannot remain in place, the Contractor shall remove and replace
the affected Lot or Sublots. If the Engineer allows the Lot to remain in place, payment will be limited to a maximum of 75% of the bid price for the item.

(4) Final Lot Acceptance Determination.

After each HMA Category A Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Department Acceptance data and Validated Contractor QC data for the Lot. The Department will accept the subject Lot if the Engineer’s evaluation of all testing data for the Lot is in conformance with the applicable Quality Limits as outlined in paragraph (2) and paragraph (3) above.

Table 450.19 - Quality Limits for Acceptance of HMA Lots

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Target</th>
<th>Specification Limits</th>
<th>Engineering Limits</th>
<th>Acceptance Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG Asphalt Binder Grading</td>
<td>Per Binder Grade specified</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>Per JMF</td>
<td>Target - 0.3 %</td>
<td>Target - 0.4 %</td>
<td>60 PWL</td>
</tr>
<tr>
<td>Volumetrics: Air Voids</td>
<td>4 %</td>
<td>2.7 %</td>
<td>5.3 %</td>
<td>60 PWL</td>
</tr>
<tr>
<td>In-Place HMA Mat Density (Cores)</td>
<td>95 % of $G_{mm}$</td>
<td>92.5 % of $G_{mm}$</td>
<td>97.5 % of $G_{mm}$</td>
<td>60 PWL</td>
</tr>
<tr>
<td>In-Place HMA Mat Density (Bridge Courses)</td>
<td>95 % of $G_{mm}$</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Thickness: (All Courses 1 inch (25mm) or greater)</td>
<td>Per Plans</td>
<td>-20 % of Target Thickness</td>
<td>+20 % of Target Thickness</td>
<td>60 PWL</td>
</tr>
<tr>
<td>Ride Quality: Greater than or equal to 55 mph (90 km/hr)</td>
<td>50 in/mile (0.79 m/km)</td>
<td>N/A</td>
<td>70 in/mile (1.10 m/km)</td>
<td>60 PWL</td>
</tr>
<tr>
<td>Ride Quality: 40mph (65 km/hr) to 55 mph (90 km/hr)</td>
<td>70 in/mile (1.10 m/km)</td>
<td>N/A</td>
<td>100 in/mile (1.58 m/km)</td>
<td>60 PWL</td>
</tr>
<tr>
<td>Ride Quality: Less than 40 mph (65 km/hr)</td>
<td>N/A</td>
<td>Not subject to ride testing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prior to final acceptance of each HMA Category B Lot produced and placed, the Engineer will periodically evaluate all available Department Acceptance testing data for the Lot.

The Contractor’s random QC testing data for each Lot will be included with the Department’s random Acceptance testing data in the acceptance determination, provided that the QC data has been Validated. The Department’s Acceptance data and all Validated Contractor QC data will be evaluated for conformance with Engineering Limits and for Lot Quality Level in accordance with the requirements of Subsection 450.77A above using the applicable Quality Limits specified in Table 450.19.

After each HMA Category B Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Department Acceptance data and Validated Contractor QC data for the Lot. The Department will accept the subject Lot if the Engineer’s evaluation of all testing data for the Lot is in conformance with the applicable Quality Limits.

C. Evaluation of Lot Category C Testing Data.

For each HMA Category C Lot produced and placed, the Engineer will evaluate all Department Acceptance testing data for the Lot entered into the Department’s MS-Excel QA Data Spreadsheets after all HMA Sublots are complete in-place. The Contractor’s random QC testing data for each Lot will not be included with the Department’s random Acceptance testing data in the acceptance determination. The individual Sublot test results for each HMA Category C Lot will be evaluated against the Specification Limits contained in Table 450.19 (Note: the Engineering Limits are not applied since the inherent variability for Minor Lot quantities is expected to be within the Specification Limits). Work under HMA Lot Category C will not be subject to an evaluation of Lot Quality Level using QLA procedures.

If a Sublot test result is outside of the Specification Limits, the Engineer will further assess the Sublot quality in accordance with the requirements of Subsection 450.77A(2). The Engineer will determine the disposition of the Sublot in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

After each HMA Category C Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Department Acceptance data. The Department will accept the subject Lot if the Engineer’s evaluation of the testing data for each Sublot is in conformance with the Specification Limits.
450.78 Quality Level Analysis Procedures.

For each Quality Characteristic subject to analysis of Lot Quality Level, the Quality Level Analysis (QLA) - Standard Deviation Method will be used to determine the percentage of the Lot that is within the Specification Limits. The number of significant figures retained in each step of the QLA calculations and the rounding of all reported values will be as established in the Department’s MS Excel QA Data Spreadsheets. The estimated percentage of Work that is within the Specification Limits for a given Lot will be determined as follows:

A. Step 1 – Determine Lot Mean.

The Mean (X) will be determined for each Lot using all random Department Acceptance sample test values and all random Contractor QC sample test values (provided they have been Validated). The Mean is calculated using the following equation:

\[
X = \frac{\sum x}{n}
\]

Where:  
\(\Sigma\) = summation of  
\(x\) = individual test value of each material sample  
\(n\) = total number of material samples tested

B. Step 2 – Determine Lot Standard Deviation.

The Standard Deviation (s) will be determined for each Lot using all random Department Acceptance sample test values and all random Contractor QC sample test values (provided they have been Validated). The Standard Deviation is calculated using the following equation:

\[
s = \sqrt{\frac{n\Sigma(x^2) - (\Sigma x)^2}{n(n-1)}}
\]

Where:  
\(\Sigma(x^2)\) = summation of the squares of individual test values  
\((\Sigma x)^2\) = summation of the individual test values squared

C. Step 3 – Determine Upper Quality Index for Lot.

The Upper Quality Index (QU) will be determined for each Lot using the Lot Mean and Lot Standard Deviation calculated in Step 1 and Step 2 above. The Upper Quality Index is calculated using the following equation:

\[
QU = \frac{USL - X}{s}
\]

Where:  
USL = Upper Specification Limit from Table 450.19  
X = The Lot Mean  
s = The Lot Standard Deviation
D. Step 4 – Determine Lower Quality Index for Lot.

The Lower Quality Index (QL) will be determined for each Lot using the Lot Mean and Lot Standard Deviation calculated in Step 1 and Step 2 above. The Upper Quality Index is calculated using the following equation:

\[
Q_L = \frac{X - LSL}{s}
\]

Where:  
- LSL = Lower Specification Limit from Table 450.19  
- X = The Lot Mean  
- s = The Lot Standard Deviation


The estimated percentage of the Lot falling below the Upper Specification Limit (PU) will be determined using Table 450.20. The PU value is determined from the table by entering the column for the number of material samples (n) representing the Lot and locating the row that corresponds to the QL value determined in Step 3 above. If no USL is specified in Table 450.20, the PU value is equal to 100.


The estimated percentage of the Lot falling above the Lower Specification Limit (PL) will be determined using Table 450.20. The PL value is determined from the table by entering the column for the number of material samples (n) representing the Lot and locating the row that corresponds to the QL value determined in Step 4 above. If no LSL is specified in Table 450.20, the PL value is equal to 100.

G. Step 7 – Determine Estimated Percent Within Limits for Lot.

The Lot Quality Level will be determined by estimating the Percent Within Limits (PWL). The PWL is determined using the PU value from Step 5 and the PL value from Step 6 above. The Percent Within Limits is calculated using the following equation:

\[
PWL = (PU + PL) - 100
\]
<table>
<thead>
<tr>
<th>$n$</th>
<th>Upper Quality Index ($Q_U$)</th>
<th>Lower Quality Index ($Q_L$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.65</td>
<td>0.37</td>
</tr>
<tr>
<td>12</td>
<td>0.60</td>
<td>0.35</td>
</tr>
<tr>
<td>15</td>
<td>0.56</td>
<td>0.32</td>
</tr>
<tr>
<td>19</td>
<td>0.52</td>
<td>0.29</td>
</tr>
<tr>
<td>26</td>
<td>0.48</td>
<td>0.26</td>
</tr>
<tr>
<td>38</td>
<td>0.46</td>
<td>0.24</td>
</tr>
<tr>
<td>70</td>
<td>0.45</td>
<td>0.23</td>
</tr>
<tr>
<td>201</td>
<td>0.44</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Note: If the calculated value of $Q_U$ or $Q_L$ does not correspond exactly to a value in the table, use the next lower value.

If $Q_U$ or $Q_L$ are negative values, $P_U$ or $P_L$ is equal to 100 minus the table value for $P_U$ or $P_L$.

* $P_U$ or $P_L$ = Percent Within limits for positive values of $Q_U$ or $Q_L$.
450.80  Disputable items

The Contractor or the Department may dispute any of the test values that are utilized in the acceptance determination for a given Lot. The specific Quality Characteristics which may be disputed are as listed in Table 450.21 below. All disputes shall be initiated within the 30 day split sample retention time limit as specified in Subsection 450.82 below.

450.81  Basis for Dispute

Differences from one individual Contractor QC test value to another (or from one individual Department Acceptance test value to another) within a Lot are expected due to inherent variability. Differences are also expected between the QC test values and the Acceptance values for a given Lot as a result of inherent variability. An individual QC test value cannot be directly compared to an individual Acceptance test value since the samples are randomly obtained independent of one another. However, if one or more of the Contractor’s random QC test values for a Lot significantly differs from the Department’s Acceptance test values for the same Lot, either party may dispute the validity of an individual test value.

450.82  Dispute Resolution Samples

Samples used for Dispute Resolution testing shall be the split samples required to be retained for thirty (30) days by the Contractor and the Department in accordance with Subsection 450.65D and Subsection 450.74E. Original cores are to be retained and shall be protected from damage. If In-place density or thickness is disputed, then the original core, unless damaged, will be used in the Dispute Resolution process. If the original disputed core is damaged, then a new core shall be obtained from within a 2-foot (600mm) radius of the location of the original core by the party whose data is being disputed in the presence of the other party. If ride quality smoothness test data is disputed, then the disputed Sublot(s) shall be re-sampled/retested by the party whose data is being disputed in the presence of the other party.

450.83  Dispute Resolution Steps

The Contractor may dispute the Department’s Acceptance results and the Department may dispute the Contractor’s Quality Control results by requesting that the dispute resolution split sample be tested. Such a request, either from the Contractor or the Department, must be made in writing within five days after the original sample was obtained. The following shall be provided in the written request:

- Sample reference number, including Lot and Sublot
- The specific Quality Characteristic and test result(s) being disputed
- The complete NETTCP test report form containing the disputed results

A.  Step 1 – Split Sample Correlation.

Immediately prior to conducting testing for Dispute Resolution, the Contractor’s QC testing personnel, the Department’s Acceptance testing personnel (from the District), and a Department Independent Assurance (IA) technician will conduct Split Sample Correlation testing as detailed in Subsection 450.75. Split Sample Correlation testing will be conducted on a separate material sample obtained independent from the original sample and the Dispute Resolution sample.
The purpose of the Split Sample Correlation testing is to determine if testing procedures or equipment utilized by the Contractor or the Department might be the cause of the disputed result(s).

B. Step 2 – Dispute Resolution Sample Testing.
   If a Department Acceptance test value is being disputed, the Department’s Acceptance testing personnel (from the District) will test the Dispute Resolution split sample. If a Contractor QC test value is being disputed, the Contractor’s QC testing personnel will test the Dispute Resolution split sample. In either case, testing of the Dispute Resolution split sample shall be performed by the same Contractor QC testing personnel and Department Acceptance testing personnel that performed the split sample correlation in step 1 above. Testing of the Dispute Resolution split sample shall be performed in the presence of both the Contractor and the Department.

C. Step 3 – Additional Dispute Resolution Testing.
   If either the Contractor or the Department believes that the results of the Dispute Resolution split sample testing in Step 2 above do not conclusively resolve the dispute, additional sampling and testing within the disputed Sublot may be requested. In such case, an independent AASHTO accredited laboratory will be utilized to obtain and test three (3) random samples from the disputed Sublot. The Mean of the three test results will be used as the Dispute Resolution test value.

450.84 Final Disposition.
   If the difference between the original test value and the Dispute Resolution test value (as determined under either Step 2 or Step 3 above) is within the maximum test difference values listed in Table 450.21, then the original test value will be used in the acceptance determination for the Lot. If the difference between the original test value and the Dispute Resolution test value exceeds the maximum difference values in Table 450.21, then the Dispute Resolution test value will be used in the acceptance determination. In such case, the record of the original test value will be retained (with notation of the outcome of Dispute Resolution); however, it will not be used in calculating the Lot quality level.

Table 450.21 – Dispute Resolution Maximum Test Difference Values

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Maximum Test Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Specific Gravity (G&lt;sub&gt;mm&lt;/sub&gt;)</td>
<td>+/- 0.020</td>
</tr>
<tr>
<td>Bulk Specific Gravity (G&lt;sub&gt;mm&lt;/sub&gt;)</td>
<td>+/- 0.030</td>
</tr>
<tr>
<td>PG Asphalt Binder Content</td>
<td>+/- 0.4</td>
</tr>
<tr>
<td>Volumetrics - Air Voids</td>
<td>+/- 1.4</td>
</tr>
<tr>
<td>In-place HMA Mat Density</td>
<td>+/- 1.4</td>
</tr>
<tr>
<td>Thickness</td>
<td>+/- 10% of original value</td>
</tr>
<tr>
<td>Ride Quality (IRI)</td>
<td>+/- 10% of original value</td>
</tr>
</tbody>
</table>
450.90  \textbf{Method of Measurement.}

A. \textbf{Patching.}

HMA for Patching will be measured for payment by the ton (Megagram) and shall be the actual quantity complete, in place and accepted by the Engineer.

B. \textbf{Tack Coat.}

Asphalt Emulsion for Tack Coat, as required by the plans or these specifications, will be measured by the gallon (liter).

C. \textbf{Joint Sealer.}

HMA Joint Sealant used for sealing all longitudinal joints and transverse joints in HMA pavement courses will be measured by the linear foot (linear meter).

D. \textbf{Hot Mix Asphalt.}

Hot Mix Asphalt pavement course mixtures will be measured by the ton (Megagram) and shall be the actual pavement course quantity complete, in place and accepted by the Engineer. The quantity shall be determined only by weight slips that have been properly countersigned by the Engineer at the time of delivery.

E. \textbf{Contractor Quality Control.}

The Contractor's Quality Control system as specified in Subsection 450.60 through Subsection 450.69 will be measured by the ton (Megagram) and shall be represented by the actual quantity of HMA for Patching and all HMA pavement courses complete, in place and accepted by the Engineer.

450.91  \textbf{Basis of Payment.}

A. \textbf{Patching.}

HMA for Patching will be paid for at the contract unit price per ton (Megagram) of the HMA mixture type specified under Pay Item 451. Payment shall include all sawcutting, removal of existing distressed or unsound pavement, applying hot poured rubberized asphalt sealant to vertical faces, and transportation, delivery, placement, and compaction of HMA for Patching in accordance with Subsection 450.53C.

B. \textbf{Tack Coat.}

Asphalt Emulsion for Tack Coat will be paid for at the contract unit price per gallon (liter) of applied tack coat under Pay Item 452. Payment shall include sweeping existing surfaces and applying the tack coat to all required surfaces at the specified rate in accordance with Subsection 450.53F.

C. \textbf{Joint Sealer.}

HMA Joint Sealant will be paid for at the contract unit price per linear foot (linear meter) of joint sealed under Pay Item 453. Payment shall include application of the joint sealer to all longitudinal joints and transverse joints in HMA pavement courses as required and in accordance with Subsection 450.57.
D. Hot Mix Asphalt.

Each Hot Mix Asphalt pavement course will be paid for at the contract unit price per ton (Megagram) of in-place mixture under the HMA Pay Items specified (Pay Items 450.10 through 450.70). Payment shall include sweeping the underlying surface, transportation, delivery, placement (including providing a MTV when required), and compaction of each HMA pavement course in accordance with Subsection 450.54 through Subsection 450.58.

All sawcutting required for transverse joints or longitudinal joints in accordance with Subsection 450.57 shall also be included in the contract unit price for each HMA pavement course.

E. Contractor Quality Control.

The Contractor's Quality Control system will be paid for at the contract unit price per ton (Megagram) under Pay Item 450.90. Payment will be full compensation for all QC activities required under Subsection 450.50 through Subsection 450.69 including; the Construction Quality Meeting, providing the field reference system, preparing and maintaining the approved Quality Control Plan, preparing all HMA mixture designs, performing QC sampling, testing and inspection (including the Control Strip when required), evaluating all QC data, and maintaining proper QC records. No separate payment will be made for any assistance provided by the Contractor to the Engineer in obtaining Department Acceptance samples. Failure of the Contractor to perform adequate Quality Control in accordance with the specifications and the Contractor’s approved QC Plan will be justification for withholding payment.

450.92 Pay Adjustment (PA).

Payment for each HMA Category A Lot and Category B Lot will be determined based on the final Lot Quality Level (PWL) computed in accordance with the QLA procedures contained in Subsection 450.78. Pay adjustments will be determined for each of the Acceptance Quality Characteristics identified in Table 450.22. The relative pay adjustment weight assigned to each of the HMA Quality Characteristics is indicated in Table 450.22.

<table>
<thead>
<tr>
<th>HMA Quality Characteristics</th>
<th>Pay Adjustment Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG Asphalt Binder Content</td>
<td>10 percent</td>
</tr>
<tr>
<td>Volumetrics - Air Voids</td>
<td>25 percent</td>
</tr>
<tr>
<td>In-Place HMA Mat Density</td>
<td>25 percent</td>
</tr>
<tr>
<td>Thickness</td>
<td>10 percent</td>
</tr>
<tr>
<td>Ride Quality (IRI)</td>
<td>30 percent</td>
</tr>
</tbody>
</table>

A. Lot Pay Factor.

A Pay Factor (PF) will be determined for each HMA Lot using the Quality Level (PWL) computed for the Lot and the equation below:

\[
PayFactor(PF) = \frac{55 + 0.5(\text{Quality Level})}{100}
\]

The Lot Pay Factor will be used to determine the pay adjustment for each Quality Characteristic as further outlined below.
B. Pay Adjustment for PG Asphalt Binder Content.
Pay adjustment for PG Asphalt Binder Content shall be applied to Pay Item 999.490 at the completion of the HMA Lot. The total Lot pay adjustment for PG Asphalt Binder Content will be determined as follows:

\[ PA_{PGAB} = \sum (PF_i - 1) (Q_i) (P_i) (0.10) \]

Where:
- \( PA_{PGAB} \) = Pay adjustment in dollars for PG Asphalt Binder Content.
- \( PF_i \) = Pay factor based on Quality Level (PWL) of PG Asphalt Binder Content for individual Lot (i).
- \( Q_i \) = Quantity represented by individual Lot (i) in tons (Mg).
- \( P_i \) = Contract unit price per ton (Mg) for individual Lot (i).
- 0.10 = Weight given to PG Asphalt Binder Content pay adjustment

C. Pay Adjustment for Volumetrics (Air Voids).
Pay adjustment for Volumetrics (Air Voids) shall be applied to Pay Item 999.491 at the completion of the HMA Lot. The total Lot pay adjustment for Volumetrics (Air Voids) will be determined as follows:

\[ PA_{Air\ Voids} = \sum (PF_i - 1) (Q_i) (P_i) (0.25) \]

Where:
- \( PA_{Air\ Voids} \) = Pay adjustment in dollars for Volumetrics (Air Voids).
- \( PF_i \) = Pay factor based on Quality Level (PWL) of Volumetrics (Air Voids) for individual Lot (i).
- \( Q_i \) = Quantity represented by individual Lot (i) in tons (Mg).
- \( P_i \) = Contract unit price per ton (Mg) for individual Lot (i).
- 0.25 = Weight given to Volumetrics (Air Voids) pay adjustment

D. Pay Adjustment for In-Place HMA Mat Density.
Pay adjustment for In-Place HMA Mat Density shall be applied to Pay Item 999.492 at the completion of the HMA Lot. The total Lot pay adjustment for In-Place HMA Mat Density will be determined as follows:

\[ PA_{In-Place\ Density} = \sum (PF_i - 1) (Q_i) (P_i) (0.25) \]

Where:
- \( PA_{In-Place\ Density} \) = Pay adjustment in dollars for In-Place HMA Mat Density.
- \( PF_i \) = Pay factor based on Quality Level (PWL) of In-Place HMA Mat Density for individual Lot (i).
- \( Q_i \) = Quantity represented by individual Lot (i) in tons (Mg).
- \( P_i \) = Contract unit price per ton (Mg) for individual Lot (i).
- 0.25 = Weight given to In-Place HMA Mat Density pay adjustment
E. Pay Adjustment for Thickness.

Pay adjustment for Thickness shall be applied to Pay Item 999.493 at the completion of the HMA Lot. The total Lot pay adjustment for Thickness will be determined as follows:

\[ PA_{\text{Thickness}} = \sum (PF_i - 1) (Q_i)(P_i) (0.10) \]

Where:
- \( PA_{\text{Thickness}} \) = Pay adjustment in dollars for Thickness.
- \( PF_i \) = Pay factor based on Quality Level (PWL) of Thickness for individual Lot (i).
- \( Q_i \) = Quantity represented by individual Lot (i) in tons (Mg).
- \( P_i \) = Contract unit price per ton (Mg) for individual Lot (i).
- 0.10 = Weight given to Thickness pay adjustment.

B. Pay Adjustment for Ride Quality.

Pay adjustment for Ride Quality shall be applied to Pay Item 999.494 at the completion of all HMA Lots. Although Ride Quality Acceptance testing will be performed only on the final pavement course, the pay adjustment will be applied to the total quantity of all HMA pavement courses placed. Since each wheel path of the final pavement course represents a Lot for Ride Quality, the quantity for each Lot shall be computed by dividing the total quantity of all pavement courses placed by the number of wheel paths for all lanes tested in the final pavement course. The total Lot pay adjustment for Ride Quality will be determined as follows:

\[ PA_{\text{Ride Quality}} = \sum (PF_i - 1) (\sum (Q_{pc})(P_{pc})) / N_{wp} (0.30) \]

Where:
- \( PA_{\text{Ride Quality}} \) = Pay adjustment in dollars for Ride Quality.
- \( PF_i \) = Pay factor based on Quality Level (PWL) of Ride Quality for individual Lot (i).
- \( Q_{pc} \) = Quantity represented by individual pavement course (pc) in tons (Mg).
- \( P_{pc} \) = Contract unit price per ton (Mg) for individual pavement course (pc).
- \( N_{wp} \) = Total number of wheel paths for all lanes tested.
- 0.30 = Weight given to Ride Quality pay adjustment.
<table>
<thead>
<tr>
<th>450.93</th>
<th>Payment Items</th>
<th>Payment Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>450.10</td>
<td>Open Graded Friction Course - Polymer Modified (OGFC-P)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.21</td>
<td>SUPERPAVE Surface Course - 4.75 (SSC - 4.75)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.22</td>
<td>SUPERPAVE Surface Course - 9.5 (SSC - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.23</td>
<td>SUPERPAVE Surface Course - 12.5 (SSC - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.24</td>
<td>SUPERPAVE Surface Course - 19.0 (SSC - 19.0)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.31</td>
<td>SUPERPAVE Intermediate Course - 12.5 (SIC - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.32</td>
<td>SUPERPAVE Intermediate Course - 19.0 (SIC - 19.0)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.41</td>
<td>SUPERPAVE Base Course - 25.0 (SBC - 25.0)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.42</td>
<td>SUPERPAVE Base Course - 37.5 (SBC - 37.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.51</td>
<td>SUPERPAVE Leveling Course - 4.75 (SLC - 4.75)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.52</td>
<td>SUPERPAVE Leveling Course - 9.5 (SLC - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.53</td>
<td>SUPERPAVE Leveling Course - 12.5 (SLC - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.60</td>
<td>SUPERPAVE Bridge Surface Course - 9.5 (SSC-B - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.61</td>
<td>SUPERPAVE Bridge Surface Course - 12.5 (SSC-B - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.70</td>
<td>SUPERPAVE Bridge Protective Course - 9.5 (SPC-B - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.71</td>
<td>SUPERPAVE Bridge Protective Course - 12.5 (SPC-B - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>450.90</td>
<td>Contractor Quality Control</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>451</td>
<td>HMA for Patching</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>452</td>
<td>Asphalt Emulsion for Tack Coat</td>
<td>Gallon (Liter)</td>
</tr>
<tr>
<td>453</td>
<td>HMA Joint Sealant</td>
<td>Linear Foot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Meter)</td>
</tr>
<tr>
<td>999.490</td>
<td>HMA Pay Adjustment – PG Asphalt Binder Content ¹</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.491</td>
<td>HMA Pay Adjustment – Volumetrics (Air Voids) ¹</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.492</td>
<td>HMA Pay Adjustment – In-place Mat Density ¹</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.493</td>
<td>HMA Pay Adjustment – Thickness ¹</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.494</td>
<td>HMA Pay Adjustment – Ride Quality ¹</td>
<td>Dollar</td>
</tr>
</tbody>
</table>

¹ Not a bid item
SECTION 455
SUPERPAVE HOT MIX ASPHALT PAVEMENT

Section 455 - SUPERPAVE Hot Mix Asphalt Pavement amends Section 450 - Hot Mix Asphalt Pavement. The provisions herein replace the Subsections of Section 450 as indicated.

NOTE: The HMA pavement produced and placed for this project is part of a Gyratory Compaction Study evaluating the placement and performance characteristics of HMA pavements designed at different Superpave gyration levels.

For any HMA pavement course/mixture type having a project quantity ≥15,000 Tons, at least 50% of the pavement course/mixture type quantity shall be designed and produced using the design criteria in Table 455.5A (Standard Superpave HMA) and at least 40% of the pavement course/mixture type quantity shall be designed and produced using the design criteria in Table 455.5B (Modified Superpave HMA).

For any HMA pavement course/mixture type having a project quantity <15,000 Tons, at least 50% of the pavement course quantity shall be designed and produced using the design criteria in Table 455.5A (Standard Superpave HMA) and at the Contractor’s option, up to 50% of the pavement course/mixture type quantity may be designed and produced using the design criteria in Table 455.5B (Modified Superpave HMA).

For each HMA pavement course/mixture type, both mix designs (Standard Superpave HMA - Table 455.5A and Modified Superpave HMA - Table 455.5B) shall use the same source of materials (i.e. Aggregates, PG Asphalt Binder, RAP, MAS) for the LTMF and HMA production.

All Study samples (loose mixture and cores) will be obtained by MassDOT personnel in conjunction with Acceptance samples. These Study samples will be drawn from either a split sample of each randomly obtained Department Acceptance sample or from separate random samples obtained by the Department. The Contractor shall also provide a split sample from each random QC sample if requested by the Department. Each sample will be clearly marked to indicate that it is from a Standard Superpave Mixture (S) or from a Modified Superpave Mixture (M). The Study will analyze all QC and Acceptance testing data from this project for all Quality Characteristics tested for Acceptance.

The Contractor shall submit with their Quality Control Plan a written Gyratory Compaction Study Plan delineating the location, limits and estimated pavement course/mixture type quantities of Standard Superpave HMA and Modified Superpave HMA to be designed, produced, and placed. The Contractor shall cooperate and coordinate with MassDOT to obtain Study samples (loose mixture plant-produced HMA samples and cores) and to share all project testing data in accordance with MassDOT’s Study Work Plan. The Contractor shall also record and submit to MassDOT the equipment, rolling patterns, and relative compactive effort utilized to achieve the specified HMA pavement density for each pavement course/mixture type placed.

NOTE: The Pay Adjustment provisions included in Subsection 450.92 will be applied to items under this contract.
DESCRIPTION

*Delete Subsection 450.20 - General and replace with the following:*

**455.20 General.**

This work shall consist of producing and placing Hot Mix Asphalt (HMA) pavement. All HMA mixtures shall meet the requirements of the SUPERPAVE volumetric design system. The HMA pavement shall be constructed in courses on the prepared or existing base in accordance with these specifications and in conformance with the lines, grades, compacted thickness and typical cross section as shown on the plans. Each SUPERPAVE HMA pavement course placed shall be comprised of one of the mixture types listed in Table 455.1.

**Table 455.1 - SUPERPAVE HMA Pavement Courses & Mixture Types**

<table>
<thead>
<tr>
<th>Pavement Course</th>
<th>Mixture Type</th>
<th>Mixture Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction Course</td>
<td>• Open-Graded Friction Course - Polymer Modified</td>
<td>OGFC – P</td>
</tr>
<tr>
<td>Surface Course</td>
<td>• SUPERPAVE Surface Course - 4.75</td>
<td>SSC - 4.75</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 9.5</td>
<td>SSC - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 12.5</td>
<td>SSC - 12.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Surface Course - 19.0</td>
<td>SSC - 19.0</td>
</tr>
<tr>
<td>Intermediate Course</td>
<td>• SUPERPAVE Intermediate Course - 12.5</td>
<td>SIC - 12.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Intermediate Course - 19.0</td>
<td>SIC - 19.0</td>
</tr>
<tr>
<td>Base Course</td>
<td>• SUPERPAVE Base Course - 25.0</td>
<td>SBC - 25.0</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Base Course - 37.5</td>
<td>SBC - 37.5</td>
</tr>
<tr>
<td>Leveling Course</td>
<td>• SUPERPAVE Leveling Course - 4.75</td>
<td>SLC - 4.75</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Leveling Course - 9.5</td>
<td>SLC - 9.5</td>
</tr>
<tr>
<td>Bridge Surface Course</td>
<td>• SUPERPAVE Bridge Surface Course - 9.5</td>
<td>SSC-B - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Bridge Surface Course - 12.5</td>
<td>SSC-B - 12.5</td>
</tr>
<tr>
<td>Bridge Protective Course</td>
<td>• SUPERPAVE Bridge Protective Course - 9.5</td>
<td>SPC-B - 9.5</td>
</tr>
<tr>
<td></td>
<td>• SUPERPAVE Bridge Protective Course - 12.5</td>
<td>SPC-B - 12.5</td>
</tr>
</tbody>
</table>

When a SUPERPAVE Surface Course - 19.0 (SSC - 19.0) is specified in the contract, the Laboratory Trial Mix Formula (LTMF) aggregate gradation shall provide a fine-graded HMA mixture as defined in Subsection 455.42F.
Delete Subsection 450.40 - General and replace with the following:

455.40 General.

SUPERPAVE HMA mixtures shall be composed of the following: Mineral aggregate, mineral filler (if required), Performance Graded Asphalt Binder (PGAB), and as permitted, reclaimed materials (limited to Reclaimed Asphalt Pavement (RAP), Reclaimed Asphalt Shingles (RAS), and Processed Glass Aggregate (PGA)). Materials shall meet the requirements in the following Subsections of Division III, Materials and as otherwise specified herein:

- Asphalt Emulsion M3.03.0
- Hot Poured Joint Sealer M3.05.0
- Asphalt Anti-Stripping Additive M3.10.0
- Mineral Aggregate M3.11.04
- Mineral Filler M3.11.05
- Plant Requirements M3.11.07

Delete Subsection 450.42 - Hot Mix Asphalt Mix Design and replace with the following:

455.42 SUPERPAVE Hot Mix Asphalt Mixture Design.

The Contractor shall be responsible for development of all SUPERPAVE HMA mixture designs. All HMA surface courses, intermediate courses, base courses, leveling courses, bridge surface courses, and bridge protective courses shall be supported by volumetric mixture designs using the SUPERPAVE mixture design system. All SUPERPAVE HMA mixture designs shall be developed in accordance with the following AASHTO standards, as modified herein:

- AASHTO M 323
- AASHTO R 35
- AASHTO T 312

Volumetric mixture designs are not required for OGFC. The aggregate gradation structure and target PG Asphalt Binder content for Open-Graded Friction Course - Polymer Modified (OGFC-P) shall conform to the master ranges in M3.11.03 – Table B.

A. Development of Laboratory Trial Mix Formula (LTMF).

The Contractor shall develop and submit for Department approval, a minimum of forty-five (45) days prior to the start of SUPERPAVE HMA pavement construction, a Laboratory Trial Mix Formula (LTMF) as the proposed Job Mix Formula (JMF) for each SUPERPAVE mixture type to be used on the project. Two or more JMFs per HMA mixture type may be approved for a particular plant, however, only HMA conforming to one JMF is permitted to be produced and placed on any given day.
The following is a general outline of the steps for developing an LTMF and an approved JMF:

1. Estimate Percentage of RAP to be utilized and select PG Asphalt Binder as required by the specifications (Subsection 455.42C.);
2. Evaluate aggregates (and reclaimed materials) for conformance with Consensus Properties (Subsection 455.42D.) and Source Properties (Subsection 455.42E.);
3. Develop trial aggregate blends and estimate PG Asphalt Binder content in accordance with AASHTO R 35. Compact each of the blends. Based on volumetric analysis, select the best trial blend that meets the requirements of M 323 (Subsections 455.42F and 455.42G.);
4. Determine volumetric properties of LTMF and select PG Asphalt Binder content (Subsection 455.42H.);
5. Evaluate Moisture Sensitivity of the mixture (Subsection 455.42I.);
6. LTMF to be verified in the laboratory by the Department (Subsection 455.43);
7. Through production of a Control Strip Lot, verify that LTMF can be produced through the plant. (Subsection 450.66B.). Verification of the LTMF results in an approved JMF;
8. Repeat process for all mixtures to be utilized.

B. Estimated Design Traffic.

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is XX Million 18-kip (80-kn) ESALs.

C. Performance Graded Asphalt Binder.

The Asphalt Binder used for all HMA mixtures under this contract shall comply with the requirements of Subsection 450.48. The PGAB Grade selected for this Contract is PGXX-XX. The Contractor shall provide PGAB samples to the Department for verification of each LTMF a minimum of forty-five (45) days prior to SUPERPAVE HMA production.

D. Aggregate Consensus Properties.

Aggregates utilized in SUPERPAVE HMA mixtures, including RAP if used in the mixture, shall be tested for conformance with the following Consensus Property requirements:

- Determining the Percentage of Fractured Particles in Coarse Aggregate (ASTM D 5821)
- Uncompacted Void Content of Fine Aggregate (AASHTO T 304 - Method A)
- Flat or Elongated Particles (ASTM D 4791)
- Clay Content/Sand Equivalent Test (AASHTO T 176)

The Consensus Property test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture. The Contractor shall provide aggregate samples a minimum of forty-five (45) days prior to production for each LTMF to the Department for LTMF verification prior to SUPERPAVE HMA production. The required minimum or maximum criteria for each of the Consensus Property tests for the total aggregate blend are specified below in Table 455.2 below.
### Table 455.2 - Aggregate Consensus Property Requirements

<table>
<thead>
<tr>
<th>Traffic Level</th>
<th>Design ESALs (18-kip (80-kn)))</th>
<th>Coarse Aggregate Angularity (1) (2) ASTM D5821 (Percent Minimum)</th>
<th>Fine Aggregate Angularity (1) AASHTO T 304 - Method A (Percent Minimum)</th>
<th>Flat or Elongated Particles (2) ASTM D4791 (Percent Maximum)</th>
<th>Sand Equivalent AASHTO T 176 (Percent Minimum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 0.3 (million)</td>
<td>55/-/--</td>
<td>--/--</td>
<td>--/---</td>
<td>40/---</td>
</tr>
<tr>
<td>2</td>
<td>0.3 to &lt; 3.0</td>
<td>75/-/--</td>
<td>50/-/--</td>
<td>40/---</td>
<td>40/---</td>
</tr>
<tr>
<td>3</td>
<td>3 to &lt; 10</td>
<td>85/80</td>
<td>60/-/--</td>
<td>40/---</td>
<td>40/---</td>
</tr>
<tr>
<td>4</td>
<td>10 to &lt; 30.0</td>
<td>95/90</td>
<td>80/75</td>
<td>40/---</td>
<td>40/---</td>
</tr>
<tr>
<td>5</td>
<td>≥ 30.0</td>
<td>100/100</td>
<td>100/100</td>
<td>45/45</td>
<td>40/---</td>
</tr>
<tr>
<td></td>
<td>Design ESALs are the anticipated project traffic level expected on the design lane, projected over a 20 year period, regardless of the actual expected design life of the roadway.</td>
<td>Criteria presented as minimum values. 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.</td>
<td>Criteria presented as minimum percent air voids in loosely compacted fine aggregate passing the #8 (2.36 mm) sieve.</td>
<td>Criteria presented as maximum percent by mass of flat or elongated particles of materials retained on the #4 (4.75 mm) sieve, determined at 5:1 ratio.</td>
<td>Criteria presented as minimum values for fine aggregate passing the #4 (4.75 mm) sieve.</td>
</tr>
</tbody>
</table>

**Notes:**

1. If less than 25% of a given layer is within 4 inches (100 mm) of the anticipated top surface, the layer may be considered to be below 4 inches (100 mm) for mixture design purposes.
2. This criterion does not apply to #4 (4.75 mm) nominal maximum size mixtures.
Aggregate Source Properties.

The coarse mineral aggregate utilized in SUPERPAVE HMA mixtures shall be clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock. It shall be free from dirt or other objectionable materials. The coarse aggregate, including RAP if used in the mixture, shall be tested for conformance with the following Source Property requirements:

- Toughness as Determined by: Los Angeles Abrasion (AASHTO T 96)
- Soundness as Determined by: Soundness (AASHTO T 104)
- Deleterious Materials as Determined by: Clay Lumps & Friable Particles (AASHTO T 112)
- Specific Gravity (AASHTO T 8)

Testing for each of the Source Properties shall be performed for each SUPERPAVE HMA mixture design developed for the project. The Source Property test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture. The Contractor shall provide samples of each aggregate material from each stock pile, a minimum of forty-five (45) days prior to production for each LTMF to the Department for verification prior to SUPERPAVE HMA production. The requirements for each of the Source Properties are as indicated in Table 455.3 below.

<table>
<thead>
<tr>
<th>Source Property Test</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toughness (AASHTO T 96)</td>
<td>Maximum Loss &lt; 30 %</td>
</tr>
<tr>
<td>Soundness (AASHTO T 104)</td>
<td>Maximum Loss &lt; 10 %</td>
</tr>
<tr>
<td>Deleterious Materials (AASHTO T 112)</td>
<td>Maximum Permissible &lt; 0.5 %</td>
</tr>
</tbody>
</table>

F. SUPERPAVE Aggregate Gradation and Specific Gravity Requirements.

The combined aggregate blend for each SUPERPAVE HMA mixture shall conform to the Gradation Control Point requirements specified in Table 455.6 below. The results of the selected optimum Design Aggregate Structure shall be plotted on a 0.45 Power Chart and included with the LTMF.

The combined aggregate gradation shall be classified as coarse-graded when it passes below the Primary Control Sieve (PCS) control point as defined in Table 455.4. All other gradations shall be classified as fine graded.

The specific gravity of each coarse and fine aggregate component shall be determined in accordance with AASHTO T 85 and T 84 respectively, and the specific gravity of the mineral filler shall be determined in accordance with AASHTO T 100. The individual aggregate specific gravities shall be included with the LTMF. The Contractor shall provide samples of each aggregate material a minimum of forty-five (45) days prior to production for each LTMF to the Department for verification of the selected optimum Design Aggregate Structure and specific gravity of each stock pile.
Table 455.4 - Gradation Classification

<table>
<thead>
<tr>
<th>PCS Control Point for Mixture Nominal Maximum Aggregate Size</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Maximum Aggregate Size</td>
<td>1-1/2”</td>
</tr>
<tr>
<td></td>
<td>(37.5 mm)</td>
</tr>
<tr>
<td>Primary Control Sieve</td>
<td>3/8”</td>
</tr>
<tr>
<td></td>
<td>(9.5 mm)</td>
</tr>
<tr>
<td>PCS Control point (% Passing)</td>
<td>47</td>
</tr>
</tbody>
</table>

G. Gyratory Compaction Criteria.
Each SUPERPAVE HMA mixture shall be designed and controlled during production using an approved Gyratory Compactor which meets the requirements of AASHTO T 312. Compaction shall be in accordance with the requirements of AASHTO T 312. The density of each SUPERPAVE HMA mixture shall be evaluated at the initial number of gyrations (N_initial), the design number of gyrations (N_design), and the maximum number of gyrations (N_max). The gyratory-compacted specimens for each LTFM shall meet the density requirements specified in Table 455.5 below.

H. Volumetric Design Requirements.
Each SUPERPAVE HMA mixture shall be designed in accordance with the volumetric mixture design specifications contained in AASHTO M 323 and procedures contained in AASHTO R 35, as modified herein. Each HMA mixture LTFM shall be tested for conformance with the following volumetric properties:

- Air Voids at N_design (V_a)
- Voids in the Mineral Aggregate at N_design (VMA)
- Voids Filled with Asphalt at N_design (VFA)
- Fines to Effective Asphalt Ratio (P_0.075 / P_be)

The volumetric property test results shall be submitted with the LTFM for each SUPERPAVE HMA mixture. The required minimum or maximum criteria for each of the volumetric property tests are specified in Table 455.6 below.
### Table 455.5A - Standard SUPERPAVE HMA Design Requirements

<table>
<thead>
<tr>
<th>Traffic Level</th>
<th>Design ESALs</th>
<th>Number of Gyrations by Superpave Gyratory Compactor</th>
<th>Percent Density of Gmm from HMA Specimen</th>
<th>Voids Filled with Asphalt (VFA)* Based on Nominal Maximum Aggregate Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(million)</td>
<td>Nini</td>
<td>Ndes**</td>
<td>Nmax</td>
</tr>
<tr>
<td>1</td>
<td>&lt; 0.3</td>
<td>6</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>0.3 to &lt; 3</td>
<td>7</td>
<td>75</td>
<td>115</td>
</tr>
<tr>
<td>3</td>
<td>3 to &lt; 10</td>
<td>8</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td>4</td>
<td>10 to &lt; 30</td>
<td>8</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td>5</td>
<td>≥ 30</td>
<td>9</td>
<td>125</td>
<td>205</td>
</tr>
</tbody>
</table>

*The VFA values contained in Table 455.5A have been modified from AASHTO M 323 to ensure adequate PG Asphalt Binder content in each SUPERPAVE HMA mixture.

### Table 455.5B - Modified SUPERPAVE HMA Design Requirements

<table>
<thead>
<tr>
<th>Traffic Level</th>
<th>Design ESALs</th>
<th>Number of Gyrations by Superpave Gyratory Compactor</th>
<th>Percent Density of Gmm from HMA Specimen</th>
<th>Voids Filled with Asphalt (VFA)* Based on Nominal Maximum Aggregate Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(million)</td>
<td>Nini</td>
<td>Ndes**</td>
<td>Nmax</td>
</tr>
<tr>
<td>1</td>
<td>&lt; 0.3</td>
<td>6</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>0.3 to &lt; 3</td>
<td>7</td>
<td>65</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>3 to &lt; 10</td>
<td>8</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td>4</td>
<td>10 to &lt; 30</td>
<td>8</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td>5</td>
<td>≥ 30</td>
<td>9</td>
<td>100</td>
<td>160</td>
</tr>
</tbody>
</table>

*The VFA values contained in Table 455.5B have been modified from AASHTO M 323 to ensure adequate PG Asphalt Binder content in each SUPERPAVE HMA mixture.

**The Ndes** gyration levels are selected based on depth from final pavement surface. When 75% or more of the depth of a pavement layer is greater than four (4) inches (100 mm) below the final pavement surface, that pavement layer shall be designed at the next lower Design Traffic Level in Table 455.5B.
### Table 455.6 - Gradation and Volumetric Requirements

<table>
<thead>
<tr>
<th>Sieve #</th>
<th>SUPERPAVE HMA Mixture Nominal Maximum Aggregate Size</th>
<th>LTMF Verification Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#4 (4.75 mm)</td>
<td>3/8&quot; (9.5 mm)</td>
</tr>
<tr>
<td>Index</td>
<td>CONTROL POINTS</td>
<td>CONTROL POINTS</td>
</tr>
<tr>
<td>2</td>
<td>10 - 15</td>
<td>10 - 15</td>
</tr>
<tr>
<td>1.5</td>
<td>10 - 15</td>
<td>10 - 15</td>
</tr>
<tr>
<td>1.0</td>
<td>90 - 100</td>
<td>90 - 100</td>
</tr>
<tr>
<td>0.0</td>
<td>35 - 77</td>
<td>67 - 120</td>
</tr>
<tr>
<td>0.002</td>
<td>0.8 - 2.0</td>
<td>0.6 - 1.2</td>
</tr>
<tr>
<td>VMA (%)</td>
<td>17.0</td>
<td>16.0</td>
</tr>
<tr>
<td>VMA (%)</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>VFA</td>
<td>Per Table 455.5 ± 5 off 1,LTMF</td>
<td>Per Table 455.5 ± 5 off 1,LTMF</td>
</tr>
<tr>
<td>Ske</td>
<td>LTMF value</td>
<td>LTMF value</td>
</tr>
<tr>
<td>Grad</td>
<td>LTMF value</td>
<td>LTMF value</td>
</tr>
<tr>
<td>Dust/Bc (O)</td>
<td>0.8 - 2.0</td>
<td>0.6 - 1.2</td>
</tr>
<tr>
<td>Mixture Temp</td>
<td>265 - 325°F (1)</td>
<td>265 - 325°F (1)</td>
</tr>
<tr>
<td>PCS (%)</td>
<td>Sieve #6</td>
<td>47</td>
</tr>
</tbody>
</table>

(1) Based on the final design PCA Asphalt Binder certification. (2) Dust is considered to be the percent of material passing the #200 (75 μm) sieve. The calculated effective asphalt content (Pce) shall be used for this calculation. (3) Voids in Mineral Aggregate shall be computed as specified by AASHTO R-35. (4) If the aggregate gradation passes beneath the PCS Control Point specified in Table 455.4, the dust-to-binder ratio range may be increased from 0.6-1.2 to 0.8-1.6 at the Engineer's discretion. (5) When used as a Surface Course under OGFC the Min %s for the #6 (1.18 mm) Sieve should be 40.

Each SUPERPAVE HMA mixture type, for both mix designs (Standard Superpave HMA - Table 455.5A and Modified Superpave HMA - Table 455.5B), shall be tested by the Contractor for Moisture Sensitivity in accordance with the requirements of AASHTO T 283. The compacted specimens for each LTMF shall exhibit a minimum tensile strength ratio of 80% as determined by AASHTO T 283. A minimum tensile strength ratio of 80% is required. The use of approved anti-stripping agents (either liquid or mineral) can be used to meet this requirement. If an anti-strip agent is required, it shall be included in the Contractor’s cost.

The Moisture Sensitivity test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture type. The Department will perform testing of the Moisture Sensitivity prior to SUPERPAVE HMA production as part of the verification of each LTMF.

J. Evaluation of LTMF for Rutting and Moisture Susceptibility.

Each SUPERPAVE LTMF that is designed for traffic levels two (2) through five (5) will be tested by the Department for rutting and moisture susceptibility using; the Hamburg Wheel Tracking Device in accordance with AASHTO T 324, the Asphalt Pavement Analyzer (APA) in accordance with AASHTO T 340, and AASHTO T 283. Each LTMF may also be evaluated by the Department using the Asphalt Mix Performance Tester (AMPT).

K. Evaluation of Plant Produced HMA for Rutting and Moisture Susceptibility.

Loose mixture plant produced Superpave HMA samples will be obtained during production and tested by the Department for rutting and moisture susceptibility using; the Hamburg Wheel Tracking Device in accordance with AASHTO T 324, the Asphalt Pavement Analyzer (APA) in accordance with AASHTO T 340, and AASHTO T 283. Each sample may also be evaluated by the Department using the Asphalt Mix Performance Tester (AMPT).

The Study samples will be drawn from either a split sample of each randomly obtained Department Acceptance sample or from separate random samples obtained by the Department. The Contractor shall also provide a split sample from each random QC sample if requested by the Department. Each sample will be clearly marked to indicate that it is from a Standard Superpave Mixture (S) or from a Modified Superpave Mixture (M).

Delete Subsection 450.66A. - Laboratory Verification of HMA Mix Design and replace with the following:

455.43 Verification of Laboratory Trial Mix Formula (LTMF)

The Contractor shall submit a LTMF with supporting documentation, a minimum of forty-five (45) days prior to production, to the Engineer with samples of blended aggregate material and PG Asphalt Binder. An adequate amount of the blended aggregate material and PG Asphalt Binder shall be supplied in order to verify the LTMF selected for production (proposed JMF).

If the Engineer is unable to verify the Contractor’s LTMF in accordance with the LTMF Verification Limits in Table 455.7, then the Engineer will work with the Contractor to resolve the verification issue(s). The Contractor shall not proceed with production and placement of the Control Strip (Section 450.66B.) until the LTMF is verified by the Engineer.
### Table 455.7 - SUPERPAVE HMA LTMF Verification Limits

<table>
<thead>
<tr>
<th>Properties</th>
<th>LTMF Verification Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Binder Content ( P_b )</td>
<td>Target ± 0.3 percent</td>
</tr>
<tr>
<td>Gradation Passing #4 (4.75 mm) and Larger Sieves</td>
<td>Target ± 6.0 percent</td>
</tr>
<tr>
<td>Gradation Passing #8 (2.36 mm) Sieve</td>
<td>Target ± 5.0 percent</td>
</tr>
<tr>
<td>Gradation Passing #16 (1.18 mm) to #50 (0.30 mm) Sieve</td>
<td>Target ± 3.0 percent</td>
</tr>
<tr>
<td>Gradation Passing #100 (0.15 mm) Sieve</td>
<td>Target ± 2.0 percent</td>
</tr>
<tr>
<td>Gradation Passing #200 (75 µm) Sieve</td>
<td>Target ± 1.0 percent</td>
</tr>
<tr>
<td>Max. Theo. Specific Gravity ( G_{mm} )</td>
<td>Target ± 0.02</td>
</tr>
<tr>
<td>Air Voids ( V_a )</td>
<td>Target ± 1.0 percent</td>
</tr>
<tr>
<td>Voids in Mineral Aggregate ( VMA )</td>
<td>Target ± 1.0 percent</td>
</tr>
<tr>
<td>Voids Filled With Asphalt ( VFA )</td>
<td>Target ± 5.0 percent</td>
</tr>
<tr>
<td>Bulk Specific Gravity ( G_{nb} )</td>
<td>Target ± 0.022</td>
</tr>
</tbody>
</table>
**COMPENSATION**

The Pay Adjustment provisions included in Subsection 450.92 - Pay Adjustment shall be applied to items under this contract.

*Delete Subsection 450.91D. - Hot Mix Asphalt and replace with the following:*

D. Hot Mix Asphalt.

Each Hot Mix Asphalt pavement course will be paid for at the contract unit price per ton (Megagram) of in-place mixture under the HMA Pay Items specified in Subsection 455.93. Payment shall include sweeping the underlying surface, transportation, delivery, placement including providing a Material Transfer Vehicle (MTV), and compaction of each HMA pavement course in accordance with Subsection 450.54 through Subsection 450.58.

All sawcutting required for transverse joints or longitudinal joints in accordance with Subsection 450.57 shall also be included in the contract unit price for each HMA pavement course.

All Contractor efforts related to the Gyratory Compaction Study, including; Superpave HMA LTMF design and verification, HMA production Quality Control, HMA placement Quality Control, and all other activities associated with the Study shall be compensated under the contract unit price for Item 450.90 - Contractor Quality Control.

*Delete Subsection 450.93 - Payment Items and replace with the following:*

<table>
<thead>
<tr>
<th>455.93</th>
<th>Payment Items</th>
<th>Payment Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>450.10</td>
<td>Open Graded Friction Course - Polymer Modified (OGFC - P)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.21</td>
<td>SUPERPAVE Surface Course - 4.75 (SSC - 4.75)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.22</td>
<td>SUPERPAVE Surface Course - 9.5 (SSC - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.23</td>
<td>SUPERPAVE Surface Course - 12.5 (SSC - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.24</td>
<td>SUPERPAVE Surface Course - 19.0 (SSC - 19.0)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.31</td>
<td>SUPERPAVE Intermediate Course - 12.5 (SIC - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.32</td>
<td>SUPERPAVE Intermediate Course - 19.0 (SIC - 19.0)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.41</td>
<td>SUPERPAVE Base Course - 25.0 (SBC - 25.0)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.42</td>
<td>SUPERPAVE Base Course - 37.5 (SBC - 37.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.51</td>
<td>SUPERPAVE Leveling Course - 4.75 (SLC - 4.75)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.52</td>
<td>SUPERPAVE Leveling Course - 9.5 (SLC - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.60</td>
<td>SUPERPAVE Bridge Surface Course - 9.5 (SSC-B - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.61</td>
<td>SUPERPAVE Bridge Surface Course - 12.5 (SSC-B - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.70</td>
<td>SUPERPAVE Bridge Protective Course - 9.5 (SPC-B - 9.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>455.71</td>
<td>SUPERPAVE Bridge Protective Course - 12.5 (SPC-B - 12.5)</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>450.90</td>
<td>Contractor Quality Control</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Unit</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>451</td>
<td>HMA for Patching</td>
<td>Ton (Megagram)</td>
</tr>
<tr>
<td>452</td>
<td>Asphalt Emulsion for Tack Coat</td>
<td>Gallon (Liter)</td>
</tr>
<tr>
<td>453</td>
<td>HMA Joint Sealant</td>
<td>Linear Foot (Meter)</td>
</tr>
<tr>
<td>999.490</td>
<td>HMA Pay Adjustment – PG Asphalt Binder Content</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.491</td>
<td>HMA Pay Adjustment – Volumetrics (Air Voids)</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.492</td>
<td>HMA Pay Adjustment – In-place Mat Density</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.493</td>
<td>HMA Pay Adjustment – Thickness</td>
<td>Dollar</td>
</tr>
<tr>
<td>999.494</td>
<td>HMA Pay Adjustment – Ride Quality</td>
<td>Dollar</td>
</tr>
</tbody>
</table>

1 Not a bid item
SPECIAL PROVISIONS – ATTACHMENT C

NATIONAL GRID DETAILS
Note: Construction joint to be sealed with asphalt or equivalent.

**PRECAST CONCRETE MANHOLES**

2 WAY DISTRIBUTION - 6 FEET X 13 FEET (INSIDE)

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>PAGE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/09</td>
<td>33-104</td>
</tr>
</tbody>
</table>
Section B-B

Detail "Y"
2 Required

Detail "Z"
8 Required

PRECAST CONCRETE MANHOLES
3 WAY DISTRIBUTION – 10 FEET X 13 FEET (INSIDE)

ISSUE | PAGE NUMBER | UNDERGROUND CONSTRUCTION STANDARD
7/09 | 33-106 | nationalgrid
Section A-A
Section A1-A1
Same As Section A-A With Exception Of Copper Ground Wire Location

Detail "Y"
2 Required

Detail "Z"
8 Required

Note: Construction joint to be sealed with asphalt or equivalent.

PRECAST CONCRETE MANHOLES
FOUR WAY DISTRIBUTION - 13 FEET X 13 FEET (INSIDE)

ISSUE PAGE NUMBER
7/09 33-108

underground construction standard
PRECAST CONCRETE MANHOLES
FOUR WAY DISTRIBUTION – 13 FEET X 13 FEET (INSIDE)
SPECIAL PROVISIONS – ATTACHMENT D

VERIZON CONDUIT & HANDHOLE SPECIFICATIONS
Enclosure Selection Guide

5. Box Styles

PG/LG Style
For use as a splice box, pull box, equipment enclosure or for any application requiring easy access to an underground service. Stackable for increased depth. Straight sides for easy adjustment of box to grade.

- LG style is 32% lighter in weight as compared to the PG box.
- Available in sizes:
  - 11” x 18”
  - 24” x 36”
  - 36” x 36”
  - 48” x 48”
  - 13” x 24”
  - 30” x 48”
  - 36” x 60”
  - 48” x 72”
  - 17” x 30”
  - 30” x 60”
  - 36” x 72”
  - 48” x 96”
- 12” - 42” depths

PD/LD Style
Enclosures with 1° (degree) flare for maximum strength. Flared design optimizes internal volume and prevents frost heave.

- Available in sizes:
  - 30” x 48”
- Design load: 15,000 lbs. Test load: 22,568 lbs.
- 24” deep

Box Numbering System

On the following Product Information pages, QUAZITE® products are referred to by an identifying part number. An example of the numbering system is shown below to help you understand how to identify the product you need for your application.

<table>
<thead>
<tr>
<th>Box Style</th>
<th>Nominal Size</th>
<th>Box Variation</th>
<th>Box Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>1730</td>
<td>BA</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>(width x length)</td>
<td>BA-box w/open bottom, BA-heavy duty BA box</td>
<td>12” deep</td>
</tr>
<tr>
<td></td>
<td>example: 17” x 30”</td>
<td>BB-box w/mouse holes, JA-footed box</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DA-box w/solid bottom, EA-extension</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DK-heavy duty DA box, BC-divided enclosure</td>
<td></td>
</tr>
</tbody>
</table>

Highlight areas indicate UL Listing.
5 Box Styles

PC Style
Straight sides permit easy movement of box should grade level change. Gasketing also available. All sizes are stackable.

- Sizes: 6" x 8", 8" x 18", 11" x 18" and 12" x 12"
  Design load: 15,000 lbs. Test load: 22,568 lbs.
- Sizes: 13" x 24" and 17" x 30"
  Design load: 5,200 lbs. Test load: 11,284 lbs.
- 6" - 18" depths

PX/LX Style
Service box assembles with flared sides. Nestable for compact storage.

- The LX style utilizes a lighter weight mix (32% lighter).
- PX/LX Sizes: 13" x 24" x 16" and 17" x 30" x 16"
  Design load: 5,200 lbs. Test load: 11,284 lbs.
- LX Size: 12" x 12" x 24"
  Design load: 15,000 lbs. Test load: 22,568 lbs.

PT/LT Style
(previously called PE style)
Flared design prevents frost heave. Covers are interchangeable with many precast concrete parts. Nestable for compact storage.

- The LT style utilizes a lighter weight mix (32% lighter).
- Sizes: 13" x 24" and 17" x 30"
- Design load: 15,000 lbs. Test load: 22,568 lbs.
- 18" deep

PR/LR Style
Round enclosures. Cover cannot fall into the box.

- Available in sizes: 27" dia. x 36" deep 39" dia. x 18", 24", 36" & 48" depths.
- Design load: 15,000 lbs. Test load: 22,568 lbs.

Highlighted areas indicate UL Listing
## Product Information

### PG - Stackable Boxes & Covers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>UPC #</th>
<th>Lead Rating (lbs.)</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PG1730CA00</td>
<td>10112</td>
<td>8,000 / 12,000</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PG1730WA00</td>
<td>11018</td>
<td>8,000 / 12,000</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Cover, Heavy Duty w/2 Bolts</td>
<td>PG1730HA00</td>
<td>10047</td>
<td>15,000 / 22,568</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>2</td>
<td>83</td>
</tr>
<tr>
<td>Box, w/Open Bottom 12&quot;</td>
<td>PG1730BA12</td>
<td>10043</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>12</td>
<td>67</td>
</tr>
<tr>
<td>Box, w/Open Bottom 18&quot;</td>
<td>PG1730BA18</td>
<td>10044</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>18</td>
<td>94</td>
</tr>
<tr>
<td>Box, w/Open Bottom 22&quot;</td>
<td>PG1730BA22</td>
<td>10045</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>22</td>
<td>106</td>
</tr>
<tr>
<td>Box, w/Open Bottom 24&quot;</td>
<td>PG1730BA24</td>
<td>11795</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>24</td>
<td>122</td>
</tr>
<tr>
<td>Box, w/Open Bottom 30&quot;</td>
<td>PG1730BA30</td>
<td>12672</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>28</td>
<td>126</td>
</tr>
<tr>
<td>Box, w/Mouseholes 12&quot;</td>
<td>PG1730BB12</td>
<td>10073</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>12</td>
<td>65</td>
</tr>
<tr>
<td>Box, w/Mouseholes 18&quot;</td>
<td>PG1730BB18</td>
<td>10074</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>18</td>
<td>92</td>
</tr>
<tr>
<td>Box, w/Mouseholes 22&quot;</td>
<td>PG1730BB22</td>
<td>10975</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>22</td>
<td>104</td>
</tr>
<tr>
<td>Box, w/Mouseholes 24&quot;</td>
<td>PG1730BB24</td>
<td>11763</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>24</td>
<td>120</td>
</tr>
<tr>
<td>Box, w/Mouseholes 30&quot;</td>
<td>PG1730BB30</td>
<td>12673</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>28</td>
<td>124</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 12&quot;</td>
<td>PG1730DA12</td>
<td>10098</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>12</td>
<td>65</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 18&quot;</td>
<td>PG1730DA18</td>
<td>10099</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>18</td>
<td>92</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 22&quot;</td>
<td>PG1730DA22</td>
<td>10990</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>22</td>
<td>124</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 24&quot;</td>
<td>PG1730DA24</td>
<td>11780</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>24</td>
<td>139</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 30&quot;</td>
<td>PG1730DA30</td>
<td>12674</td>
<td>22,568 / 33,852</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>28</td>
<td>143</td>
</tr>
<tr>
<td>Extension, w/Open Bottom</td>
<td>PG1730AE08</td>
<td>10070</td>
<td>22,568 / 33,852</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>8 3/4</td>
<td>36</td>
</tr>
<tr>
<td>Extension 3&quot; Grade Adjustable (S)</td>
<td>PG1730ED03</td>
<td>11764</td>
<td>22,568 / 33,852</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>5 1/8</td>
<td>48</td>
</tr>
<tr>
<td>Extension, w/Solid Bottom</td>
<td>PG1730EA08</td>
<td>11004</td>
<td>22,568 / 33,852</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>9 1/4</td>
<td>55</td>
</tr>
</tbody>
</table>

### PC - Stackable Boxes & Covers (For Heavy Duty Applications Use PG Series)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>UPC #</th>
<th>Lead Rating (lbs.)</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PC1730CA00</td>
<td>10035</td>
<td>5,200 / 11,284</td>
<td>18 1/8</td>
<td>31 1/4</td>
<td>3 1/2</td>
<td>33</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PC1730WA00</td>
<td>10097</td>
<td>5,200 / 11,284</td>
<td>18 1/8</td>
<td>31 1/4</td>
<td>3 1/2</td>
<td>33</td>
</tr>
<tr>
<td>Box, w/Open Bottom 12&quot;</td>
<td>PC1730BA12</td>
<td>10033</td>
<td>5,200 / 11,284</td>
<td>20 1/8</td>
<td>33 1/8</td>
<td>12</td>
<td>59</td>
</tr>
<tr>
<td>Box, w/Mouseholes 12&quot;</td>
<td>PC1730BB12</td>
<td>10853</td>
<td>5,200 / 11,284</td>
<td>20 1/8</td>
<td>33 1/8</td>
<td>12</td>
<td>58</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 12&quot;</td>
<td>PC1730DA12</td>
<td>10108</td>
<td>5,200 / 11,284</td>
<td>20 1/8</td>
<td>33 1/8</td>
<td>12</td>
<td>58</td>
</tr>
</tbody>
</table>

### PT - Nestable Boxes & Covers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>UPC #</th>
<th>Lead Rating (lbs.)</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PT1730CA00</td>
<td>12971</td>
<td>8,000 / 12,000</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PT1730WA00</td>
<td>12972</td>
<td>6,000 / 12,000</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Cover, Heavy Duty w/2 Bolts</td>
<td>PT1730HA00</td>
<td>12869</td>
<td>15,000 / 22,568</td>
<td>17 1/2</td>
<td>30 1/2</td>
<td>2</td>
<td>83</td>
</tr>
<tr>
<td>Box, w/Open Bottom 18&quot;</td>
<td>PT1730BA18</td>
<td>11627</td>
<td>15,000 / 22,568</td>
<td>19 1/8</td>
<td>32 1/8</td>
<td>18</td>
<td>96</td>
</tr>
</tbody>
</table>

### PX - Flared Boxes & Covers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>UPC #</th>
<th>Lead Rating (lbs.)</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PX1730CA00</td>
<td>10133</td>
<td>5,200 / 11,284</td>
<td>17 3/8</td>
<td>30 3/8</td>
<td>3 1/4</td>
<td>35</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PX1730WA00</td>
<td>11556</td>
<td>5,200 / 11,284</td>
<td>17 3/8</td>
<td>30 3/8</td>
<td>3 1/4</td>
<td>35</td>
</tr>
<tr>
<td>Box, w/Open Bottom 16&quot;</td>
<td>PX1730BA16</td>
<td>10125</td>
<td>5,200 / 11,284</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>16 3/4</td>
<td>88</td>
</tr>
<tr>
<td>Box, w/Mouseholes Open Bottom 16&quot;</td>
<td>PX1730BB16</td>
<td>11641</td>
<td>5,200 / 11,284</td>
<td>19 1/4</td>
<td>32 1/4</td>
<td>16 3/4</td>
<td>87</td>
</tr>
</tbody>
</table>

* Must be placed on bottom when stacking.
* UL Listed Item
* Authorized Distributor Core List item (covers listed on pg. 18)

(L) manufactured only in Lenoir City, Tennessee
(S) manufactured only in San Jose, California
# Product Information

## 24 x 36

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>UPC # 68-2037</th>
<th>Load Rating (lbs.)</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG - Stackable Boxes &amp; Covers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PG2436CA00 10072</td>
<td></td>
<td>8,000 / 12,000</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PG2436WA00 11106</td>
<td></td>
<td>8,000 / 12,000</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>Cover, Heavy Duty w/2 Bolts</td>
<td>PG2436HA00 10053</td>
<td></td>
<td>15,000 / 22,560</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>115</td>
</tr>
<tr>
<td>Box, w/Open Bottom 18&quot;</td>
<td>PG2436BA18 10049</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>151</td>
</tr>
<tr>
<td>Box, w/Open Bottom 24&quot;</td>
<td>PG2436BA24 10050</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>180</td>
</tr>
<tr>
<td>Box, w/Open Bottom 30&quot; (L)</td>
<td>PG2436BA30 10051</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>196</td>
</tr>
<tr>
<td>Box, w/Open Bottom 42&quot; (L)</td>
<td>PG2436BA42 12663</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>247</td>
</tr>
<tr>
<td>Box, w/Mouseholes 18&quot;</td>
<td>PG2436BB18 11060</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>151</td>
</tr>
<tr>
<td>Box, w/Mouseholes 24&quot;</td>
<td>PG2436BB24 11061</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>180</td>
</tr>
<tr>
<td>Box, w/Mouseholes 30&quot; (L)</td>
<td>PG2436BB30 10062</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>196</td>
</tr>
<tr>
<td>Box, w/Mouseholes 42&quot; (L)</td>
<td>PG2436BB42 12694</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>247</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 18&quot;</td>
<td>PG2436DA18 10075</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>181</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 24&quot;</td>
<td>PG2436DA24 10776</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>228</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 30&quot; (L)</td>
<td>PG2436DA30 10777</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>238</td>
</tr>
<tr>
<td>Box, w/Solid Bottom 42&quot; (L)</td>
<td>PG2436DA42 12685</td>
<td></td>
<td>22,560 / 33,852</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>285</td>
</tr>
<tr>
<td>Extension, w/Open Bottom</td>
<td>PG2436EA08 11078</td>
<td></td>
<td>22,560 / 33,852</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>57</td>
</tr>
<tr>
<td>Extension, 3&quot; Grade Adjustable (S)</td>
<td>PG2436ED04 11782</td>
<td></td>
<td>22,560 / 33,852</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>52</td>
</tr>
<tr>
<td>Extension, w/Solid Bottom</td>
<td>PG2436FA08 11092</td>
<td></td>
<td>22,560 / 33,852</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>95</td>
</tr>
</tbody>
</table>

## Divided Box & Covers

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>UPC # 68-2037</th>
<th>Load Rating (lbs.)</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PG1224CA00 10890</td>
<td></td>
<td>8,000 / 12,000</td>
<td>12 1/8</td>
<td>24</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PG1224CA00 11032</td>
<td></td>
<td>8,000 / 12,000</td>
<td>22 1/2</td>
<td>24</td>
<td>3</td>
<td>64</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PG1224WA00 10904</td>
<td></td>
<td>8,000 / 12,000</td>
<td>13 1/8</td>
<td>24</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>Cover, w/No Bolts</td>
<td>PG1224WA00 11046</td>
<td></td>
<td>8,000 / 12,000</td>
<td>22 1/2</td>
<td>24</td>
<td>3</td>
<td>64</td>
</tr>
<tr>
<td>Cover, w/2 Bolts</td>
<td>PG1224CA00 10072</td>
<td></td>
<td>8,000 / 12,000</td>
<td>24</td>
<td>35 5/8</td>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>Box, Divided 18&quot;</td>
<td>PG2436BC18 11063</td>
<td></td>
<td>8,000 / 12,000</td>
<td>26</td>
<td>37 5/8</td>
<td>3</td>
<td>155</td>
</tr>
</tbody>
</table>

* Must be placed on bottom when stacking.
☐ UL Listed Item
√ Authorized Distributor Core List item (covers listed on pg. 18)

(L) manufactured only in Lenoir City, Tennessee
(S) manufactured only in San Jose, California
**CONSTRUCTION NOTES**

TO DEVELOPER

VERIZON PIPE TO BE PLACED ON FIELD-SIDE OF TRENCH WHENEVER POSSIBLE...
DEVELOPER TO DIG TRENCH AND PLACE CONDUIT TO VERIZON SPECIFICATIONS AT NO COST TO VERIZON.

***DO NOT BACKFILL TRENCH PRIOR TO CALLING***

FOR AN INSPECTION

FAILURE TO DO SO COULD RESULT IN VERIZON REQUIRING THE CONTRACTOR TO RE-DIG THE TRENCH FOR INSPECTION PURPOSES, AT NO COST TO VERIZON.

CONTRACT WORK INSPECTOR (C.W.I.)

KEVIN HUGHES

508 751 1181

**REQUIRED**

G.L.B. PLACEMENT MAIN LINE
(SIDE VIEW)

FINISH GRADE

OPTION 'A'

(2) 4'-45 DEGREE SWEEPS & (1) 4'-22 DEGREE SWEEP

OPTION 'B'

OPTION 'C'

STONE BASE (6" MIN.)
HAND HOLE SITS ATOP OF STONE
NO STONE FILL INSIDE OF BOX

(2) 4'-45 DEGREE SWEEPS & (1) 4'-22 DEGREE SWEEP

**REQUIRED**

G.L.B. PLACEMENT MAIN LINE
(Overhead View)

FINISH GRADE

OPTION 'A'

(2) 4'-45 DEGREE SWEEPS & (1) 4'-22 DEGREE SWEEP

OPTION 'B'

OPTION 'C'

4'-MAX.
OVERHANG

EDGE OF PAVEMENT

EDGE OF PAVEMENT

ROAD

SWEETS SHOULD BE PLACED ACCORDING TO TRAFFIC PATTERNS.
IN ORDER TO PROVIDE MAXIMUM PROTECTION FROM FLOWS, AND OTHER VEHICLES.

MINIMUM OF 12" FROM FINISH GRADE

SCHEDULE 40 CLASS "C" PVC
WITH 45 DEGREE POLE BEND

TELED CATV

SAND OR SANDY SOIL

SAND OR LIGHT GRAVEL ELECTRIC

SELECT FILL FREE OF LARGE ROCKS AND DEBRIS.

A 12" SEPARATION MUST BE MAINTAINED BETWEEN ELECTRIC, PHONE, & CATV CONDUITS. THIS SEPARATION MUST BE LATERAL AND VERTICAL.
SPECIAL PROVISIONS – ATTACHMENT E

COMCAST DETAILS
**SPECIFICATIONS/DATA**

### Covers (Blank unless logo is specified)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DESIGN/TEST LOAD #</th>
<th>ANSI TIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/2 Bolts</td>
<td>PG2436CA00</td>
<td>100 (45.4 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>Gasketed w/2 Bolts</td>
<td>PG2436CG00</td>
<td>100 (45.4 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>No Bolts</td>
<td>PG2436VA00</td>
<td>100 (45.4 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>Heavy Duty w/2 Bolts</td>
<td>PG2436HA00</td>
<td>115 (52.2 kg)</td>
<td>15,000 / 22,500</td>
<td>15</td>
</tr>
<tr>
<td>Gasketed Heavy Duty</td>
<td>PG2436HG00</td>
<td>115 (52.2 kg)</td>
<td>15,000 / 22,500</td>
<td>15</td>
</tr>
<tr>
<td>Extra Heavy Duty w/2</td>
<td>PG2436HH00</td>
<td>122 (55.2 kg)</td>
<td>22,500 / 33,750</td>
<td>15*</td>
</tr>
</tbody>
</table>

- Covers with meter lids available upon request.
- Gasketed covers and bolt grommets must be used with a gasketed box. Gaskets reduce the inflow of fluids but do not make the enclosure watertight.

* Loadings for HH covers comply with all test provisions of ANSI/SCTE 77 except that the vertical design load is 22,500 lbs. with a test load of 33,750 lbs. over a 10” x 20” plate.

** Extensions (For use under 18” deep boxes only, one per box. For grade adjustable extension see page 41.)**

### Boxes (Stackable with self-aligning, replaceable EZ-Nut)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DIMENSION A</th>
<th>DIMENSION B</th>
<th>DESIGN/TEST LOAD #</th>
<th>ANSI TIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Bottom</td>
<td>PG2436BA18</td>
<td>141 (64.0 kg)</td>
<td>18” (457 mm)</td>
<td>15” (381 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BA24</td>
<td>180 (81.6 kg)</td>
<td>24” (610 mm)</td>
<td>21” (533 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BA30</td>
<td>196 (88.9 kg)</td>
<td>30” (762 mm)</td>
<td>27” (686 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BA42</td>
<td>265 (120.0 kg)</td>
<td>42” (1067 mm)</td>
<td>39” (991 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td>Open Bottom w/ Gasket</td>
<td>PG2436BG18</td>
<td>141 (64.0 kg)</td>
<td>18” (457 mm)</td>
<td>15” (381 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BG24</td>
<td>180 (81.6 kg)</td>
<td>24” (610 mm)</td>
<td>21” (533 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BG30</td>
<td>196 (88.9 kg)</td>
<td>30” (762 mm)</td>
<td>27” (686 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BG42</td>
<td>265 (120.0 kg)</td>
<td>42” (1067 mm)</td>
<td>39” (991 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td>Open Bottom w/ 2 Mouseholes</td>
<td>PG2436BB18</td>
<td>139 (63.1 kg)</td>
<td>18” (457 mm)</td>
<td>15” (381 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BB24</td>
<td>178 (80.7 kg)</td>
<td>24” (610 mm)</td>
<td>21” (533 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BB30</td>
<td>194 (88.0 kg)</td>
<td>30” (762 mm)</td>
<td>27” (686 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436BB42</td>
<td>263 (119.3 kg)</td>
<td>42” (1067 mm)</td>
<td>39” (991 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td>Solid Bottom</td>
<td>PG2436DA18</td>
<td>181 (82.1 kg)</td>
<td>18 1/2” (470 mm)</td>
<td>15” (381 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436DA24</td>
<td>228 (103.4 kg)</td>
<td>24 1/2” (622 mm)</td>
<td>21” (533 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436DA30</td>
<td>238 (107.0 kg)</td>
<td>30 1/2” (775 mm)</td>
<td>27” (686 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436DA42</td>
<td>293 (133.0 kg)</td>
<td>42 1/2” (1080 mm)</td>
<td>39” (991 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td>Solid Bottom w/ Gasket</td>
<td>PG2436DG18</td>
<td>181 (82.1 kg)</td>
<td>18 1/2” (470 mm)</td>
<td>15” (381 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436DG24</td>
<td>228 (103.4 kg)</td>
<td>24 1/2” (622 mm)</td>
<td>21” (533 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436DG30</td>
<td>238 (107.0 kg)</td>
<td>30 1/2” (775 mm)</td>
<td>27” (686 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
<tr>
<td></td>
<td>PG2436DG42</td>
<td>293 (133.0 kg)</td>
<td>42 1/2” (1080 mm)</td>
<td>39” (991 mm)</td>
<td>22,500 / 33,750</td>
<td>15**</td>
</tr>
</tbody>
</table>

* PG 2436BB42 is not UL Listed.

** Loadings comply with ANSI/SCTE 77. These boxes meet and exceed ANSI Tier 15 test provisions.

### Extensions (For use under 18” deep boxes only, one per box. For grade adjustable extension see page 41.)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DIMENSION C</th>
<th>DIMENSION D</th>
<th>DESIGN/TEST LOAD #</th>
<th>ANSI TIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Bottom</td>
<td>PG2436EA08</td>
<td>57 (25.9 kg)</td>
<td>8 3/4” (222 mm)</td>
<td>1” (25 mm)</td>
<td>22,500 / 33,750</td>
<td>15*</td>
</tr>
<tr>
<td>Solid Bottom</td>
<td>PG2436RA08</td>
<td>95 (43.1 kg)</td>
<td>9 1/4” (235 mm)</td>
<td>N/A</td>
<td>22,500 / 33,750</td>
<td>15*</td>
</tr>
</tbody>
</table>

* Loadings comply with ANSI/SCTE 77. These extensions meet and exceed ANSI Tier 15 test provisions.

Dimensions & weights in parentheses are metric equivalent.
### SPECIFICATIONS/DATA

#### Covers (Blank unless logo is specified)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DESIGN/TEST LOAD</th>
<th>ANSI TIER*</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/2 Bolts</td>
<td>PG3048CA00</td>
<td>159 (72.1 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>Gasketed w/2 Bolts</td>
<td>PG3048CG00</td>
<td>159 (72.1 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>No Bolts</td>
<td>PG3048WA00</td>
<td>159 (72.1 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>Heavy Duty w/2 Bolts</td>
<td>PG3048HA00</td>
<td>206 (93.4 kg)</td>
<td>15,000 / 22,500</td>
<td>15</td>
</tr>
<tr>
<td>Gasketed Heavy Duty w/2 Bolts</td>
<td>PG3048HC00</td>
<td>206 (93.4 kg)</td>
<td>15,000 / 22,500</td>
<td>15</td>
</tr>
<tr>
<td>Extra Heavy Duty w/2 Bolts</td>
<td>PG3048HP00</td>
<td>220 (99.7 kg)</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
<tr>
<td>2-piece w/2 Bolts</td>
<td>PG3048CS00</td>
<td>181 (82.1 kg)</td>
<td>8,000 / 12,000</td>
<td>8</td>
</tr>
<tr>
<td>Heavy Duty 2-piece w/2 Bolts</td>
<td>PG3048HS00</td>
<td>206 (93.4 kg)</td>
<td>15,000 / 22,500</td>
<td>15</td>
</tr>
</tbody>
</table>

#### PG Boxes (Stackable with self-aligning, replaceable EZ-Nut)

*24" & 36" deep boxes must be used as bottom of any stack

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DIMENSION A</th>
<th>DESIGN/TEST LOAD</th>
<th>ANSI TIER*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Bottom</td>
<td>PG3048BA18</td>
<td>185 (83.9 kg)</td>
<td>18&quot; (457 mm)</td>
<td>15&quot; (381 mm)</td>
<td>22,500 / 33,750</td>
</tr>
<tr>
<td>Open Bottom w/ Gasket</td>
<td>PG3048BG24</td>
<td>236 (107.0 kg)</td>
<td>24&quot; (609 mm)</td>
<td>21&quot; (533 mm)</td>
<td>22,500 / 33,750</td>
</tr>
<tr>
<td>Open Bottom w/ 2 Mouseholes</td>
<td>PG3048BB18</td>
<td>185 (83.9 kg)</td>
<td>18&quot; (457 mm)</td>
<td>15&quot; (381 mm)</td>
<td>22,500 / 33,750</td>
</tr>
<tr>
<td>Solid Bottom</td>
<td>PG3048DA18</td>
<td>220 (99.8 kg)</td>
<td>18 1/2&quot; (470 mm)</td>
<td>15&quot; (381 mm)</td>
<td>22,500 / 33,750</td>
</tr>
<tr>
<td>Solid Bottom w/ Gasket</td>
<td>PG3048DG36</td>
<td>394 (178.7 kg)</td>
<td>36 1/2&quot; (927 mm)</td>
<td>33&quot; (838 mm)</td>
<td>22,500 / 33,750</td>
</tr>
</tbody>
</table>

#### PD Boxes (Nestable)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DIMENSION C</th>
<th>DIMENSION D</th>
<th>DESIGN/TEST LOAD</th>
<th>ANSI TIER*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Bottom</td>
<td>PD3048BA24</td>
<td>286 (130 kg)</td>
<td>24&quot; (610 mm)</td>
<td>21&quot; (533 mm)</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
<tr>
<td>Open Bottom w/ Gasket</td>
<td>PD3048BG24</td>
<td>286 (130 kg)</td>
<td>24&quot; (610 mm)</td>
<td>21&quot; (533 mm)</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
<tr>
<td>Open Bottom w/ 2 Mouseholes</td>
<td>PD3048BB24</td>
<td>614 (278.5 kg)</td>
<td>48&quot; (1219 mm)</td>
<td>45&quot; (1143 mm)</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
</tbody>
</table>

#### Top Extension (For use on top of PG and PD boxes of any depth)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DESIGN/TEST LOAD</th>
<th>ANSI TIER*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Bottom*</td>
<td>PG3048EA11</td>
<td>100 (45.4 kg)</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
</tbody>
</table>

* In addition, this extension can be used as a bottom extension for 18” deep PG boxes.

#### Bottom Extensions (For use under 18” deep PG style box only, one per box)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>WEIGHT #</th>
<th>DIMENSION E</th>
<th>DIMENSION F</th>
<th>DESIGN/TEST LOAD</th>
<th>ANSI TIER*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Bottom</td>
<td>PG3048EA08</td>
<td>102 (46.3 kg)</td>
<td>6 3/4&quot; (222 mm)</td>
<td>1&quot; (25 mm)</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
<tr>
<td>Solid Bottom</td>
<td>PG3048RA08</td>
<td>151 (58.0 kg)</td>
<td>9 1/4&quot; (235 mm)</td>
<td>N/A</td>
<td>22,500 / 33,750</td>
<td>22</td>
</tr>
</tbody>
</table>

Dimensions & weights in parentheses are metric equivalent.

* Loadings comply with ANSI/SCTE 77 (see page 9).
Concrete Sidewalk

37 5/8"

Lifting Bolts embedded into concrete as part of sidewalk pour

PVC conduit to extend 4" from bottom of vault

Sch. 40 Conduit

¾” Gravel to extend 12" beyond vault perimeter of vault extension. ¾” Gravel stone to be no more than 6” in depth inside of vault extension.

Sch. 40 Conduit

Lifting Bolts embedded into concrete as part of sidewalk pour

PVC conduit to extend 4" from bottom of vault

Drawn By: Chris Thompson 11/29/2012
Sidewalk Layout

Note: Comcast vault cover should have CATV embossed into it.